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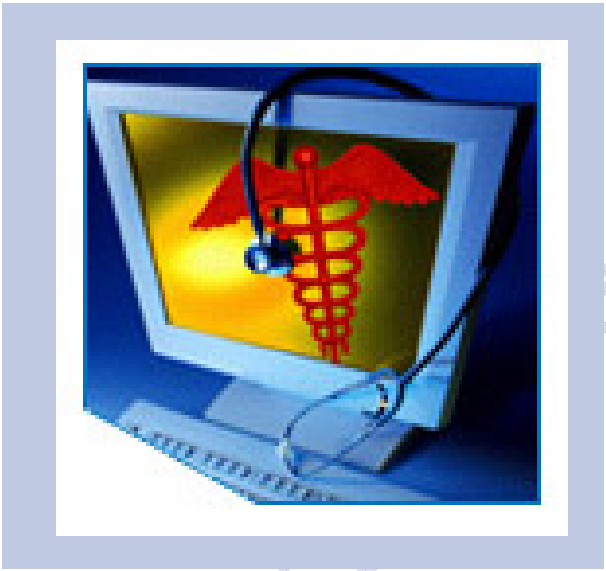
HITSP Interoperability Specification: Laboratory Result Message Component

HITSP/ISC-36



Submitted to:

Healthcare Information Technology Standards Panel

Submitted by:

Electronic Health Record Technical Committee
Biosurveillance Technical Committee

DOCUMENT CHANGE HISTORY

Version Number	Description of Change	Name of Author	Date Published
1.0	Final Draft	Electronic Health Record Technical Committee	18-August 2006

1.0 FOREWORD

Healthcare Information Technology Standards Panel (HITSP) is a multi-stakeholder coordinating body designed to provide the process within which affected parties can identify, select, and harmonize standards for communicating healthcare information throughout the healthcare spectrum. HITSP functions as a partnership of the public and private sectors and operates with a neutral and inclusive governance model administered by the American National Standards Institute. The goal of the Panel is to:

- Facilitate the development of harmonized interoperability specifications and information policies, including SDO work products (e.g. standards, technical reports). These policies, profiles and work products are essential for establishing privacy, security and interoperability among healthcare software applications.
- Coordinate, as appropriate, with other national, regional and international groups addressing healthcare informatics to ensure that the resulting standards are globally relevant.
- Be use-case driven, utilize information from stakeholders and base its decisions on industry needs.

The HITSP shall serve the public good by working to ensure that the combined work of various healthcare information standards organizations supports interoperability, accurate use, access, privacy and security of shared health information.

In order to advance the goal of expanding harmonized interoperability specifications and information policies, HITSP was tasked with developing interoperability specifications for three main use case "breakthroughs areas" in which specific, near term value to the health care consumer could be realized. The harmonized use case areas are:

1.	Biosurveillance	Transmit essential ambulatory care and emergency department visit, utilization, and lab result data from electronically enabled health care delivery and public health systems in standardized and anonymized format to authorized Public Health Agencies with less than one day lag time.
2.	Consumer Empowerment	Allow consumers to establish and manage permissions access rights and informed consent for authorized and secure exchange, viewing, and querying of their linked patient registration summaries and medication histories between designated caregivers and other health professionals.
3.	Electronic Health Record	Allow ordering clinicians to electronically access laboratory results, and allow non-ordering authorized clinicians to electronically access historical and other laboratory results for clinical care.

The interoperability specification provides a detailed mapping of existing standards and specifications such as implementation guides, integration profiles to actions and actors that satisfy the requirements imposed by the relevant use cases. It identifies and constrains standards where necessary, and creates

groupings of specific actions and actors to further describe the relevant contexts. Where gaps and overlaps are identified, the interoperability specification provides recommendations and a roadmap for corrections to be made.

2.0 INTRODUCTION

The purpose of this document is to describe the specification for a constrained Health Level Seven (HL7) V2.5 Unsolicited Specimen Oriented Observation Message (Event R22). The goals supported by this Component specification are stated in the EHR and Biosurveillance Use Cases:

- Transmission of complete, preliminary, final and updated lab results to the EHR system (local or remote) of the ordering clinician;
- Transmission of complete, preliminary, final and updated (or notification) to the EHR system (local or remote) or other clinical data system of designated providers of care (with respect to a specific patient)
- Transmit … *lab result* *data* from electronically enabled health care delivery and public health systems in standardized and anonymized format to authorized Public Health Agencies with less than one day lag time.

The Use Cases note that there are obstacles to achieving the stated goals. In particular, the following obstacle is delineated:

- Lack of harmonization among data interoperability standards including vocabulary and laboratory and other messaging standards.

This Component is the result of a considered assessment of the current practices in electronic laboratory results reporting and the requirements of the Use Case. In order to encourage rapid and widespread adoption of this component, the committee placed emphasis on the message content in current implementations and the ease with which current implementations can become compliant. HL7 Version 2.x message-based lab result reporting is the most common electronic interface in existence today and the committee did not want to invalidate those interfaces.

2.1 OVERVIEW

The Interoperability Specification focuses on a set of constrained standards for information interchange that address the core requirements of the Use Case described herein. It does not define all functions, constructs and standards necessary to implement a conforming system in a real world environment. In particular, an implementer must provide the technical infrastructure and security framework necessary to support operations in accordance with law, regulation, best practices and business agreements.

This component specification describes the structure and data fields for the HL7 Version 2.5 Unsolicited Specimen Oriented Observation Message as constrained for the HITSP EHR and Biosurveillance Use Cases. In order to satisfy both use cases, some segments and data fields are included that are needed

by only one of the use cases, but since both require the same core information, they were combined. This allows a laboratory to implement a single message for both situations.

The vocabulary for the coded attributes in this component is described in a related component document:

Related Documents	Document Description	Document Name and Location
HITSP/ISC-35	HITSP Interoperability Specification: EHR Lab Terminology Component	ISC_HITSP_35_v1.0_2006

Table 2.1-1 Document Relationships

2.2 AUDIENCE

The interoperability specification is designed to be used by analysts who need to understand the interoperability requirements for the described use case, and by implementers working to develop interoperable applications. Understanding and using the relevant interoperability set of specifications is a key requirement for establishing interoperability compliance.

2.3 TERMS AND DEFINITIONS

The definitions used for the purposes of this document can be found in the glossary. Refer to the glossary located in the appendix.

2.4 CONVENTIONS

This specification uses the following to convey the full descriptions and usage of standards:

UML sequence and activity diagrams

In these diagrams, the actors and transactions are highlighted within the framework of the specific scenario or context. The actors involved in the specified use-scenario or context are mapped out, and the interactions between each action and actor for a particular context, and the flow of data are provided through the use of arrows. Diagrams are named according to the section in which they reside, and will use the following naming convention:

Figure <section number>-<consecutive number for the diagram, e.g. 1, 2, 3, etc.>. <Short name/description of diagram>. For example, a diagram residing in section 3.1.3 showing the Actor Interactions for the Send Lab Results transaction package is named:

Figure 3.1.3-1. Send Lab Results Transaction Package

Tables

Tables are used to indicate standards categorizations, as well as dependencies and constraints between constructs. Tables are named according to the section in which they reside, and will use the following naming convention:

Table <section number>-<consecutive number for the table, e.g. 1, 2, 3, etc.>. <Short name/description of table>. For example, a table residing in section 2.7.1 showing the Dependencies between the transactions for the Send Lab Results transaction package is named:
Table 2.7.1-1. Send Lab Results Transaction Package dependencies

References

When references are made to another section within an Interoperability Specification a section number is used by itself. When references are made to other constructs that are related to the Interoperability Specification, such as Transaction Packages, Components or Composite Standards, the HITSP document short name and section number are displayed as follows:

<HITSP Document short name or Composite Standard Short Name>-<Volume Number>: <section number>

where:
<HITSP document short name> is a short designator for the construct (e.g. HITSP/ISTP-013)
<Composite Standard Short Name> is a short designator for the composite standard (e.g. IHE-ITI TF)
<Volume Number> is the applicable volume within the given composite standard (e.g. 1)
<section number> is the applicable section number (e.g. 3.1)

For example: HITSP/ISTP-013: 3.1 refers to Section 3.1 in the Interoperability Specification for a Transaction Package, IHE-ITI TF-2: 4.33 refers to Section 4.33 in volume 2 of the IHE IT Infrastructure Technical Framework.

Reproductions

Where large sections of composite standards or base standards are reproduced within a HITSP specification, the reproduced sections are cited with introductory text containing the reference information for the composite or base standard. In addition, the beginning and ending of the reproduced text are respectively shown using a beginning statement:

The text for the <composite or base standard name> specification begins here:

And an ending statement:

The text for the <composite or base standard name> ends here.

The conventions used within this document to describe the structure and field definitions follow those used in the HL7 V2.5 Standard. The message structure and segment tables for this component are defined using the format described in the Conformance section of Chapter 2 of the HL7 Standard. In addition, segments or fields that are not included in this specification have been grayed out. The usage or optionality of a field, and its cardinality, are stated in terms of conformance to the HITSP specification, which may be a tighter constraint than the HL7 Standard.

