



**LABORATORY
UNIVERSAL INTERFACE (UI)
HEALTH LEVEL (HL) V1.6
UPGRADE**

**INTERFACE SPECIFICATIONS
DOCUMENT**

PATCH LA*5.2*66

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VistA Laboratory Universal Interface (UI) Health Level (HL) V. 1.6 Upgrade Interface Specifications

1. PURPOSE:

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. The VistA Laboratory Universal Interface (UI) patch LA*5.2*66 forms the basis for the exchange of healthcare information between the VistA Laboratory software application and non-VistA systems, primarily laboratory automated instruments and generic instrument managers (GIMs) that receive laboratory orders and generate laboratory results information.

The Generic Instrument Manager (GIM) is a locally procured commercial device that controls communications between the Laboratory instruments and VistA. The VistA system downloads work lists through the GIM to the various instruments, and the instruments upload results to VistA through the GIM, eliminating the need for Laboratory developers to write a new interface for each different instrument. Due to the increased laboratory workload, higher instrument throughput, longer and more textual lab results, and the emergence of more efficient communications platforms have rendered HL7 v1.5 obsolete. HL7 v1.6 allows faster transmission, longer messages, and more advanced queue handling than HL7 v1.5.

NOTE: New Generic Instrument Manager (GIM) software **must** be obtained from the vendor in order for this new interface to work.

2. OVERVIEW:

2.1 Statement of Intent

The VistA Laboratory Universal Interface (UI) patch LA*5.2*66 implements 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 modifications and revisions to incorporate changes, improvements, and enhancements. Later versions may support additional functionality of the current HL7 (V 2.2) Standard and new functionality released in future versions of the HL7 Standard.

2.2 Scope

This document describes messages transmitted between the VistA Laboratory application and a non-VistA automated system. The purpose of these messages is to exchange information concerning laboratory tests, specifically for orders and results related to the performance of this testing on laboratory automated instruments.

3. GENERAL SPECIFICATIONS

3.1 Communication Protocol

The HL7 protocol defines only the seventh level of the Open System Interconnect (OSI) protocol. This is the application level. Levels one through six involve primarily communication protocols. The HL7 protocol provides some guidance in this area. The communication protocols that are used for interfacing with the VistA Laboratory package are based on the HL7 Hybrid Lower Level Protocol which is described in the HL7 Implementation Guide.

3.2 Application Processing Rules

The HL7 Standard describes the basic rules for application processing by the sending and receiving systems. Information contained in the Standard is not repeated here. Anyone wishing to interface with the VistA Laboratory package should become familiar with the HL7 Standard V. 2.2.

3.3 Messages

The following HL7 message types are used to support the exchange of Laboratory information:

ACK	General Acknowledgment
ORM	Order
ORU	Observational Results Unsolicited

3.4 Segments

Refer to section 4, Transaction Specifications, for details and examples of all segments used to interface with VistA Laboratory Package. The following HL7 segments are used to support the exchange of Laboratory information:

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

3.5 Fields

The segment definition tables list and describe the data fields in the segment and characteristics of their usage. The following information is specified about each data field.

Sequence Number (SEQ): The ordinal position of the data field within the segment. This number is used to refer to the data field in the text comments that follow the segment definition table.

Length (LEN): The maximum number of characters that one occurrence of the data field may occupy.

Data Type (DT): Restrictions on the contents of the data field as defined by the HL7 Standard.

Optionality (R/O/C): Whether the data field is required, optional, or conditional in a segment. The designations are: R - required; O (null) - optional; and C - conditional on the trigger event.

Repetition (RP/#): Whether the field may repeat. The designations are: N (null) - for no repetition allowed; Y - the field may repeat an indefinite or site determined number of times; and (integer) - the field may repeat up to the number of times specified in the integer.

Table (TBL#): A table of values which may be defined by HL7 or negotiated between the VistA Laboratory application and the vendor system.

Element Name: Globally unique descriptive name for the field.

The following HL7 segment fields are used to support the exchange of Laboratory data for each of the segments listed in paragraph 3.4. Tables referenced in the segments can be found in the HL7 Interface Standards document. For the standard HL7 segments, definitions of each element are provided for those fields which are utilized. The field definitions can include specific information (e.g., expected format) for transmission.

