Lab-VA HDR and COTS HL7 Interface Specification for Patch LA*5.2*68

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1 Introduction

This document specifies an interface to the Veterans Health Information Systems and Technology Architecture (VistA) Laboratory software application based upon the Health Level Seven (HL7) Standard. This interface forms the basis for the exchange of healthcare information between the VistA Laboratory software application and the VA Health Data Repository (HDR) and Commercial Off the Shelf (COTS) subscribers to VistA Laboratory HL7 result (ORU) messages. The interface is a *broadcast* type interface in which VistA Laboratory automatically notifies subscribers (receiving applications) of available Laboratory test results. The following result types are supported:

VistA Laboratory Subscript	Traditional Functional Sections
CH	Chemistry, Hematology, Coagulation, Serology, Urinalysis, etc.
MI	Microbiology, Virology, Mycology, Parasitology
SP	Surgical Pathology
CY	Cytopathology
EM	Electron Microscopy

1.1 Statement of Intent

The Office of Information developed and implemented a generic interface to the HL7 Standard for use by the VistA Laboratory application in communicating with non-VistA systems to exchange healthcare information. The interface strictly adheres to the HL7 Standard and avoids using "Z" type extensions to the Standard. This interface specification is subject to modification and revision to incorporate changes, improvements, and enhancements. Later versions may support additional functionality of the current HL7 V 2.4 Standard and new functionality released in future versions of the HL7 Standard. In some cases, data types are pre-adopted from other versions of the HL7 standard when they are more appropriate to convey required information.

1.2 Scope

This document describes the HL7 messages (ORU and ACK) transmitted from the VistA Laboratory application system. The purpose of these messages is to exchange information concerning laboratory test results, specifically for test order and reports.

1.3 Overview of HL7 Terminology

Sections 1.1.1 through 1.1.6 define the terms and concepts used throughout this Interface Specification.

1.3.1 Communication Protocol

The HL7 Standard defines only the seventh level of the Open System Inter-connect (OSI) protocol. This is the application level. Levels 1-6 involve primarily communication protocols. The HL7 Standard provides some guidance in this area. The communication Standard used for interfacing with the VistA Laboratory package is based on the HL7 Minimal Lower Level (MLLP) Standard as described in the HL7 Interface Standard document.

1.3.2 Application Processing Rules

The HL7 Standard describes the basic rules for application processing by the exchange of sending and receiving messages between systems. Information contained in the Standard is not repeated here. Interfacing with the VistA Laboratory package requires familiarization with the HL7 Standard V. 2.4.

HL7 distinguishes between two methods of update:
1. snapshot mode
2. action code/unique identifier mode

Both modes apply to repeating segments and repeating segment groups. For repeating fields, only snapshot processing applies. For the purpose of this specification, only snapshot processing is supported for segments, segment groups, and fields.

1.3.3 Messages

A message is the unit of data transferred between systems. It comprises a group of segments in a defined sequence. Each message has a **message type** that defines its purpose. A three-character code contained within each message identifies its type. The event that initiates an exchange of messages is called a trigger event. VistA Laboratory uses two HL7 messages.

ACK	General Acknowledgment
ORU	Observational Results Unsolicited

1.3.4 Segments

A segment is a logical grouping of **data fields**. Segments of a message may be required or optional. They may occur only once in a message or may be allowed to repeat. Each segment has a name and is identified by a unique three-character code known as the Segment ID.

Example
The ORU message contains segments: Message Header (MSH), Patient ID (PID), Observation Request (OBR), and Observation Segment (OBX).

The following HL7 segments support the transmission of Laboratory information. For details and examples of all segments used to interface with the VistA Laboratory software application, refer to Section 3 Transaction Specifications.

MSA	Message Acknowledgment
MSH	Message Header
NTE	Notes and Comment
OBR	Observation Request
OBX	Observation
ORC	Common Order
PID	Patient Identification
PV1	Patient Visit

Segment tables define the fields and properties of each HL7 segment throughout this document. The following terms are used in the headings of the segment tables.

Term	Description
SEQ	Sequence Number is the ordinal position of the data field within the segment. This number refers to the data field in the comments text that follows the segment definition table.
LEN	Length is the maximum number of characters that one occurrence of the data field may occupy.
DT	Data Type identifies the restrictions on the contents of the data field as defined by the HL7 Standard.
R/O/C	R/O/C indicates whether the data field is required, optional, or conditional in a segment. **R**–required **O** (null)–optional **X**–not used with the trigger event **C**–conditional on the trigger event
VA R/O/C	VA (R/O/C) indicates whether the data field is required, optional, or conditional in a segment used by the Department of Veterans Affairs (VA). **R**–required **RE**–required or empty **O** (null)–optional **X**–not used with the trigger event **C**–conditional on the trigger event
RP/#	Repetition indicates the number of times you can repeat a field. **N (null)**–no repetition allowed **Y**–the field may repeat an indefinite or site determined number of times **(integer)**–you can repeat the field the number of times specified by the integer
TBL#	Table attribute of the data field defined by the HL7 standard (for a set of coded values) or negotiated between the VistA Laboratory application and the vendor system. Local tables used by the VA begin with the prefix **99VA**.
Element Name	Globally unique, descriptive name for the field

1.3.5 Fields

A field is a string of characters. The HL7 Messaging Standard does not specify how systems must store data within an application. Fields are transmitted as character strings.

1.3.6 Data Type

Data type identifies the restrictions on the contents of a data field. HL7 defines a number of data types. This information is in a column labeled **DT** in the segment attribute tables from the HL7 Messaging Standards.

Data Type	Data Type Name
AD	Address
CD	Channel definition
CE	Coded element
CF	Coded element with formatted values
CK	Composite ID with check digit
CM	Composite
CN	Composite ID number and name
CNE	Coded with no exceptions
CP	Composite price
CQ	Composite quantity with units
CWE	Coded with exceptions
CX	Extended composite ID with check digit
DLN	Driver's license number
DR	Date/time range
DT	Date
ED	Encapsulated data
EI	Entity identifier
FC	Financial class
FN	Family name
FT	Formatted text
HD	Hierarchic designator
ID	Coded values for HL7 tables
IS	Coded value for user-defined tables
JCC	Job code/class
MA	Multiplexed array
MO	Money
NA	Numeric array
NM	Numeric
PL	Person location
PN	Person name
PPN	Performing person time stamp
PT	Processing type
QIP	Query input parameter list
QSC	Query selection criteria

Data Type	Data Type Name
RCD	Row column definition
RI	Repeat interval
RP	Reference pointer
SAD	Street Address
SCV	Scheduling class value pair
SI	Sequence ID
SN	Structured numeric
SRT	Sort order
ST	String
TM	Time
TN	Telephone number
TQ	Timing/quantity
TS	Time stamp
TX	Text data
VH	Visiting hours
VID	Version identifier
XAD	Extended address
XCN	Extended composite ID number and name
XON	Extended composite name and ID number for organizations
XPN	Extended person name
XTN	Extended telecommunications number
A	Active
I	Inactive
L	Inactive - Lost to follow-up (cancel contract)
M	Inactive - Moved or gone elsewhere (cancel contract)
O	Other
P	Inactive - Permanently inactive (Do not reactivate or add new entries to the record)

1.4 References

- HL7 Messaging Standard version 2.4, American National Standards Institute, 2000
  HL7 Messaging Standard

- VistA HL7 Technical Documentation
  http://vista.med.va.gov/messaging/msgadmin/HL7documentation.asp

- Messaging & Interface Services (M&IS)
  http://vista.med.va.gov/messaging/plannerfaqs.asp

- VHA Software Document Library (VDL), Laboratory Electronic Data Interchange (LEDI), Clinical Section Version 5.2
  http://www.va.gov/vdl/application.asp?appid=75

- HL7 Documents and Presentations
  http://www.hl7.org/lib_admin/docs.cfm?dir=library/committees/conf&comm=conf

2 HL7 Segments in ACK and ORU Messages

HL7 segment fields support the transmission of laboratory test results in ACK and ORU messages.

2.1 MSA Segment – Message Acknowledgment

The MSA segment contains information sent in response to receiving a message.

Seq	Len	DT	R/O/C	VA R/O/C	RP#	TBL #	Element Name
1	2	ID	R	R		8	Acknowledgment Code
2	20	ST	R	R			Message Control ID
3	80	ST		C			Text Message

2.1.1 MSA Field Definitions

2.1.1.1 Acknowledgment Code (ID)

Acknowledgment Code can have the following values:

HL7 Table 0008 Acknowledgment Code

Value	Description	VA Usage
AA	Application Accept	Not used
AE	Application Error	Not used
AR	Application Reject	Not used
CA	Enhanced mode: Accept acknowledgment: Commit Accept	Used
CE	Enhanced mode: Accept acknowledgment: Commit Error	Used
CR	Enhanced mode: Accept acknowledgment: Commit Reject	Used

2.1.1.2 Message Control ID (ST)

This field identifies the message sent by the sending system. It allows the sending system to associate this response with the appropriate message.

2.1.1.3 Text Message (ST)

This optional text field describes an error condition. The text can be printed in error logs or presented to end-users.

2.2 MSH Segment – Message Header

The MSH segment defines the intent, source, destination, and some specifics of the syntax of a message.

Seq	Len	DT	R/O/C	VA R/O/C	RP#	TBL #	Element Name
1	1	ST	R	R			Field Separator
2	4	ST	R	R			Encoding Characters
3	15	HD	O	R			Sending Application
4	20	HD	O	R			Sending Facility
5	30	HD	O	R			Receiving Application
6	30	HD	O	R			Receiving Facility
7	26	TS	R	R			Date/Time Of Message
8	40	ST	O	X			Security
9	7	CM	R	R		76	Message Type
10	20	ST	R	R			Message Control ID
11	1	PT	R	R		103	Processing ID
12	8	VID	R	R		104	Version ID
15	2	ID	O	R		155	Accept Acknowledgment Type
16	2	ID	O	X		155	Application Acknowledgment Type

2.2.1 MSH Field Definitions

The segment terminator is always a carriage return (in ASCII, a hex 0D).
The other delimiters are defined in the MSH segment, with the field delimiter in the fourth character position, and the other delimiters occurring as in the field called Encoding Characters, which is the first field after the segment ID. The delimiter values used in the MSH segment are the delimiter values used throughout the entire message.

2.2.1.1 Field Separator (ST)

This field is the separator between the segment ID and the first real field, MSH-2-encoding characters. It serves as the separator and defines the character to be used as a separator for the rest of the message.

VistA Laboratory does not have pre-defined field separators. Applications are advised to use the value of this field to determine the field separator used throughout the message.

2.2.1.2 Encoding Characters (ST)

This field is four characters in the following order: component separator, repetition separator, escape character, and subcomponent separator.

VistA Laboratory does not have pre-defined encoding characters. Applications are advised to use the value of this field to determine the encoding characters used throughout the message.

2.2.1.3 Sending Application (HD)

This field interfaces with lower level protocols.

LA7LAB identifies VistA Laboratory.

2.2.1.4 Sending Facility (HD)

This field addresses one of several occurrences of the same application within the sending system. This field is the three-digit number identifying the medical center division, as found in the VistA INSTITUTION file (#4), Station Number field (#99). The actual facility name is entered into this field by the VistA HL package when addressing the message to each subscriber. It is in the form of a DNS type value and reflects the domain name associated with the VA facility.

2.2.1.5 Receiving Application (HD)

Refer to sending application. The actual subscriber's application name is entered into this field by the VistA HL package when addressing the message to each subscriber. For messages addressed to the VA Health Data Repository (HDR) the value is LA7HDR.

2.2.1.6 Receiving Facility (HD)

Refer to sending facility. The actual subscriber's facility name is entered into this field by the VistA HL package when addressing the message to each subscriber.

2.2.1.7 Date/Time of Message (TS)

This field is the date/time that the sending system created the message. If the time zone is specified, it is used throughout the message as the default time zone.

2.2.1.8 Security (ST)

In some applications of HL7, this field implements security features. Its use is not yet specified.

2.2.1.9 Message Type (CM)

Message Type is a composite element made up of the following:

```
<message type> <trigger event> <message structure>
```

- The first component is the message type, found in Table 76 - Message Type.
- The second component is the trigger event code found in Table 3 - Event Type Code.

- The third component is the abstract message structure code defined by HL7 Table 0354 - Message Structure.

The receiving system uses this field to know the data segments to recognize, and possibly the application to which to route this message.

2.2.1.10 Message Control ID (ST)

This field is a number or other identifier that uniquely identifies the message. The receiving system echoes this ID back to the sending system in the Message Acknowledgment segment (MSA) of the accept (commit) acknowledgment message (ACK).

2.2.1.11 Processing ID (ID)

This field determines whether to process the message as defined in the HL7 application processing rules.

HL7 Table 0103 Processing ID

Value	Description
D	Debugging
P	Production
T	Training

2.2.1.12 Version ID (ID)

This field is matched by the receiving system to its own version to be sure the message is interpreted correctly.

HL7 Table 0104 Version ID

Value	Description
2.1	Released 2.1 March 1990
2.2	Released 2.2 December 1994
2.3	Released 2.3 May 1997
2.3.1	Released 2.3.1 May 1999
2.4	Released 2.4 November 2000

Note: Lab HDR requires V. 2.4

2.2.1.15 Accept Acknowledgment Type (ID)

This field defines the conditions under which accept acknowledgments must be returned in response to this message.

HL7 Table 0155 Accept/Application Acknowledgment Conditions

Value	Description
AL	Always
NE	Never

Value	Description
ER	Error/reject conditions only
SU	Successful completion only

Note: VistA Laboratory specifies a value of **AL** for this field.

2.2.1.16 Application Acknowledgment Type (ID)

This field defines the conditions under which application acknowledgments are required in response to this message.

HL7 Table 155 Accept/Application Acknowledgment Conditions

Value	Description
AL	Always
NE	Never
ER	Error/reject conditions only
SU	Successful completion only

Note: VistA Laboratory specifies a value of **NE** for this field.

2.3 NTE Segment – Laboratory Notes and Comments

The NTE segment reports the Laboratory notes or comments.

Seq	Len	DT	R/O/C	VA R/O/C	RP#	TBL #	Element Name
1	4	SI	O	R			Set ID - Notes And Comments
2	8	ID	O	R		0105	Source Of Comment
3	64k	FT	O	R	Y		Comment
4	250	CE	O	R		0364	Comment Type

2.3.1 NTE Field Definitions

2.3.1.1 Set ID - Notes and Comments (SI)

This field is used where multiple NTE segments are included in a message.

2.3.1.2 Source of Comment (ID)

VistA Laboratory encodes this field with **L** for Lab Result (ORU) messages.

2.3.1.3 Comment (FT)

This field contains the comment associated with the specimen and/or a specific test.

2.3.1.4 Comment Type (CE)

This field contains the comment type.

- VA user-defined entries (VA-LR*) indicate the type of comments and their source within a VistA Laboratory report.
- Entries (VA-LRMI*) indicate Microbiology (MI-subscript) report comments.
- This field is valued when a microbiology report (MI subscript) contains comments that follow an OBR segment and describe the nature of the microbiology comment.

User-defined Table 0364 - Comment type

Value	Description	Comment
PI	Patient Instructions	
AI	Ancillary Instructions	
GI	General Instructions	
1R	Primary Reason	
2R	Secondary Reason	
GR	General Reason	
RE	Remark	
DR	Duplicate/Interaction Reason	
VA-LR001	Order Comment	Laboratory order comment
VA-LR002	Result Comment	Laboratory result comment
VA-LR003	Result Interpretation	Laboratory test result interpretation
VA-LRMI001	Comment on Specimen (#. 99)	Lab microbiology comment
VA-LRMI010	Bact Rpt Remark (#13)	Lab microbiology comment
VA-LRMI011	Preliminary Bact Comment (#1)	Lab microbiology comment
VA-LRMI012	Bacteriology Test(s) (#1.5)	Lab microbiology comment
VA-LRMI013	Bacteriology Smear/Prep (#11.7)	Lab microbiology comment
VA-LRMI020	Parasite Rpt Remark (#17)	Lab microbiology comment
VA-LRMI021	Preliminary Parasite Comment (#16.5)	Lab microbiology comment
VA-LRMI022	Parasite Test(s) (16.4)	Lab microbiology comment
VA-LRMI023	Parasitology Smear/Prep (#15.51)	Lab microbiology comment
VA-LRMI030	Mycology RPT Remark (#21)	Lab microbiology comment
VA-LRMI031	Preliminary Mycology Comment (#20.5)	Lab microbiology comment
VA-LRMI032	Mycology Test(s) (#20.4)	Lab microbiology comment
VA-LRMI033	Mycology Smear/Prep (#19.6)	Lab microbiology comment
VA-LRMI040	TB Rpt Remark (#27)	Lab microbiology comment
VA-LRMI041	Preliminary TB Comment (#26.5)	Lab microbiology comment

Value	Description	Comment
VA-LRMI042	TB Test(s) (#26.4)	Lab microbiology comment
VA-LRMI050	Virology Rpt Remark (#37)	Lab microbiology comment
VA-LRMI051	Preliminary Virology Comment (#36.5)	Lab microbiology comment
VA-LRMI052	Virology Test (#36.4)	Lab microbiology comment

2.4 OBR Segment – Observation Request

In the reporting of clinical data, the OBR serves as the report header. The OBR segment identifies the observation set represented by the following observations.