180 The following tables show the usage and cardinality codes and definitions that are used in the structure and message segment tables:

Usage

Value	Description	Comment
R	Required	A conforming sending application shall populate all "R" elements with a non-empty value. Conforming receiving application shall process (save/print/archive/etc.) or ignore the information conveyed by required elements. A conforming receiving application must not raise an error due to the presence of a required element, but may raise an error due to the absence of a required element. Any element designated as required in a standard HL7 message definition shall also be required in all HL7 message profiles of that standard message.
RE	Required but may be empty	The element may be missing from the message, but must be sent by the sending application if there is relevant data. A conforming sending application must be capable of providing all "RE" elements. If the conforming sending application knows the required values for the element, then it must send that element. If the conforming sending application does not know the required values, then that element will be omitted. Receiving applications will be expected to process (save/print/archive/etc.) or ignore data contained in the element, but must be able to successfully process the message if the element is omitted (no error message should be generated because the element is missing).
O	Optional	This code indicates that the Usage for this element has not yet been defined. A usage of 'Optional' may not be used in 'implementation' profiles (no-optionality profiles). Conformance may not be tested on an Optional field. Narrower profiles may be defined based on this profile, and may assign any usage code to the element
C	Conditional	This usage has an associated condition predicate If the predicate is satisfied: A conformant sending application must always send the element. A conformant receiving application must process or ignore data in the element. It may raise an error if the element is not present. If the predicate is NOT satisfied: A conformant sending application must NOT send the element. A conformant receiving application must NOT raise an error if the condition predicate is false and the element is not present, though it may raise an error if the element IS present.

Value	Description	Comment
CE	Conditional but it may be empty	This usage has an associated condition predicate If the predicate is satisfied: If the conforming sending application knows the required values for the element, then the application must send the element. If the conforming sending application does not know the values required for this element, then the element shall be omitted. The conforming sending application must be capable of knowing the element (when the predicate is true) for all 'CE' elements. If the element is present, the conformant receiving application shall process (display/print/archive/etc.) or ignore the values of that element. If the element is not present, the conformant receiving application shall not raise an error due to the presence or absence of the element. If the predicate is not satisfied: The conformant sending application shall not populate the element. The conformant receiving application may raise an application error if the element is present.
X	Not supported	For conformant sending applications, the element will not be sent. Conformant receiving applications may ignore the element if it is sent, or may raise an application error.

185 Table 2.4-1 Usage and cardinality codes used in message segment tables

Cardinality

Cardinality identifies the minimum and maximum number of repetitions for a particular element (Segment Group, Segment or Field).

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Value	Description	Comment
[0..0]	Element never present	
[0..1]	Element may be omitted and it 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 for 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	

Table 2.4-2 Element Cardinalities

2.5 COMMENTS

To submit comments for this interoperability specification, please download the Comment Submission sheet from the HITSP site at www.hitsp.org and provide all relevant information, and then email the completed document to hitspcomments@ansi.org. Comments are consolidated periodically and sent to the Technical Committees for review.

2.6 COPYRIGHT PERMISSIONS

3.0 STANDARDS REFERENCES

It is HITSP's policy to only incorporate standards that have been approved according to the formal policy of the standards development organization that publishes the standard. HITSP interprets approval to include standards for trial use. The objective is to incorporate only standards that are managed within a formal life cycle process as defined by the SDO. In some cases, where we believe a not yet approved standard best meets the requirements of an Interoperability Specification, HITSP may provisionally select and conditionally use such standard subject to the following:

- The standard is approved by the time that the Interoperability Specification is released by HITSP.
- The standard approved is substantially the same as it was when provisionally used.

If either condition is not met at the date of the HITSP Interoperability Specification release, HITSP may continue to use the "standard" as it was in its provisional state until such time as HITSP can replace it with a more suitable artifact. In this circumstance, the SDO would have no responsibility to maintain or correct this artifact.

The EHR Selected standards June v1.4 deliverable contains a list of all the considered standards and a designation as to which ones were definitely selected and which ones are provisional. This selection was arrived at by a consensus of the members of the EHR Technical Committee and validated through the HITSP oversight process. HL7 2.x was selected because of its wide adoption in the U.S. and 2.5 was selected because it is the most current ANSI approved 2.x version. HL7 2.5 was also selected because it was the best fit to the functional scope of the use case.

3.1 LIST OF BASE STANDARDS

This component specification is drawn directly from the HL7 Version 2.5 standard.

Information Interchange Standards	
Standard	Description/Reason for selection/Reference
Health Level Seven (HL7) Messaging Standard Version 2.5 ORU – Unsolicited Observation Message – (Event R01)	The HL7 Version 2 Messaging Standard is an application protocol for electronic data exchange in healthcare that is maintained by HL7, an (ANSI) -accredited Standards Developing Organization (SDO) operating in the healthcare arena. HL7 Version 2 was chosen because of its widespread use in the US and internationally and its proven effectiveness. Version 2.5 was chosen because it has the specimen fields necessary for the Biosurveillance Use Case. Visit www.hl7.org for more information

Table 3.1-1 List of Base Standards

3.2 LIST OF COMPOSITE STANDARDS

This specification is based on the HL7 V2.5 Messaging Standard. It has been informed by the EHR-Lab Interoperability and Connectivity Standards (ELINCS) project developed by the California HealthCare Foundation (CHCF). It has also been informed by IHE Lab and the extensive experience of the HITSP panel members in developing lab interfaces using HL7.

4.0 COMPONENT

4.1 CONTEXT OVERVIEW

The context for the Lab Result Message has the premise that a lab has received an order to perform a test. The test has been performed and the results, preliminary or final, are ready to be reported back to the ordering clinician. It does not matter if the order was a paper order or an electronic order. If it is a paper order, the lab enters the order information into the Laboratory Information System (LIS), including the placer order number, and the LIS collects the results from the instruments or through manual data entry.

4.1.1 CONTEXTUAL CONSTRAINTS

This component is based directly on the HL7 V2.5 standard. As is typical with all HL7 interfaces, this specification places constraints on the individual fields in the message to guarantee a certain amount of predictability in obtaining the required information for the HITSP use cases. Optional use of elements has been retained for fields that are not of interest to HITSP, but may already exist in current implementations. Further, a number of elements are optional to allow for additional constraints to be applied in other HITSP constructs. It is not the intent of this specification to invalidate current implementations because they contain useful information that is not needed in the HITSP use cases.

This specification has attempted to define all of the fields necessary to report microbiology results, but the mechanism for encoding these results in the HL7 Unsolicited Specimen Oriented Observation Message –

(Event R22) is complicated. It involves linking segments within a message and linking parent messages to children messages. This complication is necessary to allow the flexibility to report multiple organisms and multiple susceptibilities for each organism while still providing an unambiguous method for updating results. Additional explanation for this linking is provided at Appendix B.

4.1.2 TECHNICAL ACTORS

The technical actors for this component are:

Actor	Description
Lab Result Sender	A system that has lab result information and has a need to communicate that information with another system
Lab Result Receiver	A system that has a requirement to process lab results and receives those results from another source.

Table 4.1.2-1 List of Technical Actors

4.2 INFORMATION INTERCHANGE COMPONENTS: RULES FOR IMPLEMENTING

The Lab Result Message Component contains the field-level detail for the data elements in a lab result message. It defines constraints on the HL7 Version 2.5 Unsolicited Specimen Oriented Observation Message (Event R22) by indicating fields that a vendor or system implementer must implement to be conformant with the HITSP use cases.

4.2.1 PROCESS PRE-CONDITIONS

Before this message can be sent, the order and specimen must have been received by the lab and the ordered test completed. Information about the patient, the order, the specimen, and the test are available to the sender of this message.

4.2.1.1 PROCESS TRIGGERS

The trigger for this message varies depending on the circumstance. It may be a routine report from a lab to the ordering provider or it may be something more complicated like a report to a public health agency. These triggers are described in higher-level specifications that include this component.

4.2.2 PROCESS POST-CONDITIONS

The post condition for this message transmission is that the receiver is able to accept the transmission and parse the content. Additional post conditions may be described in higher level specifications that include this component.

4.2.2.1 PROCESS OUTPUTS

The output from this message transmission is the message itself. The use of the information is dependent on the circumstances. These circumstances are described in higher-level specifications that include this component.

4.2.3 DATA STRUCTURE

The following is extracted from the HL7 Version 2.5 standard and defines the usage for the message structure selected from the HL7 standard for use in communicating lab results to providers of care (this does not include lab result documents which are covered in another EHR component specification).

ORU – Unsolicited Observation Message – (Event R01)

This message was designed to accommodate laboratory testing.

The table below lists the segments in the Unsolicited Observation Message (Event R01) and follows the convention for usage and cardinality described above under Section 2.4 Conventions.

