

OTObase

HL7 Integration Reference Guide

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1. HL7 General Overview

The HL7 (Health Level Seven) standard was developed by a community of healthcare subject matter experts and information scientists collaborating to create standards for the exchange, management and integration of electronic healthcare information.

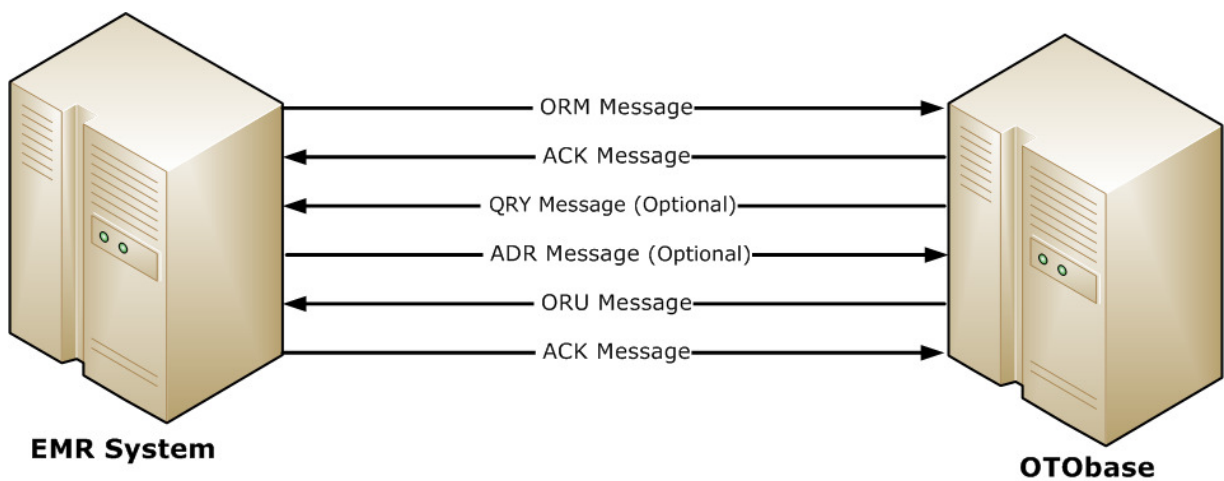
The HL7 refers to the highest level of the international Standards Organization’s (ISO) communication model for Open System Interconnection (OSI).

The application level addresses the data definition to be exchanged, the interchange timing, and the communication of certain error to the application. The seventh level supports such functions as security checks, participant identification, availability checks, exchange mechanism negotiations and most importantly support standard for exchange of data among healthcare applications.

2. OTObase EMR Connector for HL7 Interface

The OTObase EMR connector for HL7 Interface provides standard messaging format for transferring information from system to system. OTObase EMR Connector provides a workflow to interchange the electronic data of patient such as demographic data and audiology measurement report.

The following response paradigms relate to the communication between EMR System and the OTObase HL7 interface.



- ORM (Observation/Order Request Message) messages are sent by the EMR system to OTObase while ORU (Observation Result Message) messages containing the finished transcriptions are sent back to the EMR system by OTObase.
- OTObase will send the QRY (Patient Query Message) messages to the EMR System and EMR System will send ADR (Patient Query Response Message) message to the OTObase.
- OTObase will send the ACK (Acknowledgment Message) to the EMR System as a reply of ORM message. EMR message should send the ACK message to the OTObase as a

reply of ORU message. Patient Query message send by OTObase should be replied by EMR System via ADR message only.

3. Supported HL7 Messages Types

The below tables defines the color codes for HL7 message field's usage i.e. Required, Optional or Unused:

Sr.	Use Identifier	Description
1	O	Optional
2	R	Required
3	U	Unused

The Following are the HL7 messages types supported by OTObase EMR Connector for HL7 Interface:

3.1 ORM (Observation/Order Request Order Message)

The function of this message is to initiate the transmission of information about an order/observation. This includes placing new observation request and opening existing order details.

3.1.1 Placing new Order request

The HL7 Order message (ORM) should contain the following information in order to place new observation/order request in OTObase.

