Unified Clinical Archive Version 11.2
HL7 Conformance Statement

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1 Introduction

The Unified Clinical Archive product utilizes the medical industry standard HL7 2.5 messaging protocol to exchange information with other HL7 compliant applications such as Hospital Information Systems (HIS) and Radiology Information Systems (RIS) on the network. The primary use of the HL7 protocol in the Unified Clinical Archive is to support the IHE Scheduled Workflow profile (SWF), support the IHE Patient Information Reconciliation profile (PIR) and the ability to prefetch prior studies from all Inbound Message supported.

1.1 Acronyms and Abbreviations

Definitions, terms and abbreviations used in this document are defined within the HL7 standard. Abbreviations and terms are as follows:

Table 1: Acronyms and Abbreviations

Abbreviation	Expansion
ADT	Admission, Discharge, and Transfer message
AL1	Patient Allergy Information segment.
CHCS	Composite Health Care System, the RIS used by the US Military
EVN	Event Type segment
HL7	Health Level 7
IHE	Integrating the Healthcare Enterprise
MFN	Master Files Change Notification
MRG	Merge Patient Information segment
MSH	Message Header segment
NTE	Notes and comments segment
OBR	Observation Request segment
OBX	Observation/Result segment
ORC	Common Order segment
ORM	Order Request message
ORU	Observation Results - Unsolicited message
PID	Patient ID segment
PV1	Patient Visit segment
QBP	Get Corresponding Identifiers
QPD	Query Parameter Definition segment
QRD	Query Definition segment
RCP	Response Control Parameter segment
RIS	Radiology Information System
SIU	Schedule Information Unsolicited

1.2 Related Documentation

- HL7 Standard version 2.5

- IHE Radiology Technical Framework

2 Messages Supported

2.1 Inbound Messages

Table 2: Inbound Messages Supported

Message Type Trigger	Definition	Comments
ADT^A01	Patient Admission.	For Prefetch
ADT^A04	Patient Registration	For Prefetch
ADT^A05	Patient Pre-Admission	For Prefetch
ADT^A08	Update patient information	For PIR and Prefetch
ADT^A40	Merge patient – Patient identifier list	For PIR and Prefetch
ORM^O01	Order message	For SWF & Prefetch
ORU^R01	Observation message	To Create a DICOM Structured Report
RSP^K23	Get Corresponding Identifiers Response	Response to QBP^Q23 message

2.2 Outbound Messages

Table 3: Outbound Messages Supported

Message Type Trigger	Definition	Comments
ADT^A01	Patient Admission.	For XDS Registration
QBP^Q23	Get Corresponding Identifiers	For Patient Matching & MIMA
ORU^R01	Observation Message	Study Availability Notification
ORU^R03	Observation Message	Study Availability Notification

2.3 Inbound and Outbound Message Framing

Table 4: Inbound and Outbound Message Framing

Message Framing	Description	Characters
Header	Before each message	0x0B
End of Segment	After each message segment	0x0D
Footer	After each message	0x1C, 0x0D

2.4 Segments Supported

Table 5: Segments Supported

Segment	Required	Comments
MSH	R	Message Header Segment
MSA	O	Message Acknowledge Segment (Returned by Unified Clinical for messages)
EVN	O	Event Type Segment
ERR	C	Error Segment
PID	R	Patient Identification Segment
PV1	O	Patient Visit Segment
PV2	O	Additional Patient Visit Segment
ORC	C	Common Order Segment
OBR	C	Observation Request Segment
MRG	C	Merge Patient Information Segment
QAK	C	Query Acknowledge Segment
QPD	O	Query Parameter Definition Segment
RCP	O	Response Control Parameter Segment
ZDS	O	IHE Additional Information Segment

Legend: In the "Required" column, the value denotes the following:

R (Required)	Required for all Unified Clinical Archive supported messages
C (Conditional)	Required for some Unified Clinical Archive supported messages
O (Optional)	Not required for Unified Clinical Archive supported messages

