PHILIPS

Vue PACS 12.2.8

HL7 Interface Specifications

Part # HA1669
2021-03-26

Table of Contents

1 Introduction

This document describes IS Link HL7 dialect for interfacing with information systems.

1.1 Who Should Use This Document?

This document is intended for customers.

1.2 IS Link Introduction

IS Link includes two main processes:

1. Listener process—Receives HL7 messages from a RIS, usually via an interface engine, and stores it in a message queue in IS Link's database. The listener uses the HL7 Start-Stop communication protocol. It expects to receive messages on the TCP/IP socket where the start of a message is signaled by start bytes (header) and the end of the message is signaled by stop bytes (trailer). These can be configured in the configuration file.
2. Converter process—Fetches HL7 messages from the message queue and processes them. This process separates the message into segments according to a segment separator (a byte contains 0x0D) and parses the segments according to the syntax described in this document.

2 Communication Protocol and Standard Definitions

IS Link HL7 interface is based on version 2.3.1 of the HL7 standard.

IS Link is a server application. It waits on a specified port for TCP/IP connections from clients (usually a RIS). After establishing the connection, the client application sends IS Link HL7 messages. IS Link uses the HL7 “Minimal Lower Layer Protocol” as described in section C.4 of appendix C – “Lower Level Protocols” in the HL7 (version 2.3.1) Implementation Support Guide.

Note: The *V2.3 Implementation Support Guide*, which is from Health Level Seven International, is available on the Internet with the proper login information.

Each HL7 message is sent over the TCP/IP connection as byte buffer enclosed by special characters to form a block. The format is as follows:

`<SB>dddd<EB><CR>`

`<SB>`	Start Block character (1 byte)—ASCII <VT>, i.e., 0x0B in hexadecimal.
`dddd`	Data bytes (variable number of bytes). This is the HL7 data content of the block (the HL7 message itself). The data can contain any displayable ASCII characters and the carriage return character, ASCII <CR>, 0x0D in hexadecimal that serves as a separator between HL7 segments.
`<EB>`	End Block character (1 byte)—ASCII <FS>, i.e., 0x1C in hexadecimal.
`<CR>`	Carriage Return (1 byte)—The ASCII carriage return character, i.e., 0x0D in hexadecimal.

2.1 HL7 Messages

A message is the smallest unit of data transferred between systems. It is comprised of a group of segments in a defined sequence.

Each message has a message type that defines its purpose. For example, the ADT Message type is used to transmit portions of a patient’s Patient Administration (ADT) data from one system to another. A three-character code contained within each message identifies its type.

The real-world event that initiates an exchange of messages is called a trigger event. See section 2.2.1 “Trigger Events” of the HL7 2.3 Standard Specifications for more a detailed description of trigger events. These codes represent values such as “A patient is admitted” or “An order event occurred.”

Note: The *V2.3 Implementation Support Guide*, which is from Health Level Seven International, is available on the Internet with the proper login information.

There is a one-to-many relationship between message types and trigger event codes. The same trigger event code may not be associated with more than one message type.

2.2 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 they may be allowed to repeat.

Each segment is given a name. For example, the ADT message may contain the following segments:

- Message Header (MSH)
- Event Type (EVN)
- Patient ID (PID)
- Patient Visit (PV1).

Each segment is identified by a unique three-character code known as the Segment ID.

2.3 Fields

A field is a string of characters. HL7 does not care how systems actually store data within an application. When fields are transmitted, they are sent as character strings.

Except where noted, HL7 data fields may take on the null value. Sending the null value, which is transmitted as two double quote marks (“ ”), is different from omitting an optional data field. The difference appears when the contents of a message will be used to update a record in a database rather than create a new one. If no value is sent, (i.e., it is omitted) the old value should remain unchanged. If the null value is sent, the old value should be changed to null.

2.4 Position (Sequence Within the Segment)

This is 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.

In the segment attribute tables, this information is in a column labeled SEQ.

2.5 Maximum Length

The maximum length is the maximum number of characters that one occurrence of the data field may occupy. It is calculated to include the component and subcomponent separators. Because the maximum length is that of a single occurrence, the repetition separator is not included in calculating the maximum length.

In the segment attribute tables, this information is in a column labeled LEN.

2.6 Data Type

The data type restricts the contents of the data field. There are a number of data types defined by HL7.

This information is in a column labeled **DT** in the segment attribute tables.

The data types used in this specification are described in the following table.