Segment	Unsolicited Observation Message (Event R01)	Usage	Cardinality	HL7 Chapter
MSH	Message Header	R	[1..1]	2
[{SFT}]	Software Segment	O	[0..*]	2
[NTE]	Notes and Comments	O	[0..*]	2
{	--- PATIENT_RESULT begin	R	[1..*]	
[	--- PATIENT begin	RE	[0..1]	
PID	Patient Identification	R	[1..1]	3
[PD1]	Additional Demographics	O	[0..1]	3
[{NTE}]	Notes and Comments (for Patient ID)	O	[0..*]	2
[{NK1}]	Next of Kin/Associated Parties	O	[0..*]	3
[	--- VISIT begin	O	[0..1]	
PV1	Patient Visit	R	[1..1]	3
[PV2]	Patient Visit – Additional Information	RE	[0..1]	3
]	--- VISIT end			
]	--- PATIENT end			
{	--- ORDER_OBSERVATION begin	R	[1..*]	
[ORC]	Order common	O	[0..1]	4
OBR	Observation Order	R	[1..1]	7
[{NTE}]	Notes and Comments (for Detail)	O	[0..*]	2
[{	--- TIMING_QTY begin	RE	[0..*]	
TQ1	Timing/Quantity	R	[1..1]	4
[{TQ2}]	Timing/Quantity Order Sequence	O	[0..*]	4
}]	--- TIMING_QTY end			
[CTD]	Contact Data	O	[0..1]	11
[{	--- OBSERVATION begin	RE	[0..*]	
OBX	Observation related to OBR	R	[1..1]	7

Segment	Unsolicited Observation Message (Event R01)	Usage	Cardinality	HL7 Chapter
[{NTE}]	Notes and Comments	O	[0..*]	2
}]	--- OBSERVATION end			
[{FT1}]	Financial Transaction	O	[0..*]	6
[{CTI}]	Clinical Trial Identification	O	[0..*]	7
[{	--- SPECIMEN begin	RE	[0..*]	
SPM	Specimen information	R	[1..1]	7
[{ OBX }]	Observation Result (for Specimen)	O	[0..*]	7
}	--- SPECIMEN end			
}	--- ORDER_OBSERVATION end			
}	--- PATIENT_RESULT end			
[DSC]	Continuation Pointer	X	[0..0]	2

Table 4.2.3-1 ORU Unsolicited Observation Message

NOTES:

1. See HL7 Version 2.5 Messaging Standard for a definition of segments not otherwise described in this document.
2. There is a risk in using OBX and NTE segments that pertain to the identification of patients and providers, and potential compromise of privacy protections.
3. The Observation Group, although shown as RE for this HITSP Component, is REQUIRED for both the ONC EHR Lab use case and the ONC Biosurveillance use case.
4. For the Specimen Group, best practice is always to populate the group, and it is REQUIRED to populate the group for microbiologic studies for the Biosurveillance use case.

4.2.3.1 DATA MAPPING

The following tables present the HL7 Unsolicited Specimen Oriented Observation Message (Event 22) segments and field definitions. The segment is first presented with a row for each field in the message as is commonly seen in the HL7 Version 2.5 Standard. Following each segment are tables to indicate significant characteristics and notes about each selected field. Vocabulary for the coded attributes is indicated in the field-level tables. The value sets themselves are shown in Appendix A.

4.2.3.1.1 MESSAGE HEADER SEGMENT

HL7 Attribute Table - MSH – Message Header

SEQ	LEN	DT	USE	CARD	TBL#	ITEM#	ELEMENT NAME
1	1	ST	R	[1..1]		00001	Field Separator
2	4	ST	R	[1..1]		00002	Encoding Characters
3	227	HD	RE	[0..1]	HL70361	00003	Sending Application
4	227	HD	R	[1..1]	HL70362	00004	Sending Facility

SEQ	LEN	DT	USE	CARD	TBL#	ITEM#	ELEMENT NAME
5	227	HD	RE	[0..1]	HL70361	00005	Receiving Application
6	227	HD	RE	[0..1]	HL70362	00006	Receiving Facility
7	26	TS	R	[1..1]		00007	Date/Time Of Message
8	40	ST	O	[0..1]		00008	Security
9	15	MSG	R	[1..1]		00009	Message Type
10	20	ST	R	[1..1]		00010	Message Control ID
11	3	PT	R	[1..1]		00011	Processing ID
12	60	VID	R	[1..1]		00012	Version ID
13	15	NM	RE	[0..1]		00013	Sequence Number
14	180	ST	O	[0..1]		00014	Continuation Pointer
15	2	ID	O	[0..1]		00015	Accept Acknowledgment Type
16	2	ID	O	[0..1]		00016	Application Acknowledgment Type
17	3	ID	O	[0..1]		00017	Country Code
18	16	ID	O	[0..*]		00692	Character Set
19	250	CE	O	[0..1]		00693	Principal Language Of Message
20	20	ID	O	[0..1]		01317	Alternate Character Set Handling Scheme
21	427	EI	R	[1..*]		01598	Message Profile Identifier

Table 4.2.3.1.1-1 Message Header Segment

NOTES:

1. Sending application/facility and receiving application/facility elements should be populated to uniquely identify the sender and receiver.
2. Message profile identifier is REQUIRED to be populated with an ONC use case designation (TBD). This may be used for HITSP conformance testing and/or for other purposes.

4.2.3.1.2 PATIENT IDENTIFICATION AND INFORMATION SEGMENT

HL7 Attribute Table - PID - Patient Identification

SEQ	LEN	DT	USE	CARD	TBL#	ITEM#	ELEMENT NAME
1	4	SI	R	[1..1]		00104	Set ID – PID
2	20	CX	X	[0..0]		00105	Patient ID
3	250	CX	R	[1..*]		00106	Patient Identifier List
4	20	CX	X	[0..0]		00107	Alternate Patient ID - PID
5	250	XPN	R	[1..1]		00108	Patient Name
6	250	XPN	RE	[0..1]		00109	Mother's Maiden Name
7	26	TS	RE	[0..1]		00110	Date/Time of Birth
8	1	IS	RE	[0..1]	0001	00111	Administrative Sex
9	250	XPN	X	[0..0]		00112	Patient Alias
10	250	CE	O	[0..*]		00113	Race
11	250	XAD	RE	[0..*]		00114	Patient Address
12	4	IS	X	[0..0]	0289	00115	County Code
13	250	XTN	O	[0..*]		00116	Phone Number – Home
14	250	XTN	O	[0..*]		00117	Phone Number - Business
15	250	CE	O	[0..1]		00118	Primary Language
16	250	CE	O	[0..1]		00119	Marital Status
17	250	CE	O	[0..1]		00120	Religion
18	250	CX	O	[0..1]		00121	Patient Account Number
19	16	ST	X	[0..0]		00122	SSN Number – Patient
20	25	DLN	X	[0..0]		00123	Driver's License Number - Patient
21	250	CX	O	[0..*]		00124	Mother's Identifier
22	250	CE	O	[0..*]		00125	Ethnic Group
23	250	ST	O	[0..1]		00126	Birth Place
24	1	ID	O	[0..1]		00127	Multiple Birth Indicator
25	2	NM	O	[0..1]		00128	Birth Order
26	250	CE	O	[0..*]		00129	Citizenship
27	250	CE	O	[0..1]		00130	Veterans Military Status
28	250	CE	X	[0..0]	0212	00739	Nationality
29	26	TS	RE	[0..1]		00740	Patient Death Date and Time
30	1	ID	RE	[0..1]	0136	00741	Patient Death Indicator
31	1	ID	R	[1..1]	0136	01535	Identity Unknown Indicator
32	20	IS	O	[0..*]		01536	Identity Reliability Code
33	26	TS	O	[0..1]		01537	Last Update Date/Time
34	241	HD	O	[0..1]		01538	Last Update Facility
35	250	CE	O	[0..1]	0446	01539	Species Code
36	250	CE	O	[0..1]	0447	01540	Breed Code
37	80	ST	O	[0..1]		01541	Strain
38	250	CE	O	[0..2]	0429	01542	Production Class Code
39	250	CWE	O	[0..*]	0171	01840	Tribal Citizenship

Identifier	PID-1 Set ID	
Description	Sequence number of patients being identified. Only one patient per message is permitted by this specification.	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	SI	Sequence Identifier
Conformance	R	Value must always be supplied (no nulls)
Repetitions	N	Does not repeat
Code Domain	fixed value	Only the number 1 may be used

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Identifier	PID-3.1 Patient Identifier List: ID Number	
Description	Full Identification Number of Patient, including all check digits and other qualifiers	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ST	String
Conformance	R	Value must always be supplied (no nulls)
Repetitions	Y	Must be at least one occurrence, but may repeat, along with other components of PID-3, for each ID Number the Source wishes to convey at its discretion
Code Domain	n/a	Free text

Identifier	PID-3.4.2 Patient Identifier List Assigning Authority's Universal ID	
Description	A value identifying the organization or facility that assigned the patient ID Number	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ST	String
Conformance	R	Value must always be supplied (no nulls)
Repetitions	Y	Must be at least one occurrence, but may repeat, along with other components of PID-3, for each ID Number the Source wishes to convey at its discretion
Code Domain	See PID-3.4.3	Free text

Identifier	PID-3.4.3 Patient Identifier List: Assigning Authority's Universal ID Type	
Description	A value identifying the source of the value used for Assigning Authority's Universal ID	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ID	Coded value from code domain list below
Conformance	R	Value must always be supplied (no nulls)
Repetitions	Y	Must be at least one occurrence, but may repeat, along with other components of PID-3, for each ID Number the Source wishes to convey at its discretion
Code Domain	"NPI" "TIN"	HIPAA National Provider ID Federal Tax Identification Number; which shall only be used if Assigning Authority is not classified as a "covered health care provider" under Title 45 of the Code of Federal Regulations, §162.402

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Identifier	PID-5.1 Patient Name: Family Name Surname / Last Name Surname	
Description	Family / last name surname of patient being identified.	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	FN	Family Name
Conformance	R	Value must always be supplied (no nulls)
Repetitions	Y	Must be at least one occurrence, but may repeat, along with other components of PID-5, for each Patient Name the Source wishes to convey at its discretion
Code Domain	n/a	Free text

Identifier	PID-5.2 Patient Name: Given Name / First Name	
Description	Given / first name of patient being identified.	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ST	String
Conformance	RE	Value must be supplied when data is available
Repetitions	Y	Must be at least one occurrence, but may repeat, along with other components of PID-5, for each Patient Name the Source wishes to convey at its discretion
Code Domain	n/a	Free text