2.5 Supported Segment Matrix

Table 6: Supported Segment Matrix

Message	MSH	MSA	EVN	ERR	PID	PV1	PV2	ORC	OBR	OBX	MRG	QAK	QPD	RCP	TXA	ZDS
ADT^A01	R	O	O	O	R	O	O	O	O	O	O	O	O	O	O	O
ADT^A04	R	O	O	O	R	O	O	O	O	O	O	O	O	O	O	O
ADT^A05	R	O	O	O	R	O	O	O	O	O	O	O	O	O	O	O
ADT^A08	R	O	O	O	R	O	O	O	O	O	O	O	O	O	O	O
ADT^A40	R	O	O	O	R	O	O	O	O	O	R	O	O	O	O	O
ORM^O01	R	O	O	O	R	O	O	R	R	O	O	O	O	O	O	O
ORU^R01 [*]	R	O	O	O	R	O	O	O	R	O	O	O	O	O	O	O
ORU^R01 [+]	R	O	O	O	R	O	O	O	R	R	O	O	O	O	O	O
ORU^R03	R	O	O	O	R	O	O	O	R	R	O	O	O	O	O	O
QBP^Q23	R	O	O	O	O	O	O	O	O	O	O	O	R	R	O	O
RSP^K23	R	R	O	O	R	O	O	O	O	O	O	R	R	O	O	O

Legend: [*] Inbound, [+] Outbound

2.6 Message Header Segment

Table 7: Message Header Segment (MSH)

Sequence	Length	Required	Repeating	Element Name	Comment
1	1	Y	N	Field Separator	Usually "|"
2	4	Y	N	Encoding Characters	Usually "^~\&"
3	180	N	N	Sending Application	This is the Source AE Title of the ORM^O01 message.
4	180	N	N	Sending Facility	
5	180	N	N	Receiving Application	
6	180	N	N	Receiving Facility	
7	26	N	N	Date/Time of Message	
8	40	N	N	Security	
9	7	Y	N	Message Type	
10	20	Y	N	Message Control ID	
11	3	Y	N	Processing ID	
12	60	Y	N	Version ID	
13	15	N	N	Sequence Number	
14	180	N	N	Continuation Pointer	
15	2	N	N	Accept Acknowledgement Type	
16	2	N	N	Application Acknowledgement Type	
17	2	N	N	Country Code	
18	16	N	Y	Character Set	Please see Table 8
19	60	N	N	Principal Language of Message	
20	20	N	N	Alternate Character Set Handling	Please see Table 8
21	427	N	Y	Message Profile Identifier	
22	567	N	N	Sending Responsible Organization	
23	567	N	N	Receiving Responsible Organization	
24	227	N	N	Sending Network Address	
25	227	N	N	Receiving Network Address	

2.7 Inbound Message Character Set Encoding

When HL7 Messages are received by the UCA application they can be encoded with characters other than just ASCII characters. If a message contains characters other than ASCII, the MSH segment of the message must specify what character set(s) is used in the MSH-18 "Character Set" field and the MSH-20 "Alternate Character Set Handling Scheme" field. The encodings allowed by the HL7 Standard (v2.5 and v2.3.1) are listed in Table 8. Unlike DICOM the entire HL7 message must be encoded using the specified character set. However, the standard strongly suggests that certain character set encodings (e.g. CJK and ISO 2022 encodings) only be used for text fields.

Table 8: Inbound Message Character Set Encoding

MSH 18	MSH 20	Description
ISO_IR 6	None	US ASCII
ISO_IR 192	None	ISO 10646-1/2 (Unicode)
ISO_IR 100	None	ISO 8859-1 (Latin 1)
ISO 2022 IR 13*	ISO 2022 -1994	ISO 2022 JIS X 0201 (Katakana/Romaji)
ISO 2022 IR 14*	ISO 2022 -1994	ISO 2022 JIS X 0201 (Romaji)
ISO 2022 IR 87*	ISO 2022 -1994	ISO 2022 JIS X 0208 (Kanji)
ISO 2022 IR 159*	ISO 2022 -1994	ISO 2022 JIS X 0212 (Suppl. Kanji)

Legend: * UCA Release Version 7.1 or late

2.8 Message Acknowledgement Segment (MSA)

Table 9: Message Acknowledgement Segment (MSA)