3.5.1 Segment: MSA - Message Acknowledgment

The MSA segment contains information sent while acknowledging another message.

MSA						
SEQ	LEN	DT	R/O	RP	TBL	ELEMENT NAME
1	2	ID	R		8	ACKNOWLEDGMENT CODE
2	20	ST	R			MESSAGE CONTROL ID
3	80	ST	C			TEXT MESSAGE

3.5.7.0 MSA Field Definitions

3.5.7.1 ACKNOWLEDGMENT CODE (ID)

The ACKNOWLEDGMENT CODE can have the following values:

HL7 Table 8 ACKNOWLEDGMENT CODE

Value	Description
AA	Application Accept
AE	Application Error
AR	Application Reject

3.5.7.2 MESSAGE CONTROL ID (ST)

Identifies the message sent by the sending system. It allows the sending system to associate this response with the message for which it is intended.

3.5.7.3 TEXT MESSAGE (ST)

Further describes an error condition. The text may be printed in error logs or presented to an end user.

3.5.8 Segment: MSH - Message Header

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

MSH						
SEQ	LEN	DT	R/O	RP	TBL	ELEMENT NAME
1	1	ST	R			FIELD SEPARATOR
2	4	ST	R			ENCODING CHARACTERS
3	15	ST	R			SENDING APPLICATION
4	20	ST	R			SENDING FACILITY
5	30	ST	R			RECEIVING APPLICATION
6	30	ST	R			RECEIVING FACILITY
7	26	TS	R			DATE/TIME OF MESSAGE
9	7	CM	R		76	MESSAGE TYPE
10	20	ST	R			MESSAGE CONTROL ID
11	1	ID	R		103	PROCESSING ID
12	8	ID	R		104	VERSION ID

3.5.8.0 MSH Field Definitions

3.5.8.1 FIELD SEPARATOR (ST)

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.

3.5.8.2 ENCODING CHARACTERS (ST)

Four characters in the following order: the component separator, repetition separator, escape character and subcomponent separator.

3.5.8.3 SENDING APPLICATION (ST)

Used for interfacing with lower level protocols.

ORM uses LA7LAB

ORU uses LA7UIx (where "x" is an integer 1-10)

3.5.8.4 SENDING FACILITY (ST)

The three digit number identifying the medical center division, as found in the VistA INSTITUTION file (#4), STATION NUMBER field (#99). The VA station # of the primary VistA facility should be used for all interfaces implemented at a multi-divisional/integrated VistA system.

3.5.8.5 RECEIVING APPLICATION (ST)

ORM uses LA7UIx: (where "x" is an integer 1-10)

ORU uses LA7LAB

3.5.8.6 RECEIVING FACILITY (ST)

Same as sending facility.

3.5.8.7 DATE/TIME OF MESSAGE (TS)

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.

3.5.8.8 SECURITY (ST)

In some applications of HL7 this field is used to implement security features. Its use is not yet further specified.

3.5.8.9 MESSAGE TYPE (CM)

A composite element made up of the following:

<message type> <trigger event>

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

ORM~O01: Order message from VistA.

ORU~R01: Result message to VistA.

3.5.8.10 MESSAGE CONTROL ID (ST)

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).

3.5.8.11 PROCESSING ID (ID)

Used to decide whether to process the message as defined in the HL7 application processing rules.

HL7 Table 103 PROCESSING ID

Value	Description
D	Debugging
P	Production
T	Training

3.5.8.12 VERSION ID (ID)

Matched by the receiving system to its own version to be sure the message is interpreted correctly. Only the following values are expected/accepted: 2.2

3.5.8.15 ACCEPT ACKNOWLEDGMENT TYPE (ID)

Defines the conditions under which accept acknowledgments are required to be returned 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

This interface uses HL7 “original mode” acknowledgements.

3.5.8.16 APPLICATION ACKNOWLEDGMENT TYPE (ID)

Defines the conditions under which application acknowledgments are required to be returned 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

This interface uses HL7 “original mode” acknowledgements.

3.5.9. Segment: NTE – Laboratory Notes and Comments

The NTE segment is used to report 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

3.5.9. 0 NTE Field Definitions3.5.9. 1 SET ID - NOTES AND COMMENTS (SI)

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

3.5.9.2 SOURCE OF COMMENT (ID)3.5.9.3. COMMENT (FT)

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

Comments generated by automated instruments that relate to the specimens can be transmitted by the external GIM following the OBR segment.