Data Type Category or Data Type	Data Type Name	Notes and Format
CE	Coded Element	Identifier ^ text ^ name of coding system ^ alternate identifier ^ alternate text ^ name of alternate coding system
CM	Composite	Combination of components of varying data types
CQ	Composite quantity with units	quantity (NM) ^ units (CE)
CX	Extended composite ID with check digit	ID ^ check digit ^ code identifying the check digit scheme employed
EI	Entity identifier	Entity identifier ^ namespace ID ^ universal ID ^ universal ID type
FT	Formatted text	See section 2.9 “Use of escape sequences in text fields” of the HL7 2.3 Standard Specifications for a list of allowed formatting commands. Note: The V2.3 Implementation Support Guide, which is from Health Level Seven International, is available on the Internet with the proper login information.
HD	Hierarchic designator	Namespace ID ^ universal ID ^ universal ID type

Data Type Category or Data Type	Data Type Name	Notes and Format
ID	Coded value for HL7 defined tables	Valued from a table of HL7 legal values
IS	Coded value for user-defined tables	Valued from a table of site legal values
PT	Processing type	Processing ID ^ processing mode
ST	String	String data is left justified with trailing blanks optional
TQ	Timing quantity	Utilizes the Priority component for order priority
TS	Time Stamp	YYYYMMDDHHMMSS
TX	Text Data	String data meant for user display
XCN	Extended composite id number and name for persons	ID ^ family name ^ given name ^ middle initial or name
XPN	Extended person name	Family name ^ given name ^ middle initial or name
XTN	Extended Telecommunication Number	Connection information, such as phone and fax numbers, and email addresses

2.7 Optionality

Optionality indicates whether the field is required, optional, or conditional in a segment. The designations are:

- R—required
- O—optional
- C—conditional on the trigger event or on other fields
- X—not used with this trigger event

In the segment attribute tables this information is in a column labeled OPT.

2.8 Repetition

Repetition indicates whether the field may repeat. The designations are:

- N—No repetition
- Y—The field may repeat an indefinite or site-determined number of times.
- (integer)—The field may repeat up to the number of times specified by the integer.

Each occurrence may contain the number of characters specified by the field's maximum length. In the segment attribute tables, this information is in a column labeled RP/#.

2.9 Message Delimiters

In constructing a message, the following special characters are used.

- Segment terminator—The segment terminator is always a carriage return (in ASCII, a hex 0D).
- Field separator

- Component separator
- Subcomponent separator
- Repetition separator
- Escape character

The other delimiters are defined in the MSH segment with the field delimiter in the fourth character position. Other delimiters occurring as in the field called Encoding Characters are indicated in the first field after the segment ID.

The delimiter values used in the MSH segment are the delimiter values used throughout the entire message. Each delimiter character can be escaped when required to be used as a field value as opposed to a delimiter.

Delimiter	Suggested Value	Encoding Character Position	Escaping Character	Usage
Segment Terminator	<cr> hex 0D	-	\n	Terminates a segment record. This value cannot be changed by implementers.
Field Separator	|	-	\F\	Separates two adjacent data fields within a segment. It also separates the segment ID from the first data field in each segment.
Component Separator	^	1	\S\	Separates adjacent components of data fields where allowed.
Subcomponent Separator	&	4	\T\	Separates adjacent subcomponents of data fields where allowed. If there are no subcomponents, this character may be omitted.
Repetition Separator	~	2	\R\	Separates multiple occurrences of a field where allowed.
Escape Character	\	3	Not supported	Escape character for use with any field represented by an ST, TX or FT data type, or for use with the data (fourth) component of the ED data type If no escape characters are used in a message, this character may be omitted. However, it must be present if subcomponents are used in the message.

3 General Concepts

In this document, the terms “encounter” and “visit” are synonymous.

IS Link configuration should be used to define the data that each message updates. For example, ADT A01 (admit a patient) should update patient information (which resides in the PID segment of that message) and the encounter/visit information (which resides in the PV1 segment). ADT A02 (transfer a patient) should update only encounter/visit information and not patient information. IS Link may notify its log if an ADT A02 conveys an updated patient information.

IS Link expects each encounter/visit to have a start time (PV1-44-Admit date/time). The encounter/visit is considered “open” (the patient is still in the facility) until an end time (PV1-45-Discharge date/time) is received (usually by an ADT A03 message).