Sequence	Length	Required	Repeating	Element Name	Comment
1	1	Y	N	Acknowledgement Code	
2	20	Y	N	Message Control ID	
3	80	N	N	Text Message	
4	15	N	N	Expected Sequence Number	
5	1	N	N	Delayed Acknowledgement Type	
6	100	N	N	Error Condition	

2.9 Patient Identifier Segment (PID)

Table 10: Patient Identification Segment (PID)

Sequence	Length	Required	Repeating	Element Name	Comment
1	4	N	N	Set ID – PID	
2	20	N	N	Patient ID	
3	20	Y	Y	Patient Identifier List	This is the Patient Id from the ADT^A01, ADT^A04, ADT^A05, ADT^A08 and ORM^O01 messages. This is the Replacement Patient Id from the ADT^A40 message. This is a list of Patient Id's and Assigning Authorities returned by the RSP^K23 message in response to the QBP^Q23 message. Each Patient Id Assigning Authority combination is separated by a tilde (~).
4	20	N	Y	Alternate Patient ID	This is the Alternate Patient Id from the ADT^A01, ADT^A04, ADT^A05, ADT^A08, ADT^A40 and ORM^O01 messages. (if configured)
5	48	Y	Y	Patient Name	This is the Patient Name from the ADT^A01, ADT^A04, ADT^A05, and ORM^O01 messages. This is the Replacement Patient Name from the ADT^A08 and ADT^A40 messages.
6	48	N	Y	Mother's Maiden Name	
7	26	N	N	Date/Time of Birth	This is the Replacement Patient's Birth Date and Time from the ADT^A08 and ADT^A40 messages.
8	1	N	N	Sex	This is the Replacement Patient's Sex from the ADT^A08 and ADT^A40 messages.
9	48	N	Y	Patient Alias	
10	80	N	Y	Race	
11	106	N	Y	Patient Address	
12	4	N	N	Country Code	
13	40	N	Y	Phone Number - Home	
14	40	N	Y	Phone Number - Business	
15	60	N	N	Primary Language	
16	80	N	N	Marital Status	
17	80	N	N	Religion	
18	20	N	N	Patient Account Number	
19	16	N	N	Social Security Number - Patient	
20	25	N	N	Driver's License Number - Patient	
21	20	N	Y	Mother's Identifier	
22	80	N	Y	Ethnic Group	

Sequence	Length	Required	Repeating	Element Name	Comment
23	60	N	N	Birth Place	
24	1	N	N	Multiple Birth Indicator	
25	2	N	N	Birth Order	
26	80	N	Y	Citizenship	
27	60	N	N	Veterans Military Status	
28	80	N	N	Nationality	
29	26	N	N	Patient Death Date and Time	
30	1	N	N	Patient Death Indicator	
31	1	N	N	Identity Unknown Indicator	
32	20	N	Y	Identity Reliability Code	
33	26	N	N	Last Update Date/Time	
34	40	N	N	Last Update Facility	
35	250	N	N	Species Code	
36	250	N	N	Breed Code	
37	80	N	N	Strain	
38	250	N	Y	Production Code	

2.10 Patient Visit Segment (PV1)

Table 11: Patient Visit Segment (PV1)

Sequence	Length	Required	Repeating	Element Name	Comment
1	4	N	N	Set ID – PV1	
2	1	Y	N	Patient Class	
3	80	N	N	Assigned Patient Location	
4	2	N	N	Admission Type	
5	20	N	N	Pre-admit Number	
6	80	N	N	Prior Patient Location	
7	60	N	Y	Attending Doctor	
8	60	N	Y	Referring Doctor	
9	60	N	Y	Consulting Doctor	
10	3	N	N	Hospital Service	
11	80	N	N	Temporary Location	
12	2	N	N	Pre-admit Test Indicator	
13	2	N	N	Re-admission Indicator	
14	3	N	N	Admit Source	
15	2	N	Y	Ambulatory Status	
16	2	N	N	VIP Indicator	
17	60	N	Y	Admitting Doctor	
18	2	N	N	Patient Type	
19	20	N	N	Visit Number	
20	50	N	Y	Financial Class	
21	2	N	N	Charge Price Indicator	
22	2	N	N	Courtesy Code	
23	2	N	N	Credit Rating	
24	2	N	Y	Contract Code	
25	8	N	Y	Contract Effective Date	
26	12	N	Y	Contract Amount	
27	3	N	Y	Contract Period	
28	2	N	N	Interest Code	
29	1	N	N	Transfer to Bad Debt Code	
30	8	N	N	Transfer to Bad Debt Date	
31	10	N	N	Bad Debt Agency Code	
32	12	N	N	Bad Debt Transfer Amount	
33	12	N	N	Bad Debt Recovery Amount	
34	1	N	N	Delete Account Indicator	
35	8	N	N	Delete Account Date	
36	3	N	N	Discharge Disposition	
37	25	N	N	Discharged to Location	
38	80	N	N	Diet Type	
39	2	N	N	Servicing Facility	
40	1	N	N	Bed Status	
41	2	N	N	Account Status	