Comments generated by automated instruments that relate to specific results can be transmitted by the external GIM following the OBX segment.

3.5.10 Segment: OBR - Observation Request

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

OBR						
SEQ	LEN	DT	R/O	RP	TBL	ELEMENT NAME
1	4	SI	C			SET ID - OBSERVATION REQUEST
2	75	CM	C			PLACER ORDER NUMBER
3	75	CM	R			FILLER ORDER NUMBER
4	200	CE	R			UNIVERSAL SERVICE ID
7	26	TS	C			OBSERVATION DATE/TIME
12	60	CE	C			DANGER CODE
13	300	ST	C			RELEVANT CLINICAL INFO.
14	26	TS	R			SPECIMEN RECEIVED DATE/TIME
15	300	CM	R		0070	SPECIMEN SOURCE
16	60	CN	C	Y		ORDERING PROVIDER
18	60	ST	R			PLACER FIELD #1
19	60	ST	R			PLACER FIELD #2
27	200	TQ	R	Y		QUANTITY/TIMING

3.5.10.0 OBR Field Definitions

3.5.10.1 SET ID - OBSERVATION REQUEST (SI)

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

3.5.10.2 PLACER ORDER NUMBER (CM)

A composite element made up of the following:

<unique filler ID> <filler application ID>

This field is a permanent identifier for an order and its associated observations. Currently the first component is filled in with the VistA unique accession number. This number is carried throughout the VistA testing cycle and returned with the results.

This field contains either the accession number component of the accession or the 10 character unique identifier (UID) associated with the accession. Determination of which ID is used is based on the ACCESSION file (#68) TYPE OF ACCESSION NUMBER field (#.092).

3.5.10.3 FILLER ORDER NUMBER (CM)

A composite element made up of the following:

<unique filler ID> <filler application ID>

This field contains either the accession number component of the accession or the 10 character unique identifier (UID) associated with the accession. Determination of which ID is used is based on the ACCESSION file (#68) TYPE OF ACCESSION NUMBER field (#.092). This number is then returned with the results.

3.5.10.4 UNIVERSAL SERVICE ID (CE)

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 is indicated as the Order NLT. The UI Test code is the test code mapped via AUTO INSTRUMENT file (#62.4), CHEM TESTS subfile (#62.41), UI TEST CODE field (#6). This UI Test Code is usually the instrument specific code recognized by the automated instrument to perform the requested test.

<UI test code>^<text>^<99001>^<Order NLT>^<text>^<99VA64>

3.5.10.7 OBSERVATION DATE/TIME (TS)

The clinically relevant date/time of the observation. This is the actual date and time of the specimen collection. This data is pulled from the ACCESSION file (#68), ACCESSION NUMBER subfile (#68.02), DRAW TIME field (#9).

3.5.10.12 DANGER CODE (CE)

Contains the information located within the LAB DATA file (#63), PAT.INFO. field (#.091).

3.5.10.13 RELEVANT CLINICAL INFO.

Contains the information located within the ACCESSION file (#68), ACCESSION NUMBER subfile (68.02), COMMENT field (#13.6).

3.5.10.14 SPECIMEN RECEIVED DATE/TIME (TS)

The actual time of a specimen's arrival at the diagnostic service. The lab arrival time from VistA ACCESSION file (#68), ACCESSION NUMBER subfile (#68.02), LAB ARRIVAL TIME field (#12).

3.5.10.15 SPECIMEN SOURCE (CM)

Contains the information on the specimen source.

Components: <specimen source name or code (CE)>^<^<free text>^<^<^>

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 sub-components. The VistA TOPOGRAPHY FIELD file (#61) is mapped to corresponding entry in LAB ELECTRONIC CODES file (#64.061). The 2nd sub-component text will contain the Table 0070 description. The 3rd sub-component will contain the HL7 table identifier. The four through six sub-components will contain the local topography file entry. The 4th sub-component contains the internal entry number of the specimen's relate entry in TOPOGRAPHY FIELD file (#61). The 5th component contains the text of the topography entry and the 6th component contains "99VA61" as the coding system. The 3rd component free text will contain the value "CONTROL" when the specimen is related to an entry in LAB CONTROL NAME file (#62.3).