Seq	Len	DT	R/O/C	VA R/O/C	RP#	TBL #	Element Name
1	4	SI	C	R			Set ID - Observation Request
2	22	EI	C	C			Placer Order Number
3	22	EI	C	R			Filler Order Number
4	250	CE	R	R			Universal Service ID
7	26	TS	C	R			Observation Date/Time
11	1	ID	O	C			Specimen Action Code
12	60	CE	O	C			Danger Code
14	26	TS	C	R			Specimen Received Date/Time
15	300	CM	O	R		0070	Specimen Source
16	60	XCN	O	R	Y		Ordering Provider
19	60	ST	O	R			Placer Field #2
20	60	ST	O	R			Filler Field #1
21	60	ST	O	R			Filler Field #2
22	26	TS	O	R			Results Rpt/Status Chng - D/T
24	10	ID	O	R		0074	Diagnostic Serv Sect ID
25	1	ID	C	RE		0123	Result Status
26	200	CM	O	RE			Parent Result
29	200	CM	O	RE			Parent
32	200	CM	0	C			Principle Result Interpreter
33	200	CM	O	C	Y		Assistant Result Interpreter
34	200	CM	O	C	Y		Technician
35	200	CM	O	C	Y		Transcriptionist
44	250	CE	O	RE		0088	Procedure Code

2.4.1 OBR Field Definitions

2.4.1.1 Set ID - Observation Request (SI)

This field is a sequence number. For the first order transmitted, the sequence number is 1; for the second order, it is 2; and so on.

2.4.1.2 Placer Order Number (EI)

This field contains an entity identifier made up of the following:

```
<entity identifier> <namespace ID><universal ID><Universal ID Type (ID)>
```

It is a permanent identifier for an order and its associated observations on the system of the placer. Currently the first component is valued with the VistA Lab Unique Identifier (UID) or the human readable accession. This identifier is returned with the results. The VistA Lab UID is a ten-character alpha/numeric identifier. The accession is constructed from the associated accession area abbreviation, concatenated with the abbreviated accession date, concatenated with the accession number.

For entity identifier

- For **CH** subscript tests, the UID field (#.31) within the Chem, Hem, Tox, Ria, Ser, etc. subfile (#4) of the VistA LAB DATA file (#63)

  Note: When the instance of the order pre-dates the generation of the UID or is not available, the ACCESSION field (#.06) within the Chem, Hem, Tox, Ria, Ser, etc. subfile (#4) of the VistA LAB DATA file (#63) is transmitted.

- For **MI** subscript tests, the UID field (#.31) within the Microbiology, etc. subfile (#5) of the VistA LAB DATA file (#63)

  Note: When the instance of the order pre-dates the generation of the UID or is not available, the MICROBIOLOGY ACCESSION field (#.06) within the Microbiology, etc. subfile (#5) of the VistA LAB DATA file (#63) is transmitted.

- For **SP** subscript tests, the SURGICAL PATH ACC # field (#.06) within the Surgical Pathology subfile (#8) of the VistA LAB DATA file (#63)
- For **CY** subscript tests, the CYTOPATH ACC # field (#.06) within the Cytopathology subfile (#63.09) of the VistA LAB DATA (#63)
- For **EM** subscript test, the EM ACC # field (#.06) within the Electron Microscopy subfile (#62.02) of the VistA LAB DATA file (#63)
- For **Point of Care** (POC) testing when the POC system transmitted an order number

For namespace ID

- **LR** – for VistA Laboratory related tests
- **LRPOC** – for VistA Laboratory Point of Care related tests

For universal ID

The institution related to the order in the form of a VistA HL7 standard DNS reference.

For universal ID type

DNS

Example
```
|1073100001~LR~TEST.DEVELOPEMNT.MED.VA.GOV~DNS|
```

2.4.1.3 Filler Order Number (EI)

This field contains an entity identifier made up of the following:

```
<entity identifier> <namespace ID> <universal ID><Universal ID Type (ID)>
```

It is a permanent identifier for an order and its associated observations on the system of the filler. Currently the first component is valued with the VistA Lab Unique Identifier (UID) or accession. This identifier is returned with the results. The VistA Lab UID is a ten-character alpha/numeric identifier. The accession is constructed from the associated accession area abbreviation, concatenated with the abbreviated accession date, concatenated with the accession number

For entity identifier

- For **CH** subscript tests, the UID field (#.31) within the Chem, Hem, Tox, Ria, Ser, etc. subfile (#4) of the VistA LAB DATA file (#63)

  Note: When the instance of the order pre-dates the generation of the UID or is not available, the ACCESSION field (#.06) within the Chem, Hem, Tox, Ria, Ser, etc. subfile (#4) of the VistA LAB DATA file (#63) is transmitted.

- For **MI** subscript tests, the UID field (#.31) within the Microbiology, etc. subfile (#5) of the VistA LAB DATA file (#63)

  Note: When the instance of the order pre-dates the generation of the UID or is not available, the MICROBIOLOGY ACCESSION field (#.06) within the Microbiology, etc. subfile (#5) of the VistA LAB DATA file (#63) is transmitted.

- For **SP** subscript tests, the SURGICAL PATH ACC # field (#.06) within the Surgical Pathology subfile (#8) of the VistA LAB DATA file (#63)
- For **CY** subscript tests , the CYTOPATH ACC # field (#.06) within the Cytopathology subfile (#63.09) of the VistA LAB DATA (#63)
- For **EM** subscript test, the EM ACC # field (#.06) within the Electron Microscopy subfile (#62.02) of the VistA LAB DATA (#63)

For namespace ID

LR – for VistA Laboratory related tests

For universal ID

The institution related to the order in the form of a VistA HL package standard DNS reference.

For universal ID type

DNS

2.4.1.4 Universal Service ID (CE)

This field is a coded element made up of the following:

```
<identifier> <text> <name of coding system> <alternate identifier> <alternate text>
<name of alternate coding system>
```

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

The WKLD CODE file (#64) is used to identify the observed test and will be the value of the universal service id. It contains the VA National Laboratory Test code. Future versions may utilize LOINC codes as an additional coding system. The alternate code is the local test name from LABORATORY TEST file (#60).

```
<NLT code File #64 Field #1>^<text>^<99VA64>^<File #60 internal entry number>^<File
#60, NAME field (#.01)>^<99VA60>
```

2.4.1.7 Observation Date/Time (TS)

This field is the clinically relevant date/time of the observation. This is the date and time of the specimen collection. Value for this field is derived from Date/Time Specimen Taken field (#.01) within VistA LAB DATA file (#63).

Subscript	Subfile	Field
CH	63.04	Date/Time Specimen Taken (#.01)
CY	63.09	Date/Time Specimen Taken (#.01)
EM	63.02	Date/Time Specimen Taken (#.01)
MI	63.05	Date/Time Specimen Taken (#.01)
SP	63.08	Date/Time Specimen Taken (#.01)

2.4.1.11 OBR-11 Specimen Action Code (ID)

This field identifies the action to take with respect to the specimens that accompany or precede this order. The purpose of this field is to further qualify (when appropriate) the general action indicated by the order control code contained in the accompanying ORC segment.

Example
When a new order (ORC - "NW") is sent to the lab, this field tells the lab whether or not to collect the specimen ("L" or "O"). Refer to HL7 Table 0065 - Specimen action code for valid values.

HL7 Table 0065 - Specimen action code

Value	Description
A	Add ordered tests to the existing specimen
G	Generated order; reflex order
L	Lab to obtain specimen from patient
O	Specimen obtained by service other than Lab
P	Pending specimen; Order sent prior to delivery
R	Revised order
S	Schedule the tests specified below

Currently VistA Laboratory does not value this field. A subsequent VistA Laboratory patch will record this information with laboratory results at which time this field will be valued when available.

2.4.1.12 Danger Code (CE)

This field contains the code and/or text indicating any known or suspected patient or specimen hazards, e.g., patient with active tuberculosis or blood from a hepatitis patient. Either code and/or text may be absent. However, the code is always placed in the first component position and any free text in the second component position. Free text without a code must be preceded by a component delimiter.

Components

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

The Danger Code contains the information located within the LAB DATA file (#63) Pat. Info. field (#.091). VistA does not code this information. It is transmitted as text and occurs in the second component of this field.

2.4.1.14 Specimen Received Date/Time (TS)

This field is the actual time of arrival of a specimen at the diagnostic service. Depending on the nature of the test, the value for this field is derived from the following fields within VistA LAB DATA file (#63).

Subscript	Subfile	Field
CH	63.04	Date/Time Specimen Taken (#.01)
CY	63.09	Date/Time Specimen Received (#.1)
EM	63.02	Date/Time Specimen Received (#.1)
MI	63.05	Date/Time Received (#.1)
SP	63.08	Date/Time Specimen Received (#.1)

For Chemistry/Hematology (**CH**), VistA Lab attempts to retrieve this value from the LAB ARRIVAL TIME (#12) within the Accession Number subfile (#68.02), within the Date subfile (#68.01) of the VistA Accession file (#68). If no value is found, the Date/Time Specimen Taken field (#.01), within the CHEM, HEM, TOX, RIA, SER, etc. subfile (#62.04) is reported to maintain compliance with HL7 standard.

2.4.1.15 Specimen Source (CM)

This field contains the information on the specimen source.

Components

```
<specimen source name or code>^<additives>^<freetext>^<body site>^<site
modifier>^<collection method modifier code>
```

The specimen source component is encoded as a CWE data type and contains nine subcomponents.

> **Note:** Use of CWE data type is pre-adopted from HL7 v2.6 to facilitate expression of coding system version and local terms.

```
<code from HL7 Table 0070>&<text>&<HL70070>^<SNOMED code>&<text>&<SNM>&<coding system
version id&<alternate coding system version id>&<local specimen name>
```

Note: In a future VistA Laboratory patch, the SNOMED code system will be replaced with the SNOMED CT code system.

The entries in Table 0070 are mapped to one specific entry in the LAB ELECTRONIC CODES file (#64.061) and are placed in the first three subcomponents.

- The first is the VistA TOPOGRAPHY file (#61), which is mapped to the corresponding entry in file #64.061.
- The second subcomponent text contains the Table 0070 description.
- The third subcomponent contains the HL7 table identifier.
- The fourth through sixth subcomponents contain the corresponding SNOMED code with the text of the topography from VistA TOPOGRAPHY file (#61).
- The eighth component contains the version of the SNOMED code.
- The ninth component contains the name (text) of the related local topography as specified in the table.

Subscript	Subfile	Field
CH	63.04	Specimen Type (#.05)
CY	63.09	Specimen Topography (#.06)
EM	63.02	Specimen Topography (#.06)
MI	63.05	Site/Specimen (#.05)
SP	63.08	Specimen Topography (#.06)

The body site component (fourth) contains the related collection sample encoded as a CWE data type when the specimen relates to a microbiology (**MI** subscript) report.

- When the collection sample is mapped to SNOMED CT the first three subcomponents contain the applicable SNOMED CT code with the seventh subcomponent indicating the SNOMED CT version.
- The fourth through sixth components contain the local code based on the VistA Laboratory COLLECTION SAMPLE file (#62).
- The ninth component contains the local name (text) of the related collection sample

Example

```
257261003&Swab (specimen)&SCT&50&SWAB&99VA62&20060101&&SWAB
```

2.4.1.16 Ordering Provider (XCN)

This field contains the identity of the person who is responsible for creating the request (i.e., ordering physician).

This field identifies the provider who ordered the test. The ID code and the name may be present. This field is repeated in ORC-12 and contains the same value per the HL7 standards.

Components

```
<ID number (ST)> ^ <family name (FN)> ^ <given name (ST)> ^ <second or further given
names or initials thereof (ST)> ^ <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR)
(ST)> ^ <degree (e.g., MD) (IS)> ^ <source table (IS)> ^ <assigning authority (HD)> ^
<name type code (ID)> ^ <identifier check digit (ST)> ^ <code identifying the check
digit scheme employed (ID)> ^ <identifier type code (IS)> ^ <assigning facility (HD)>
^ <name representation code (ID)> ^ <name context (CE)> ^ <name validity range (DR)> ^
< name assembly order (ID)>
```

Subcomponents of assigning authority

```
<namespace ID (IS)> & <universal ID (ST)> & universal ID type (ID)
```

Subcomponents of assigning facility

```
<namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)
```

ID can be valued with one of three identifiers.

When the provider is assigned a National Provider ID (NPI) the NPI is transmitted as the ID, the assigning authority (ninth component) contains USDHHS. The check digit is transmitted in the identifier check digit (eleventh component). NPI.is transmitted as the code identifying the check digit scheme employed (twelfth component) and NPI is transmitted as the identifier type code (thirteenth component).

Example
HL7 delimiters |^~\&

```
|0000000003^LRPROVIDER^ONE^D^^^MD^^USDHHS^^3^NPI^NPI|
```

- When the provider has no NPI and is assigned a VA Person ID (VPID), the VPID is transmitted as the ID, the assigning authority (ninth component) contains USVHA and identifier type code (thirteenth component) contains PN.
- If there is no NPI or VPID, the internal entry number (DUZ) of the person in the VistA NEW PERSON file (#200) is transmitted concatenated with **-VA** and the VA station number.

2.4.1.19 Placer Field (#2) (ST)

This field (#2) contains vital information for linking the incoming result with the original order. The data must be passed in the following format:

```
<>^<>^<Accession Area>^<Accession Date>^<Accession Number>^<Accession>^
<Universal ID>^<Sequence Number>
```

All components are optional except the Universal ID, which must match with the Placer Order Number.

Note: Data in this field can be encoded using HL7 escape sequences.

2.4.1.20 Filler Field (#1) (ST)

This field (#1) contains information relating to the filler of the results and the reference to the data storage location of the results in VistA LAB DATA file (#63).

The data is structured using the following format:

```
<LRDFN (VistA LAB DATA file (#63) internal entry number)>^<File #63 subscript (“CH”,
“CY”,“MI”,”SP”,”EM”)>^<specimen date/time internal entry number in VistA LAB DATA file
(#63>
```

Note: This field can be HL7 escape encoded when the data conflicts with the HL7 delimiters used to encode the HL7 message.

2.4.1.21 Filler Field (#2) (ST)

This field (#2) contains information relating to the filler of the results and the reference to the accession related to the results in VistA LAB DATA file (#63).

The data is structured using the following format:

```
LRACC^LRAA^LRAD^LRAN^Accession Area^Area Abbreviation^NLT
```

Where:

LRACC	Human readable accession
LRAA	Internal entry number of accession area in ACCESSION file (#68)
LRAD	FileMan accession date
LRAN	Accession number
Accession Area	Accession area name from ACCESSION file (#68) based on LRAA value
Area Abbreviation	Accession area abbreviation from ACCESSION file (#68) based on LRAA value
NLT	Order NLT code of ordered test

Note: This field can be HL7 escape encoded when the data conflicts with the HL7 delimiters used to encode the HL7 message.

2.4.1.22 Results Report/Status Change – Date/Time (TS)

This field contains the date and time the report is released. It is derived from the following fields in VistA LAB DATA file (#63):

Subscript	Subfile	Field
CH	63.04	Date Report Completed (#.03)
CY	63.09	Report Release Date/Time (#.11)
EM	63.02	Report Release Date/Time (#.11)
MI	63.05	Date Report Completed (#.03)
SP	63.08	Report Release Date/Time (#.11)

2.4.1.24 Diagnostic Serv Sect ID (ID)

This field contains a reference to the data storage location of the results in VistA LAB DATA file (#63). The various subscripts are mapped as follows.

HL7 Table 0074 – Diagnostic Serv Sect ID Mapping

VistA Subscript	HL7 Table 0074 – Diagnostic Serv Sect ID
CH	CH

VistA Subscript	HL7 Table 0074 – Diagnostic Serv Sect ID
MI-Micro bacteriology	MB
MI-Parasitology	PAR
MI-Mycology	MYC
MI-Mycobacteriology	MCB
MI-Virology	VR
CY	CY
SP	SP
EM	PAT
AU	PAT
BB	BLB

2.4.1.25 Result Status (ID)

This field is the status of results for this order. This conditional field is required whenever the OBR is contained in a report message. It is not required as part of an initial order.