3.1.1.1 Message Header (MSH) Segment

Pos	Element	Use	Example
1	Field Separator	R	Pipe symbol -
2	Encoding Characters 1. Component 2. Repeat 3. Escape 4. Subcomponent	R	^~\& ^ ~ \ &
3	Sending Application Name	R	OTObase
4	Sending Facility Name	R	OTObase
5	Receiving Application	R	EMR System
6	Receiving Facility	R	EMR System
7	Date and Time of Message	R	YYYYMMDDhhmmss 20130125052045
8	Security	U	
9	Message Type 1. Message Type 2. Trigger Event	R	ORM001 ORM 001
10	Message Control Identifier	R	ORM20130125052045

11	Processing ID	O	P = Production T = Training D= Debugging
12	HL7 Version	R	2.4,2.5,2.6,2.7.
13	Sequence Number	U	A non-null value in this field implies that The sequence number protocol is in use. This numeric field is incremented by one For each subsequent value.
14	Continuation Pointer	U	This field is used to define continuations in application-specific ways.
15	Accept Acknowledgement Type	U	AL = Always NE = Never ER = Erroneous conditions SU = Successfully completion
16	Application Acknowledgement Type	U	AL = Always NE = Never ER = Erroneous conditions SU = Successfully completion
17	Country Code	U	ISO 3166 provides a list of country codes
18	Character Set	U	Alternate character sets not used.
19	Principle Language of Message	U	ISO 639 provides a list of codes

3.1.1.2 Patient Identification (PID) Segment

Pos	Element	Use	Example
1	Set ID	U	
2	Patient ID – External ID	O	
3	Patient ID – Internal ID	R	00004
4	Alternate Patient ID	U	
5	Patient Name 1. Last Name 2. First Name 3. Middle Initial 4. Suffix 5. Prefix	R	Fischer Martin Mr.
6	Mother's Maiden Name	U	
7	Date and Time of Birth	R	YYYYMMDDhhmmss 19730704063200

8	Sex	R	M
9	Patient Alias 1. Last Name 2. First Name 3. Middle Initial 4. Suffix 5. Prefix	U	
10	Race	U	
11	Patient Address 1. Street Or Mailing Address 2. Other destination 3. City 4. State 5. Postal Code 6. Country	R	123 West St. Denver CO 80020 USA
12	County Code	U	
13	Phone Number - Home	R	01-22010-4520
14	Phone Number - Business	R	01-22011-4520
15	Primary Language	O	
16	Marital Status	O	
17	Religion	O	
18	Patient Account Number	O	
19	Social Security Number	O	
20	Driver's License Number	U	
21	Mother's Identifier	U	
22	Ethnic Group	U	
23	Birth Place	U	
24	Multiple Birth Indicator	U	
25	Birth Order	U	
26	Citizenship	U	
27	Veteran's Military Status	U	
28	Nationality	U	
29	Patient Death and Time	U	
30	Patient Death Indicator	U	

3.1.1.3 Common Order (ORC) Segment

Pos	Element	Use	Example
1	Order Control	O	NW
2	Placer Order Number	O	3071014
3	Filler Order Number	U	
4	Placer Group Number	U	
5	Order Status	U	
6	Response Flag	U	
7	Quantity/Timing	U	
8	Parent	U	

9	Date and Time of Transaction	U	
10	Entered By	U	
11	Verified By	U	
12	Ordering Provider	U	
13	Enterer's Location	U	
14	Callback Phone Number	U	
15	Order Effective Date and Time	U	
16	Order Control Code Reason	U	
17	Entering Organization	U	
18	Entering Device	U	
19	Action By	U	

3.1.1.4 Observation Request (OBR) Segment

Pos	Element	Use	Example
1	Set ID	O	1
2	Placer Order Number	R	20060307110
3	Filler Order Number	R	0109 Note: value of this field will be used in case of request is being sent to open exiting order/observation details.
4	Universal Service Identifier	U	
5	Priority	U	
6	Requested Date and Time	U	
7	Observation Date and Time	U	
8	Observation End Date and Time	U	
9	Collection Volume	U	
10	Collector Identifier	U	
11	Specimen Action Code	U	
12	Danger Code	U	
13	Relevant Clinical Information	U	
14	Specimen Received Date and Time	U	
15	Specimen Source	U	
16	Ordering Provider	U	
17	Order Callback Phone Number	U	
18	Placer Field 1	U	
19	Placer Field 2	U	
20	Filler Field 1	U	
21	Filler Field 2	U	
22	Results Report/Status Change Date and Time	U	
23	Charge to Practice	U	
24	Diagnostic Service Section ID	U	