3.5.10.16 ORDERING PROVIDER (CN)

A composite ID number and name made up of the following:

<id number> <family name> <given name> <middle initial or name> <suffix> <prefix>
<degree> <source table>

This field identifies the provider who ordered the test. The ID code and the name may be present.

Internal entry number of ordering provider in NEW PERSON file (#200) concatenated with "-VA" and VA station number is used as the id number.

3.5.10.18 PLACER FIELD #1 (ST)

Contains vital information for the processing of incoming results. The field contains the name of the auto-instrument from the AUTO INSTRUMENT file (#62.4), NAME field (#.01).

The data should be passed in the following format:
<Name of Analyzer or Instrument>^<Card Address>

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

3.5.10.19 PLACER FIELD #2 (ST)

Contains vital information for linking the incoming result with the original order. The data should be passed in the following format:

<Tray>^<Cup>^<Accession Area>^<Accession Date>^<Accession Number>^<Accession>^<Universal ID>^<Sequence Number>

All components are optional except the Universal ID which should match with the PLACER ORDER NUMBER.

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

3.5.10.22 RESULTS REPORT/STATUS CHANGE - DATE/TIME (TS)

Contains the date and time the report is released.

3.5.10.27 QUANTITY/TIMING

Contains the information concerning the timing and urgency of certain tests.

VistA values the 6th component priority with the related test urgency from VistA ACCESSION file (#68), ACCESSION NUMBER subfile (#68.02), TESTS field (#11) subfile (#68.04), URGENCY OF TEST field (#1).

3.5.11 Segment: OBX - Observation

The OBX segment is used to transmit a single observation or observation fragment.

OBX						
SEQ	LEN	DT	R/O	RP	TBL	ELEMENT NAME
1	4	SI	R			SET ID - OBSERVATION SIMPLE
2	3	ID	R		125	VALUE TYPE
3	80	CE	R			OBSERVATION IDENTIFIER
5	var	ST	R			OBSERVATION VALUE
11	2	ID	R		85	OBSERV RESULT STATUS
14	26	TS	R			DATE/TIME OF THE OBSERVATION

3.5.11.0 OBX Field Definitions

3.5.11.1 SET ID - OBSERVATION SIMPLE (SI)

A sequence number used to identify the segment repetitions.

3.5.11.2 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
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 supported by VistA.

3.5.11.3 OBSERVATION IDENTIFIER (CE)

A coded element made up of the following:

<NLT or WKLD CODE> <text> <99VA64> <alternate identifier> <alternate text> <name of alternate coding system>

This field is a unique identifier for the observation test results. The UI Test code is the test code mapped via AUTO INSTRUMENT file (#62.4), CHEM TESTS subfile (#62.41), UI TEST CODE field (#6). This UI Test Code is usually the instrument specific code recognized by the automated instrument to perform and report the requested test.

<UI test code>^<text>^<99001>

3.5.11.5 OBSERVATION VALUE (ST)

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

3.5.11.11 OBSERV RESULT STATUS (ID)

This field reflects the current completion status of the results for one OBSERVATION IDENTIFIER.

HI7 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
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

3.5.11.14 DATE/TIME OF THE OBSERVATION (TS)

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.

3.5.12 Segment: ORC - Common Order

The primary means of communicating specific lab order information. This segment contains data items that are common to all orders.

ORC						
SEQ	LEN	DT	R/O	RP	TBL	ELEMENT NAME
1	2	ID	R		0119	ORDER CONTROL
2	22	CM	C			PLACER ORDER NUMBER
3	22	CM	C			FILLER ORDER NUMBER
9	26	TS	R			Date/time of TRANSACTION
12	250	CN	R			ORDERING PROVIDER

3.5.12.0 ORC Field Definitions

The value that determines the function of the order segment. The contents are hard coded with “NW” for order messages and “RE” for result messages for messages originating from VistA.

ORM message will contain “NW”. ORU message will contain “RE”.

3.5.12.2 PLACER ORDER NUMBER (CM)

The placer application’s order number, which should be returned with the result message.
Components: <unique placer ID>^<placer application ID>

This field contains either the accession number component of the accession or the 10 character unique identifier (UID) associated with the accession. Determination of which ID is used is based on the ACCESSION file (#68), TYPE OF ACCESSION NUMBER field (#.092).