Sequence	Length	Required	Repeating	Element Name	Comment
42	80	N	N	Pending Location	
43	80	N	N	Prior Temporary Location	
44	26	N	N	Admit Date/Time	
45	26	N	N	Discharge Date/Time	
46	12	N	N	Current Patient Balance	
47	12	N	N	Total Charges	
48	12	N	N	Total Adjustments	
49	12	N	N	Total Payments	
50	20	N	N	Alternate Visit ID	
51	1	N	N	Visit Indicator	
52	60	N	Y	Other Healthcare Provider	

2.11 Common Order Segment (ORC)

Table 12: Common Order Segment (ORC)

Sequence	Length	Required	Repeating	Element Name	Comment
1	2	N	N	Order Control	
2	22	N	N	Placer Order Number	5th field checked for Accession Number for Report in ORU^001
3	22	N	N	Filler Order Number	6th field checked for Accession Number for Report in ORU^001
4	22	N	N	Placer Group Number	
5	2	N	N	Order Status	
6	1	N	N	Response Flag	
7	200	N	N	Quantity/Timing	
8	200	N	N	Parent Order	
9	26	N	N	Date/Time of Transaction	
10	120	N	Y	Entered By	
11	120	N	Y	Verified By	
12	120	N	Y	Ordering Provider	
13	80	N	N	Enterer's Location	
14	40	N	Y	Call Back Phone Number	
15	26	N	N	Order Effective Date/Time	
16	200	N	N	Order Control Code Reason	
17	60	N	N	Entering Organization	
18	60	N	N	Entering Device	
19	120	N	Y	Action By	
20	40	N	N	Advanced Beneficiary Notice Code	
21	60	N	Y	Ordering Facility Name	
22	106	N	Y	Ordering Facility Address	
23	48	N	Y	Ordering Facility Phone Number	
24	106	N	Y	Ordering Provider Address	

Order Control Codes Supported (ORC - Sequence 1)

Control Code	Description
NW	New Order
CA	Cancel Order Request
DC	Discontinue Order Request
OC	Order Cancelled
OD	Order Discontinued
SC	Order Scheduled
XO	Change Order Request

Order Status Codes Supported (ORC - Sequence 5)

Control Code	Description
C	Order was Cancelled
CM	Order is Completed
DC	Order was Discontinued
IP	Order in Progress

2.12 Observation Request Segment (OBR)

Table 13: Observation Request Segment (OBR)

Sequence	Length	Required	Repeating	Element Name	Comment
1	4	N	N	Set ID – OBR	
2	22	N	N	Placer Order Number	3rd field checked for Accession Number for Report in ORU^001
3	22	N	N	Filler Order Number	4th field checked for Accession Number for Report in ORU^001
4	200	Y	N	Universal Service ID	This is the Source Body Part of the ORM^O01 message.
5	2	N	N	Priority-OBR	
6	26	N	N	Requested Date/Time	
7	26	N	N	Observation Date/Time	
8	26	N	N	Observation End Date/Time	
9	20	N	N	Collection Volume	
10	60	N	Y	Collector Identifier	
11	1	N	N	Specimen Action Code	
12	60	N	N	Danger Code	
13	300	N	N	Relevant Clinical Information	
14	26	N	N	Specimen Received Date/Time	
15	300	N	N	Specimen Source	
16	120	N	Y	Ordering Provider	
17	40	N	Y	Order Callback Phone Number	
18	60	N	N	Placer Field 1	1st field checked for Accession Number for Report in ORU^001 Modality for outbound study availability notifications
19	60	N	N	Placer Field 2	Viewer URL for outbound study availability notifications
20	60	N	N	Filler Field 1	2nd field checked for Accession Number for Report in ORU^001
21	60	N	N	Filler Field 2	
22	26	N	N	Result Rpt/Status Change - Date/Time	
23	40	N	N	Charge To Practice	
24	10	N	N	Diagnostic Serv Sect Id	This is the Scheduled Modality Type / Source Modality from the ORM^O01 message.
25	1	N	N	Result Status	
26	200	N	N	Parent Result	
27	200	N	Y	Quantity/Timing	