25	Result Status	U	
26	Parent Result	U	
27	Quantity / Timing	U	
28	Result Copies to	U	
29	Parent	U	
30	Transportation Mode	U	
31	Reason for Study	U	
32	Principal Result Interpreter	U	
33	Assistant Result Interpreter	U	
34	Technician	U	
35	Transcriptionist	U	
36	Scheduled Date and Time	U	
37	Number of Sample Containers	U	
38	Transport Logistics of Collected Samples	U	
39	Collector's Comment	U	
40	Transport Arrangement Responsibility	U	
41	Transport Arranged	U	
42	Escort Required	U	
43	Planned Patient Transport Comment	U	

3.1.1.5 Example of ORM Message for new Order request

The following is an example ORM message

```
MSH|^~\&|EMR|EMR|OTObase| OTObase |20060307110114| |ORM^001| ORM20130125110113
|P|2.7
PID|||00004||Fischer^Martin^^^Mr.||19670824|M|||123 West St. ^^Denver ^CO ^80020 ^USA|||||
PV1||O|OP^PAREG^|||2342^Jones^Bob|||OP|||||2|||||||20060307110111|
ORC|NW|20060307110114
OBR|1|20060307110114||003038^Urinalysis^L||20060307110114
```

3.1.2 Opening Existing Order

The HL7 Order message (ORM) should contain the all information same as Placing new Order request (see section 3.1.1 *Placing new Order request*) along with the **Filler Id** in the OBR segment (see section 3.1.1.4 *Observation Request Segment position 3*).

3.1.2.1 Example of ORM Message for opening existing Order

The following is an example ORM message

```
MSH|^~\&|EMR|EMR|OTObase| OTObase |20060307110114||ORM^001| ORM20130125110114
|P|2.7
PID|||00004||Fischer^Martin^^^Mr.||19670824|M|||123 West St. ^^Denver ^CO ^80020 ^USA|||||
PV1||O|OP^PAREG^|||2342^Jones^Bob|||OP|||||2|||||||20060307110111|
ORC|NW|20060307110114
OBR|1|20060307110114|1009|003038^Urinalysis^L||20060307110114
```

3.2 ACK (Acknowledgements) message for ORM

OTObase sends acknowledgement (ACK) messages to all ORM messages. The structure of the ACK is as follows:

3.2.1 Message Header (MSH) Segment

Pos	Element	Use	Example
1	Field Separator	R	Pipe symbol -
2	Encoding Characters 1. Component 2. Repeat 3. Escape 4. Subcomponent	R	^~\& ^ ~ \ &
3	Sending Application Name	R	OTObase (User defined during configuration)
4	Sending Facility Name	R	OTObase (User defined during configuration)
5	Receiving Application	R	EMR System (User defined during configuration)
6	Receiving Facility	R	EMR System (User defined during configuration)
7	Date and Time of Message	R	YYYYMMDDhhmmss 20130125052045
8	Security	U	
9	Message Type	R	ACK
10	Message Control Identifier	R	ORM20130125052045
11	Processing ID	O	P = Production T = Training D = Debugging
12	HL7 Version	R	2.4,2.5,2.6,2.7.
13	Sequence Number	U	
14	Continuation Pointer	U	
15	Accept Acknowledgement Type	U	
16	Application Acknowledgement Type	U	
17	Country Code	U	
18	Character Set	U	
19	Principle Language of Message	U	

3.2.2 Message Acknowledgement (MSA) Segment

Pos	Element	Use	Example
1	Acknowledgement Code	R	AA = Success AE = Error AR = Reject
2	Message Control ID	R	ORM20130125052045
3	Text Message	O	Success, Or Failure