This field is the response to an order status query where the level of detail requested does not include the OBX segments. When the individual status of each result is necessary, **OBX-11 – Observ Result Status** may be used.

For chemistry/hematology, etc. (CH) subscript tests this field is not valued. For status of the individual results, refer to **OBX-11 – Observ Result Status**.

For microbiology (MI) subscript and anatomic pathology (SP, CY, and EM) subscripts, this field contains the status of the whole report.

HL7 Table 0123 – Result Status

Value	Description	VA Usage
O	Order received; specimen not yet received	Used
I	No results available; specimen received, procedure incomplete	Used
S	No results available; procedure scheduled, but not done	Not Used
A	Some, but not all, results available	Used
P	Preliminary: A verified early result is available, final results not yet obtained	Used
C	Correction to results	Used
R	Results stored; not yet verified	Not used
F	Final results; results stored and verified. Can only be changed with a corrected result	Used
X	No results available; Order canceled	Used

Value	Description	VA Usage
Y	No order on record for this test (Used only on queries)	Not used
Z	No record of this patient (Used only on queries)	Not used

2.4.1.26 Parent Result (CM)

This field uniquely identifies the parent result's OBX segment related to this order.

```
<OBX-3-observation identifier of parent result>^<OBX-4-sub-ID of parent result>
```

If the current battery is an antimicrobial susceptibility, the parent results identified OBX contains a result, which identifies the organism on which the susceptibility was run.

VistA currently only uses this field for microbiology (MI) subscript results when reporting antibiotic susceptibility.

2.4.1.29 Parent (CM)

This field relates a child to its parent when a parent-child relationship exists. Parent is a two-component field. The components of the placer order number and the filler order number are transmitted in subcomponents of this two-component field.

```
<parent's placer order number>^<parent's filler order number>
```

Antimicrobial susceptibilities spawned by cultures, need to record the parent (culture) filler order number here.

2.4.1.32 Principle Result Interpreter (CM)

This field identifies the physician or other clinician who interpreted the observation and is responsible for the report content. This information is derived from Pathologist field (# .02) for Surgical Pathology (SP), Cytopathology (CY) and Electron Microscopy (EM) subscripts in LAB DATA file (#63).

Components

```
<name (XCN)> ^ <start date/time (TS)> ^ <end date/time (TS)> ^ <point of care (IS)> ^
<room (IS)> ^ <bed (IS)> ^ <facility (HD)> ^ <location status (IS)> ^ <patient
location type (IS)> ^ <building (IS)> ^ <floor (IS)>
```

Note: XCN Replaces CN data type as of v 2.3. XCN data type pre-adopted to convey additional information regarding the type of identifier.

Subcomponents of name

```
<ID number (ST)> & <family name (ST)> & <given name (ST)> & <middle initial or name
(ST)> & <suffix (e.g., JR. III) (ST)> & <prefix (e.g., DR)> & <degree (e.g., MD) (ST)>
& <source table (IS)> & <assigning authority (HD)> ^ <name type code (ID)> ^
<identifier check digit (ST)> ^ <code identifying the check digit scheme employed
(ID)> ^ <identifier type code (IS)> ^ <assigning facility (HD)> ^ <name representation
code (ID)> ^ <name context (CE)> ^ <name validity range (DR)> ^ <name assembly order
(ID)>
```

- When the provider is assigned a National Provider ID (NPI), the NPI is transmitted as the ID and the assigning authority (ninth component) contains USDHHS, the check digit is transmitted in identifier check digit (eleventh component).. NPI is transmitted as the code identifying the check digit scheme

employed (twelfth component) and NPI is transmitted as the identifier type code (thirteenth component).

- When the provider has no NPI and is assigned a VA Person ID (VPID), the VPID is transmitted as the ID and the assigning authority (ninth component) contains USVHA. PN is transmitted as the identifier type code (thirteenth component).
- When there is no NPI or VPID, the internal entry number (DUZ) of the person in the VistA NEW PERSON file (#200) is transmitted concatenated with (-VA) and the VA station number.

Subcomponents of facility

```
<namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

The Facility field is expressed as a DNS ID with the namespace ID (first component) containing the VA station number of the facility, the universal ID (second component) containing the related domain name of the facility (xxx.med.va.gov), and the universal ID type (third component) containing DNS.

2.4.1.33 Assistant Result Interpreter (CM)

This field identifies the clinical observer who assisted in the interpretation of study. This information is derived from RESIDENT PATHOLOGIST field (# .021) for Surgical Pathology (SP); CYTOTECH (# .021) for Cytopathology (CY); and RESIDENT OR EMTECH (# .06) field for Electron Microscopy (EM) subscripts in LAB DATA file (#63).

Components

```
<name (XCN)> ^ <start date/time (TS)> ^ <end date/time (TS)> ^ <point of care (IS)> ^
<room (IS)> ^ <bed (IS)> ^ <facility (HD)> ^ <location status (IS)> ^ <patient
location type (IS)> ^ <building (IS)> ^ <floor (IS)>
```

Note: XCN Replaces CN data type as of v 2.3. XCN data type pre-adopted to convey additional information regarding the type of identifier.

Subcomponents of name

```
<ID number (ST)> & <family name (ST)> & <given name (ST)> & <middle initial or name
(ST)> & <suffix (e.g., JR. III) (ST)> & <prefix (e.g., DR)> & <degree (e.g., MD) (ST)>
& <source table (IS)> & <assigning authority (HD)> ^ <name type code (ID)> ^
<identifier check digit (ST)> ^ <code identifying the check digit scheme employed
(ID)> ^ <identifier type code (IS)> ^ <assigning facility (HD)> ^ <name representation
code (ID)> ^ <name context (CE)> ^ <name validity range (DR)> ^ <name assembly order
(ID)>
```

- When the provider is assigned a National Provider ID (NPI), the NPI is transmitted as the ID and the assigning authority (ninth component) contains USDHHS, the check digit is transmitted in identifier check digit (eleventh component). NPI is transmitted as the code identifying the check digit scheme employed (twelfth component) and NPI is transmitted as the identifier type code (thirteenth component).
- When the provider has no NPI and is assigned a VA Person ID (VPID), the VPID is transmitted as the ID and the assigning authority (9th component) contains USVHA. PN is transmitted as the identifier type code (thirteenth component).
- When there is no NPI or VPID, the internal entry number (DUZ) of the person in the VistA NEW PERSON file (#200) is transmitted concatenated with (-VA) and the VA station number.

Subcomponents of facility

<namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>

Facility field is expressed as a DNS ID with the namespace ID (first component) containing the VA station number of the facility, the universal ID (second component) containing the related domain name of the facility (xxx.med.va.gov), and the universal ID type (third component) containing DNS.

2.4.1.34 Technician (CTM)

This field identifies the performing technician. This information is derived from CYTOTECH field (# .021) for Cytopathology (CY) and RESIDENT OR EMTECH field (# .021) for Electron Microscopy (EM) subscripts in file LAB DATA (#63).

Components

```
<name (XCN)> ^ <start date/time (TS)> ^ <end date/time (TS)> ^ <point of care (IS)> ^
<room (IS)> ^ <bed (IS)> ^ <facility (HD)> ^ <location status (IS)> ^ <patient
location type (IS)> ^ <building (IS)> ^ <floor (IS)>
```

Note: XCN Replaces CN data type as of v 2.3. XCN data type pre-adopted to convey additional information regarding the type of identifier.

Subcomponents of name

```
<ID number (ST)> & <family name (ST)> & <given name (ST)> & <middle initial or name
(ST)> & <suffix (e.g., JR. III) (ST)> & <prefix (e.g., DR)> & <degree (e.g., MD) (ST)>
& <source table (IS)> & <assigning authority (HD)> ^ <name type code (ID)> ^
<identifier check digit (ST)> ^ <code identifying the check digit scheme employed
(ID)> ^ <identifier type code (IS)> ^ <assigning facility (HD)> ^ <name representation
code (ID)> ^ <name context (CE)> ^ <name validity range (DR)> ^ <name assembly order
(ID)>
```

- When the technician is assigned a VA Person ID (VPID), the VPID is transmitted as the ID and the assigning authority (ninth component) contains USVHA. PN is transmitted as the identifier type code (thirteenth component).
- When there is no VPID, the internal entry number (DUZ) of the person in the VistA NEW PERSON file (#200) is transmitted concatenated with (VA) and the VA station number.

Subcomponents of facility

```
<namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

Facility field is expressed as a DNS ID with the namespace ID (first component) containing the VA station number of the facility, the universal ID (second component) containing the related domain name of the facility (xxx.med.va.gov), and the universal ID type (third component) containing DNS.

2.4.1.35 Typist (CM)

This field identifies the report transcriber. This information is derived from TYPIST field (# .09) for Surgical Pathology (SP); CYTOTECH (# .021) for Cytopathology (CY); and RESIDENT OR EMTECH (# .06) for Electron Microscopy (EM) subscripts in file LAB DATA file (#63).

Components

```
<name (XCN)> ^ <start date/time (TS)> ^ <end date/time (TS)> ^ <point of care (IS)> ^
<room (IS)> ^ <bed (IS)> ^ <facility (HD)> ^ <location status (IS)> ^ <patient
location type (IS)> ^ <building (IS)> ^ <floor (IS)>
```

Note: XCN Replaces CN data type as of v 2.3. XCN data type pre-adopted to convey additional information regarding the type of identifier.

Subcomponents of name

```
<ID number (ST)> & <family name (ST)> & <given name (ST)> & <middle initial or name
(ST)> & <suffix (e.g., JR. III) (ST)> & <prefix (e.g., DR)> & <degree (e.g., MD) (ST)>
& <source table (IS)> & <assigning authority (HD)> ^ <name type code (ID)> ^
<identifier check digit (ST)> ^ <code identifying the check digit scheme employed
(ID)> ^ <identifier type code (IS)> ^ <assigning facility (HD)> ^ <name representation
code (ID)> ^ <name context (CE)> ^ <name validity range (DR)> ^ <name assembly order
(ID)>
```

- When the typist is assigned a VA Person ID (VPID), the VPID is transmitted as the ID and the assigning authority (ninth component) contains USVHA. PN is transmitted as the identifier type code (thirteenth component).
- When there is no VPID, the internal entry number (DUZ) of the person in the VistA NEW PERSON file (#200) is transmitted concatenated with (-VA) and the VA station number.

Subcomponents of facility

```
<namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

Facility field is expressed as a DNS ID with the namespace ID (first component) containing the VA station number of the facility, the universal ID (second component) containing the related domain name of the facility (xxx.med.va.gov), and the universal ID type (third component) containing DNS.

2.4.1.44 Procedure Code (CE)

This field contains a unique identifier assigned to the procedure, if any, associated with the charge. Refer to User-defined table 0088 - Procedure code for suggested values. This field is a CE data type for compatibility with clinical and ancillary systems

Components

```
<Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^ <Alternate Identifier
(ST)> ^ <Alternate Text (ST)> ^ <Name of Alternate Coding System (ID)>
```

- When the ordered laboratory test has an associated order NLT code, the order NLT and CPT code is reported. The CPT code is reported as the primary code and the NLT code as the alternate.
- When the NLT code is not linked to an associated CPT code, the NLT code is reported as the primary code.

```
<CPT code File #81 Field #1>^<text>^<C4 or HCPCS>^<NLT code File #64 Field
#1>^<text>^<99VA64
or
<NLT code File #64 Field #1>^<text>^<99VA64
```

Example

```
|84100~ASSAY OF PHOSPHORUS~C4~84100.0000~Phosphate Inorganic~99VA64|
```

2.5 OBX Segment - Observation

The OBX segment transmits a single observation or observation fragment.

Seq	Len	DT	Usage	VA R/O/C	RP/#	TBL#	Element Name
1	4	SI	O	R			Set Id – OBX
2	3	ID	C	C		0125	Value Type
3	250	CWE	R	R			Observation Identifier
4	20	ST	C	C			Observation Sub-ID
5	65536		O	C			Observation Value
6	250	CE	O	C			Units
7	60	ST	O	R			Reference Ranges
8	5	IS	O	C		0078	Abnormal Flags
11	1	ID	R	R		0085	Observ Result Status
13	20	ST	0	C			User Defined Access Checks
14	26	TS	O	R			Date/Time Of The Observation
15	250	CE	O	R			Producer's ID
16	250	XCN	O	R			Responsible Observer
17	250	CE	O	C			Observation Method
18	22	EI	O	C			Equipment Instant Identifier
19	26	TS	O	C			Date/Time Of Analysis
23	567	XON	O	C			Performing Organization Name
24	631	XAD	O	C			Performing Organization Address
25	3002	XCN	O	C			Performing Organization Medical Director

Note: OBX-23/OBX-24/OBX-25 were pre-adopted from HL7 v2.5.1 in preparation for conformance with HITSP.

2.5.1 OBX Field Definitions

2.5.1.1 Set ID - Observation Simple (SI)

This field is a sequence number used to identify the segment repetitions.

2.5.1.2 Value Type (ID)

This field is the format of the observation value in OBX.

HL7 Table 0125 – Value Type

Value	Description
CE	Coded Entry
CNE	Coded with no exceptions
CWE	Coded with exceptions
FT	Formatted Text
NM	Numeric
SN	Structured Numeric
ST	String Data
TX	Text

Although there are other entries in the HL7 table, only the above values are transmitted by VistA. It is valued unless OBX-11 is not valued per the HL7 Standard: *It must be valued if OBX-11-Observ result status is not valued with an 'X'*. If OBX-11 contains "X" and OBX-5 is not valued, OBX-2 is not valued.

2.5.1.3 Observation Identifier (CWE)

Components

```
<identifier (ST)> ^ <text (ST)> ^ <name of coding system (IS)> ^ <alternate identifier
(ST)> ^ <alternate text (ST)> ^ <name of alternate coding system (IS)> ^ <coding
system version ID (ST)> ^ alternate coding system version ID (ST)> ^ <original text
(ST)>
```

Observation Identifier is a coded element

- When a result is LOINC (Logical Observation Identifiers Names and Codes) encoded, LOINC is the coding system and VUID the alternate coding system. The text for the VUID (Veterans Health Administration (VHA) Unique ID) code is the VA assigned national test display name.
- When no VA display name is associated with the VUID, the field is blank. The local test name is the VistA LABORATORY TEST file (#60), Name field (#.01), when expressing laboratory test results associated with the VistA CH subscript.