IS Link expects all of the fields of a segment that has a value to be conveyed with every message. If a certain field has a certain value in a message and in a later message it has no value (null), its value is deleted from the IS Link database. In other words, IS Link treats the whole segment as updated (as mentioned previously—depending on configuration, IS Link determines if a specific segment in a specific message should update the database at all).

In most of the messages, when IS Link encounters a new patient or a new visit it is added to the IS Link database, even if the specific message is defined for other purposes. For example, if IS Link receives an ADT A02 – transfer a patient message and the patient is not familiar to IS Link, it is added. IS Link uses the information carried in the specific message to create the new patient in its database.

The exception is the “Old” patient and “Old” encounter/visit in the MRG segment of ADT A34 and A44 messages. In these cases, if IS Link cannot find the requested patient or encounter/visit to be merged/moved, it displays an error.

4 Messages

This section describes the HL7 messages IS Link can receive. The segments listed for every message type are required, segments in square brackets are optional, and segments that do not appear are ignored.

4.1 ADT A01 – Admit a Patient

MSH
PID
PV1

[PR1]

[ZAP]

[ZAV]
[IN1]

4.2 ADT A02 – Transfer a Patient

MSH
PID
PV1

[PR1]

[ZAP]

[ZAV]
[IN1]

4.3 ADT A03 – Discharge a Patient

It is expected that for every encounter/visit created without a <PV1-45-Discharge date\time> there is an ADT A03 message issued that ends the encounter/visit and contains that field.

MSH
PID
PV1

[PR1]

[ZAP]

[ZAV]
[IN1]

4.4 ADT A04 – Register a Patient

MSH
PID
PV1

[PR1]

[ZAP]

[ZAV]
[IN1]

4.5 ADT A05 – Pre-admit a Patient

MSH
PID
PV1

[PR1]

[ZAP]

[ZAV]
[IN1]

4.6 ADT A06 – Out-patient to In-patient

It is expected that this message either changes the details of an existing encounter/visit or creates a new encounter/visit and is then followed by an ADT A03 message that ends the previous visit.

MSH
PID
PV1

[PR1]

[ZAP]

[ZAV]
[IN1]

4.7 ADT A07 – In-patient to Out-patient

It is expected that this message either changes the details of an existing encounter/visit or creates a new encounter/visit and is then followed by an ADT A03 message that ends the previous visit.

MSH
PID
PV1

[PR1]

[ZAP]

[ZAV]
[IN1]

4.8 ADT A08 – Update Patient Information

MSH
PID
PV1

[PR1]

[ZAP]

[ZAV]
[IN1]

4.9 ADT A11 – Cancel Admit/Visit Notification

This message causes IS Link to cancel (update status) a patient admission.

MSH
PID
PV1

[PR1]

[ZAP]

[ZAV]
[IN1]

4.10 ADT A12 – Cancel Patient Transfer

This message conveys the correct information of the encounter/visit as it was before the transfer.

MSH
PID
PV1

4.11 ADT A13 – Cancel Patient Discharge

This message conveys the correct information of the encounter/visit as it was before the discharge.

MSH
PID
PV1

4.12 ADT A18 – Merge Patient Information

A18 is retained for backward compatibility. It behaves the same as event A34 (merge patient information-patient ID only).

4.13 ADT A23 – Delete a Patient Visit

This message causes IS Link to delete a patient-specific visit. Orders and observations of this visit are not deleted.

MSH
PID
PV1

4.14 ADT A24 – Link Patients

This message causes IS Link to link two patients. If the patients do not exist in IS Link, they are created and linked. If the patients already exist, only a link is created.

MSH
PID
PID

4.15 ADT A28 – Add Person Information

MSH
PID
PV1

4.16 ADT A31 – Update Person Information

MSH
PID
PV1

4.17 ADT A34 – Merge Patient Information – Patient ID Only

This message causes IS Link to move all encounters/visits for a patient specified in the MRG segment to the patient specified in the PID segment. Then IS Link deletes the patient specified in the MRG segment from the database.

MSH
PID
MRG

4.18 ADT A35 – Merge Patient Information – Account Number Only

Not supported.

4.19 ADT A37 – Unlink patients

This message causes IS Link to unlink two patients (these patients can only unlink if they were already linked to each other).

MSH
PID
PID

4.20 ADT A38 – Cancel Patient Pre-admission

This message causes IS Link to cancel (update status) an admitted patient's visit.

MSH
PID
PV1

4.21 ADT A45 – Move Visit Information

This message causes IS Link to move the encounter/visit specified in <MRG-5-Prior visit id> from the patient specified in the MRG segment to the patient specified in the PID segment.