4	Expected Sequence Number	U	
5	Delayed Acknowledgement Type	U	
6	Error Condition	O	

3.2.3 Example of ACK Message for Success

The following is an example of success ACK message.

```
MSH|^~\&|OTObase|OTObase|EMR|EMR|20130128012045||ACK|ORM20130125110114|P|2.7
MSA|AA|ORM20130125110114|Success|||
```

3.2.4 Example of ACK Message for Failure

The following is an example of failure ACK message.

```
MSH|^~\&|OTObase|OTObase|EMR|EMR|20130128012045||ACK|ORM20130125110114|P|2.7
MSA|AE|ORM20130125110114|Failure|||
```

3.3 QRY_A19 (Patient Query Request Message)

The function of this message is to send patient information query to the EMR system. This message will contain the patient number for unique identification filter.

3.3.1 Message Header (MSH) Segment

Pos	Element	Use	Example
1	Field Separator	R	Pipe symbol -
2	Encoding Characters 1. Component 2. Repeat 3. Escape 4. Subcomponent	R	^~\& ^ ~ \ &
3	Sending Application Name	R	OTObase (User defined during configuration)
4	Sending Facility Name	R	OTObase (User defined during configuration)
5	Receiving Application	R	EMR System (User defined during configuration)
6	Receiving Facility	R	EMR System (User defined during configuration)
7	Date and Time of Message	R	YYYYMMDDhhmmss 20130125052045
8	Security	U	
9	Message Type 1. Message Type 2. Trigger Event	R	QRY^A19 QRY A19
10	Message Control Identifier	R	QRY20130125052045

11	Processing ID	O	P = Production T = Training D= Debugging
12	HL7 Version	R	2.4,2.5,2.6,2.7.
13	Sequence Number	U	
14	Continuation Pointer	U	
15	Accept Acknowledgement Type	U	
16	Application Acknowledgement Type	U	
17	Country Code	U	
18	Character Set	U	
19	Principle Language of Message	U	

3.3.2 Query Definition (QRD) Segment

Pos	Element	Use	Example
1	Query Date Time	R	YYYYMMDDhhmmss 201301251911
2	Query Format Code	R	R (record oriented response)
3	Query Priority	R	I (Immediate)
4	Query ID	U	
5	Deferred Response Type	U	
6	Deferred Response Date Time	U	
7	Quantity	U	
8	Who Subject Filter 1. Patient ID Number 2. Family Name 3. Given Name	R	10204
9	What Subject Filter	U	
10	What Department Data Code	U	
11	What Data Code Value	U	
12	Query Result Level	U	

3.3.3 Example of QRY_A19 Message

The following is an example of patient query request message (for Patient Number: 10204).

```
MSH|^~\&|OTObase|OTObase|EMR|EMR|20130125191110||QRY^A19|QRY20130125191110|P|2.7
QRD|201301251911|R|||10204|||
```

This message queries for the demographics information for a patient based upon the patient id/number (medical record number). The Patient ID Number is specified in QRD-8- who subject field.

3.4 ADR_A19 (Patient Query Response Message)

This message should be send by the EMR system in response to the Patient Query Request (QRY_A19) message sent by OTObase. This message should contain the patient

demographic information for particular patient based upon the patient ID Number (medical record number).

3.4.1 Message Header (MSH) Segment

Pos	Element	Use	Example
1	Field Separator	R	Pipe symbol -
2	Encoding Characters 1. Component 2. Repeat 3. Escape 4. Subcomponent	R	^~\& ^ ~ \ &
3	Sending Application Name	R	EMR System (User defined during configuration)
4	Sending Facility Name	R	EMR System (User defined during configuration)
5	Receiving Application	R	OTObase (User defined during configuration)
6	Receiving Facility	R	OTObase (User defined during configuration)
7	Date and Time of Message	R	YYYYMMDDhhmmss 20130125052045
8	Security	U	
9	Message Type 1. Message Type 2. Trigger Event	R	ADR^A19 ADR A19
10	Message Control Identifier	R	QRY20130128145136
11	Processing ID	O	P = Production T = Training D= Debugging
12	HL7 Version	R	2.4,2.5,2.6,2.7.
13	Sequence Number	U	
14	Continuation Pointer	U	
15	Accept Acknowledgement Type	U	
16	Application Acknowledgement Type	U	
17	Country Code	U	
18	Character Set	U	
19	Principle Language of Message	U	