Identifier	PID-5.3 Patient Name: Middle Names	
Description	Middle names of patient being identified.	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ST	String
Conformance	RE	Value(s) must be supplied when data is available. If more than one middle name is available, all available middle names shall be repeated within this data element
Repetitions	Y	Must be at least one occurrence, but may repeat, along with other components of PID-5, for each Patient Name the Source wishes to convey at its discretion
Code Domain	n/a	Free text

Identifier	PID-5.4 Patient Name: Name Suffix	
Description	Name suffix of patient being identified.	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ST	String
Conformance	RE	Value(s) must be supplied when data is available. If more than one suffix is available, all available suffixes shall be repeated within this data element
Repetitions	Y	Must be at least one occurrence, but may repeat, along with other components of PID-5, for each Patient Name the Source wishes to convey at its discretion
Code Domain	n/a	Free text

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Identifier	PID-5.5 Patient Name: Name Prefix / Title	
Description	Name prefix / title of patient being identified.	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ST	String
Conformance	RE	Value(s) must be supplied when data is available. If more than one prefix / title is available, all available prefixes and titles shall be repeated within this data element
Repetitions	Y	Must be at least one occurrence, but may repeat, along with other components of PID-5, for each Patient Name the Source wishes to convey at its discretion
Code Domain	n/a	Free text

Identifier	PID-5.7 Patient Name: Name Type Code	
Description	Type of patient name being identified.	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ID	Coded value from code domain list below
Conformance	R	Value must always be supplied (no nulls)
Repetitions	Y	Must be at least one occurrence, but may repeat, along with other components of PID-5, for each Patient Name the Source wishes to convey at its discretion
Code Domain	Table 0200	Name Type

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Identifier	PID-6.1 Mother's Maiden Name: Family Name / Last Name Surname	
Description	Mother's Maiden Family Name Surname / Mother's Maiden Last Name Surname of patient being identified. Only one mother's maiden name per message is permitted by this specification.	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	FN	Family Name
Conformance	RE	Value must be supplied when data is available
Repetitions	N	Does not repeat. If more than one name per patient is desired, then a separate message for each patient name shall be used.
Code Domain	n/a	Free text

Identifier	PID-7 Date/Time of Birth	
Description	Date and time patient was born.	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	TS	Time Stamp
Conformance	RE	Value must be supplied when data is available
Repetitions	N	Does not repeat.
Code Domain	n/a	Free text

Identifier	PID-8 Administrative Sex	
Description	Patient's gender as commonly used	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	IS	Coded value from open-ended list
Conformance	RE	Value must be supplied when data is available
Repetitions	N	Does not repeat.
Code Domain	Table 0001	Administrative Sex

Identifier	PID-11.1 Patient Address: Street Address Line 1	
Description	Patient's Postal Service Street Address, first line	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	SAD	Street Address
Conformance	O	Value may be included at sender's discretion
Repetitions	Y	May repeat, along with other components of PID-11, for each Patient Address the Source wishes to convey at its discretion
Code Domain	n/a	Free text that shall contain structure number and street where structure is located as listed in the United States, Canada, or other country's standardized address listings

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Identifier	PID-11.2 Patient Address: Other Designation	
Description	Patient's Postal Service Street Address, second line	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ST	String
Conformance	O	Value may be included at sender's discretion
Repetitions	Y	May repeat, along with other components of PID-11, for each Patient Address the Source wishes to convey at its discretion
Code Domain	n/a	Free text that shall contain additional structure address information as listed in the United States, Canada, or other country's standardized address listings

Identifier	PID-11.3 Patient Address: City	
Description	Patient's Postal Service City Name	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ST	String
Conformance	O	Value may be included at sender's discretion
Repetitions	Y	May repeat, along with other components of PID-11, for each Patient Address the Source wishes to convey at its discretion
Code Domain	n/a	Free text that shall contain city name as listed in the United States, Canada, or other country's standardized address listings

Identifier	PID-11.4 Patient Address: State / Province	
Description	Patient's Postal Service State / Province Name	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ST	String
Conformance	O	Value may be included at sender's discretion
Repetitions	Y	May repeat, along with other components of PID-11, for each Patient Address the Source wishes to convey at its discretion
Code Domain	n/a	Free text that shall contain state / province name as listed in the United States, Canada, or other country's standardized address listings

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Identifier	PID-11.5 Patient Address: ZIP / Postal Code	
Description	Patient's Postal Service ZIP / Postal Code	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ST	String
Conformance	O	Value may be included at sender's discretion
Repetitions	Y	May repeat, along with other components of PID-11, for each Patient Address the Source wishes to convey at its discretion
Code Domain	n/a	Free text that shall contain ZIP / postal code as listed in the United States, Canada, or other country's standardized address listings

Identifier	PID-11.6 Patient Address: Country	
Description	Patient's Postal Service Country Name	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ST	String
Conformance	O	Value may be included at sender's discretion
Repetitions	Y	May repeat, along with other components of PID-11, for each Patient Address the Source wishes to convey at its discretion
Code Domain	ISO-3166	International Standards Organization Codes for Representation of Names and Countries: available from American National Standards Institute 11 West 42nd Street, 13th Floor New York, NY 10036

Identifier	PID-11.7 Patient Address: Address Type	
Description	Type of Address	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ID	Coded value from code domain list below
Conformance	O	Value may be included at sender's discretion
Repetitions	Y	May repeat, along with other components of PID-11, for each Patient Address the Source wishes to convey at its discretion
Code Domain	Table 0190	Address Type

Identifier	PID-11.9 Patient Address: County / Parish Code	
Description	Patient's Postal Service County / Parish Code	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ST	String
Conformance	O	Value may be included at sender's discretion
Repetitions	Y	May repeat, along with other components of PID-11, for each Patient Address the Source wishes to convey at its discretion
Code Domain	n/a	Free text that shall contain county / parish code as listed in the United States, Canada, or other country's standardized address listings

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Identifier	PID-23 Birth Place	
Description	Patient's Place of Birth	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ST	String
Conformance	O	Value may be included at sender's discretion
Repetitions	N	Does not repeat
Code Domain	n/a	Free text

Identifier	PID-29 Patient Death Date and Time	
Description	Date and time patient died.	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	TS	Time Stamp
Conformance	RE	Value must be supplied when data is available
Repetitions	N	Does not repeat.
Code Domain	n/a	Free text

Identifier	PID-30 Patient Death Indicator	
Description	Coded value indicating whether patient is or is not dead	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ID	Coded value from predetermined list
Conformance	RE	Value must be supplied when data is available
Repetitions	N	Does not repeat.
Code Domain	Table 0136	"Y" Patient is deceased "N" Patient is not deceased

Identifier	PID-31 Identity Unknown Indicator	
Description	Coded value indicating whether identify of patient is known or unknown	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ID	Coded value from predetermined list
Conformance	R	Value must always be supplied (no nulls)
Repetitions	N	Does not repeat.
Code Domain	Table 0136	"Y" Patient's identity is unknown "N" Patient's identity is known

375 4.2.3.1.3 PATIENT VISIT INFORMATION

HL7 Attribute Table - PV1 - Patient Visit

SEQ	LEN	DT	USE	CARD	TBL#	ITEM#	ELEMENT NAME
1	4	SI	R	[1..1]		00131	Set ID - PV1
2	1	IS	R	[1..1]	0004	00132	Patient Class
3	80	PL	C	[0..1]		00133	Assigned Patient Location
4	2	IS	CE	[0..1]		00134	Admission Type
5	250	CX	O	[0..1]		00135	Preadmit Number
6	80	PL	O	[0..1]		00136	Prior Patient Location
7	250	XCN	O	[0..*]		00137	Attending Doctor
8	250	XCN	O	[0..*]		00138	Referring Doctor
9	250	XCN	O	[0..*]		00139	Consulting Doctor
10	3	IS	RE	[0..1]		00140	Hospital Service
11	80	PL	O	[0..1]		00141	Temporary Location
12	2	IS	O	[0..1]		00142	Preadmit Test Indicator
13	2	IS	O	[0..1]		00143	Re-admission Indicator
14	6	IS	O	[0..1]		00144	Admit Source
15	2	IS	O	[0..*]		00145	Ambulatory Status
16	2	IS	O	[0..1]		00146	VIP Indicator
17	250	XCN	O	[0..*]		00147	Admitting Doctor
18	2	IS	O	[0..1]		00148	Patient Type
19	250	CX	O	[0..1]		00149	Visit Number
20	50	FC	O	[0..*]		00150	Financial Class
21	2	IS	O	[0..1]		00151	Charge Price Indicator
22	2	IS	O	[0..1]		00152	Courtesy Code
23	2	IS	O	[0..1]		00153	Credit Rating
24	2	IS	O	[0..*]		00154	Contract Code
25	8	DT	O	[0..*]		00155	Contract Effective Date
26	12	NM	O	[0..*]		00156	Contract Amount
27	3	NM	O	[0..*]		00157	Contract Period
28	2	IS	O	[0..1]		00158	Interest Code
29	4	IS	O	[0..1]		00159	Transfer to Bad Debt Code
30	8	DT	O	[0..1]		00160	Transfer to Bad Debt Date
31	10	IS	O	[0..1]		00161	Bad Debt Agency Code
32	12	NM	O	[0..1]		00162	Bad Debt Transfer Amount
33	12	NM	O	[0..1]		00163	Bad Debt Recovery Amount
34	1	IS	O	[0..1]		00164	Delete Account Indicator
35	8	DT	O	[0..1]		00165	Delete Account Date
36	3	IS	RE	[0..1]		00166	Discharge Disposition
37	47	DLD	O	[0..1]		00167	Discharged to Location
38	250	CE	O	[0..1]		00168	Diet Type
39	2	IS	O	[0..1]		00169	Servicing Facility
40	1	IS	X	[0..0]		00170	Bed Status
41	2	IS	O	[0..1]		00171	Account Status
42	80	PL	O	[0..1]		00172	Pending Location
43	80	PL	O	[0..1]		00173	Prior Temporary Location
44	26	TS	RE	[0..1]		00174	Admit Date/Time
45	26	TS	RE	[0..*]		00175	Discharge Date/Time
46	12	NM	O	[0..1]		00176	Current Patient Balance