```
<LOINC CODE> <text> <LN> <VUID  CODE> <text> <99VA95.3> <LOINC version #> < VUID
version #> <local test name>
```

VUID is a unique meaningless integer assigned to reference terms VHA wide.

When a local code is used as either the primary or alternate for chemistry/hematology ("CH") subscript results, it is encoded as: <"CH" data name number<>data name label<>99VA63>.
This field is a unique identifier for the observation test results.

HL7 delimiters |^~\&

Example
LOINC as primary, VUID as alternate

```
|2345-7^GLUCOSE:MCNC:PT:SER/PLAS:QN^LN^4665460^ ^99VA95.3^2.14^2.14^Serum Glucose|
```

Example
LOINC code as primary, local code as alternate (no VUID available)

```
|2951-2^SODIUM:SCNC:PT:SER/PLAS:QN^LN^CH5^SODIUM^99VA63^2.13^5.2^SODIUM|
```

Example
Local code as primary, (no LOINC/VUID available) HL7 delimiters: |^~\&

```
|CH5^SODIUM^99VA63^^^^^5.2^SODIUM|
```

For microbiology (MI subscript) and anatomic pathology (SP, CY and EM subscripts) the coding of this field is as specified in section 3.4 of this specification.

2.5.1.4 Observation Sub-ID (ST)

This field distinguishes between multiple OBX segments with the same observation ID organized under one OBR.

VistA for chemistry/hematology type results (CH subscript) values this field with "CH" concatenated with the field number of the field used to store the instance of this result within the CHEM, HEM, TOX, RIA, SER, etc. subfile (#4) of the VistA LAB DATA file (#63).

VistA uses this field for microbiology results, which contain multiple organisms and antibiotic susceptibilities, anatomic pathology results to distinguish multiple sections of the report, and for general chemistry/hematology/serology, etc. type results to distinguish results using the same observation ID.

2.5.1.5 Observation Value (ST)

This field is the value observed by the observation producer. The length of this field is variable, depending upon the value type.

2.5.1.6 Units (CE)

This field is a coded element.

Components

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

The default coding system for Units consists of the ISO abbreviations as defined in Section 7.1.4 of the *HL7 Standard V. 2.4*. Currently VistA uses units derived from a local file. These are encoded with coding system **L**. The text component contains the value of the identifier component.

2.5.1.7 Reference Range (ST)

The field contains the identified range for this specific result.

2.5.1.8 Abnormal Flag (ID)

This field contains the entries identified by table 0078.

HL7 Table 0078 – Value Type

Value	Description	VA Usage
L	Below low normal	Used
H	Above high normal	Used
LL	Below lower panic limits	Used
HH	Above upper panic limits	Used
<	Below absolute low-off instrument scale	Not Used
>	Above absolute high-off instrument scale	Not Used
N	Normal (applies to non-numeric results)	Not Used
A	Abnormal (applies to non-numeric results)	Not Used
AA	Very abnormal (applies to non-numeric results, analogous to panic limits for numeric results)	Not Used
Null	No range defined, or normal ranges don't apply	Used
U	Significant change up	Not Used
D	Significant change down	Not Used
B	Better—use when direction not relevant	Not Used
W	Worse—use when direction not relevant	Not Used
	For microbiology susceptibilities only	
S	Susceptible	Used
R	Resistant	Used
I	Intermediate	Used
MS	Moderately susceptible	Used
VS	Very susceptible	Used

2.5.1.11 Observ Result Status (ID)

This field reflects the current completion status of the results for one Observation Identifier.

HL7 Table 0085 – Observation Result Status Codes Interpretation

Value	Description	VA Usage
C	Record coming over is a correction and thus replaces a final result	Used
D	Deletes the OBX record	Not Used
F	Final results; can only be changed with a corrected result	Used
I	Specimen in lab; results pending	Used
N	Not asked	Not Used
O	Order detail description only (no result)	Not Used

Value	Description	VA Usage
P	Preliminary results	Used
R	Results entered – not verified	Not Used
S	Partial results	Used
X	Results cannot be obtained for this observation	Used
U	Results status change to final without retransmitting results already sent as 'preliminary'.	Not used
W	Post original as wrong	Not Used

2.5.1.13 User Defined Access Checks

This field permits the producer to record results-dependent codes for classifying the observation at the receiving system.

The VistA system values this field when an antimicrobial susceptibility result is reported and access checks are specified by the reporting facility.

Value	VUID	Description
Always Display	4500665	Always display the result
Never Display	4500805	Never display the result, unless the user has the LRLAB key that indicates user is laboratory personnel
Restrict Display	4500877	Display the result only when the interpretation of all antibiotics, which are always displayed, is resistant

2.5.1.14 Date/Time of the Observation (TS)

The observation date/time is the physiologically relevant date/time or the closest approximation to that date/time. In the case of observations taken directly on the patient, the observation date-time is the date-time that the observation is performed.

2.5.1.15 Producer's ID (CE)

This field contains the unique identifier of the responsible producing service and must be reported accurately. For instance, accuracy is imperative when the test results are produced at outside laboratories.

If this field is null, the receiving system assumes the observations are produced by the sending organization. This information supports CLIA regulations in the US. The code for producer ID is recorded as a CE data type. In the US, the Medicare number of the producing service is usually used as the identifier.

Components

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

The ID number is the station number found in the VistA INSTITUTION file (#4), Station Number field (#99). The text is the value of the Official VA Name field (#100). If this value is null, the value of the Name field (#.01) is used.

The Laboratory CLIA number, when available, is transmitted as the alternate identifier with the name of the coding system, **99VACLIA**.

2.5.1.16 Responsible Observer (XCN)

When required, this field contains the identifier of the individual directly responsible for the observation (such as, the person who performed or verified the observation).

- In a nursing service, the observer is usually the professional who performed the observation (such as, took the blood pressure).
- In a laboratory, the observer is the technician who performed or verified the analysis.

The code for the observer is recorded as a CE data type. If the code is sent as a local code, it must be unique and unambiguous when combined with OBX-15-producer ID. When available, the code is transmitted with results.

Components

```
<ID number (ST)> ^ <family name (FN)> ^ <given name (ST)> ^ <second or further given
names or initials thereof (ST)> ^ <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR)
(ST)> ^ <degree (e.g., MD) (IS)> ^ <source table (IS)> ^ <assigning authority (HD)> ^
<name type code (ID)>  ^ <identifier check digit (ST)> ^ <code identifying the check
digit scheme employed (ID)> ^ <identifier type code (IS)> ^ <assigning facility (HD)>
^ <name representation code (ID)> ^ <name context (CE)> ^ <name validity range (DR)> ^
< name assembly order (ID)>
```

Subcomponents of assigning authority

```
<namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

Subcomponents of assigning facility ID

```
<namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

When the provider is assigned a National Provider ID (NPI), the NPI is transmitted as the ID, the assigning authority (ninth component) contains USDHHS, and the check digit is transmitted in identifier check digit (eleventh component). NPI is transmitted as the code identifying the check digit scheme employed (twelfth component) and NPI is transmitted as the identifier type code (thirteenth component).

- When the responsible observer is assigned a VA Person ID (VPID), the VPID is transmitted as the ID, the assigning authority (ninth component) contains USVHA, and the identifier type code (thirteenth component) contains PN.
- If there is no VPID, the internal entry number (DUZ) of the person in the VistA NEW PERSON file (#200) is transmitted, concatenated with **-VA** and the VA station number.

The Facility field is expressed as a DNS ID with the namespace ID (first component) containing the VA station number of the facility, the universal ID (second component) containing the related domain name of the facility (xxx.med.va.gov), and the universal ID type (third component) containing **DNS**.

2.5.1.17 Observation Method (CE) 00936

Use this optional field to transmit the method or procedure by which an observation is obtained when the sending system needs to distinguish a measurement obtained by different methods where the distinction is not implicit in the test ID.

Components

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

VistA values this field, when available, with the related methodology associated with the result from WKLD SUFFIX CODES file (#64.2).

```
<WKLD SUFFIX CODE> <text> <99VA64_2 > <alternate identifier> <alternate text> <name of
alternate coding system
```

2.5.1.18 Equipment Instant Identifier (EI)

This field identifies the Equipment Instance (such as, Analyzer, Analyzer module, group of Analyzers) responsible for the production of the observation.

Components

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

VistA Laboratory values this field with the information and in the form originally transmitted by the automated instrument that produced the result.

2.5.1.19 Date/Time of the Analysis (TS)

This field transfers the time stamp associated with the generation of the analytical result by the instrument specified in Equipment Instance Identifier.

VistA values this field with the date/time at which the associated results are verified and released.

2.5.1.23 Performing Organization Name (XON)

This field contains the name of the organization/service responsible for performing the service. When this field is null, the receiving system assumes the observations are produced by the sending organization. The information for producer ID is recorded as an XON data type.

For laboratories, this field specifies the laboratory that produced the test result described in this OBX segment and must be reported accurately. For instance, accuracy is imperative when the test results are produced at outside laboratories. This information supports CLIA regulations in the US. For producing laboratories, which are CLIA certified, the CLIA identifier is used as the organization identifier (component 10).

Components

```
<Organization Name (ST)> ^ <Organization Name Type Code (IS)> ^ ID Number (NM)> ^
<Check Digit (NM)> ^ <Check Digit Scheme (ID)> ^ <Assigning Authority (HD)> ^
<Identifier Type Code (ID)> ^ <Assigning Facility (HD)> ^ <Name Representation Code
(ID)> ^ <Organization Identifier (ST)>
```

Note: Pre-adopted from HL7 v2.5.1

- Organization Name (first component) contains the name of the VA facility or other organization.
- Organization Name Type (second component) contains:
  a. **D** to display the name when Facility is found in the VistA INSTITUTION file (#4)

b. **L** to display the legal name when the official VA Name field (#100) is found in the VistA INSTITUTION file (#4)
c. **A** to display the alias name when the Facility name is known

- ID Number (third component) contains the VA station number when it is numeric
- Assigning authority (sixth component) contains:
  a. **USVHA** when there is a facility ID
  b. **CLIA** when there is a CLIA identifier
- Identifier Type Code (seventh component) contains:
  a. **FI** when there is a facility identifier.
  b. **LN** when there is a CLIA identifier
- Name Representation Code (ninth component) is **A** when it is a facility identifier
- Organization Identifier (tenth component) contains:
  a. **VA** station number when it is a VA facility identifier
  b. DoD DMIS ID when there is a DoD facility identifier
  c. 3-letter local ID when there is a non-VA, non-DoD facility identifier
  d. Laboratory CLIA number when there is a CLIA identifier.

2.5.1.24 Performing Organization Address (XAD)

This field contains the address of the organization/service responsible for performing the service. For laboratories, this field specifies the address of the laboratory that produced the test result described in this OBX segment and must be reported accurately. For instance, accuracy is imperative when the test results are produced at outside laboratories. This information supports CLIA regulations in the US.

Components

```
<Street Address (SAD)> ^ <Other Designation (ST)> ^ <CITY (ST)> ^ <State or Province
(ST)> ^ <Zip or Postal Code (ST)> ^ <Country (ID)> ^ <Address Type (ID)> ^ <Other
Geographic Designation (ST)> ^ <County/Parish Code (IS)> ^ <Census Tract (IS)> ^
<Address Representation Code (ID)> ^ <DEPRECATED-Address Validity Range (DR)> ^
<Effective Date (TS)> ^ <Expiration Date (TS)>
```

Note: Pre-adopted from HL7 v2.5.1

Currently only components 1-6 are valued by VistA. Organization address is derived from the VistA INSTITUTION file (#4) using VistA HL supported API $$HLADDR^HLFNC.

Example

```
1234 Anyplace Avenue^Building 456^VistA City^TX^99999^USA
```

2.5.1.25 Performing Organization Medical Director (XCN)

This field contains the medical director of the organization/service responsible for performing the service. For laboratories, this field specifies the medical director of the laboratory that produced the test result described in this OBX segment and must be reported accurately. For instance, accuracy is imperative when the test results are produced at outside laboratories.

This field is different from OBX-16. OBX-16 identifies the individual who performed the lab test (made the observation), whereas this field identifies the individual who is the medical director of the organization responsible for the result. This information supports CLIA regulations in the US.

Components

<ID Number (ST)> ^ <Family Name (FN)> ^ <Given Name (ST)> ^ <Second and Further Given Names or Initials Thereof (ST)> ^ <Suffix (e.g., JR or III) (ST)> ^ <Prefix (e.g., DR) (ST)> ^ <DEPRECATED-Degree (e.g., MD) (IS)> ^ <Source Table (IS)> ^ <Assigning Authority (HD)> ^ <Name Type Code (ID)> ^ <Identifier Check Digit (ST)> ^ <Check Digit Scheme (ID)> ^ <Identifier Type Code (ID)> ^ <Assigning Facility (HD)> ^ <Name Representation Code (ID)> ^ <Name Context (CE)> ^ <DEPRECATED-Name Validity Range (DR)> ^ <Name Assembly Order (ID)> ^ <Effective Date (TS)> ^ <Expiration Date (TS)> ^ <Professional Suffix (ST)> ^ <Assigning Jurisdiction (CWE)> ^ <Assigning Agency or Department (CWE)>

Subcomponents for Family Name (FN)

<Surname (ST)> & <Own Surname Prefix (ST)> & <Own Surname (ST)> & <Surname Prefix From Partner/Spouse (ST)> & <Surname From Partner/Spouse (ST)>

Subcomponents for Assigning Authority (HD)

<Namespace ID (IS)> & <Universal ID (ST)> & <Universal ID Type (ID)>

Subcomponents for Assigning Facility (HD)

<Namespace ID (IS)> & <Universal ID (ST)> & <Universal ID Type (ID)>

Subcomponents for Name Context (CE)

<Identifier (ST)> & <Text (ST)> & <Name of Coding System (ID)> & <Alternate Identifier (ST)> & <Alternate Text (ST)> & <Name of Alternate Coding System (ID)>

Subcomponents for DEPRECATED-Name Validity Range (DR)

<Range Start Date/Time (TS)> & <Range End Date/Time (TS)>

Note: Subcomponent contains sub-subcomponents

Subcomponents for Effective Date (TS)

<Time (DTM)> & <DEPRECATED-Degree of Precision (ID)>

Subcomponents for Expiration Date (TS)

<Time (DTM)> & <DEPRECATED-Degree of Precision (ID)>

Subcomponents for Assigning Jurisdiction (CWE)

<Identifier (ST)> & <Text (ST)> & <Name of Coding System (ID)> & <Alternate Identifier (ST)> & <Alternate Text (ST)> & <Name of Alternate Coding System (ID)> & <Coding System Version ID (ST)> & <Alternate Coding System Version ID (ST)> & <Original Text (ST)>

Subcomponents for Assigning Agency or Department (CWE)

<Identifier (ST)> & <Text (ST)> & <Name of Coding System (ID)> & <Alternate Identifier (ST)> & <Alternate Text (ST)> & <Name of Alternate Coding System (ID)> & <Coding System Version ID (ST)> & <Alternate Coding System Version ID (ST)> & <Original Text (ST)>

Note: Pre-adopted from HL7 v2.5.1

Currently VistA does not support this field. Support will be added in a future version of this interface specification as part of the VA implementation of the HITSP Use Case for Laboratory Result Reporting.

2.6 ORC Segment – Common Order

All applications use the ORC segment as the primary means of communicating specific laboratory order information. This segment contains data items that are common to all orders.

Seq	Len	DT	R/O/C	VA R/O/C	RP#	TBL #	Element Name
1	2	ID	R	R		0119	Order Control
2	22	EI	C	R			Placer Order Number
3	22	EI	C	R			Filler Order Number
12	250	XCN	O	R			Ordering Provider
13	80	PL	O	C			Enterer's Location
17	60	CE	O	O			Entering Organization
21	250	XON	O	R	N		Ordering Facility Name
22	250	XAD	O	R	N		Ordering Facility Address

2.6.1 ORC Field Definitions

2.6.1.1 Order Control (SI)

This field is the value that determines the function of the order segment. The contents are hard-coded with **RE** for result messages originating from VistA. All ORU messages contain **RE**.

2.6.1.2 Placer Order Number (EI)

This field is an entity identifier made up of the following:

```
<entity identifier> <namespace ID><universal ID>
```

It is a permanent identifier for an order and its associated observations on the placer's system. Currently the first component is valued with the VistA Lab Unique Identifier (UID) or human readable accession. This identifier is returned with the results. The VistA Lab UID is a ten-character alpha/numeric identifier. The accession is constructed from the associated accession area abbreviation, concatenated with the abbreviated accession date, concatenated with the accession number

For entity identifier

- For **CH** subscript tests, the UID field (#.31) within the CHEM, HEM, TOX, RIA, SER, etc. subfile (#4) of the VistA LAB DATA file (#63)

  Note: When the instance of the order pre-dates the generation of the UID or is not available, the ACCESSION field (#.06) within the CHEM, HEM, TOX, RIA, SER, etc. subfile (#4) of the VistA LAB DATA file (#63) is transmitted.

- For **MI** subscript tests, the UID field (#.31) within the Microbiology, etc. subfile (#5) of the VistA LAB DATA file (#63)

Note: When the instance of the order pre-dates the generation of the UID or is not available, the MICROBIOLOGY ACCESSION field (#.06) within the Microbiology, etc. subfile (#5) of the VistA LAB DATA file (#63) is transmitted.

- For **SP** subscript tests, the SURGICAL PATH ACC # field (#.06) within the Surgical Pathology subfile (#8) of the VistA LAB DATA file (#63)
- For **CY** subscript tests, the CYTOPATH ACC # field (#.06) within the Cytopathology subfile (#63.09) of the VistA LAB DATA file (#63)
- For **EM** subscript test, the EM ACC # field (#.06) within the Electron Microscopy subfile (#62.02) of the VistA LAB DATA file (#63)
- For **Point of Care (POC)** testing after the POC system transmits an order number

For namespace ID

- LR – for VistA Laboratory related tests
- LRPOC – for VistA Laboratory Point of Care related tests

For universal ID

The institution related to the order in the form of a VistA HL package standard DNS reference.

For universal ID type

DNS

2.6.1.3 Filler Order Number (EI)

This field is an entity identifier made up of the following:

```
<entity identifier> <namespace ID><universal ID>
```

It is a permanent identifier for an order and its associated observations on the placer's system. Currently the first component is valued with the VistA Lab Unique Identifier (UID) or human readable accession. This identifier is returned with the results. The VistA Lab UID is a ten-character alpha/numeric identifier. The accession is constructed from the associated accession area abbreviation, concatenated with the abbreviated accession date, concatenated with the accession number

For entity identifier

- For **CH** subscript tests, the UID field (#.31) within the CHEM, HEM, TOX, RIA, SER, etc. subfile (#4) of the VistA LAB DATA file (#63)

  Note: When the instance of the order pre-dates the generation of the UID or is not available, the ACCESSION field (#.06) within the CHEM, HEM, TOX, RIA, SER, etc. subfile (#4) of the VistA LAB DATA file (#63) is transmitted.

- For **MI** subscript tests, the UID field (#.31) within the Microbiology, etc. subfile (#5) of the VistA LAB DATA file (#63)

  Note: When the instance of the order pre-dates the generation of the UID or is not available, the MICROBIOLOGY ACCESSION field (#.06) within the Microbiology, etc. subfile (#5) of the VistA LAB DATA file (#63) is transmitted.

- For **SP** subscript tests, the SURGICAL PATH ACC # field (#.06) within the Surgical Pathology subfile (#8) of the VistA LAB DATA file (#63)
- For **CY** subscript tests , the CYTOPATH ACC # field (#.06) within the Cytopathology subfile (#63.09) of the VistA LAB DATA file (#63)

- For **EM** subscript test, the EM ACC # field (#.06) within the Electron Microscopy subfile (#62.02) of the VistA LAB DATA file (#63)

For namespace ID

LR – for VistA Laboratory related tests

For universal ID

The institution related to the order in the form of a VistA HL package standard DNS reference.

For universal ID type

DNS

2.6.1.12 Ordering Provider (XCN)

This field contains the person responsible for creating the request. The sequence is in the standard HL7 Composite Name format. This field repeats in OBR-16.

Components

In Version 2.3 and later, instead of the CN data type, use