3.4.2 Message Acknowledgement (MSA) Segment

Pos	Element	Use	Example
1	Acknowledgement Code	R	AA = Success AE = Error AR = Reject

2	Message Control ID	R	QRY20130128145136
3	Text Message	O	Success, Or Failure
4	Expected Sequence Number	U	
5	Delayed Acknowledgement Type	U	
6	Error Condition	O	

3.4.3 Query Definition (QRD) Segment

Pos	Element	Use	Example
1	Query Date Time	R	YYYYMMDDhhmmss 201301251911
2	Query Format Code	R	R (record oriented response)
3	Query Priority	R	I (Immediate)
4	Query ID	U	
5	Deferred Response Type	U	
6	Deferred Response Date Time	U	
7	Quantity	U	
8	Who Subject Filter 1. Patient ID Number 2. Family Name 3. Given Name	R	10204
9	What Subject Filter	U	
10	What Department Data Code	U	
11	What Data Code Value	U	
12	Query Result Level	U	

3.4.4 Patient Identification (PID) Segment

Pos	Element	Use	Example
1	Set ID	U	
2	Patient ID – External ID	O	
3	Patient ID – Internal ID (Patient Identifier List\ID Number)	R	9068
4	Alternate Patient ID	U	
5	Patient Name 1. Last Name 2. First Name 3. Middle Initial 4. Suffix 5. Prefix	R	Fischer Martin Mr.
6	Mother's Maiden Name	U	
7	Date and Time of Birth	R	YYYYMMDDhhmmss 19730704063200
8	Sex	R	M
9	Patient Alias	U	

	1. Last Name 2. First Name 3. Middle Initial 4. Suffix 5. Prefix		
10	Race	U	
11	Patient Address 1. Street Or Mailing Address 2. Other destination 3. City 4. State 5. Postal Code 6. Country	R	123 West St. Denver CO 80020 USA
12	County Code	U	
13	Phone Number – Home	R	01-22010-4520
14	Phone Number – Business	R	01-22011-4520
15	Primary Language	O	
16	Marital Status	O	
17	Religion	O	
18	Patient Account Number	O	
19	Social Security Number	O	S102T44503
20	Driver’s License Number	U	
21	Mother’s Identifier	U	
22	Ethnic Group	U	
23	Birth Place	U	
24	Multiple Birth Indicator	U	
25	Birth Order	U	
26	Citizenship	U	
27	Veteran’s Military Status	U	
28	Nationality	U	
29	Patient Death and Time	U	
30	Patient Death Indicator	U	

3.4.5 Patient Visit (PV1) Segment

Information present in Patient Visit segment is not used in current version of OTObase.

Pos	Element	Use	Example
1	Set ID	U	
2	Patient Class	U	
3	Assigned Patient Location	U	
4	Admission Type	U	
5	Pre admit Number	U	
6	Prior Patient Location	U	
7	Attending Doctor 1. Last Name	U	

	2. First Name 3. Middle Initial		
8	Referring Doctor 1. Last Name 2. First Name 3. Middle Initial	U	
9	Consulting Doctor 1. Last Name 2. First Name 3. Middle Initial	U	
10	Hospital Service	U	
11	Temporary Location	U	
12	Pre-admit Test Indicator	U	
13	Re-admission Indicator	U	
14	Admit Source	U	
15	Ambulatory Status	U	
16	VIP Indicator	U	
17	Admitting Doctor	U	
18	Patient Type	U	
19	Visit Number	U	
20	Financial Class	U	
21	Charge Price Indicator	U	
22	Courtesy Code	U	
23	Credit Rating	U	
24	Contract Code	U	
25	Contract Effective Date	U	
26	Contract Amount	U	
27	Contract Period	U	
28	Interest Code	U	
29	Transfer to Bad Debt Code	U	
30	Transfer to Bad Debt Date	U	
31	Bad Debt Agency Code	U	
32	Bad Debt Transfer Amount	U	
33	Bad Debt Recovery Amount	U	
34	Delete Account Indicator	U	
35	Delete Account Date	U	
36	Discharge Disposition	U	
37	Discharged to Location	U	
38	Diet Type	U	
39	Servicing Facility	U	
40	Bed Status	U	
41	Account Status	U	
42	Pending Location	U	
43	Prior Temporary Location	U	
44	Admit Date and Time	U	