MSH
PID
MRG

4.22 ORM O01 – General Order Message

This message may contain multiple OBR segments but each repetition must follow a PID segment.

MSH
{
PID
[PV1]
[ORC]
OBR
[ZDS] Additional identification information (custom for IHE)
[PR1] Consent information
[ZLK] Additional information (custom for IHE)
[ZAP] Additional information (custom for IHE)
[ZAV] Additional information (custom for IHE)
[ZAO] Additional information (custom for IHE)
[IN1] Insurance information

}

4.23 ORU R01 – Observational Results

MSH
PID
PV1
{
ORC
[OBR]
}
OBX
[ZDS] Additional identification information (custom for IHE)

[ZAO] Additional information (custom for IHE)

[ZLK] Additional information (custom for IHE)

Many report headers (OBR) may be sent beneath each patient segment, with many separate observation segments (OBX) beneath each OBR. Note segments (NTE) may be inserted after any of the segments. The note segment applies to the entity that immediately precedes it, i.e., the patient, if it follows the PID segment, the observation, if it follows the OBR segment, and the individual result, if it follows the OBX segment.

5 Segments

In the Optional/Required column, R indicates that the field is required in the segment and R2 indicates that the field is required for later use by the diagnostic imaging department.

5.1 MSH – Message Header

#	Field Name	HL7 Type	Optional/Required	Repeated	Comments
1	Field Separator	ST	R	No	One character, the 4th in the message buffer (right after the 'MSH').
2	Encoding Characters	ST	R	No	4 Characters (usually '^~\&') define the component separator, sub-component separator, encoding character and repeating separator.
3	Sending Application	HD	O	No	N/A
4	Sending Facility	HD	O	No	N/A
5	Receiving Application	HD	O	No	N/A
6	Receiving Facility	HD	O	No	N/A
7	Message Date/Time	TS	O	No	N/A
8	Security	ST	O	No	N/A
9	Message Type	CM	R	No	See supported message type above.
10	Message Control ID	ST	R	No	N/A
11	Processing ID	PT	R	No	N/A
12	Version ID	ID	R	No	HL7 V2.3
13	Sequential Number	NM	O	No	N/A
14	Continuation Pointer	ST	O	No	N/A
15	Accept Acknowledgement type	ID	O	No	N/A
16	Application Acknowledgement type	ID	O	No	N/A
17	Country Code	ID	O	No	N/A
18	Character Set	ID	O	R	N/A
19	Language of Message	CE	O	No	N/A

5.2 PID – Patient Identification and Details

#	Field Name	HL7 Type	Optional/Required	Repeated	Comments
1	Set ID	NM	O	No	N/A

#	Field Name	HL7 Type	Optional/Required	Repeated	Comments
2	Patient External ID	CX	O	R	N/A
3	Patient Internal ID	CX	R	R	Uniquely identifies a patient.
4	Patient Alternate ID	CX	O	R	N/A
5	Patient Name	XPN	R	No	Family and given names are required.
6	Mother's Maiden name	XPN	O	No	N/A
7	Patient Date of Birth	TS	R2	No	N/A
8	Patient Sex	ID	R2	No	N/A
9	Patient Alias	XPN	O	R	N/A
10	Patient Race	ID	O	No	N/A
11	Patient Address	XAD	O	R	N/A
12	Country Code	ID	O	No	N/A
13	Home Phone	XTN	O	R	N/A
14	Business Phone	XTN	O	R	N/A
15	Language	CE	O	No	N/A
16	Marital Status	ID	O	No	N/A
17	Religion	ID	O	No	N/A
18	Account Number	CX	O	No	This field is not used. See PV1-19-Visit ID.
19	Social Security Number	ST	O	No	N/A
20	Driver License Number	CM	O	No	N/A
21	Mothers ID	CX	O	R	N/A
22	Ethnic Group	ID	O	No	N/A
23	Birth Place	ST	O	No	N/A
24	Multiple Birth Indicator	ID	O	No	N/A
25	Birth Order	NM	O	No	N/A
26	Citizenship	ID	O	R	N/A
27	Veterans Military Status	CE	O	No	N/A
28	Nationality	CE	O	No	N/A
29	Death Date/Time	TS	O	No	N/A
30	Death Indicator	ID	O	No	N/A