```
<ID number (ST)> ^ <family name (FN)> ^ <given name (ST)> ^ <second or further given
names or initials thereof (ST)> ^ <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR)
(ST)> ^ <degree (e.g., MD) (IS)> ^ <source table (IS)> ^ <assigning authority (HD)> ^
<name type code (ID)>  ^ <identifier check digit (ST)> ^ <code identifying the check
digit scheme employed (ID)> ^ <identifier type code (IS)> ^ <assigning facility (HD)>
^ <name representation code (ID)> ^ <name context (CE)> ^ <name validity range (DR)> ^
< name assembly order (ID)>
```

ID can be valued with one of three identifiers.

1. When the provider is assigned a National Provider ID (NPI), the NPI is transmitted as the ID, the assigning authority (ninth component) contains USDHHS, and the check digit is transmitted in identifier check digit (eleventh component). NPI is transmitted as the code identifying the check digit scheme employed (twelfth component) and NPI is transmitted as the identifier type code (thirteenth component).
2. When the provider has no NPI and is assigned a VA Person ID (VPID), the VPID is transmitted as the ID, the assigning authority (ninth component) contains USVHA , and the identifier type code (13th component) contains PN.
3. If there is no NPI or VPID, the internal entry number (DUZ) of the person in the VistA NEW PERSON file (#200) is transmitted concatenated with **-VA** and the VA station number.

The value for this field is derived from fields in the LAB DATA file (#63).

Subscript	Subfile	Field
CH	63.04	Requesting Person (#.1)
CY	63.09	Physician (#.07)
EM	63.02	Physician (#.07)
MI	63.05	Physician (#.07)
SP	63.08	Surgeon/Physician (#.07)

2.6.1.13 Enterer's Location (PL)

This field specifies the location (such as, nurse station, ancillary service location, clinic, and floor) where the person who entered the request was physically located when the order was entered.

Note: This refers to the current transaction as reflected in ORC-1 Order Control Code.

Only those subcomponents relevant to the enterer's location should be valued (commonly nursing unit; facility; building; floor). The person who entered the request is defined in ORC-10 Entered By.

Components

```
<point of care (IS)> ^ <room (IS)> ^ <bed (IS)> ^ <facility (HD)> ^ <location status
(IS)> ^ <person location type (IS)> ^ <building (IS)> ^ <floor (IS)> ^ <location
description (ST)> Subcomponents of facility: <namespace ID (IS)> & <universal ID (ST)>
& <universal ID type (ID)
```

VistA values this field as follows:

For point of care

The hospital location as named in HOSPITAL LOCATION file (#44)

For facility

The facility as found in the INSTITUTION file (#4)

For personal location type

If the type of location is Point of Care – C, N, D

Example

```
1 TEST (NORTH)^^^170K&REGION 7 ISC,TX (KRN)&L^^N
```

2.6.1.17 Entering Organization (CE)

This field is a coded element.

```
<identifier><text><99VA4>
```

The identifier number is the station number found in the VistA INSTITUTION file (#4), field Station Number (#99). The text is the value of field Official VA Name (#100). If this value is null, the value of field Name (#.01) is used.

2.6.1.21 Ordering Facility Name (XON)

This field contains the name of the facility placing the order.

Components

```
<Organization Name (ST)> ^ <Organization Name Type Code (IS)> ^<DEPRECATED-ID Number
(NM)> ^ <Check Digit (NM)> ^ <Check Digit Scheme (ID)> ^ <Assigning Authority (HD)> ^
<Identifier Type Code (ID)> ^<Assigning Facility (HD)> ^ <Name Representation Code
(ID)> ^
<Organization Identifier (ST)>
```

Subcomponents for Assigning Authority (HD)

```
<Namespace ID (IS)> & <Universal ID (ST)>& <Universal ID Type (ID)>
```

Subcomponents for Assigning Facility (HD)

```
<Namespace ID (IS)> & <Universal ID (ST)>& <Universal ID Type (ID)>
```

- Organization Name (first component) contains the name of the VA facility or other organization.
- Organization Name Type (second component) contains:
  a. **D** to display the name when Facility is found in the VistA INSTITUTION file (#4)
  b. **L to** display the legal name when the official VA Name field (#100) is found in the VistA INSTITUTION file (#4)
  c. **A** to display the alias name when the Facility name is known
- ID Number (third component) contains the VA station number when it is numeric
- Assigning authority (sixth component) contains:
  a. **USVHA** when there is a facility ID
  b. **CLIA** when there is a CLIA identifier
- Identifier Type Code (seventh component) contains:
  a. **FI** when there is a facility identifier.
  b. **LN** when there is a CLIA identifier
- Name Representation Code (ninth component) is **A** when it is a facility identifier
- Organization Identifier (tenth component) contains:
  a. VA station number when it is a VA facility identifier
  b. DoD DMIS ID when there is a DoD facility identifier
  c. 3-letter local ID when there is a non-VA, non-DoD facility identifier
  d. Laboratory CLIA number when there is a CLIA identifier.

2.6.1.22 Ordering Facility Address (XAD)

This field contains the address of the facility placing the order. It is the physical address of the facility as stored in the VA INSTITUTION file (#4) using VistA HL supported API $$HLADDR^HLFNC.

Components

```
<Street Address (SAD)> ^ <Other Designation (ST)> ^ <City (ST)> ^ <State or Province
(ST)> ^ <Zip or Postal Code (ST)> ^ <Country (ID)> ^ <Address Type (ID)> ^ <Other
Geographic Designation (ST)> ^ <County/Parish Code (IS)> ^ <Census Tract (IS)> ^
<Address Representation Code (ID)> ^<DEPRECATED-Address Validity Range (DR)> ^
<Effective Date (TS)> ^<Expiration Date (TS)>
```

Subcomponents for Street Address (SAD)

```
<Street or Mailing Address (ST)> & <Street Name (ST)> & <Dwelling Number (ST)>
```

Subcomponents for DEPRECATED-Address Validity Range (DR)

```
<Range Start Date/Time (TS)> & <Range and Date/Time (TS)>
```

Subcomponents for Effective Date (TS)

```
<Time (DTM)> & <DEPRECATED-Degree of Precision (ID)>
```

Subcomponents for Expiration Date (TS)

```
<Time (DTM)> & <DEPRECATED-Degree of Precision(ID)>
```

Example

```
1234 Anyplace Avenue^Building 456^VistA City^TX^99999^USA
```

2.7 PID Segment – Patient Identification

The PID segment is used by all applications as the primary means of communicating patient identification information. This segment contains permanent patient identifying, and demographic information that is not likely to change frequently.

VistA Laboratory uses an application Programming interface (API) to the Patient Information Management System (PMIS), which constructs the PID segment. This is by way of API BLDPID^VAFCQRY. Documentation for the PID segment produced by this API is contained in the MPI/PD HL7 Interface Specification located in the VistA Software Document Library at http://www4.va.gov/vdl/application.asp?appid=16

2.8 PV1 Segment – Patient Visit

The PV1 segment is used to communicate information on a visit specific basis.
VistA Laboratory uses an API to the Patient Information Management System (PMIS), which constructs the PV1 segment. This is through APIs:

- $$IN^VAFHLPV1 to build PV1 segments on inpatients
- $$OUT^VAFHLPV1 to build PV1 segments on outpatients

Documentation for the PV1 segment produced by these APIs is contained in the MPI/PD HL7 Interface Specification located on the VistA Software Document Library at
http://www4.va.gov/vdl/application.asp?appid=16

3 Transaction Specifications

3.1 General

VistA initiates ORU result messages, which are acknowledged with an ACK accept acknowledgment.

3.2 Event and Subscriber Protocols

VistA initiates ORU result messages, which are acknowledged with an ACK accept acknowledgment.

```
NAME: LA7 LAB RESULTS ACTION
ITEM TEXT: Lab process results for HL7 messaging
TYPE: action
PACKAGE: AUTOMATED LAB INSTRUMENTS
DESCRIPTION: Action protocol to setup sending lab results to HL7 message subscribers
via protocol LA7 LAB RESULTS AVAILABLE (EVN) - Lab Results Available Event. This
protocol should be attached to protocol LAB RESULTS => EXTERNAL PACKAGE [LR7O ALL
EVSEND RESULTS] which is an extended action protocol triggered by the lab result
verification process.
ENTRY ACTION: D QUEUE^LA7HDR          TIMESTAMP: 59056,40855

NAME: LA7 LAB RESULTS AVAILABLE (EVN) ITEM TEXT: Lab Results Available Event
TYPE: event driver
DESCRIPTION:
A VistA Laboratory package HL7 ORU result message is created and sent by the HL
package for transmission to any subscribers of event protocol LA7 LAB RESULTS
AVAILABLE (EVN).
It provides the capability for the generation of a Laboratory HL7 ORU message
containing patient laboratory results to subscribers of the HL7 event protocol LA7 LAB
RESULTS AVAILABLE (EVN) as these results are made available within the Laboratory
package.
```

The following subscripts are supported by the event: **CH**, **MI**, **SP**, **CY**, **EM**.

```
TIMESTAMP: 59725,36770                SENDING APPLICATION: LA7LAB
TRANSACTION MESSAGE TYPE: ORU         EVENT TYPE: R01
MESSAGE STRUCTURE: ORU_R01            ACCEPT ACK CODE: AL
APPLICATION ACK TYPE: NE              VERSION ID: 2.4
RESPONSE PROCESSING ROUTINE: D ACK^LA7VHL
SUBSCRIBERS: LA7 LAB RESULTS TO HDR (SUB)

NAME: LA7 LAB RESULTS TO HDR (SUB)      ITEM TEXT: Send Lab Results to HDR
TYPE: subscriber                        CREATOR: LRUSER,ONE
DESCRIPTION:   This protocol should be attached to the HL7 event protocol LA7 LAB
RESULTS AVAILABLE (EVN). See this protocol for further information.

This subscriber protocol is used by the Laboratory package to indicate to the HL
package to send laboratory results to the VA Health Data Repository (HDR).

It utilizes the "Router" Subscriber Protocol supported by the VistA HL package. The
routing logic uses the value of the parameter passed into the router to determine
which Laboratory package subscript should be sent to the HDR.
```

```
The following subscripts are supported by the event:
    "CH", "MI", "SP", "CY", "EM".

Examples:

ROUTING LOGIC: D RTR^LA7HDR("CH;") will only send to HDR results associated with
Laboratory "CH" subscript.

ROUTING LOGIC: D RTR^LA7HDR("MI;") will only send to HDR results associated with
Laboratory "MI" subscript.

ROUTING LOGIC: D RTR^LA7HDR("CH;MI;") will only send to HDR results associated with
Laboratory "CH", and "MI" subscripts.

ROUTING LOGIC: D RTR^LA7HDR("CH;MI;SP;") will only send to HDR results associated with
Laboratory "CH", "MI", and "SP" subscripts.

ROUTING LOGIC: D RTR^LA7HDR("CH;MI;SP;CY;EM;") will send to HDR results associated
with all Laboratory subscripts currently supported.

Note: The order of the subscripts listed in the input parameter is not significant.
Separating the subscripts using the ";" character is significant.
TIMESTAMP: 61205,41189                RECEIVING APPLICATION: LA
EVENT TYPE: R01
RESPONSE MESSAGE TYPE: ACK            SENDING FACILITY REQUIRED?: YES
RECEIVING FACILITY REQUIRED?: YES
ROUTING LOGIC: ;D RTR^LA7HDR("CH;")
```

3.3 Activate Message Generation and Transmission

Use the following steps only when activating the transmission of laboratory data to the VA HDR and/or interfacing to a Commercial Off the Shelf System (COTS) or other VistA subscriber.
No further action is required, if there is no requirement to activate this interface.

- To activate messaging to the VA HDR perform steps 1, 2, and 3.
- To activate messaging to COTS and other VistA subscribers perform steps 1 and 4.

1. Generate and transmit HL7 Lab ORU result messages
   a. Enable the configuration **LA7HDR** in LA7 MESSAGE PARAMETER file (#62.48), and use VA File Manager to set the field Status (#2) to **Active**.
   b. When this field is set to **Inactive**, the generation of the Lab HL7 ORU message is turned off.

```
Select VA FileMan Option:  Enter or Edit File Entries

INPUT TO WHAT FILE: LA7 MESSAGE PARAMETER// 62.48  LA7 MESSAGE PARAMETER
 EDIT WHICH FIELD: ALL// STATUS
 THEN EDIT FIELD:

Select LA7 MESSAGE PARAMETER CONFIGURATION: LA7HDR
STATUS: INACTIVE// ACTIVE  ACTIVE
```

2. Set up the **VDEFVIE4** link for Laboratory data transmission
   a. Use the HL7 Main Menu: select **Filer and Link Management Options** option to edit logical link **VDEFVIE4**.

b. Enable **Auto Startup** and add the IP address and port number.
   IP address: **10.224.67.234**
   Port number: **5021**
c. Use the HL7 Main Menu, **Start/Stop Links** option to start the **VDEFVIE4** link.
d. Use the HL7 Main Menu, **Site Parameters Edit** option to select **VDEF** view and add **VDEFVIE4** to the view.

3. Activate the interface to the VA HDR
   a. On the HL package, Interface Developer Options [HL MENU INTERFACE TK], use the **Protocol Edit [HL EDIT INTERFACE]** menu option to edit the protocol **LA7 LAB RESULTS TO HDR (SUB)**.
   b. On the second ScreenMan screen, remove the leading (**;**) character from the **Routing Logic** field.
   c. Enter the **Save** command to retain the changes to the protocol.

Example: Editing the Routing Logic field

```
                          HL7 SUBSCRIBER                        PAGE 2 OF 2
                        LA7 LAB RESULTS TO HDR (SUB)
 ---------------------------------------------------------------------------

      RECEIVING APPLICATION: LA7HDR

      RESPONSE MESSAGE TYPE: ACK                          EVENT TYPE: R01

 SENDING FACILITY REQUIRED?: YES          RECEIVING FACILITY REQUIRED?: YES

      SECURITY REQUIRED?:

      LOGICAL LINK: VDEFVIE4

 PROCESSING RTN:

 ROUTING LOGIC: D RTR^LA7HDR("CH;")              <-- remove leading ";" character
 ___________________________________________________________________________

 COMMAND:                                    Press <PF1>H for help    Insert
```

After the change, the field displays as:

```
ROUTING LOGIC: D RTR^LA7HDR("CH;")
```

4. Transmit Lab HL7 ORU result messages to another system, such as a Commercial Off the Shelf System (COTS)
   a. Create an HL7 subscriber protocol, as documented in the *HL7 Site Manager & Developer Manual* version 1.6*56.
   b. Attach the HL7 subscriber protocol as a subscriber to HL7 event protocol, **LA7 LAB RESULTS AVAILABLE (EVN)**.
5. On the HL package, Interface Developer Options [HL MENU INTERFACE TK] menu option, use the **Protocol Edit [HL EDIT INTERFACE]** option to add the HL7 subscriber.

3.4 Inactivate Message Generation and Transmission

Notify the HDR Project Office
in the event that this interface is deactivated and the interface to
the HDR was previously activated

To control Lab HL7 ORU message generation and transmission after the interface is activated or to inactivate message generation and/or transmission, perform the following steps.

- Use step 1 to inactivate **all** message generation to **all** subscribers.
- Use step 2 to inactivate message generation/transmission to a **specific** subscriber.

1. Inactivate Lab HL7 ORU message generation and transmission to **all** subscribers of event protocol, **LA7 LAB RESULTS AVAILABLE (EVN)**
   a. Disable the configuration **LA7HDR** in the LA7 MESSAGE PARAMETER file (#62.48), and set the field Status (#2) to **Inactive** using VA File Manager Enter or Edit File Entries [DIEDIT].
   b. When this field is set to **Inactive**, the generation of the Lab HL7 ORU message is turned off.
2. Inactivate message transmission to a **specific** subscriber
   a. On the HL package, Interface Developer Options [HL MENU INTERFACE TK] menu option, use the **Protocol Edit [HL EDIT INTERFACE]** option to remove the related subscriber protocol from the event protocol **LA7 LAB RESULTS AVAILABLE (EVN)**.
   b. For the VA HDR, remove subscriber protocol **LA7 LAB RESULTS TO HDR (SUB)**.

3.5 Specific Message Consideration

3.5.1 Anatomic Pathology Results

Anatomic Pathology is not CPRS-aware and is unable to notify CPRS about the release of anatomic pathology results. HDR is notified of the availability of anatomic pathology results by three new-style cross-references in the LAB DATA file (#63). These indexes also trigger generation of the Lab HL7 ORU message, if this capability was enabled.

1. Subfile #63.02