45	Discharge Date and Time	U	
46	Current Patient Balance	U	
47	Total Charges	U	
48	Total Adjustments	U	
49	Total Payments	U	
50	Alternative Visit ID	U	
51	Visit Indicator	U	
52	Other Healthcare Provider	U	

3.4.6 Example of ADR_A19 Message when Patient found

The following is an example of patient query response message (for Patient Number: 10204).

```
MSH|^~\&|AWS1|ZISSERVER|OTObase|OTObase|20130128145137||ADR^A19|QRY20130128145136|P|2.7|
MSA|AA|QRY20130128145136
QRD|201301281451|R|||10204
PID|||00004||Fischer^Martin^^^Mr.||19670824|M|||123 West St. ^^Denver ^CO ^80020 ^USA|||||
PV1||I|A5TA^5014^|||0019^Jonge^^MWC^^de^Jhr.
Dr.|||||||O|0000519145|||||||200405201030|
```

Above message contains patient demographic & visit information.

3.4.7 Example of ADR_A19 Message when Patient not found

The following is an example of patient query response message (for Patient Number: 10204) if patient information not found.

```
MSH|^~\&|AWS1|ZISSERVER|OTObase|OTObase|20130128145137||ADR^A19|QRY20130128145136|P|2.7|
MSA|AE|QRY20130128145136|Patient Not found.
```

3.5 ORU (Observation Result Unsolicited) Message

OTObase returns finished transcriptions (PDF report containing latest Tone, Speech & Impedance measurement for both ears) to the EMR system using Observation Result Unsolicited (ORU) messages that are triggered by the OTObase when patient is Signed Off (manually/automatically). The HL7 message will contain the following information.

3.5.1 Message Header (MSH) Segment

Pos	Element	Use	Example
1	Field Separator	R	Pipe symbol -
2	Encoding Characters 1. Component 2. Repeat 3. Escape 4. Subcomponent	R	^~\& ^ ~ \ &
3	Sending Application Name	R	OTObase (User defined during configuration)

4	Sending Facility Name	R	OTObase (User defined during configuration)
5	Receiving Application	R	EMR System (User defined during configuration)
6	Receiving Facility	R	EMR System (User defined during configuration)
7	Date and Time of Message	R	YYYYMMDDhhmmss 20130125052045
8	Security	U	
9	Message Type 1. Message Type 2. Trigger Event	R	ORU^R01 ORU R01
10	Message Control Identifier	R	ORU20130128145120
11	Processing ID	O	P = Production T = Training D= Debugging
12	HL7 Version	R	2.4,2.5,2.6,2.7.
13	Sequence Number	U	
14	Continuation Pointer	U	
15	Accept Acknowledgement Type	U	
16	Application Acknowledgement Type	U	
17	Country Code	U	
18	Character Set	U	
19	Principle Language of Message	U	

3.5.2 Common Order (ORC) Segment

Pos	Element	Use	Example
1	Order Control	O	NW
2	Placer Order Number	O	3071014
3	Filler Order Number	O	105400
4	Placer Group Number	U	
5	Order Status	U	
6	Response Flag	U	
7	Quantity/Timing	U	
8	Parent	U	
9	Date and Time of Transaction	U	
10	Entered By	U	
11	Verified By	U	
12	Ordering Provider	U	
13	Enterer's Location	U	
14	Callback Phone Number	U	
15	Order Effective Date and Time	U	
16	Order Control Code Reason	U	