3.5.12.3 FILLER ORDER NUMBER (CM)

The filler application’s order number.
Components: <unique placer ID>^<placer application ID>

This field contains either the accession number component of the accession or the 10 character unique identifier (UID) associated with the accession. Determination of which ID is used is based on the ACCESSION file (#68), TYPE OF ACCESSION NUMBER field (#.092).

3.5.12.9 DATE/TIME OF TRANSACTION (TS)

Date ordered. VistA values this field with the related date ordered from VistA ACCESSION file (#68), ACCESSION NUMBER subfile (#68.02), DATE ORDERED field (#3).

3.5.12.12 ORDERING PROVIDER (CN)

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

Internal entry number of ordering provider in NEW PERSON file (#200) concatenated with “-VA” and VA station number is used as the id number.

3.5.13 Segment: PID - 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.

PID						
SEQ	LEN	DT	R/O	RP	TBL	ELEMENT NAME
1	4	SI				SET ID - PATIENT ID
3	20	CM	R	Y		PATIENT ID (INTERNAL ID)
5	48	PN	R			PATIENT NAME
7	8	DT				DATE OF BIRTH
8	1	ID			1	SEX
19	16	ST				SSN NUMBER - PATIENT

3.5.13.0 PID Field Definitions

3.5.13.1 SET ID - PATIENT ID (SI)

A sequence number used to identify the segment repetitions.

Vista Laboratory supports multiple “patient” types - both PATIENT file (#2) and other human and non-human patients. To insure a consistent “patient” identifier the internal entry number (LRDFN) of the “patient” in LAB DATA file (#63) is used.

3.5.13.5 PATIENT NAME (PN)

Standard HL7 format.

3.5.13.7 DATE OF BIRTH (DT)

The patient’s date of birth.

3.5.13.8 SEX (ID)

The patient’s sex. Although there are other entries in the HL7 table, only the following values are transmitted.

HL7 Table 1 - SEX

Value	Description
F	Female
M	Male

3.5.13.19 SSN NUMBER - PATIENT (ST)

The patient’s social security number.

3.5.14 Segment PV1 - Patient Visit

Used to communicate information on a visit specific basis.

PVI						
SEQ	LEN	DT	R/O	RP	TBL	ELEMENT NAME
1	4	SI	R			SET ID - PATIENT VISIT
2	1	ID	R		0004	PATIENT CLASS
3	12	CM				ASSIGNED PATIENT LOCATION

3.5.14.0 PV1 Field Definitions**3.5.14.1 SET ID - PATIENT VISIT (SI)**

The number uniquely identifying this transaction.

3.5.14.2 PATIENT CLASS (ID)

Categorizes the patient by site. VA facilities will presently code either “I” – inpatient or “O” – outpatient.

3.5.14.3 ASSIGNED PATIENT LOCATION (CM)

Uses the current inpatient location from PATIENT file (#2), WARD LOCATION field (#.1). Otherwise the current report routing location as designated in the VistA LAB DATA file (#63), REPORT ROUTING (LOCATION) field (#.1).

4. TRANSACTION SPECIFICATIONS

4.1 General

4.2 Specific Transactions

4.2.1 Order Message (ORM)

ORM	General Order Message
MSH	Message Header
{ PID	Patient Identification
[PV1]	Patient Visit
{ ORC	Common Order
OBR	Observations Report ID
}	
}	
}	