SEQ	LEN	DT	USE	CARD	TBL#	ITEM#	ELEMENT NAME
47	12	NM	O	[0..1]		00177	Total Charges
48	12	NM	O	[0..1]		00178	Total Adjustments
49	12	NM	O	[0..1]		00179	Total Payments
50	250	CX	O	[0..1]		00180	Alternate Visit ID
51	1	IS	O	[0..1]		01226	Visit Indicator
52	250	XCN	X	[0..0]		01274	Other Healthcare Provider

Identifier	PV1-3.1 Assigned Patient Location: Place of Care	
Description	Full Identification code that identifies a location of patient care. Code shall be unique within any given facility.	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed. Public Health agencies may infer some location information	
Data Type	IS	Coded value from open-ended list
Conformance	C	Based on PV1-2: if inpatient type, PV1-3 required, optional if PV1-2 is outpatient class type.
Repetitions	N	Does not repeat
Code Domain	n/a	Free text

Identifier	PV1-3.4.3 Assigned Patient Location: Facility's Universal ID Type	
Description	A value identifying the source of the value used for Facility's Universal ID	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	ID	Coded value from code domain list below
Conformance	C	Value (no nulls) must be supplied when Assigned Patient Location is included in message
Repetitions	N	Does not repeat
Code Domain	"NPI" "TIN"	HIPAA National Provider ID Federal Tax Identification Number; which shall only be used if Facility is not part of an organization classified as a "covered health care provider" under Title 45 of the Code of Federal Regulations, §162.402

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4.2.3.1.4 PV2 - PATIENT VISIT - ADDITIONAL INFORMATION SEGMENT

The PV2 segment is a continuation of information contained on the PV1 segment.

HL7 Attribute Table - PV2 - Patient Visit - Additional Information

SEQ	LEN	DT	USE	CARD	TBL#	ITEM#	ELEMENT NAME
1	80	PL	O	[0..1]		00181	Prior Pending Location
2	250	CE	O	[0..1]		00182	Accommodation Code
3	250	CE	RE	[0..1]		00183	Admit Reason
4	250	CE	O	[0..1]		00184	Transfer Reason
5	25	ST	O	[0..*]		00185	Patient Valuables
6	25	ST	O	[0..1]		00186	Patient Valuables Location
7	2	IS	O	[0..*]		00187	Visit User Code
8	26	TS	O	[0..1]		00188	Expected Admit Date/Time
9	26	TS	O	[0..1]		00189	Expected Discharge Date/Time
10	3	NM	O	[0..1]		00711	Estimated Length of Inpatient Stay
11	3	NM	O	[0..1]		00712	Actual Length of Inpatient Stay
12	50	ST	O	[0..1]		00713	Visit Description
13	250	XCN	O	[0..*]		00714	Referral Source Code
14	8	DT	O	[0..1]		00715	Previous Service Date
15	1	ID	RE	[0..1]	0136	00716	Employment Illness Related Indicator
16	1	IS	O	[0..1]		00717	Purge Status Code
17	8	DT	O	[0..1]		00718	Purge Status Date
18	2	IS	O	[0..1]		00719	Special Program Code
19	1	ID	O	[0..1]		00720	Retention Indicator
20	1	NM	O	[0..1]		00721	Expected Number of Insurance Plans
21	1	IS	O	[0..1]		00722	Visit Publicity Code
22	1	ID	O	[0..1]		00723	Visit Protection Indicator
23	250	XON	RE	[0..*]		00724	Clinic Organization Name
24	2	IS	O	[0..1]		00725	Patient Status Code
25	1	IS	O	[0..1]		00726	Visit Priority Code
26	8	DT	O	[0..1]		00727	Previous Treatment Date
27	2	IS	O	[0..1]		00728	Expected Discharge Disposition
28	8	DT	O	[0..1]		00729	Signature on File Date
29	8	DT	O	[0..1]		00730	First Similar Illness Date
30	250	CE	O	[0..1]		00731	Patient Charge Adjustment Code
31	2	IS	O	[0..1]		00732	Recurring Service Code
32	1	ID	O	[0..1]		00733	Billing Media Code
33	26	TS	O	[0..1]		00734	Expected Surgery Date and Time
34	1	ID	O	[0..1]		00735	Military Partnership Code
35	1	ID	O	[0..1]		00736	Military Non-Availability Code
36	1	ID	O	[0..1]		00737	Newborn Baby Indicator
37	1	ID	O	[0..1]		00738	Baby Detained Indicator
38	250	CE	O	[0..1]		01543	Mode of Arrival Code
39	250	CE	O	[0..*]		01544	Recreational Drug Use Code
40	250	CE	RE	[0..1]		01545	Admission Level of Care Code
41	250	CE	O	[0..*]		01546	Precaution Code
42	250	CE	O	[0..1]		01547	Patient Condition Code
43	2	IS	O	[0..1]		00759	Living Will Code
44	2	IS	O	[0..1]		00760	Organ Donor Code

SEQ	LEN	DT	USE	CARD	TBL#	ITEM#	ELEMENT NAME
45	250	CE	O	[0..*]		01548	Advance Directive Code
46	8	DT	O	[0..1]		01549	Patient Status Effective Date
47	26	TS	O	[0..1]		01550	Expected LOA Return Date/Time
48	26	TS	O	[0..1]		01841	Expected Pre-admission Testing Date/Time
49	20	IS	O	[0..*]		01842	Notify Clergy Code

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Identifier	PV2-3 Admit Reason	
Description	A gross explanation of why the patient needed services	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed. Frequently used for chief complaint.	
Data Type	CE	Coded Element
Conformance	RE	Value must be supplied when data is available
Repetitions	N	Does not repeat.
Code Domain	n/a	CPT or ICD-9?

4.2.3.1.5 OBSERVATION ORDER INFORMATION

HL7 Attribute Table – OBR – Observation Request

SEQ	LEN	DT	USE	CARD	TBL#	ITEM #	ELEMENT NAME
1	4	SI	R	[1..1]		00237	Set ID – OBR
2	427	EI	RE	[0..1]		00216	Placer Order Number
3	427	EI	R	[1..1]		00217	Filler Order Number
4	250	CE	R	[1..1]		00238	Universal Service Identifier
5	2	ID	X	[0..0]		00239	Priority – OBR
6	26	TS	X	[0..0]		00240	Requested Date/Time
7	26	TS	R	[1..1]		00241	Observation Date/Time #
8	26	TS	RE	[0..1]		00242	Observation End Date/Time #
9	20	CQ	X	[0..0]		00243	Collection Volume *
10	250	XCN	O	[0..*]		00244	Collector Identifier *
11	1	ID	O	[0..1]		00245	Specimen Action Code *
12	250	CE	O	[0..1]		00246	Danger Code
13	300	ST	O	[0..1]		00247	Relevant Clinical Information
14	26	TS	X	[0..0]		00248	Specimen Received Date/Time *
15	300	SPS	X	[0..0]		00249	Specimen Source
16	250	XCN	C	[0..*]		00226	Ordering Provider
17	250	XTN	O	[0..2]		00250	Order Callback Phone Number
18	60	ST	O	[0..1]		00251	Placer Field 1
19	60	ST	O	[0..1]		00252	Placer Field 2
20	60	ST	O	[0..1]		00253	Filler Field 1 +
21	60	ST	O	[0..1]		00254	Filler Field 2 +

SEQ	LEN	DT	USE	CARD	TBL#	ITEM #	ELEMENT NAME
22	26	TS	C	[0..1]		00255	Results Rpt/Status Chng - Date/Time +
23	40	MOC	O	[0..1]		00256	Charge to Practice +
24	10	ID	O	[0..1]		00257	Diagnostic Serv Sect ID
25	1	ID	R	[1..1]	HL70123	00258	Result Status +
26	400	PRL	C	[0..1]		00259	Parent Result +
27	200	TQ	X	[0..0]		00221	Quantity/Timing
28	250	XCN	RE	[0..*]		00260	Result Copies To
29	200	EIP	C	[0..1]		00261	Parent
30	20	ID	O	[0..1]		00262	Transportation Mode
31	250	CE	O	[0..*]		00263	Reason for Study
32	200	NDL	O	[0..1]		00264	Principal Result Interpreter +
33	200	NDL	O	[0..*]		00265	Assistant Result Interpreter +
34	200	NDL	O	[0..*]		00266	Technician +
35	200	NDL	O	[0..*]		00267	Transcriptionist +
36	26	TS	O	[0..1]		00268	Scheduled Date/Time +
37	4	NM	O	[0..1]		01028	Number of Sample Containers *
38	250	CE	O	[0..*]		01029	Transport Logistics of Collected Sample *
39	250	CE	O	[0..*]		01030	Collector's Comment *
40	250	CE	O	[0..1]		01031	Transport Arrangement Responsibility
41	30	ID	O	[0..1]		01032	Transport Arranged
42	1	ID	O	[0..1]		01033	Escort Required
43	250	CE	O	[0..*]		01034	Planned Patient Transport Comment
44	250	CE	O	[0..1]		00393	Procedure Code
45	250	CE	O	[0..*]		01316	Procedure Code Modifier
46	250	CE	O	[0..*]		01474	Placer Supplemental Service Information
47	250	CE	O	[0..*]		01475	Filler Supplemental Service Information
48	250	CWE	O	[0..1]		01646	Medically Necessary Duplicate Procedure Reason.
49	2	IS	O	[0..1]		01647	Result Handling