Sequence	Length	Required	Repeating	Element Name	Comment
28	150	N	Y	Result Copies To	
29	200	N	N	Parent Number	
30	20	N	N	Transportation Mode	
31	300	N	Y	Reason For Study	
32	200	N	N	Principal Result Interpreter	
33	200	N	Y	Assistant Result Interpreter	
34	200	N	Y	Technician	
35	200	N	Y	Transcriptionist	
36	26	N	N	Scheduled Date/Time	This is the Scheduled Study Date of the ORM^O01 message.
37	4	N	N	Number of Sample Containers	
38	60	N	Y	Transport Logistics of Collected Sample	
39	200	N	Y	Collector's Comment	
40	60	N	N	Transport Arrangement Responsibility	
41	30	N	N	Transport Arranged	
42	1	N	N	Escort Required	
43	200	N	Y	Planned Patient Transport Comment	
44	80	N	N	Procedure Code	
45	80	N	Y	Procedure Code Modifier	

2.13 Observation Segment (OBX)

Table 14: Observation Segment (OBX)

Sequence	Length	Required	Repeating	Element Name	Comment
1	4	N	N	Set ID - OBX	
2	2	Y	N	Value Type	
3	590	Y	N	Observation Identifier	Report Title Identifier. Included in DICOM SR Narrative Text.
4	20	N	N	Observation Sub-ID	
5	65536	N	Y	Observation Value	Report Text included in DICOM SR from ORU^O01 Viewer URL for outbound study availability notifications
6	60	N	N	Units	
7	10	N	N	References Range	
8	5	N	Y	Abnormal Flags	
9	5	N	N	Probability	
10	2	N	N	Nature of Abnormal Test	
11	1	Y	N	Observe Result Status	Report Status. Included in DICOM SR Narrative Text. The following status is identified: F=Final, P=Preliminary, I=Incomplete, O=Ordered, R=Result not Final. If OBX.3 is blank then no status is displayed
12	26	N	N	Date Last Obx Normal Values	
13	20	N	N	User Defined Access Checks	
14	26	N	N	Date/Time of the Observation	
15	60	N	N	Producer's ID	
16	80	N	N	Responsible Observer	
17	80	N	Y	Prior Visit Number	

2.14 Merge Patient Information Segment (MRG)

Table 15: Merge Patient Information Segment (MRG)

Sequence	Length	Required	Repeating	Element Name	Comment
1	20	Y	Y	Prior Patient Identifier List	This is the Prior Patient ID from the ADT^A40 message.
2	20	N	Y	Prior Alternate Patient ID	
3	20	N	N	Prior Patient Account Number	
4	20	N	N	Prior Patient ID	
5	20	N	N	Prior Visit Number	
6	20	N	N	Prior Alternate Visit ID	
7	48	N	Y	Prior Patient Name	

2.15 Query Parameter Definition Segment (QPD)

Table 16: Query Parameter Definition Segment (QPD)

Sequence	Length	Required	Repeating	Element Name	Comment
1	250	Y	N	Message Query Name	
2	32	N	N	Query Tag	
3	256	N	N	User Parameters	This is the Patient Id and Assigning Authority from the QBP^Q23 message for a PIX Query.