5.3 PV1 – Patient Visit Details

#	Field Name	HL7 Type	Optional/ Required	Repeated	
1	Set ID	NM	O	No	N/A
2	Patient Class	ID	R	No	N/A
3	Patient Location	PL	R2	No	Used to determine where the patient was admitted.
4	Admission Type	ID	R2	No	N/A
5	Pre-admit Number	CX	O	No	N/A
6	Prior Location	PL	O	No	N/A
7	Attending Doctor	XCN	R2	R	N/A
8	Referring Doctor	XCN	R2	R	N/A
9	Consulting Doctor	XCN	R2	R	N/A
10	Hospital Service	ID	R2	No	N/A
11	Temporary Location	PL	O	No	N/A
12	Pre-admit test indicator	ID	O	No	N/A
13	Re-admission Indicator	ID	O	No	N/A
14	Admit Source	ID	O	No	N/A
15	Ambulatory Status	ID	O	R	N/A
16	VIP Indicator	ID	O	No	N/A
17	Admitting doctor	XCN	R2	R	N/A
18	Patient Type	ID	R2	No	N/A
19	Visit ID	CX	R	No	Uniquely identifies an encounter/visit.
20	Financial Class	CM	O	R	N/A
21	Charge Price Indicator	ID	O	No	N/A
22	Courtesy Code	ID	O	No	N/A
23	Credit Rating	ID	O	No	N/A
24	Contract Code	ID	O	R	N/A
25	Contract Effective Date	DT	O	R	N/A
26	Contract Amount	NM	O	R	N/A
27	Contract Period	NM	O	R	N/A
28	Interest Code	ID	O	No	N/A

#	Field Name	HL7 Type	Optional/ Required	Repeated	
29	Transfer to Bad Debt Code	ID	O	No	N/A
30	Transfer to Bad Debt Date	DT	O	No	N/A
31	Bad Debt Agency Code	ID	O	No	N/A
32	Bad Debt Date Transfer Amount	NM	O	No	N/A
33	Bad Debt Date recovery Amount	NM	O	No	N/A
34	Delete Account Indication	ID	O	No	N/A
35	Delete Account Date	DT	O	No	N/A
36	Discharge Disposition	ID	O	No	N/A
37	Discharge Location	CM	O	No	N/A
38	Diet Type	ID	O	No	N/A
39	Servicing Facility	ID	O	No	N/A
40	Bed Status	ID	O	No	N/A
41	Account Status	ID	O	No	N/A
42	Pending Location	PL	O	No	N/A
43	Prior Temporary Location	PL	O	No	N/A
44	Admit Date/Time	TS	R	No	N/A
45	Discharge Date/Time	TS	(R)	No	Required in a message ending an encounter/visit.
46	Current Balance	NM	O	No	N/A
47	Total Charge	NM	O	No	N/A
48	Total Adjustments	NM	O	No	N/A
49	Total Payments	NM	O	No	N/A
50	Alternative Visit ID	CX	O	No	N/A
51	Visit indicator	ID	O	No	N/A
52	Other Healthcare Provider	XCN	O	R	N/A

5.4 MRG – Merge Information

#	Field Name	HL7 Type	Optional/ Required	Repeated	
1	Prior Internal Patient ID	CX	R	No	Uniquely identifies a patient.
2	Prior Alternate Patient ID	CX	O	No	N/A
3	Prior Patient Account Number	CX	O	No	Not used. See MRG-5-Prior Visit Number.
4	Prior External Patient ID	CX	O	No	N/A
5	Prior Visit Number	CX	(R)	No	Uniquely identifies an encounter/visit. Required for ADT A44.
6	Prior Alternate Visit ID	CX	O	No	N/A
7	Prior Patient Name	XPN	O	No	N/A

Example:

New Order was created: Internal ID = 860311, Order ID = 992231

MSH|^~\&|CERNER|NYGH|HCI|NYGH|19990728135714||ORM^O01|Q90053T45054|T|2.3

PID|1|1010101010^JJ^^ON^HC|860311||COMBINE^TEST^^^MRS.^^CURRENT||19660404000000|F|||22 GOLFING DR^^TORONTO^ON^M9P1C8^CA^HOME^^1806||||EN|M||10554^^^^FINNBR

OBR||||CTCHEST||||||||||8823^Bernard^BIANCA||445321

Another new order was created: Internal ID = 860312 Order ID = 992232

MSH|^~\&|CERNER|NYGH|HCI|NYGH|19990728135934||ORM^O01|Q90059T45055|T|2.3

PID|1|1010101010^JJ^^ON^HC|860312||COMB^KELLY^^^MS.^^CURRENT||19660404000000|F|||||||||10555^^^^FINNBR

OBR|||992232|CTCHEST||||||||||8823^Bernard^BIANCA||445325

Merge Patients: Right/New Patient (PID segment) Internal ID = 860311,
Old Patient (MRG segment) Internal ID = 860312.