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Identifier	OBR-2 Placer Order Number	
Description	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.	
Source – where created	Sending Software Application	
Rationale – where used	The Filler Order Number, along with the Placer Order Number, are foreign keys exchanged between applications for uniquely identifying orders and the associated results across applications.	
Data Type	EI	Entity Identifier
Conformance	RE	Value must be supplied when data is available.
Repetitions	N	Does not repeat
Code Domain	n/a	
Field Note	Normally, it is a type of system identifier assigned by the placer software application. The Placer Order Number, along with the Filler Order Number are foreign keys exchanged between applications for uniquely identifying orders and the associated results across Applications. Pre-adopt field length for OBR2 & 3 from v2.6 (427 characters	

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Identifier	OBR-3 Filler Order Number	
Description	Order number associated with the filling application. This number is assigned to the test by the organization performing the test.	
Source – where created	Sending Software Application	
Rationale – where used	The Filler Order Number, along with the Placer Order Number, are 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. This is critical for making parent/child results relationships work properly. Microbiology cultures and sensitivities are linked in this fashion in PHIN messaging.	
Data Type	EI	Entity Identifier
Conformance	R	Value must be supplied.
Repetitions	N	Does not repeat
Code Domain	Universal IdType	Must be ISO implying an OID for Universal ID.
Field Note	This field should not contain the accession number or specimen identifier for a specimen. The accession/specimen identifier should be placed in SPM-2. The filler order number identifiers this order as distinct from all other orders this filler application is processing. Normally, this is a type of system identifier assigned by the filler software application. Pre-adopt field length for OBR2 & 3 from v2.6 (427 characters	

Identifier	OBR-4 Universal Service Identifier	
Description	The identifier code for the requested observation/test/battery.	
Source – where created	Sending Software Application	
Rationale – where used	Receiving system uses as needed	
Data Type	CE	Coded Element
Conformance	R	Value must be supplied.
Repetitions	N	Does not repeat.
Code Domain	?	Terminology gap

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Identifier	OBR-26 Parent Result	
Description	This field uniquely identifies the parent result's OBX segment related to this order. Together with OBR-29 (Parent), allows this result to be linked to a specific OBX segment associated with another OBR segment.	
Source – where created	Defined in the OBX-3 of the parent result.	
Rationale – where used	This field is required when linking child sensitivities to the parent culture.	
Data Type	PRL	Parent Observation Identifier
Conformance	C	This field is required when linking child sensitivities to the parent culture.
Repetitions	N	Does not repeat
Field Note	The value of this OBX segment in the parent result is the organism or chemical species about which this battery reports	

Identifier	OBR-26.1 Parent Observation Identifier	
Description	Identifier of the OBX-3 Observation ID of the parent result. Typically, this is used in microbiology results where the sensitivities are linked to the specific culture OBX where the organism was identified.	
Source – where created	Parent OBX -3 Observation ID	
Rationale – where used	Used by the receiving system when linking child sensitivities to the parent culture.	
Data Type	CE	Coded Element
Conformance	C	Value must be supplied when linking child sensitivities to the parent culture.
Repetitions	N	Does not repeat
Code Domain	n/a	

405

Identifier	OBR-26.2 Parent Observation Sub-identifier	
Description	Identifier of the OBX-4 observation sub-ID associated with the OBX-3 observation ID of the parent result.	
Source – where created	Parent OBX -4 Observation Sub ID	
Rationale – where used	Used by the receiving system when linking child sensitivities to the parent culture.	
Data Type	ST	String
Conformance	C	Value must be supplied when linking child sensitivities to the parent culture and the parent has a sub ID.
Repetitions	N	Does not repeat
Code Domain	n/a	
Field Note	Typically, this is used in microbiology results where the sensitivities are linked to the specific culture OBX where the organism was identified. The combination of OBX-3 and OBX-4 must be unique within a particular OBR.	

Identifier	OBR-26.3 Parent Observation Value Descriptor:	
Description	Text name of the organism identified in the OBX pointed to by components 1 and 2.	
Source – where created	Parent OBX value (OBX-5)	
Rationale – where used	Used by the receiving system when linking child sensitivities to the parent culture.	
Data Type	TX	Free Text
Conformance	CE	Value may be supplied when linking child sensitivities to the parent culture.
Repetitions	N	Does not repeat
Code Domain	n/a	

410

Identifier	OBR-28 Result Copies To	
Description	This field is the people who are to receive copies of the results.	
Source – where created	Placer Order	
Rationale – where used	Used by the sending system to identify other recipients of this result message	
Data Type	XCN	Extended Composite ID Number and Name for Persons
Conformance	RE	Value must be supplied when data is available.
Repetitions	Y	Does not repeat
Code Domain	n/a	

Identifier	OBR-29 Parent	
Description	Field used to link this OBR with a parent OBR. For example, observations that are spawned by previous observations, e.g., antimicrobial susceptibilities spawned by blood cultures, need to record the parent (blood culture) filler order number here.	
Source – where created	Parent OBX placer and filler numbers	
Rationale – where used	This is commonly used with microbiology messages to link a susceptibility result with the parent culture that identified the organism.	
Data Type	EIP	Entity Identifier Pair
Conformance	C	This field is required when linking child sensitivities to the parent culture
Repetitions	N	Does not repeat
Code Domain	n/a	
	For this linking to work properly, the Filler Order Number must uniquely identify the specific parent OBR. This means that the same filler number cannot be used to identify multiple OBRs.	

4.2.3.1.6 TIMING AND QUANTITY INFORMATION

415 HL7 Attribute Table – TQ1 – Timing/Quantity

SEQ	LEN	DT	USE	CARD	TBL#	ITEM#	ELEMENT NAME
1	4	SI	R	[1..1]		01627	Set ID - TQ1
2	20	CQ	O	[0..1]		01628	Quantity
3	540	RPT	O	[0..*]		01629	Repeat Pattern
4	20	TM	O	[0..*]		01630	Explicit Time
5	20	CQ	O	[0..*]		01631	Relative Time and Units
6	20	CQ	O	[0..1]		01632	Service Duration
7	26	TS	RE	[0..1]		01633	Start date/time
8	26	TS	O	[0..1]		01634	End date/time

SEQ	LEN	DT	USE	CARD	TBL#	ITEM#	ELEMENT NAME
9	250	CWE	RE	[0..*]	HL7 User Defined 0485	01635	Priority
10	250	TX	O	[0..1]		01636	Condition text
11	250	TX	O	[0..1]		01637	Text instruction
12	10	ID	O	[0..1]		01638	Conjunction
13	20	CQ	O	[0..1]		01639	Occurrence duration
14	10	NM	O	[0..1]		01640	Total occurrence's

4.2.3.1.7 SPECIMEN INFORMATION

HL7 Attribute Table – SPM – Specimen

SEQ	LEN	DT	USE	CARD	TBL#	ITEM #	ELEMENT NAME
1	4	SI	R	[1..1]		01754	Set ID – SPM
2	80	EIP	RE	[0..1]		01755	Specimen ID
3	80	EIP	O	[0..*]		01756	Specimen Parent IDs
4	250	CWE	R	[1..1]	HL70487 or SNOMED	01900	Specimen Type
5	250	CWE	O	[0..*]		01757	Specimen Type Modifier
6	250	CWE	O	[0..*]		01758	Specimen Additives
7	250	CWE	RE	[0..1]	HL70488	01759	Specimen Collection Method
8	250	CWE	RE	[0..1]	SNOMED (subset)	01901	Specimen Source Site
9	250	CWE	RE	[0..*]	SNOMED (subset)	01760	Specimen Source Site Modifier
10	250	CWE	O	[0..1]		01761	Specimen Collection Site
11	250	CWE	O	[0..*]		01762	Specimen Role
12	20	CQ	RE	[0..1]		01902	Specimen Collection Amount
13	6	NM	O	[0..1]		01763	Grouped Specimen Count
14	250	ST	O	[0..*]		01764	Specimen Description
15	250	CWE	O	[0..*]		01908	Specimen Handling Code
16	250	CWE	O	[0..*]		01903	Specimen Risk Code
17	26	DR	RE	[0..1]		01765	Specimen Collection Date/Time
18	26	TS	RE	[0..1]		00248	Specimen Received Date/Time
19	26	TS	O	[0..1]		01904	Specimen Expiration Date/Time
20	1	ID	O	[0..1]		01766	Specimen Availability
21	250	CWE	O	[0..*]		01767	Specimen Reject Reason
22	250	CWE	O	[0..1]		01768	Specimen Quality
23	250	CWE	O	[0..1]		01769	Specimen Appropriateness

SEQ	LEN	DT	USE	CARD	TBL#	ITEM #	ELEMENT NAME
24	250	CWE	O	[0..*]		01770	Specimen Condition
25	20	CQ	O	[0..1]		01771	Specimen Current Quantity
26	4	NM	O	[0..1]		01772	Number of Specimen Containers
27	250	CWE	O	[0..1]		01773	Container Type
28	250	CWE	O	[0..1]		01774	Container Condition
29	250	CWE	O	[0..1]		01775	Specimen Child Role