```
New-Style Indexes:
AC (#98)    FIELD    MUMPS        ACTION
Short Descr:  Notify HDR and others that this report is available.
Description:  This MUMPS cross-reference triggers the sending of this report to the
Health Data Repository (HDR) and other subscribers when Electron Microscopy results
are released.
Set Logic: D APQ^LA7HDR(DA(1),"EM",DA)
Kill Logic: Q
         X(1): REPORT RELEASE DATE (63.02,.11) (Subscr 1) (forwards)
```

2. Subfile #63.08

```
New-Style Indexes:
AD (#95)    FIELD    MUMPS        ACTION
Short Descr:  Notify HDR and others that this report is available. Description:
This MUMPS cross-reference triggers the sending of this report to the Health Data
```

```
Repository (HDR) and other subscribers when Surgical Pathology results are
released.
Set Logic:  D APQ^LA7HDR(DA(1),"SP",DA)
Kill Logic: Q
         X(1): REPORT RELEASE DATE/TIME (63.08,.11) (Subscr 1) (forwards)
```

3. Subfile #63.09

```
New-Style Indexes:
AD (#96)    FIELD    MUMPS        ACTION
Short Descr: Notify HDR and others that this report is available.
Description: This MUMPS cross-reference triggers the sending of this report to the
Health Data Repository (HDR) and other subscribers when Cytopathology results are
released.
Set Logic: D APQ^LA7HDR(DA(1),"CY",DA)
Kill Logic: Q
         X(1): REPORT RELEASE DATE/TIME  (63.09,.11) (Subscr 1) (forwards)
```

3.5.2 **Microbiology Results**

The current Laboratory package does not support LOINC encoding of microbiology results. A default encoding is enabled to LOINC encode standard microbiology tests and antibiotics.

There is default mapping of NLT/LOINC codes to standard fields within the Microbiology subfile (#5) multiple of LAB DATA file (#63).

Test	Order NLT	Result NLT	LOINC Code
Bacteriology report (#11)	87993.0000		
Gram stain (#11.6)	87993.0000	87754.0000	664-3
Urine Screen (#11.57)	87993.0000	93949.0000	630-4
Sputum Screen (#11.58)	87993.0000	93948.0000	6460-0
Bacteria colony count (#12,1)		87719.0000	564-5
Parasite report (#14)	87505.0000		
Parasite organism (#16)	87505.0000	87576.0000	17784-0
Mycology report (#18)	87994.0000		
Fungal organism (#20)	87994.0000	87578.0000	580-1
Fungal colony count (#20,1)	87994.0000	87723.0000	19101-5
Mycobacterium report (#22)	87995.0000		
Acid Fast stain (#24)	87995.0000	87756.0000	11545-1
Acid Fast stain quantity (#25)	87995.0000	87583.0000	11545-1
Mycobacterium organism (#26)	87995.0000	87589.0000	543-9
Virology report (#33)	87996.0000		
Viral agent (#36)	87996.0000	87590.0000	6584-7

3.5.3 Bacteriology Results

The susceptibilities of a bacteriology or mycobacterium (TB) organism are based on the local site's mapping of the National VA Lab Code field (#64) in the ANTIMICROBIAL SUSCEPTIBILITY file (#62.06) and the related default LOINC code associated with the VA NLT code.

3.5.4 Surgical Pathology Results

The current Laboratory package does not support LOINC encoding of Surgical Pathology results.

There is default mapping of NLT/LOINC codes to standard fields within the SURGICAL PATHOLOGY file (#8) multiple of the LAB DATA file (#63).

Test	Order NLT	Result NLT	LOINC Code
Specimen (#.012)	88515.0000	88539.0000	22633-2
Brief clinical history (#.013)	88515.0000	88542.0000	22636-5
Preoperative diagnosis (#.014)	88515.0000	88544.0000	10219-4
Operative findings (#.015)	88515.0000	88546.0000	10215-2
Postoperative diagnosis (#.016)	88515.0000	88547.0000	10218-6
Gross description (#1)	88515.0000	88549.0000	22634-0
Microscopic description (#1.1)	88515.0000	88563.0000	22635-7
Frozen section (#1.3)	88515.0000	88569.0000	22635-7
Surgical path diagnosis (#1.4)	88515.0000	88571.0000	22637-3
Supplementary report (#1.2)	88515.0000	88589.0000	22639-9
Specimen weight (#2)	88515.0000	81233.0000	3154-2

3.5.5 Cytopathology Results

The current Laboratory package does not support LOINC encoding of Cytopathology results.

There is default mapping of NLT/LOINC codes to standard fields within the Cytopathology (#9) multiple of LAB DATA file (#63).

Test	Order NLT	Result NLT	LOINC Code
Specimens (#.012)	88593.0000	88539.0000	22633-2
Brief clinical history (#.013)	88593.0000	88542.0000	22636-5
Preoperative diagnosis (#.014)	88593.0000	88544.0000	10219-4
Operative findings (#.015)	88593.0000	88542.0000	10215-2
Postoperative diagnosis (#.016)	88593.0000	88547.0000	10218-6
Gross description (#1)	88593.0000	88549.0000	22634-0
Microscopic examination (#1.1)	88593.0000	88563.0000	22635-7

Test	Order NLT	Result NLT	LOINC Code
Supplementary report (#1.2)	88593.0000	88589.0000	22639-9
Cytopathology diagnosis (#1.4)	88593.0000	88571.0000	22637-3

3.5.6 Electron Microscopy Results

The current Laboratory package does not support LOINC encoding of Electron Microscopy.

There is default mapping of NLT/LOINC codes to standard fields within the Electron Microscopy (#2) multiple of LAB DATA file (#63).

Test	Order NLT	Result NLT	LOINC Code
Specimens (#.012)	88597.0000	88057.0000	22633-2
Brief clinical history (#.013)	88597.0000	88542.0000	22636-5
Preoperative diagnosis (#.014)	88597.0000	88544.0000	10219-4
Operative findings (#.015)	88597.0000	88542.0000	10215-2
Postoperative diagnosis (#.016)	88597.0000	88547.0000	10218-6
Gross description (#1)	88597.0000	88549.0000	22634-0
Microscopic examination (#1.1)	88597.0000	88563.0000	22635-7
Supplementary report (#1.2)	88597.0000	88589.0000	22639-9
EM diagnosis (#1.4)	88597.0000	88571.0000	22637-3

3.6 Specific Transactions

3.6.1 Result Message

ORU Observational Results Unsolicited Message

MSH	Message Header
{[PID]	Patient Identification
[PV1]	Patient Visit
{[ORC]	Order Common
OBR	Observations Report ID
{[NTE]}	Laboratory Note or Comment
{[OBX]	Observation Segment
{[NTE]}	Laboratory Note or Comment
}	
}	
}	

Example: Chemistry/hematology/serology message

```
MSH|^~\&|LA7LAB|522^MHCVSS.FO-
ALBANY.MED.VA.GOV^DNS|LA7HDR|200HD^HDR.MED.VA.GOV^DNS|20090303164215-
0500||ORU^R01^ORU_R01|52245904|T|2.4|||AL|NE|

PID|1||000001111^^^USSSA&&0363^SS^VA FACILITY ID&522&L~375^^^USVHA&&0363^PI^VA
FACILITY ID&522&L||LRPATIENT^ONE^^JR^^^L|LRMOTHER^MAIDEN^^^^^M|19200212|M||2054-5-
SLF^^0005^2054-5^^CDC|^^^^^^P^^~^^WASHINGTON^DC^^^N|||||M|25||000001111||||WASHINGTON
DC|N|||||||

PV1|1|I||||^^|115^LRPROVIDER^ONE^^JR^DR^MD|||1|||||||NSC
VETERAN|||15|||||||||||||||||522|||||20060106105459-0500|

ORC|RE|0381580001^LR^FS.FO-ALBANY.MED.VA.GOV^DNS|0381580001^LR^FS.FO-
ALBANY.MED.VA.GOV^DNS||||^^^^^R|||||1111111112^LRPROVIDER^ONE^^JR^DR^MD^^USDHHS^^2^NPI
^NPI|1 TEST (NORTH)^^^170K&REGION 7 ISC,TX (KRN)&L^^N||||170K^REGION 7 ISC,TX
(KRN)^99VA4||||ZZ BONHAM^D^522^^^USVHA^FI^^A^522|^Building 456^^TX^^USA

OBR|1|0381580001^LR^FS.FO-ALBANY.MED.VA.GOV^DNS|0381580001^LR^FS.FO-
ALBANY.MED.VA.GOV^DNS|81122.0000^Auto Chem >18 test^99VA64^268^CHEM
20^99VA60|||20080606131851-0500||||L|||20080606131923-0500|67922002&Serum
(substance)&SCT&SER&Serum&HL70070&20060101&&SERUM|1111111112^LRPROVIDER^ONE^^JR^DR^MD^
^USDHHS^^2^NPI^NPI|||\S\\S\\S\\S\\S\0381580001|356\S\CH\S\6919392.868149|SMAC 0606
1\S\1\S\3080606\S\1\S\CHEM-20\S\SMAC\S\81122.0000|20080703231815-
0500||CH||||||||||||||||||||81122.0000^Auto Chem >18 test^99VA64

NTE|1|L|For Test: CHEM 20~Testing Lab HDR interface|VA-LR001^Order Comment^HL70364

NTE|2|L|Specimen slightly hemolyzed~Recommend repeating in one week~CREATININE
reported incorrectly as 7.2 by [235-VA522].~Changed to 13.3 on Jul 03, 2008@23:18 by
[6521-VA522].~CREATININE normalcy reported incorrectly as H by [235-VA522].~Changed to
H* on Jul 03, 2008@23:18 by [6521-VA522].|VA-LR002^Result Comment^HL70364

OBX|1|NM|14749-
6^Glucose:SCnc:Pt:Ser/Plas:Qn^LN^4656317^^99VA95.3^2.19^2.19^GLUCOSE|CH2|765|mg/dL^mg/
dL^L|60-123|HH|||F|||20080606131851-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT ACA^99VA64.2~81352.0000^Glucose
Fasting^99VA64||20080606132123-0500||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building456^^TX^^USA

NTE|1|L|         70-99 mg/dL NORMAL~         100-125 mg/dL Impaired Fasting Glucose~
>/= 126 mg/dL Provisional Diagnosis of Diabetes~ ~  **5/17/04 Reference Range Changed,
OLD RANGE    70-110**|VA-LR003^Result Interpretation^HL70364

OBX|2|NM|3094-0^Urea nitrogen:MCnc:Pt:Ser/Plas:Qn^LN^4673484^^99VA95.3^2.19^2.19^UREA
NITROGEN|CH3|3|mg/dL^mg/dL^L|11-24|L|||F|||20080606131851-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT
ACA^99VA64.2~83940.0000^BUN^99VA64||20080606132123-0500||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|3|NM|2160-
0^Creatinine:MCnc:Pt:Ser/Plas:Qn^LN^4663483^^99VA95.3^2.19^2.19^CREATININE|CH4|13.3|mg
/dL^mg/dL^L|.8-1.3|HH|||C|||20080606131851-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|00000000000000000001^LRUSER^LAB^^^^^^USVHA^^^^PN|.303
5^DU PONT ACA^99VA64.2~82565.0000^Creatinine^99VA64||20080703231813-0500||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|4|NM|2947-
0^Sodium:SCnc:Pt:Bld:Qn^LN^4671867^^99VA95.3^2.19^2.19^SODIUM|CH5|110|meq/L^meq/L^L|13
5-145|LL|||F|||20080606131851-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
```

```
VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT
ACA^99VA64.2~84295.0000^Sodium^99VA64||20080606132123-0500||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|5|NM|2823-
3^Potassium:SCnc:Pt:Ser/Plas:Qn^LN^4670505^^99VA95.3^2.19^2.19^POTASSIUM|CH6|6.7|meq/L
^meq/L^L|3.8-5.3|HH|||F|||20080606131851-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT
ACA^99VA64.2~84140.0000^Potassium^99VA64||20080606132123-0500||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|6|NM|2075-
0^Chloride:SCnc:Pt:Ser/Plas:Qn^LN^4662584^^99VA95.3^2.19^2.19^CHLORIDE|CH7|123|meq/L^m
eq/L^L|100-108|H|||F|||20080606131851-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT
ACA^99VA64.2~82435.0000^Chloride^99VA64||20080606132123-0500||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|7|NM|1963-
8^Bicarbonate:SCnc:Pt:Ser:Qn^LN^4661390^^99VA95.3^2.19^2.19^CO2|CH8|55|meq/L^meq/L^L|2
3-31|HH|||F|||20080606131851-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT
ACA^99VA64.2~83646.0000^HCO3^99VA64||20080606132123-0500||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

NTE|1|L|Any interpretive test related information will appear in this section of the
report.|VA-LR003^Result Interpretation^HL70364

OBX|8|NM|2000-
8^Calcium:SCnc:Pt:Ser/Plas:Qn^LN^4661785^^99VA95.3^2.19^2.19^CALCIUM|CH9|15.2|mg/dL^mg
/dL^L|9-11|HH|||F|||20080606131851-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT
ACA^99VA64.2~82310.0000^Calcium^99VA64||20080606132123-0500||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|9|NM|2777-
1^Phosphate:MCnc:Pt:Ser/Plas:Qn^LN^4670018^^99VA95.3^2.19^2.19^PO4|CH10|1.2|mg/dL^mg/d
L^L|2.2-3.9|L|||F|||20080606131851-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT
ACA^99VA64.2~83141.0000^Phosphorus^99VA64||20080606132123-0500||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|10|NM|CH11^URIC ACID^99VA63^^^^5.2^^URIC ACID|CH11|2.3|mg/dL^mg/dL^L|4.2-
8.5|L|||F|||20080606131851-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT ACA^99VA64.2~84550.0000^Uric
Acid^99VA64||20080606132123-0500||||ZZ BONHAM^D^^^^CLIA^LN^^A^987654321|^Building
456^^TX^^USA

OBX|11|NM|2093-
3^Cholesterol:MCnc:Pt:Ser/Plas:Qn^LN^4662777^^99VA95.3^2.19^2.19^CHOLESTEROL|CH12|99|m
g/dL^mg/dL^L|135-288|L|||F|||20080606131851-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT
ACA^99VA64.2~83679.0000^Cholesterol^99VA64||20080606132123-0500||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|12|NM|CH13^PROTEIN,TOTAL^99VA63^^^^5.2^^PROTEIN,TOTAL|CH13|9.8|g/dL^g/dL^L|6.2-
7.7|H|||F|||20080606131851-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT ACA^99VA64.2~84155.0000^Protein
Total^99VA64||20080606132123-0500||||ZZ BONHAM^D^^^^CLIA^LN^^A^987654321|^Building
456^^TX^^USA
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OBX|13|NM|1751-
7^Albumin:MCnc:Pt:Ser/Plas:Qn^LN^4659241^^99VA95.3^2.19^2.19^ALBUMIN|CH14|4.9|g/dL^g/d
L^L|3.8-5||||F|||20080606131851-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT
ACA^99VA64.2~82040.0000^Albumin^99VA64||20080606132123-0500||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|14|NM|1975-2^Bilirubin:MCnc:Pt:Ser/Plas:Qn^LN^4661507^^99VA95.3^2.19^2.19^TOT.
BILIRUBIN|CH15|15.1|mg/dL^mg/dL^L|.3-1.7|H|||F|||20080606131851-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT
ACA^99VA64.2~82250.0000^Bilirubin Total^99VA64||20080606132123-0500||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building456^^TX^^USA