MSH|^~\&|CERNER|NYGH|HCI|NYGH|19990728140113||ADT^A34|Q90067C9037T0|T|2.3

PID|1|1010101010^JJ^^ON^HC|860311||COMBINE^TEST^^^MRS.^^CURRENT||19660404|F|COMB^KELLY^^^MS.^^PREVIOUS||22 GOLFING DR^^TORONTO^ON^M9P1C8^CA^HOME^^1806|1806|||EN|M

MRG|860312

Result:

1. Right/New Patient owns both orders and report.

2. Old Patient deleted.

Multi-site example:

PID segment could contain multiple patient identifiers for the same patient:

Register a patient:

MSH^|&\~^|Carestream||^PacsRisInterface||||ADT^A04|||2.3.1

PID|||PID001^^^iss1~PID001^^^iss2||LAST^FIRST||201711080854|M

Result:

New patient created with 2 patient identifiers - PID001^^^iss1, PID001^^^iss2

Now, the patient is updated with an additional patient identifier, and the following HL7 message is sent:

MSH^|&\~^|Carestream||^PacsRisInterface||||ADT^A08|||2.3.1
PID|||PID001^^^iss1~PID001^^^iss2~PID001^^^iss3||LAST^FIRST||201711080854|M

Result:

Previous patient updated; now he has 3 patient identifiers - PID001^^^iss1, PID001^^^iss2, PID001^^^iss3

Link patients example:

Two patients from different sites (multi-site scenario) but that are basically the same patient need to be linked in the data center.

The following HL7 message is sent to the data center in order to link them:

MSH^|&\~^|Carestream||^PacsRisInterface||||ADT^A24|||2.3.1

PID|||PID001^^^iss1||LAST^FIRST||200711080854|M

PID|||PID002^^^iss2||LAST^FIRST||200711080854|M

Result:

Two different patients are linked to the same master patient.

To unlink these two patients, the following HL7 message is sent:

MSH^|&\~^|Carestream||^PacsRisInterface||||ADT^A37|||2.3.1

PID|||PID001^^^iss1||

PID|||PID002^^^iss2||

Result:

The two patients' data is not changed, but they are unlinked from the master patient and are now separate patients.

5.5 ORC – Order Control Segment

This segment conveys the order control information.

#	Field Name	HL7 Type	Optional/ Required	DICOM Tags	
1	Order Control	ID	R	N/A	NW—Add new order SC—Update order CA—Cancel order
2	Placer Order Number	EI	O	0008,0030 and/or 0040,2016	If presented should be identical to OBR-2.
3	Filler Order Number	EI	R	0040,2017	Uniquely identifies the order. If presented should be identical to OBR-3.
4	Placer Group Number	EI	O	N/A	N/A
5	Order Status	ID	R1	N/A	SC—Order scheduled CA—Order canceled
6	Response Flag	ID	O	N/A	N/A
7	Quantity Timing	TQ	R1	0040,1003	The time the order was scheduled to (the scan/test should) take place, in the fourth component. The priority information of the order in the sixth component. If presented, it should be identical to OBR-27.
8	Parent	CM	O	N/A	N/A
9	Transaction Date/Time	TS	O	N/A	N/A
10	Entered By	XCN	O	0040,2008	N/A
11	Verified By	XCN	O	N/A	N/A
12	Ordering Provider	XCN	R1	0032,1032	Ordering referring physician. If presented should be identical to OBR-16
13	Enterer Location	PL	O	0032,1033	N/A
14	Callback Phone Number	XTN	O	0040,2010	If presented should be identical to OBR-17
15	Order Date/Time	TS	O	N/A	N/A
16	Order Control Code Reason	CE	O	N/A	N/A

#	Field Name	HL7 Type	Optional/ Required	DICOM Tags	
17	Entering Organization	CE	O	0040,2009	N/A
18	Entering Device	CE	O	N/A	N/A
19	Action By	XCN	O	N/A	N/A

5.6 OBR – Order Segment

This segment conveys the order information.