420 4.2.3.1.8 OBSERVATION RESULT INFORMATION

HL7 Attribute Table – OBX – Observation/Result

SEQ	LEN	DT	USE	CARD	TBL#	ITEM#	ELEMENT NAME
1	4	SI	R	[1..1]		00569	Set ID – OBX
2	2	ID	C	[0..1]	HL70125	00570	Value Type
3	250	CE	R	[1..1]	LOINC + SNOMED + RxNorm	00571	Observation Identifier
4	20	ST	C	[0..1]		00572	Observation Sub-ID
5	99999[1]	varies	C	[0..*]	SNOMED for coded values + RxNorm Even SNOMED may be inadequate here.	00573	Observation Value
6	250	CE	RE	[0..1]	UCUM	00574	Units
7	60	ST	RE	[0..1]		00575	References Range
8	5	IS	RE	[0..*]	HL70078	00576	Abnormal Flags
9	5	NM	O	[0..1]		00577	Probability
10	2	ID	O	[0..*]		00578	Nature of Abnormal Test
11	1	ID	R	[1..1]	HL70085	00579	Observation Result Status
12	26	TS	O	[0..1]		00580	Effective Date of Reference Range
13	20	ST	O	[0..1]		00581	User Defined Access Checks
14	26	TS	O	[0..1]		00582	Date/Time of the Observation
15	250	CE	RE	[0..1]		00583	Producer's ID
16	250	XCN	RE	[0..*]		00584	Responsible Observer
17	250	CE	RE	[0..*]	V3 Observation method AS a starter set. May be extended locally	00936	Observation Method
18	22	EI	O	[0..*]		01479	Equipment Instance Identifier
19	26	TS	RE	[0..1]		01480	Date/Time of the Analysis
20			X	[0..0]			Reserved

[1] The length of the observation field is variable, depending upon value type. See *OBX-2 value type*.

SEQ	LEN	DT	USE	CARD	TBL#	ITEM#	ELEMENT NAME
21			X	[0..0]			Reserved
22			X	[0..0]			Reserved
23	567	XON	CE	[0..1]			Performing Laboratory Organization (Need to confirm position with OO).
24	631	XAD	CE	[0..1]			Performing Laboratory Address (Need to confirm position with OO)
25	3002	XCN	CE	[0..1]			Performing Laboratory Medical Director (Need to confirm position with OO)

ADDITIONAL CONSTRAINTS:

1. OBX-2 – conditional statement: if OBX-5 is populated, OBX-2 is required
2. OBX-5/OBX-6 – conditional statement: when you are sending a numeric value, do not send it as a string (OBX-5="5mg"), to comply you must send the value and the string (OBX-5=5, OBX-6=mg)

NOTES:

1. Added OBX.23, Performing Laboratory Organization. Pre-adopting from 2.7. Need to confirm position with OO. Condition rule: If OBX.15 Producer ID is not present, then this field must be populated. If both OBX.15 and OBX.23 are populated, they should identify the same organization.
2. Added OBX.24 Performing Laboratory Address. Pre-adopting from 2.7. Need to confirm position with OO. Condition rule: If OBX.23, Performing Laboratory Organization is present, this field must also be populated.
3. Added OBX.25 Performing Laboratory Medical Director. Pre-adopting from 2.7. Need to confirm position with OO. Condition rule: If OBX.23, Performing Laboratory Organization is present, this field must also be populated.
4. OBX.3 (CE) Observation identifier: This field provides a code for the type of observation. OBX.3 in conjunction with OBX.4 Observation Sub-ID should uniquely identify this OBX from all other OBX's associated with this OBR.
5. OBX.4 (ST) Observation Sub-ID: Condition Rule: Field required if there is more than one OBX with the same OBX-3 (Observation Identifier) associated with the same OBR. Normally, this field is populated with a number, but text values may also be used.

4.2.4 MINIMUM DATA-SET

See above message structure and data element table for usage requirements. The minimum data set is represented by all fields and segments set to "R", "RE", "C" or "CE".

4.2.5 ADDITIONAL SPECIFICATIONS

Not Applicable

5.0 CONSTRAINTS FOR REUSE

This component may be reused by any set of communicating applications where the required fields are necessary and sufficient. In addition, optional fields may be populated and used between communicating applications without impairing the intended use by HITSP.

6.0 APPENDIX A - HL7 REPORTING OF CULTURE AND SUSCEPTIBILITIES

INTRODUCTION

Parent-child relationships such as culture and sensitivities can be reported using the Health Level Seven (HL7) electronic messaging standard. However, this is an area where many vendors and large laboratories have augmented the standard to account for variations in the systems with which they work. This usually does not present a problem until these messages must be shared between systems (for instance, between laboratories and sub-contracted laboratories, or between laboratories and public health agencies).

Parent-child information such as culture and susceptibilities (*e.g.*, reporting of multi-resistant tuberculosis or drug-resistant gonoccocus or pneumococcus) is a critical component of electronic, laboratory-based, public health reporting.

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 (*e.g.*, 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), 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

Using the template above, an example for a patient with three pathogens identified from a stool specimen are provided. The example does not show the entire message, just those fields of particular interest for a culture result.

```
MSH|…
PID|…
OBR|1|23456^^2.16.840.1.114222.4.3.2^ISO|9700122^^2.16.840.1.11422
    2.4.3.2^ISO|87045^Culture, bacterial, definitive;
    stool^2.16.840.1.113883.6.12|…
OBX|1|CE|625-4^MICROORGANISM IDENTIFIED:PRID:PT:STL:NOM:STOOL
    CULTURE^2.16.840.1.113883.6.1|1|66543000^Campylobacter
    jejuni^2.16.840.1.113883.6.96|…
OBX|2|SN|564-5^COLONY
    COUNT:NUM:PT:XXX:QN:VC^2.16.840.1.113883.6.1|1|^10,000^-
    ^90,000|…
OBX|3|CE|625-4^MICROORGANISM IDENTIFIED:PRID:PT:STL:NOM:STOOL
    CULTURE^2.16.840.1.113883.6.1|2|302620005^Salmonella group B
    phase 1 a-e^2.16.840.1.113883.6.96|…
OBX|4|SN|564-5^COLONY
    COUNT:NUM:PT:XXX:QN:VC^2.16.840.1.113883.6.1|2|>^100,000|…
OBX|5|CE|625-4^MICROORGANISM IDENTIFIED:PRID:PT:STL:NOM:STOOL
    CULTURE^2.16.840.1.113883.6.1|3|77352002^Shigella^2.16.840.1.1
    13883.6.96|…
OBX|6|SN|564-5^COLONY
    COUNT:NUM:PT:XXX:QN:VC^2.16.840.1.113883.6.1|3|<^1,000|…
SPM|1|38294523&&2.16.840.1.114222.4.3.2&ISO^9876543&&2.16.840.1.11
    4222.4.3.2&ISO||119339001^Stool
    specimen^2.16.840.1.113883.6.96…
```

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

TEMPLATE OF CULTURE AND SUSCEPTIBILITY RESULTS

The template and example in Appendix B, described 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 Appendix B, 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"). All messages are ORU^R01 messages.

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) |…
```

Parent SPM Segment

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

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) |…
```

The use of the parent-child relationship for reporting culture and susceptibilities may appear to be cumbersome or over-complicated. However, a system for reporting the complex relationships inherent in microbiology requires a flexible messaging approach. The approach described above allows for a series of reports that can provide interim data in the way the tests are actually performed in the laboratory. For instance, a first report might show "Gram Negative Diplococci," followed by a report showing "Neisseria species, penicillin-sensitive," and a final report of "Neisseria meningitidis, penicillin-sensitive." The use of the "pointers" in the child results allows information to be linked back to the parent result, even if the parent result is not yet identified. This means that the relationship to the parent remains, even if the parent itself is changing.