OBX|15|NM|1968-7^Bilirubin.glucuronidated+Bilirubin.albumin
bound:MCnc:Pt:Ser/Plas:Qn^LN^4661437^^99VA95.3^2.19^2.19^DIR.
BILIRUBIN|CH16|1.4|mg/dL^mg/dL^L|0-.3|H|||F|||20080606131851-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT
ACA^99VA64.2~82249.0000^Bilirubin Direct^99VA64||20080606132123-0500||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|16|NM|CH17^ALKALINE PHOSPHATASE^99VA63^^^^5.2^^ALKALINE
PHOSPHATASE|CH17|427|U/L^U/L^L|48-136|H|||F|||20080606131851-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT
ACA^99VA64.2~82110.0000^Phosphatase Alkaline Placental^99VA64||20080606132123-
0500||||ZZ BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|17|NM|2532-0^Lactate
dehydrogenase:CCnc:Pt:Ser/Plas:Qn^LN^4667425^^99VA95.3^2.19^2.19^LDH|CH18|962|U/L^U/L^
L|128-227|H|||F|||20080606131851-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT
ACA^99VA64.2~83802.0000^LDH^99VA64||20080606132123-0500||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA
OBX|18|NM|CH19^SGOT^99VA63^^^^5.2^^SGOT|CH19|555|U/L^U/L^L|11-
32|H|||F|||20080606131851-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT ACA^99VA64.2~81122.0000^Auto Chem >18
test^99VA64||20080606132123-0500||||ZZ BONHAM^D^^^^CLIA^LN^^A^987654321|^Building
456^^TX^^USA

OBX|19|NM|CH20^SGPT^99VA63^^^^5.2^^SGPT|CH20|432|U/L^U/L^L|12-
66|H|||F|||20080606131851-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT ACA^99VA64.2~81122.0000^Auto Chem >18
test^99VA64||20080606132123-0500||||ZZ BONHAM^D^^^^CLIA^LN^^A^987654321|^Building
456^^TX^^USA

OBX|20|NM|2324-2^Gamma glutamyl
transferase:CCnc:Pt:Ser/Plas:Qn^LN^4665239^^99VA95.3^2.19^2.19^GAMMA-
GTP|CH21|123|U/L^U/L^L|0-65|H|||F|||20080606131851-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT
ACA^99VA64.2~81234.0000^GGTP^99VA64||20080606132123-0500||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|21|NM|CH791^CALCULATED OSMOLALITY^99VA63^^^^5.2^^CALCULATED
OSMOLALITY|CH791|248|mOsm/L^mOsm/L^L|275-300||||F|||20080606131851-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|.3035^DU PONT
ACA^99VA64.2~81122.0000^Auto Chem >18 test^99VA64|||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA
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Example: Microbiology message

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MSH|^~\&|LA7LAB|522^MHCVSS.FO-
ALBANY.MED.VA.GOV^DNS|LA7HDR|200HD^HDR.MED.VA.GOV^DNS|20090303170542-
0500||ORU^R01^ORU_R01|52245905|T|2.4|||AL|NE|

PID|1||000001111^^^USSSA&&0363^SS^VA FACILITY ID&522&L~375^^^USVHA&&0363^PI^VA
FACILITY ID&522&L||LRPATIENT^ONE^^JR^^^L|LRMOTHER^MAIDEN^^^^^M|19200212|M||2054-5-
SLF^^0005^2054-5^^CDC|^^^^^^P^^~^^WASHINGTON^DC^^^N|||||M|25||000001111||||WASHINGTON
DC|N|||||||

PV1|1|I||||^^|115^LRPROVIDER^ONE^^JR^DR^MD|||1|||||||NSC
VETERAN|||15|||||||||||||||||522|||||20060106105459-0500|

ORC|RE|1408000004^LR^FS.FO-ALBANY.MED.VA.GOV^DNS|1408000004^LR^FS.FO-
ALBANY.MED.VA.GOV^DNS|||||||||1111111112^LRPROVIDER^ONE^^JR^DR^MD^^USDHHS^^2^NPI^NPI|1
TEST (NORTH)^^^170K&REGION 7 ISC,TX (KRN)&L^^N||||170K^REGION 7 ISC,TX
(KRN)^99VA4||||ZZ BONHAM^D^522^^^USVHA^FI^^A^522|^Building 456^^TX^^USA

OBR|1|1408000004^LR^FS.FO-ALBANY.MED.VA.GOV^DNS|1408000004^LR^FS.FO-
ALBANY.MED.VA.GOV^DNS|87993.0000^Micro Bacteriology Culture^99VA64|||20080501111313-
0500|||||||20080501111313-0500|78014005&Urine
(substance)&SCT&UR&Urine&HL70070&20060101&&URINE^^^78014005&Urine
(substance)&SCT&15&URINE&99VA62&20060101&&URINE|1111111112^LRPROVIDER^ONE^^JR^DR^MD^^U
SDHHS^^2^NPI^NPI|||\S\\S\\S\\S\\S\\S\1408000004|356\S\MI\S\6919497.888687|MICRO 08
4\S\12\S\3080000\S\4\S\MICROBIOLOGY\S\MICRO\S\87993.0000|20081110||MB|P|||||||^^^^^^52
2&FS.FO-ALBANY.MED.VA.GOV&DNS|||||||||||||87040^BLOOD CULTURE FOR
BACTERIA^C4^87993.0000^Micro Bacteriology Culture^99VA64

NTE|1|L||VA-LRMI001^Comment on Specimen (#.99)^HL70364

NTE|2|L|Several organisms found upon culture|VA-LRMI010^Bact Rpt Remark (#13)^HL70364

NTE|3|L|General comment on the culture/report|VA-LRMI010^Bact Rpt Remark (#13)^HL70364

OBX|1|CWE|630-4^Bacteria
identified:Prid:Pt:Urine:Nom:Culture^LN^4684556^^99VA95.3^2.19^2.19^URINE
SCREEN||10828004^Positive^SCT^^^^20060101||||||P|||20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|2|ST|664-3^Microscopic observation:Prid:Pt:XXX:Nom:Gram
stain^LN^4684916^^99VA95.3^2.19^2.19^GRAM STAIN||GRAM POSITIVE COCCI, IN
CHAINS||||||P|||20080501111313-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ BONHAM^D^^^^CLIA^LN^^A^987654321|^Building
456^^TX^^USA

OBX|3|ST|664-3^Microscopic observation:Prid:Pt:XXX:Nom:Gram
stain^LN^4684916^^99VA95.3^2.19^2.19^GRAM STAIN||GRAM POSITIVE
RODS||||||P|||20080501111313-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ BONHAM^D^^^^CLIA^LN^^A^987654321|^Building
456^^TX^^USA

OBX|4|ST|664-3^Microscopic observation:Prid:Pt:XXX:Nom:Gram
stain^LN^4684916^^99VA95.3^2.19^2.19^GRAM STAIN||GRAM POSITIVE COCCI, IN CLUSTERS WITH
SPORES||||||P|||20080501111313-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ BONHAM^D^^^^CLIA^LN^^A^987654321|^Building
456^^TX^^USA
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OBX|5|CWE|11475-1^Microorganism
identified:Prid:Pt:XXX:Nom:Culture^LN^4652804^^99VA95.3^2.19^2.19^ORGANISM|99VA4:522:3
-1|112283007^Escherichia coli (organism)^SCT^1^ESCHERICHIA
COLI^99VA61.2^20060101^5.2^ESCHERICHIA COLI|||A|||P|||20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

NTE|1|L|organism comment shows here|RE^Remark^HL70364

OBX|6|ST|564-5^Colony
count:Num:Pt:XXX:Qn:VC^LN^4683874^^99VA95.3^2.19^2.19^QUANTITY|99VA4:522:3-1|>10,000 -
<25,000|CFU/ml^CFU/ml^L|||||P|||20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|7|CWE|11475-1^Microorganism
identified:Prid:Pt:XXX:Nom:Culture^LN^4652804^^99VA95.3^2.19^2.19^ORGANISM|99VA4:522:3
-2|52499004^Pseudomonas aeruginosa (organism)^SCT^4836^PSEUDOMONAS
AERUGINOSA^99VA61.2^20060101^5.2^PSEUDOMONAS AERUGINOSA|||A|||P|||20080501111313-
0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

NTE|1|L|Comment #1 on the organism|RE^Remark^HL70364

NTE|2|L|Comment #2 on the organsim|RE^Remark^HL70364

OBX|8|ST|564-5^Colony
count:Num:Pt:XXX:Qn:VC^LN^4683874^^99VA95.3^2.19^2.19^QUANTITY|99VA4:522:3-2|>50,000 -
<75,000|CFU/ml^CFU/ml^L|||||P|||20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|9|CWE|11475-1^Microorganism
identified:Prid:Pt:XXX:Nom:Culture^LN^4652804^^99VA95.3^2.19^2.19^ORGANISM|99VA4:522:3
-3|73457008^Proteus mirabilis (organism)^SCT^4833^PROTEUS
MIRABILIS^99VA61.2^20060101^5.2^PROTEUS MIRABILIS|||A|||P|||20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

NTE|1|L|Comment on the proteus isolate|RE^Remark^HL70364

OBX|10|ST|564-5^Colony
count:Num:Pt:XXX:Qn:VC^LN^4683874^^99VA95.3^2.19^2.19^QUANTITY|99VA4:522:3-3|>25,000 -
<50,000|CFU/ml^CFU/ml^L|||||P|||20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBR|2|1408000004^LR^FS.FO-ALBANY.MED.VA.GOV^DNS|1408000004^LR^FS.FO-
ALBANY.MED.VA.GOV^DNS|87565.0000^Bacteriology Susc^99VA64|||20080501111313-
0500|||||||20080501111313-0500|78014005&Urine
(substance)&SCT&UR&Urine&HL70070&20060101&&URINE^^^78014005&Urine
(substance)&SCT&15&URINE&99VA62&20060101&&URINE|1111111112^LRPROVIDER^ONE^^JR^DR^MD^^U
SDHHS^^2^NPI^NPI|||\S\\S\\S\\S\\S\\S\1408000004|356\S\MI\S\6919497.888687|MICRO 08
4\S\12\S\3080000\S\4\S\MICROBIOLOGY\S\MICRO\S\87565.0000|20081110||MB|P|11475-
1&Microorganism
identified:Prid:Pt:XXX:Nom:Culture&LN&4652804&&99VA95.3&2.19&2.19&ORGANISM^99VA4:522:3
-1^Escherichia coli (organism)|||1408000004^1408000004|||^^^^^^522&FS.FO-
ALBANY.MED.VA.GOV&DNS||||||||||||87565.0000^Bacteriology Susc^99VA64

OBX|1|CWE|18928-
2^Gentamicin:Susc:Pt:Isolate:OrdQn^LN^4660716^^99VA95.3^2.19^2.19^GENTMCN||131196009^S
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usceptible^SCT^^^^20060101^^S|||S|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|2|CWE|18903-
5^Chloramphenicol:Susc:Pt:Isolate:OrdQn^LN^4660690^^99VA95.3^2.19^2.19^CHLORAM||131196
009^Susceptible^SCT^^^^20060101^^S|||S|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|3|CWE|18993-
6^Tetracycline:Susc:Pt:Isolate:OrdQn^LN^4660787^^99VA95.3^2.19^2.19^TETRCLN||131196009
^Susceptible^SCT^^^^20060101^^S|||S|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|4|CWE|18864-
9^Ampicillin:Susc:Pt:Isolate:OrdQn^LN^4660646^^99VA95.3^2.19^2.19^AMPICLN||131196009^S
usceptible^SCT^^^^20060101^^S|||S|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

NTE|1|L|DISPLAY COMMENT|RE^Remark^HL70364

OBX|5|CWE|18873-
0^Carbenicillin:Susc:Pt:Isolate:OrdQn^LN^4660656^^99VA95.3^2.19^2.19^CARBCLN||13119600
9^Susceptible^SCT^^^^20060101^^S|||S|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|6|CWE|18996-
9^Tobramycin:Susc:Pt:Isolate:OrdQn^LN^4660790^^99VA95.3^2.19^2.19^TOBRMCN||131196009^S
usceptible^SCT^^^^20060101^^S|||S|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|7|CWE|18912-
6^Colistin:Susc:Pt:Isolate:OrdQn^LN^4660700^^99VA95.3^2.19^2.19^COLISTIN||30714006^Res
istant^SCT^^^^20060101^^R|||R|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBR|3|1408000004^LR^FS.FO-ALBANY.MED.VA.GOV^DNS|1408000004^LR^FS.FO-
ALBANY.MED.VA.GOV^DNS|87565.0000^Bacteriology Susc^99VA64|||20080501111313-
0500|||||||20080501111313-0500|78014005&Urine
(substance)&SCT&UR&Urine&HL70070&20060101&&URINE^^^78014005&Urine
(substance)&SCT&15&URINE&99VA62&20060101&&URINE|1111111112^LRPROVIDER^ONE^^JR^DR^MD^^U
SDHHS^^2^NPI^NPI|||\S\\S\\S\\S\\S\\S\1408000004|356\S\MI\S\6919497.888687|MICRO 08
4\S\12\S\3080000\S\4\S\MICROBIOLOGY\S\MICRO\S\87565.0000|20081110||MB|P|11475-
1&Microorganism
identified:Prid:Pt:XXX:Nom:Culture&LN&4652804&&99VA95.3&2.19&2.19&ORGANISM^99VA4:522:3
-2^Pseudomonas aeruginosa (organism)|||1408000004^1408000004|||^^^^^^522&FS.FO-
ALBANY.MED.VA.GOV&DNS||||||||||||87565.0000^Bacteriology Susc^99VA64

OBX|1|CWE|18928-
2^Gentamicin:Susc:Pt:Isolate:OrdQn^LN^4660716^^99VA95.3^2.19^2.19^GENTMCN||131196009^S
usceptible^SCT^^^^20060101^^S|||||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA
```

```
OBX|2|CWE|18996-
9^Tobramycin:Susc:Pt:Isolate:OrdQn^LN^4660790^^99VA95.3^2.19^2.19^TOBRMCN||131196009^S
usceptible^SCT^^^^20060101^^S|||S|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|3|CWE|18860-
7^Amikacin:Susc:Pt:Isolate:OrdQn^LN^4660642^^99VA95.3^2.19^2.19^AMIKACN||30714006^Resi
stant^SCT^^^^20060101^^R|||R|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|4|CWE|18969-
6^Piperacillin:Susc:Pt:Isolate:OrdQn^LN^4660760^^99VA95.3^2.19^2.19^PIPERACILLIN||3071
4006^Resistant^SCT^^^^20060101^^R|||R|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|5|CWE|18886-
2^Cefotaxime:Susc:Pt:Isolate:OrdQn^LN^4660670^^99VA95.3^2.19^2.19^CEFOTAXIME||13119600
9^Susceptible^SCT^^^^20060101^^S|||S|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|6|CWE|18947-
2^Mezlocillin:Susc:Pt:Isolate:OrdQn^LN^4660736^^99VA95.3^2.19^2.19^MEZLOCILLIN||307140
06^Resistant^SCT^^^^20060101^^R|||R|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBR|4|1408000004^LR^FS.FO-ALBANY.MED.VA.GOV^DNS|1408000004^LR^FS.FO-
ALBANY.MED.VA.GOV^DNS|87565.0000^Bacteriology Susc^99VA64|||20080501111313-
0500|||||||20080501111313-0500|78014005&Urine
(substance)&SCT&UR&Urine&HL70070&20060101&&URINE^^^78014005&Urine
(substance)&SCT&15&URINE&99VA62&20060101&&URINE|1111111112^LRPROVIDER^ONE^^JR^DR^MD^^U
SDHHS^^2^NPI^NPI|||\S\\S\\S\\S\\S\\S\1408000004|356\S\MI\S\6919497.888687|MICRO 08
4\S\12\S\3080000\S\4\S\MICROBIOLOGY\S\MICRO\S\87565.0000|20081110||MB|P|11475-
1&Microorganism
identified:Prid:Pt:XXX:Nom:Culture&LN&4652804&&99VA95.3&2.19&2.19&ORGANISM^99VA4:522:3
-3^Proteus mirabilis (organism)|||1408000004^1408000004|||^^^^^^522&FS.FO-
ALBANY.MED.VA.GOV&DNS||||||||||||87565.0000^Bacteriology Susc^99VA64

OBX|1|CWE|18928-
2^Gentamicin:Susc:Pt:Isolate:OrdQn^LN^4660716^^99VA95.3^2.19^2.19^GENTMCN||131196009^S
usceptible^SCT^^^^20060101^^S||||||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|2|CWE|18903-
5^Chloramphenicol:Susc:Pt:Isolate:OrdQn^LN^4660690^^99VA95.3^2.19^2.19^CHLORAM||131196
009^Susceptible^SCT^^^^20060101^^S|||S|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|3|CWE|18878-
9^Cefazolin:Susc:Pt:Isolate:OrdQn^LN^4660661^^99VA95.3^2.19^2.19^CEFAZOLIN||131196009^
Susceptible^SCT^^^^20060101^^S|||S|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA
```