#	Field Name	DT	OPT	DICOM Tags	Notes
1	Set ID	NM	O	N/A	N/A
2	Placer Order Number	EI	O	0040, 2016	Should be identical to ORC-2, if presented
3	Filler Order Number	EI	R	0008, 0050 and/or 0040, 2017	This is the unique order identification number. It may be the same as the accession number (see field 18). Should be identical to ORC-3, if presented.
4	Universal Service ID	CE	R1	0008, 0100 Requested Procedure Code Value 0032,1060 and 0032,1064 (include the preceding)	Also known as Procedure Code. The first component of this field contains codes that indicate the scanning/imaging procedure that should be done. For example, “CTCHEST”, “MRHEAD”. The codes are defined by the RIS. The second component contains a textual description of the procedure.
5	Priority	ID	O	0032, 000c Study Priority ID	N/A
6	Requested Date/Time	TS	O	N/A	N/A
7	Observation Date/Time	TS	O	N/A	N/A
8	Observation End Date/Time	TS	O	N/A	N/A
9	Collection Volume	CQ	O	N/A	N/A
10	Collector ID	XCN	O	N/A	N/A
11	Specimen Action Code	ID	O	N/A	N/A
12	Danger Code	CE	O	0038, 0500	N/A

#	Field Name	DT	OPT	DICOM Tags	Notes
13	Relevant Clinical Information	ST	O	0010, 2000	N/A
14	Specimen Received Date/Time	TS	O	N/A	N/A
15	Specimen Source	CM	R1	N/A	Contains the body part in the fourth component and laterality in the fifth component: |^^^KNEE^LEFT|
16	Ordering Provider	XCN	R1	0032, 1032	The ID of the ordering referring physician. The name and other details may be conveyed, too. OBR16.16 should match OBR48.11 (if used)
17	Order Call Back Phone Number	XTN	O	0040, 2008	Should be identical to ORC-14, if presented.
18	Placer Field 1	ST	R	0008, 0050	This field conveys the accession number (a unique number used to link the order/report to the images). If the order number (see field 3) is used to do that, then this field is not used.
19	Placer Field2	ST	O	N/A	N/A
20	Filler Field 1	ST	O	N/A	N/A
21	Filler Field 2	ST	O	N/A	N/A
22	Results Date/Time	TS	O	4008, 0100 4008, 0101 or 4008, 0108 4008, 0109 or 4008, 0112 4008, 0113	Same as OBX-14-Observation Date/Time if presented in an ORU message.
23	Charge To Practice	CM	O	N/A	N/A
24	Diagnostic Service Section ID	ID	R1	0008, 0060	Scanner ID.
25	Result Status	ID	R1	4008, 0212	Same as OBX-11-Observation Result Status if presented in an ORU message.
26	Parent Result	CM	O	N/A	N/A
27	Quantity Timing	TQ	R1	N/A	This field conveys the time the order was scheduled to in the fourth component. For example, the order was scheduled for January 31st, 2000 at 16:30 with priority “ROUTINE”: “^^^200001311630^^ROUTINE”. ImagiNet uses priority information from this field.
28	Result Copies To	XCN	O	N/A	OBR28.16 should match OBR49.11 (if used)
29	Parent Order	CM	O	N/A	N/A

#	Field Name	DT	OPT	DICOM Tags	Notes
30	Transportation Mode	ID	O	0040, 1003	N/A
31	Reason For Study	CE	R1	0040, 2010	This information may help radiologists in future diagnostics (or in current analysis if the order information will be transmitted as soon as it is ordered using the ORM message).
32	Principal Result Interpreter	CM	R1	4008, 0114	This field conveys the name of the radiologist who read the study in the following format: |8798&Bird&Larry|
33	Assistant Result Interpreter	CM	R1	4008, 0102	This field conveys the name of the assistant radiologist in the following format: |98548&Shaw&Bernard|
34	Technician	CM	O	0040, 0006	N/A
35	Transcriptionist	CM	O	0048, 010a	N/A
36	Scheduled Date/Time	TS	O	N/A	N/A
37	Number of Sample Containers	NM	O	N/A	N/A
38	Transport Logistics of Collected Sample	CE	O	N/A	N/A
39	Collectors Comment	CE	O	N/A	N/A
40	Transport Arrangement Responsibility	CE	O	N/A	N/A
41	Transport Arranged	ID	O	N/A	N/A
42	Escort Required	ID	O	N/A	N/A
43	Planned Patient Transport Comment	CE	O	N/A	N/A
44	Expected number of images	NM	O	N/A	Private
45	Site ID	NM	O	N/A	Private
47	Order result notification	XTN	O	N/A	N/A
48	Ordering provider communication details	XTN	O	N/A	Private; OBR48.11 (NM) is equal to OBR28.16 (NM) in order to refer to the corresponding XCN value. OBR48.10 is 1 if the communication detail (e.g., fax number) should be used, otherwise it is 0. For email, the address should be specified in OBR48.1.