17	Entering Organization	U	
18	Entering Device	U	
19	Action By	U	

3.5.3 Observation Request (OBR) Segment

Pos	Element	Use	Example
1	Set ID	O	1
2	Placer Order Number	R	3071014
3	Filler Order Number	R	105400
4	Universal Service Identifier	U	
5	Priority	U	
6	Requested Date and Time	O	
7	Observation Date and Time	U	
8	Observation End Date and Time	U	
9	Collection Volume	U	
10	Collector Identifier	U	
11	Specimen Action Code	U	
12	Danger Code	U	
13	Relevant Clinical Information	U	
14	Specimen Received Date and Time	U	
15	Specimen Source	U	
16	Ordering Provider	U	
17	Order Callback Phone Number	U	
18	Placer Field 1	U	
19	Placer Field 2	U	
20	Filler Field 1	U	
21	Filler Field 2	U	
22	Results Report/Status Change Date and Time	U	
23	Charge to Practice	U	
24	Diagnostic Service Section ID	U	
25	Result Status	U	
26	Parent Result	U	
27	Quantity / Timing	U	
28	Result Copies to	U	
29	Parent	U	
30	Transportation Mode	U	
31	Reason for Study	U	
32	Principal Result Interpreter	U	
33	Assistant Result Interpreter	U	
34	Technician	U	
35	Transcriptionist	U	
36	Scheduled Date and Time	U	

37	Number of Sample Containers	U	
38	Transport Logistics of Collected Samples	U	
39	Collector's Comment	U	
40	Transport Arrangement Responsibility	U	
41	Transport Arranged	U	
42	Escort Required	U	
43	Planned Patient Transport Comment	U	

3.5.4 Observation Result (OBX) Segment

Pos	Element	Use	Example
1	Set ID	R	
2	Value Type	R	AD = Address DT Date ED Encapsulated Data FT Formatted Text (Display) ST String Data. TM Time TN Telephone Number TS Time Stamp (Date & Time) TX Text Data (Display)
3	Observation Identifier		102012
4	Observation Sub-ID	O	
5	Observation Value	R	PDF Report Raw data (eg. Acrobat^text^pdf^Base64^JVBE Ri0xLjQKJcfsj6IKNSAwIG9iago8PC9MZW5ndGggNiAwIFlvRmlsdG)
6	Units	U	
7	References Range	U	
8	Abnormal Flags	U	
9	Probability	U	
10	Nature of Abnormal Test	U	
11	Observation Result Status	U	
12	Date of Last Observation Normal Values	U	
13	User-Defined Access Checks	U	
14	Date and Time of the Observation	U	
15	Producer's ID	U	
16	Responsible Observer	U	
17	Observation Method	U	

3.5.5 Example of ORU Message

The following is an example of ORU message.

```
MSH|^~\&|OTObase|OTObase|EMR|EMR|20130128161405||ORU^R01|ORU20130128161405|P|2.7
PID|||0000002||Cocu^Philip||19701029
ORC|RE|3071014|105400|||||||||
OBR|1|3071014|105400|||201301251910
OBX|1|ED|Report|1|Acrobat^text^pdf^Base64^JVBERi0xLjQKJcfsj6IKNSAwIG9iago8PC9MZW5ndGg
gNiAwIFlvRmlsdGVyIC9GbGF0ZURlY29kZT4+CnN0cmVhbQp4nI1SyU7EMAy95ytyTA41dtbmitiEkIB
ROI0Qqh1mQKKgYfl/3DZ0wibRqJlV/fs52QrEchIHM5n0PUC5TH/G7EVLdjhGwt13PVyP4u9RZTMym
uBkFjyNNZIRoRWxoDgZO7FUmWNEByiCepeNwgmURsdetCNAQret+pVNwTGpBSVHBDkYkzmH4hb
bYGl6tSFbhyPij6oA03go3NGHWkPIbpv0LU20DKQ6k6Pu/Dup/r7ZICrvp6pIFdVtWa97TSfmYRgkWZ
E8JFUNwm8zBMVxWKQBYgVlRn+GaQAnv7ofqKbFpw13OZM03AXPqn4Fcxp8sar83FLPji1010Fy4Cgr
ubkTcWqAFilaYot8dprh/2wA+6cBgvX+VSY4IEo8JPK34l0zYtmSoqxjaVfLEPZWR2Ike1wywu+XwAe
MqSBGVuZHN0cmVhbQplbmRvYmoKNiAwIG9iagozMjAKZW5kb2JqCjQgMGBvYmoKPDwvVHlwZS9Q
YWdlL01lZGlhQm94IFswIDAgNTk1IDg0Ml0KL1JvdGF0ZSAwL1BhcmVudCAzIDAgUgovUmVzb3VyY2
VzPDwvUHJvY1NldFsvUERGIC9UZXh0XQovRm9udCA4IDAgUgo+PgovQ29udGVudHMgNSAwIFIKPj4
KZW5kb2JqCjMgMGBvYmoKPDwvL1R5cGUgL1BhZ2VzIC9LaWRzIFsKNCAwIFIKXSAvQ291bnQgMQo
+PgplbmRvYmoKMSAwIG9iago8PC9UeXBliC9DYXRhbG9nIC9QYWdlcyAzIDAgUgovTWV0Y
```