2.16 Response Control Parameter Segment (RCP)

Table 17: Response Control Parameter Segment (RCP)

Sequence	Length	Required	Repeating	Element Name	Comment
1	1	N	N	Query Priority	
2	10	N	N	Quantity Limited Request	
3	250	N	N	Response Modality	
4	24	N	N	Execution and Delivery Time	
5	1	N	N	Modify Indicator	
6	512	N	Y	Sort-by Field	
7	256	N	Y	Segment Group Inclusion	

2.17 Error Segment (ERR)

Table 18: Error Segment (ERR)

Sequence	Length	Required	Repeating	Element Name	Comment
1	493	N	Y	Error Code and Location	
2	18	N	Y	Error Location	
3	705	Y	N	HL7 Error Code	
4	2	Y	N	Severity	
5	705	N	N	Application Error Code	
6	80	N	Y	Application Error Parameter	
7	2048	N	N	Diagnostic Information	
8	250	N	N	User Message	
9	20	N	Y	Inform Person Indicator	
10	705	N	N	Override Type	
11	705	N	Y	Override Reason Code	
12	652	N	Y	Help Desk Contact Point	

2.18 Query Acknowledgement Segment

Table 19: Query Acknowledge Segment (QAK)

Sequence	Length	Required	Repeating	Element Name	Comment
1	32	N	N	Query Tag	
2	2	N	N	Query Response Status	
3	250	N	N	Message Query Name	
4	10	N	N	Hit Count	
5	10	N	N	This Payload	
6	10	N	N	Hits Remaining	

2.19 IHE Additional Information Segment (ZDS)

Table 20: IHE Additional Information Segment (ZDS)

Sequence	Length	Required
1	Reference Pointer	DICOM Study Instance Value
2	Application ID	Implementation Specific
3	Type of Data	"Application"
4	Subtype	"DICOM"

2.20 Supported Escape Sequences

Table 21: Supported Escape Sequences

Escape	HL7 Definition	UCA Behavior
\H\	start highlighting	Removed Applies to TX, FT, CF data types
\N\	normal text (end highlighting)	Removed Applies to TX, FT, CF data types
\F\	field separator	Replaced with the field separator defined in MSH.1, usually | (pipe) Applies to TX, FT, CF, ST data types
\S\	component separator	Replaced with the component separator defined in MSH.2, usually ^ (carat) Applies to TX, FT, CF, ST data types
\T\	subcomponent separator	Replaced with the subcomponent separator defined in MSH.2, usually & (ampersand) Applies to TX, FT, CF, ST data types
\R\	repetition separator	Replaced with the repetition separator defined in MSH.2, usually ~ (tilde)) Applies to TX, FT, CF, ST data types
\E\	escape character	Replaced with \ (backslash) Applies to TX, FT, CF, ST data types
\Xdddd...\	hexadecimal data	Replaced with 0xdddd... Applies to TX, FT, CF data types
\Zdddd...\	locally defined escape sequence	Unsupported, left as is Applies to TX, FT, CF data types
\Cxxyy\	single-byte character set	Encodes character set Applies to TX, FT, ST data types

Escape	HL7 Definition	UCA Behavior
\Mxxyyzz\	multi-byte character set	Encodes character set Applies to TX, FT, ST data types
.sp \<number\>	End current output line and skip \<number\> vertical spaces.	\<number\> is expected to be positive. Inserts \n \<number\> times Applies to FT data type
.br	Begin new output line.	Replaced with a line break (e.g \n). Will display well in other message formats and most HTML views Applies to FT data type
.fi	Begin word wrap or fill mode. This is the default state. It can be changed to a no-wrap mode using the .nf command.	Enables word wrap on current line and all subsequent lines, word wrap is on by default Applies to FT data type
.nf	Begin no-wrap mode.	Turns off word wrap on current line and all subsequent lines until re-enabled via \.fi\ Applies to FT data type
.in \<number\>	Indent \<number\> of spaces, where \<number\> is a positive or negative integer. This command cannot appear after the first printable character of a line.	Indents the current line and sub-sequent lines Applies to FT data type
.ti \<number\>	Temporarily indent \<number\> of spaces where number is a positive or negative integer. This command cannot appear after the first printable character of a line.	Indents the current line Applies to FT data type
.sk < number\>	Skip \<number\> spaces to the right.	Adds space \<number\> times Applies to FT data type

Escape	HL7 Definition	UCA Behavior
.ce	End current output line and center the next line.	Ends current output, does not center Applies to FT data type