EXAMPLE:

```

MSH|^~\&|LA7LAB|500PA|LA7UI2|500PA|20080528134451-
0600||ORM^O01|55618159|T|2.2|||||USA

PID|1||344^1^M11||ELEVEN^PATIENT||19350407|M|||||||000-00-0011|

PV1|1|O|GM|

ORC|NW|L681490001|L681490001|||||20080528|||991-VA556^PROVIDER^EIGHT^^^^|

OBR|1|L681490001|L681490001|sod^SODIUM^99001^84295.0000^Sodium^99VA64|||20080528134444-
0600||||^Patient info here||20080528134448-
0600|SER&Serum&HL70070&72&SERUM&99VA61&&5.2&SERUM|991-
VA556^PROVIDER^EIGHT^^^^||Vitros|\S\S\11\S\3080528\S\1\S\CH 0528
1\S\L681490001||||||^R|

ORC|NW|L681490001|L681490001|||||20080528|||991-VA556^PROVIDER^EIGHT^^^^|

OBR|2|L681490001|L681490001|POT^POTASSIUM^99001^84140.0000^Potassium^99VA64|||2008052813444
4-0600||||^Patient info here||20080528134448-
0600|SER&Serum&HL70070&72&SERUM&99VA61&&5.2&SERUM|991-
VA556^PROVIDER^EIGHT^^^^||Vitros|\S\S\11\S\3080528\S\1\S\CH 0528
1\S\L681490001||||||^R|

ORC|NW|L681490001|L681490001|||||20080528|||991-VA556^PROVIDER^EIGHT^^^^|

OBR|3|L681490001|L681490001|CO2^CO2^99001^82830.0000^Carbon Dioxide
Content^99VA64|||20080528134444-0600||||^Patient info here||20080528134448-
0600|SER&Serum&HL70070&72&SERUM&99VA61&&5.2&SERUM|991-
VA556^PROVIDER^EIGHT^^^^||Vitros|\S\S\11\S\3080528\S\1\S\CH 0528
1\S\L681490001||||||^R|

ORC|NW|L681490001|L681490001|||||20080528|||991-VA556^PROVIDER^EIGHT^^^^|

OBR|4|L681490001|L681490001|CL^CHLORIDE^99001^82435.0000^Chloride^99VA64|||20080528134444-
0600||||^Patient info here||20080528134448-
0600|SER&Serum&HL70070&72&SERUM&99VA61&&5.2&SERUM|991-
VA556^PROVIDER^EIGHT^^^^||Vitros|\S\S\11\S\3080528\S\1\S\CH 0528
1\S\L681490001||||||^R|

ORC|NW|L681490001|L681490001|||||20080528|||991-VA556^PROVIDER^EIGHT^^^^|

OBR|5|L681490001|L681490001|4^GLUCOSE^99001^84330.0000^Glucose
Quant^99VA64|||20080528134444-0600||||^Patient info here||20080528134448-
0600|SER&Serum&HL70070&72&SERUM&99VA61&&5.2&SERUM|991-
VA556^PROVIDER^EIGHT^^^^||Vitros|\S\S\11\S\3080528\S\1\S\CH 0528
1\S\L681490001||||||^R|

```

4.2.1.2 ORM Message Acknowledgment

Upon receipt of the order message, the VistA Laboratory system expects a **general order response message** (ORR) message. The ORR message consists of the following segments.

ORR	General Order Acknowledgment Message
------------	---

MSH	Message Header
MSA	Message Acknowledgment

EXAMPLE:

```
MSH^~|\&^LA7UI1^170^LA7LAB^170^20060515093728^^ACK~R01^269^P^2.2^^^^^
MSA^AA^15162
```

4.2.2 Result Message (ORU)

ORU	Observational Results Unsolicited Message
------------	--

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

EXAMPLE:

```

MSH|^~\&|LA7UI1|999|LA7LAB|999|20080529090809||ORU^R01|35826270|P|2.2
PID|1||218469||LRPATIENT^TWO||19001111|M|||||||000-00-1187
PV1|1||SOCNEU
ORC|RE|4081500006|4081500006|||||||00000-VA000^LRPROVIDER^TWO
OBR|1|4081500006|4081500006|||20080529085002|||||||PLAS|00000-
VA000^LRPROVIDER^TWO||DADE-AR|\S\\S\49\S\3080529\S\6\S\CH 05296\S\4081500006
NTE||1|L|SPECIMEN HEMOLYZED|
OBX|1|ST|CK^CK|||U/L||||F
OBX|2|ST|601^Cortisol||35.3|ug/dL||||F|||20080604105034||||
NTE|1|L|A.M.: 3.7-19.4 ug/dL
NTE|2|L|P.M.: 2.9-17.3ug/dL

```

4.2.2.1 ORU Message Acknowledgment

Upon receipt of the result message, the VistA Laboratory system responds with a general acknowledgment (ACK) message. The ACK message consists of the following segments.

ACK	General Acknowledgment Message
MSH	Message Header
MSA	Message Acknowledgment

EXAMPLE:

```

MSH^~|\&^LA7LAB^170^LA7UI1^170^20060515093728^^ACK~R01^269^P^2.2^^^^^
MSA^AA^229

```