3.6 ACK (Acknowledgements) message for ORU

EMR System should send the acknowledgement to all ORU messages sent by OTObase. The structure of the ACK is as follows:

3.6.1 Message Header (MSH) Segment

Pos	Element	Use	Example
1	Field Separator	R	Pipe symbol -
2	Encoding Characters 1. Component 2. Repeat 3. Escape 4. Subcomponent	R	^~\& ^ ~ \ &
3	Sending Application Name	R	EMR System (User defined during configuration)
4	Sending Facility Name	R	EMR System (User defined during configuration)
5	Receiving Application	R	OTObase (User defined during configuration)
6	Receiving Facility	R	OTObase (User defined during configuration)
7	Date and Time of Message	R	YYYYMMDDhhmmss 20130125052045
8	Security	U	
9	Message Type	R	ACK
10	Message Control Identifier	R	ORU20130128161405
11	Processing ID	O	P = Production

			T = Training D= Debugging
12	HL7 Version	R	2.4,2.5,2.6,2.7.
13	Sequence Number	U	
14	Continuation Pointer	U	
15	Accept Acknowledgement Type	U	
16	Application Acknowledgement Type	U	
17	Country Code	U	
18	Character Set	U	
19	Principle Language of Message	U	

3.6.2 Message Acknowledgement (MSA) Segment

Pos	Element	Use	Example
1	Acknowledgement Code	R	AA = Success AE = Error AR = Reject
2	Message Control ID	R	ORU20130128161405
3	Text Message	O	Success, Or Failure
4	Expected Sequence Number	U	
5	Delayed Acknowledgement Type	U	
6	Error Condition	O	

3.6.3 Example of ACK Message for success

The following is an example of success ACK message.

```
MSH|^~\&|EMR | EMR| OTObase | OTObase | 20130128012045||ACK| ORU20130128161405 |P|2.7
MSA|AA| ORU20130128161405|Success|||
```

3.6.4 Example of ACK Message for failure

The following is an example of failure ACK message.

```
MSH|^~\&|EMR | EMR| OTObase | OTObase | 20130128012045||ACK| ORU20130128161405 |P|2.7
MSA|AE| ORU20130128161405|Failure|||
```

4. Communication Protocol

OTObase EMR Connector for HL7 interface uses the TCP/IP protocol for communication and information exchange. TCP/IP Protocols means that the data just start coming in a stream and there is no set size. Some messages are quite concise with a couple of segment. Other HL7 standard messages are extremely long with repeating observation segment that contain an entire report of patient.

Hence in order to indentify where one HL7 message start and end, Minimal Lower Layer Protocol (MLLP) is used to wrap the HL7 message. HL7 message is wrapped with header and footer to insure you know where a message starts, where a message stops, and were the next message starts. These header and footers are non-printable characters that would not typically be in the content of HL7 messages.

Sr.	Description	Character
1	The header is a vertical tab character	<VT> (Hex 0x0b)
2	The footer is a field separator character, immediately followed by a carriage return.	<FS> (Hex 0x1c) <CR> (Hex 0x0d)

Message being transported via TCP/IP will look like-

<VT> HL7 message <FS> <CR>