EXAMPLES OF CULTURE AND SUSCEPTIBILITY RESULTS

Using the template above, an example is provided for a report of three pathogens identified from a stool specimen with their respective antimicrobial susceptibility tests.

```
MSH|…
PID|…
OBR|1|23456^^2.16.840.1.114222.4.3.2^ISO|9700122^^2.16.840.1.11422
    2.4.3.2^ISO|87045^Culture, bacterial, definitive;
    stool^2.16.840.1.113883.6.12|…
OBX|1|CE|625-4^MICROORGANISM IDENTIFIED:PRID:PT:STL:NOM:STOOL
    CULTURE^2.16.840.1.113883.6.1|1|66543000^Campylobacter
    jejuni^2.16.840.1.113883.6.96|…
OBX|2|SN|564-5^COLONY
    COUNT:NUM:PT:XXX:QN:VC^2.16.840.1.113883.6.1|1|^10,000^-
    ^90,000|…
OBX|3|CE|625-4^MICROORGANISM IDENTIFIED:PRID:PT:STL:NOM:STOOL
    CULTURE^2.16.840.1.113883.6.1|2|302620005^Salmonella group B
    phase 1 a-e^2.16.840.1.113883.6.96^Salmonella Group
    B^2.16.840.1.113883.6.96|…
OBX|4|SN|564-5^COLONY
    COUNT:NUM:PT:XXX:QN:VC^2.16.840.1.113883.6.1|2|>^100,000|…
OBX|5|CE|625-4^MICROORGANISM IDENTIFIED:PRID:PT:STL:NOM:STOOL
    CULTURE^2.16.840.1.113883.6.1|3|77352002^Shigella^2.16.840.1.1
    13883.6.96|…
OBX|6|SN|564-5^COLONY
    COUNT:NUM:PT:XXX:QN:VC^2.16.840.1.113883.6.1|3|<^1,000|…
```

```
SPM|1|38294523&&2.16.840.1.114222.4.3.2&ISO^9876543&&2.16.840.1.11
    4222.4.3.2&ISO||119339001^Stool
    specimen^2.16.840.1.113883.6.96…
OBR|2|23456^^2.16.840.1.114222.4.3.2^ISO|9700123^^2.16.840.1.11422
    2.4.3.2^ISO|87186^Sensitivity studies, antibiotic; microtiter,
    minimum inhibitory concentration (MIC), any number of
    antibiotics^2.16.840.1.113883.6.12||||||||||||||||||200502081
    402|||F|625-4&MICROORGANISM IDENTIFIED:PRID:PT:STL:NOM:STOOL
    CULTURE&2.16.840.1.113883.6.1^1^Campylobacter
    jejuni|||23456&&2.16.840.1.114222.4.3.2&ISO^9700122&&2.16.840.
    1.114222.4.3.2&ISO|…
OBX|1|SN|6979-9^AMPICILLIN:SUSC:PT:ISLT:ORDQN:GRADIENT
    STRIP^2.16.840.1.113883.6.1||<^0.06|ug/mL||S|…
OBX|2|SN|7016-9^GENTAMICIN:SUSC:PT:ISLT:ORDQN:GRADIENT
    STRIP^2.16.840.1.113883.6.1||^0.05|ug/mL||S|…
OBX|3|SN|7002-9^CIPROFLOXACIN:SUSC:PT:ISLT:ORDQN:GRADIENT
    STRIP^2.16.840.1.113883.6.1||^0.05|ug/mL||S|…
OBR|3|23456^^2.16.840.1.114222.4.3.2^ISO|9700124^^2.16.840.1.11422
    2.4.3.2^ISO|87186^Sensitivity studies, antibiotic; microtiter,
    minimum inhibitory concentration (MIC), any number of
    antibiotics^2.16.840.1.113883.6.12||||||||||||||||||200502081
    402|||F|625-4&MICROORGANISM IDENTIFIED:PRID:PT:STL:NOM:STOOL
    CULTURE&2.16.840.1.113883.6.1^2^Salmonella group B phase 1 a-
    e|||23456&&2.16.840.1.114222.4.3.2&ISO^9700122&&2.16.840.1.114
    222.4.3.2&ISO|…
OBX|1|SN|6979-9^AMPICILLIN:SUSC:PT:ISLT:ORDQN:GRADIENT
    STRIP^2.16.840.1.113883.6.1||<^0.06|ug/mL||S|…
OBX|2|SN|7016-9^GENTAMICIN:SUSC:PT:ISLT:ORDQN:GRADIENT
    STRIP^2.16.840.1.113883.6.1||^0.05|ug/mL||S|…
OBX|3|SN|7002-9^CIPROFLOXACIN:SUSC:PT:ISLT:ORDQN:GRADIENT
    STRIP^2.16.840.1.113883.6.1||^0.05|ug/mL||S|…
OBR|4|23456^^2.16.840.1.114222.4.3.2^ISO|9700125^^2.16.840.1.11422
    2.4.3.2^ISO|87186^Sensitivity studies, antibiotic; microtiter,
    minimum inhibitory concentration (MIC), any number of
    antibiotics^2.16.840.1.113883.6.12||||||||||||||||||200502081
    402|||F|625-4&MICROORGANISM IDENTIFIED:PRID:PT:STL:NOM:STOOL
    CULTURE&2.16.840.1.113883.6.1^2^Shigella|||23456&&2.16.840.1.1
    14222.4.3.2&ISO^9700122&&2.16.840.1.114222.4.3.2&ISO|…
OBX|1|SN|6979-9^AMPICILLIN:SUSC:PT:ISLT:ORDQN:GRADIENT
    STRIP^2.16.840.1.113883.6.1||<^0.06|µg/mL||S|…
OBX|2|SN|7016-9^GENTAMICIN:SUSC:PT:ISLT:ORDQN:GRADIENT
    STRIP^2.16.840.1.113883.6.1||^0.05|µg/mL||S|…
OBX|3|SN|7002-9^CIPROFLOXACIN:SUSC:PT:ISLT:ORDQN:GRADIENT
    STRIP^2.16.840.1.113883.6.1||^0.05|µg/mL||S|…
```

LINKING PARENT AND CHILD RESULTS

The previous example uses the information in OBR-26 as a pointer back to the parent OBX where the culture result is reported. OBR-26 has three components. The three components of OBR-26 are essentially the OBX-3, OBX-4, and part of the OBX-5 from the parent OBX segment. The pointer back to

the parent only requires the first two components. The third component is intended only 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.

```
MSH|…
PID|…
OBR|1||MC127600|Stool Culture|…
OBX|1||Microorganism identified|1|Campylobacter jejuni|…
OBX|2||Colony count|1|10,000-90,000|…
OBX|3||Microorganism identified|2|Salmonella Group B| …
OBX|4||Colony count|2|>100,000|…
OBX|5||Microorganism identified|3|Shigella Group D|…
OBX|6||Colony count|3|<1,000|…
SPM|…
OBR|2||MC127601|Stool Culture|…|Microorganism
    identified^1^Campylobacter  jejuni|||^MC127600|…
OBX|1||Ampicillin||<0.06|µg/mL||S|…
OBX|2||Gentamicin||0.05|µg/mL||S|…
OBX|3||Ciprofloxacin||0.05|µg/mL||S|…
```

For the examples given here, each child OBR describing the susceptibility testing has a different filler order number than the parent OBR. It is required that laboratories assign separate filler numbers to each OBR represented in a message. If this is not done, then there is no mechanism to determine which OBR in a message contains the sensitivities. This method of linking parent and child OBRs only works properly if each OBR can be unambiguously identified.

The use of the parent-child relationship will be consistent with how some laboratories handle the reporting of culture and sensitivities. However, this approach may impose a hierarchy that is not present at other laboratories. The overall goal is to have the culture report sent under the first OBR and to have the susceptibility report sent as a child in a subsequent OBR. For most reporting, only one organism and its susceptibilities will be sent. As a "bare bones" message, this would appear as:

```
MSH|…
PID|…
OBR|1||MC127600|Stool Culture|…
OBX|1||Microorganism identified|1|Campylobacter jejuni|…
OBR|2||MC127601|Susceptibility Panel|…|Microorganism
    identified^1^Campylobacter jejuni|||^MC127600|…
OBX|1||Ampicillin||<0.06|µg/mL||S|…
OBX|2||Gentamicin||0.05|µg/mL||S|…
OBX|3||Ciprofloxacin||0.05|µg/mL||S|…
SPM|…
```

7.0 APPENDIX

7.1 HITSP HARMONIZATION FRAMEWORK

770 There are several constructs that are being used to define the interoperability specification, with each level providing more granularity to the standards applicable for fulfillment of the Use Case. The table below describes the current framework within which the interoperability specification is being built, the relationships between each construct, and further illustrative examples.

	Construct	Definition	Example	Rules
1	Use Case Harmonization Request	Defines business/functional requirements and specifies the relevant context	ONC Harmonized ONC Harmonized EHR Use Case	
2	Interoperability Specification	Models the business/functional requirements, identifies technical/system requirements to meet the specified use-case, and then identifies how to use one or more standards to meet the use-case	HITSP EHR Interoperability Specification	Based on UML diagram to identify actors and actions Sets context Testable functional requirements Identifies transaction(s) or packages of transactions
3	Transaction Package	Defines how two or more transactions are used to support a stand-alone information exchange within a defined context between two or more systems	Record Locator Service, Entity Identification Service	Thin context and functional requirements Testable Based on analysis of like actors, context and content harmonized across the transactions May be fulfilled by one or more complex standards Expresses constraints on how the transactions are used together
4	Transaction	Logical grouping of actions, including necessary content and context, that must all succeed or fail as a group.	Query lab result, Send lab result	Fulfills all actions between two systems that meet one or more functional requirements Testable Expresses constraints on how the components and/or standards are used together
5	Component	An atomic construct used to support an information interchange or to meet an infrastructure requirement (e.g., security, logging/audit)	Lab result message, Lab result context	Typically will use one “primary” standard and may have other “secondary” standards May express constraints on how the standards are used

	Construct	Definition	Example	Rules
6	Base Standard	A standard capable of fulfilling a discrete function within a single category produced and maintained by a single standards organization.	Messaging standard, Security standard, Code set.	Per HITSP definition the term "standard" refers to (and is not limited to): –Specifications –Implementation Guides –Code Sets –Terminologies –Integration Profiles
7	Composite Standard	Grouping of coordinated base standards, often from multiple standards organizations, maintained by a single organization. In HITSP, it can serve as a component, transaction or transaction package functional requirements.	Integration profiles Implementation guides Health transaction services	Per HITSP Definition

Table 7.1-1 Harmonization Framework

7.2 GLOSSARY

The HITSP glossary that spans all the Interoperability Specifications can be found in the following folder on the HITSP site:

http://publicaa.ansi.org/sites/apdl/Documents/Forms/AllItems.aspx?RootFolder=http%3a%2f%2fpublicaa%2eansi%2eorg%2fsites%2fapdl%2fDocuments%2fStandards%20Activities%2fHealthcare%20Informatics%20Technology%20Standards%20Panel