```
OBX|4|CWE|18993-
6^Tetracycline:Susc:Pt:Isolate:OrdQn^LN^4660787^^99VA95.3^2.19^2.19^TETRCLN||30714006^
Resistant^SCT^^^^20060101^^R|||R|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|5|CWE|18864-
9^Ampicillin:Susc:Pt:Isolate:OrdQn^LN^4660646^^99VA95.3^2.19^2.19^AMPICLN||30714006^Re
sistant^SCT^^^^20060101^^R|||R|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

NTE|1|L|DISPLAY COMMENT|RE^Remark^HL70364

OBX|6|CWE|18998-
5^Trimethoprim+Sulfamethoxazole:Susc:Pt:Isolate:OrdQn^LN^4660792^^99VA95.3^2.19^2.19^T
RMSULF||131196009^Susceptible^SCT^^^^20060101^^S|||S|||P||4500665|20080501111313-
0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|7|CWE|18860-
7^Amikacin:Susc:Pt:Isolate:OrdQn^LN^4660642^^99VA95.3^2.19^2.19^AMIKACN||30714006^Resi
stant^SCT^^^^20060101^^R|||R|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|8|CWE|18888-
8^Cefoxitin:Susc:Pt:Isolate:OrdQn^LN^4660672^^99VA95.3^2.19^2.19^CEFOXITIN||30714006^R
esistant^SCT^^^^20060101^^R|||R|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|9|CWE|18969-
6^Piperacillin:Susc:Pt:Isolate:OrdQn^LN^4660760^^99VA95.3^2.19^2.19^PIPERACILLIN||3071
4006^Resistant^SCT^^^^20060101^^R|||R|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|10|CWE|18886-
2^Cefotaxime:Susc:Pt:Isolate:OrdQn^LN^4660670^^99VA95.3^2.19^2.19^CEFOTAXIME||30714006
^Resistant^SCT^^^^20060101^^R|||R|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|11|CWE|18947-
2^Mezlocillin:Susc:Pt:Isolate:OrdQn^LN^4660736^^99VA95.3^2.19^2.19^MEZLOCILLIN||307140
06^Resistant^SCT^^^^20060101^^R|||R|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|12|CWE|18986-
0^Sulfisoxazole:Susc:Pt:Isolate:OrdQn^LN^4660779^^99VA95.3^2.19^2.19^SULFISOXAZOLE||13
1196009^Susceptible^SCT^^^^20060101^^S|||S|||P||4500665|20080501111313-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

NTE|1|L|Administer as last resort due toxicity|RE^Remark^HL70364

OBX|13|NM|21070-8^Antibiotic
XXX:Susc:Pt:Isolate:OrdQn:MIC^LN^4662927^^99VA95.3^2.19^2.19^GENTAMICIN||33.4|UG/ML|||
||P|||20080501111313-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
```

```
VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ BONHAM^D^^^^CLIA^LN^^A^987654321|^Building
456^^TX^^USA

OBX|14|NM|23658-8^Antibiotic
XXX:Susc:Pt:Isolate:OrdQn^LN^4665685^^99VA95.3^2.19^2.19^GENTAMICIN||66.8|UG/ML|||||P|
||20080501111313-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ BONHAM^D^^^^CLIA^LN^^A^987654321|^Building
456^^TX^^USA

OBR|5|1408000004^LR^FS.FO-ALBANY.MED.VA.GOV^DNS|1408000004^LR^FS.FO-
ALBANY.MED.VA.GOV^DNS|93978.0000^Antibiotic Level^99VA64^547^ANTIBIOTIC
LEVEL^99VA60|||20080501111313-0500||||A|||20080501111313-0500|78014005&Urine
(substance)&SCT&UR&Urine&HL70070&20060101&&URINE^^^78014005&Urine
(substance)&SCT&15&URINE&99VA62&20060101&&URINE|1111111112^LRPROVIDER^ONE^^JR^DR^MD^^U
SDHHS^^2^NPI^NPI|||\S\\S\\S\\S\\S\\S\1408000004|356\S\MI\S\6919497.888687|MICRO 08
4\S\12\S\3080000\S\4\S\MICROBIOLOGY\S\MICRO\S\93978.0000|20080501111313-
0500||MB|||||||||||||||||||93978.0000^AntibioticLevel^99VA64

OBX|15|SN|44433-1^Antibiotic
XXX\R\peak:MCnc:Pt:Ser/Plas:Qn^LN^4703118^^99VA95.3^2.19^2.19^SUPER GENTAMCIN||12-
14|||||||||20080501111313-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ BONHAM^D^^^^CLIA^LN^^A^987654321|^Building
456^^TX^^USA
```

Example: Surgical Pathology message

```
MSH|^~\&|LA7LAB|522^MHCVSS.FO-
ALBANY.MED.VA.GOV^DNS|LA7HDR|200HD^HDR.MED.VA.GOV^DNS|20090304174009-
0500||ORU^R01^ORU_R01|52245928|T|2.4|||AL|NE|

PID|1||000001111^^^USSSA&&0363^SS^VA FACILITY ID&522&L~375^^^USVHA&&0363^PI^VA
FACILITY ID&522&L||LRPATIENT^ONE^^JR^^^L|LRMOTHER^MAIDEN^^^^^M|19200212|M||2054-5-
SLF^^0005^2054-5^^CDC|^^^^^^P^^~^^WASHINGTON^DC^^^N|||||M|25||000001111||||WASHINGTON
DC|N|||||||

PV1|1|I||||^^|115^LRPROVIDER^ONE^^JR^DR^MD|||1|||||||||NSC
VETERAN|||15|||||||||||||||||522|||||20060106105459-0500|

ORC|RE|2209000007^LR|2209000007^LR|||||||||1111111112^LRPROVIDER^ONE^^JR^DR^MD^^USDHHS
^^2^NPI^NPI|||||522^ZZ BONHAM^99VA4

OBR|1|2209000007^LR|2209000007^LR|88515.0000^Surgical Pathology Procedures
NOS^99VA64|||20090304|||||||200903041341-0500|20677005&Iliac crest bone marrow (body
structure)&SCT&776&BONE MARROW, ILIAC CREST&99VA61&20060101&5.2&BONE MARROW, ILIAC
CREST|1111111112^LRPROVIDER^ONE^^JR^DR^MD^^USDHHS^^2^NPI^NPI|||\S\\S\\S\\S\\S\\S\22090
00007|356\S\SP\S\6909694.8659|NSP 09 7\S\15\S\3090000\S\7\S\SURGICAL
PATHOLOGY\S\NSP\S\88515.0000|20090304174007-0500||SP|F|||||||^^^^^^522&FS.FO-
ALBANY.MED.VA.GOV&DNS|1111111112&LRPROVIDER&ONE&&JR&DR&MD&&USDHHS^^^^^^522&FS.FO-
ALBANY.MED.VA.GOV&DNS||^^^^^^522&FS.FO-ALBANY.MED.VA.GOV&DNS|||||||||88399^SURGICAL
PATHOLOGY PROCEDURE^C4^88515.0000^Surgical Pathology Procedures NOS^99VA64

OBX|1|CWE|22633-2^Path report.site of
origin:Anat:Pt:Specimen:Nar^LN^4664583^^99VA95.3^2.19^2.19|SPEC-1|20677005^Iliac crest
bone marrow (body structure)^SCT^776^BONE MARROW, ILIAC CREST^99VA61^20060101^5.2^Bone
Marrow, core #1||||||F|||200903041341-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|2|CWE|22633-2^Path report.site of
origin:Anat:Pt:Specimen:Nar^LN^4664583^^99VA95.3^2.19^2.19|SPEC-2|20677005^Iliac crest
bone marrow (body structure)^SCT^776^BONE MARROW, ILIAC CREST^99VA61^20060101^5.2^Bone
```

```
Marrow, core #2||||||F|||200903041341-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|3|FT|22636-5^Path report.relevant
Hx:Find:Pt:Specimen:Nar^LN^4664586^^99VA95.3^2.19^2.19||Unexplained decrease in
platelet count over 12 month period.  ||||||F|||200903041341-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|4|FT|10219-4^Operative note preoperative
Dx:Imp:Pt:\R\Patient:Nar^LN^4651469^^99VA95.3^2.19^2.19||The field contains the
patient's pre-operative diagnosis which is usually provided by the surgeon.
||||||F|||200903041341-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ BONHAM^D^^^^CLIA^LN^^A^987654321|^Building
456^^TX^^USA

OBX|5|FT|10215-2^Operative note
findings:Find:Pt:\R\Patient:Nar^LN^4651465^^99VA95.3^2.19^2.19||This is the surgeon's
operative finding after the operation has been completed.  ||||||F|||200903041341-
0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|6|FT|10218-6^Operative note postoperative
Dx:Imp:Pt:\R\Patient:Nar^LN^4651468^^99VA95.3^2.19^2.19||Post-operative Diagnosis:
Thrombocytopenia ||||||F|||200903041341-0500|522^ZZ
BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|7|FT|22634-0^Path report.gross
observation:Find:Pt:Specimen:Nar^LN^4664584^^99VA95.3^2.19^2.19||Very floppy ear
received in basket.  Domestic dispute? Seriously doubt that specimen is actually a
bone marrow from a human. Submitted by Dr. Mickey J Mouse MD ||||||F|||200903041341-
0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA

OBX|8|FT|22635-7^Path report.microscopic observation:Prid:Pt:Specimen:Nar:XXX
stain^LN^4664585^^99VA95.3^2.19^2.19||A lot of little short hairs. Looks like they
caught the little fella by the proverbial "short Hairs". What a way to go on a Sunday.
||||||F|||200903041341-0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-
VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ BONHAM^D^^^^CLIA^LN^^A^987654321|^Building
456^^TX^^USA

OBX|9|FT|22637-3^Path report.final
diagnosis:Imp:Pt:Specimen:Nar^LN^4664587^^99VA95.3^2.19^2.19||In the case of a
surgical  case, we could choose to  type the original post-operative findings of the
case directly at this prompt \.br\ \.br\OR We could choose to upload a previously
typed operative findings for this case at this prompt. \.br\\.br\OR We could choose to
type in only the diagnosis with some additional information indicating that the case
was read at XYZ Hospital as follows: \.br\ \.br\DIAGNOSIS:  Ear, right, punch biopsy -
fatal \.br\\.br\Submitted by Dr. Lab Provider, One.  ||||||F|||200903041341-
0500|522^ZZ BONHAM^99VA4^987654321^^99VACLIA|235-VA522^LRUSER^ONE^^^^^99VA4|||||||ZZ
BONHAM^D^^^^CLIA^LN^^A^987654321|^Building 456^^TX^^USA
```

3.6.2 **Message Acknowledgment**

VistA supports enhanced mode acknowledgments. Upon receipt of the result message, the receiving system responds with a general acknowledgment (ACK) message. The ACK message consists of the following segments. For this ‘broadcast’ type interface, VistA Laboratory does not expect or require

application level acknowledgments. Commit acknowledgments are implemented to insure delivery to subscribers.

ACK General Acknowledgment Message

Value	Description
MSH	Message Header
MSA	Message Acknowledgment

Example: ACK General Acknowledgment message

```
MSH^~|\&^LA7HDR^200HD~HDR.MED.VA.GOV~DNS ^LA7LAB^170~FS.ISC-ALBANY.MED.VA.GOV~DNS
^19970515093728^^ACK~R01^269^T^2.4
MSA^CA^229
```

4 Communication Requirements for HL7 Interfaces

This section specifies the requirements necessary to establish and maintain communications between VistA and all the participating systems. It includes requirements that must be satisfied by VistA, by all the participating systems, and by each system when sending or receiving a message.

4.1 Using TCP/IP and HL7 Minimal Lower Level Protocol

The interface between VistA and each participating system is established through a persistent or a transient (non-persistent) TCP/IP connection. Two TCP sockets provide bi-directional communications between each participating system.

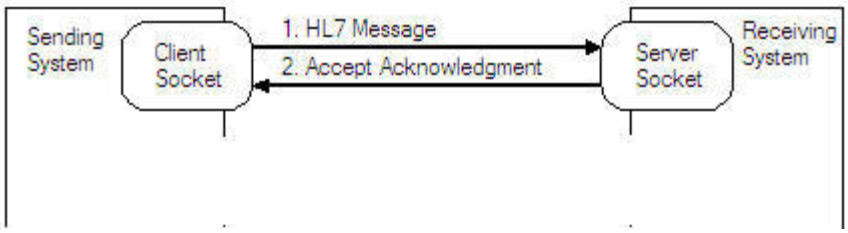
Within the context of the TCP socket, each participating system connects as the client when it initiates a message. The other system connects as the server to receive messages from the listen state.

4.1.1 Requirements

The participating system initiates the interface by establishing a TCP Server Socket. The participating system that initiates a message connects to the participating system TCP Server Socket as a TCP Client.

4.1.2 TCP/IP Connections

VistA has a client (sender) process for each remote system to send HL7 messages. This process requires a TCP socket. The client process sends HL7 messages to the remote system and receives accept acknowledgment messages from the remote system. The diagram depicts the sequence of events for an outbound message regarding messages and acknowledgments.



4.1.3 Flow Control

This interface uses the HL7 Minimal Lower Layer Protocol (MLLP) to format messages for data interchange, including acknowledgment messages. This protocol relies on the Message Header Segment (MSH) to define encoding, routing and acknowledgment rules governing the message.

4.1.4 VistA Client/Server Process Parameters

The flow of messages between VistA and the remote system can be controlled by the VistA client process parameters. The parameters for the client/server process are definable at each installation site and can be customized for each remote system.

Examples of parameters

- Server IP addresses/ports
- Client IP addresses/ports
- Number of attempts to open a socket
- Hang time for the client process between attempts to send a message
- Maximum number of times the client process attempts to send a message
- Persistent/non-persistent client connection
- Retention time for client connection to keep a non-persistent connection established

4.1.5 Automated Recovery Procedure

When either side of the interface is disabled for any reason during any TCP connection, the remaining side begins its automatic recovery procedures.

- If the remote system (TCP server) detects that VistA (TCP client) becomes disabled, the remote system resets to **listen** mode.
- If VistA detects that the remote system becomes disabled, VistA resets to **attempt connect** state.

VistA continues to attempt the reconnect for a site-specified number of times or for a site-specified period of time, before logging the situation and terminating.

4.1.6 Message Transmission Retry Attempts

When the remote system is down, and VistA cannot transmit a message to the remote system, VistA waits for a specified period of time (default is one minute) before attempting to resend the message. VistA retries until the specified maximum number of attempts (default is 2) is reached.

4.1.7 Error Management

VistA and the participating systems use automated procedures to detect when connectivity is lost and to initiate recovery procedures. VistA and the participating systems use the HL7 2.4 enhanced acknowledgment mode, so the receiving system may respond to the message with an accept acknowledgment. When the receiving system commits the message to safe storage in a manner that releases the sending system from the need to retransmit the message, it sends a positive accept acknowledgment.

Accept acknowledgments are used for all messages and the value passed in the Accept Acknowledgment field of the MSH segment (MSH-15) of the originating message is observed. Application Acknowledgments are not used.

4.1.7.1 Requirements

1. If VistA detects a remote end disconnect, it attempts to reconnect to the participating system TCP Server Socket for a locally defined number of retry attempts.
2. If VistA detects a remote end disconnect and is unable to reconnect to the participating system after a locally defined number of retry attempts, it shall log an error.
3. If the participating system detects a remote end disconnect, it closes the channel of its TCP Server Socket and awaits VistA reconnection.
4. The *receiving* system returns an accept acknowledgment with a Commit Accept (CA) status to the *sending* system for each incoming HL7 Message in which the Message Header Segment (MSH) conforms to the following criteria:
   a. The first segment is a Message Header Segment (MSH);
   b. The Message Type Field (MSH-9) contains a valid message type; and
   c. The Message Control ID Field (MSH-10) contains an ID.
5. The *receiving* system returns an accept acknowledgment with a Commit Reject (CR) status to the *sending* system for each incoming HL7 message in which the Message Header Segment (MSH) fails to conform to the following criteria:
   a. The first segment is a Message Header Segment (MSH)
   b. The Sending Application (MSH-3) is valid
   c. The Sending Facility (MSH-4) is valid
   d. The Receiving Application (MSH-5) is valid
   e. The Receiving Facility (MSH-6) is valid
   f. The Message Type Field (MSH-9) contains a valid message type
   g. The Message Control ID Field (MSH-10) contains a message ID
   h. The Message Processing ID (MSH-11) contains the appropriate value for the systems communicating
   i. The Message Version ID contains 2.4
6. The *receiving* system returns an accept acknowledgment with a Commit Error (CE) status to the *sending* system for each incoming HL7 message that it did not accept, for any reasons other than those requiring a Commit Reject (CR).
7. Upon receipt of an accept acknowledgment with either a Commit Reject (CR) or Commit Error (CE) status from the *receiving* system, the *sending* system ceases transmission of the original HL7 message.