#	Field Name	DT	OPT	DICOM Tags	Notes
49	Results copy to	XTN	O	N/A	Private; OBR49.11 (NM) is equal to OBR28.16 (NM) in order to refer to the corresponding XCN value. OBR49.10 is 1 if the communication detail (e.g., fax number) should be used for report distribution, otherwise it is 0. For email, the address should be specified in OBR49.1.

Example (consent flow):

This order was ordered by the referring physician Bianca Bernard whose ID is 8823, email address is biancab@fakemail.com and fax number is 555-6161. The unique ID assigned to it is 992231. The order was for a CT scan of the chest.

OBR|||992231|CTCHEST||||||||||8823^Bernard^BIANCA^^^^^^^^^^^^^4|||||||||||||||||||||||||||||bbianca@fakemail.com^^X.400^^^^^^^1^4~5556161^^FX^^^^^^^1^4

Example (report distribution):

This order should be distributed to Dr. Grace Cleary, whose ID is 4312; email address is gracec@fakemail.com and to Dr. Bob Shaw, whose ID is 5353 and fax numbers are 555-6561 and 555-2401. The order was for a CR of the knee, and its unique ID AP311216.

OBR|||AP311216|^CT-KNEE|||||||||||||||||||||||4312^Cleary^Grace^^^Dr^^^^^^^^^^7~5353^Shaw^Bob^^^Dr^^^^^^^^^^603|||||||||||||||||||5556561^^FX^^^^^^^1^603~5552401^^FX^^^^^^^1^603~gracec@fakemail.com^^X.400^^^^^^^1^7

5.7 PR1 – Procedure Segment

This segment conveys the consent information.

#	Field Name	DT	OPT	DICOM Tags	Notes
13	Consent	CE	O	N/A	N/A

Example:

The consent segment contains Consent Code “1” and Consent Text “MyVue”

PR1||||||||||||1^MyVue|

5.8 IN1 – Insurance Segment

This segment conveys the insurance information.

#	Field Name	DT	OPT	DICOM Tags	Notes
1	Set ID	NM	O	N/A	N/A
2	Insurance Plan ID	ID	O	N/A	N/A
4	Insurance Company Name	XON	O	N/A	N/A
5	Insurance Company Address	XAD	O	N/A	N/A
7	Insurance Phone Number	XTN	O	N/A	N/A

#	Field Name	DT	OPT	DICOM Tags	Notes
8	Insurance Group Number	NM	O	N/A	N/A
12	Insurance Plan Effective Date	DT	O	N/A	N/A
13	Insurance Plan Expiration Date	DT	O	N/A	N/A

5.9 OBX – Observation/Report Segment

This segment conveys the report information.

#	Field Name	DT	OPT	DICOM Tags	Comments
1	Set ID	NM	R	N/A	Sequential number of the OBX segment within the message.
2	Value Data-type	ID	R	N/A	“ST”
3	Observation ID	CE	R	N/A	Identifies the section of the report. For example, “FINDINGS”, “CONCLUSIONS”, etc. are used to format the report into different parts when presented to a user.
4	Observation Sub-ID	ST	O	N/A	A numeric value that may be used to sort the report lines (the OBX segments)
5	Observation Value	ST	R	4008, 010b	The report text
6	Units	CE	O	N/A	N/A
7	Reference Range	ST	O	N/A	N/A
8	Abnormal Flags	ID	O	N/A	N/A
9	Probability	NM	O	N/A	N/A
10	Nature Of Abnormal Test	ID	O	N/A	N/A
11	Observation Result Status	ID	R	0032,000a The preference is to use 4008, 0212	The status of the report. For example, ‘P’ (Preliminary), ‘F’ (Final). Defined by the RIS. Should be identical for all OBX segments of the same report. If OBR-25-Result Status exists, it should be identical.
12	Normal Values Date/Time	TS	O	N/A	N/A
13	Access Checks	ST	O	N/A	N/A
14	Observation Date/Time	TS	R	4008, 0100 4008, 0101 or 4008, 0108 4008, 0109 or 4008, 0112 4008, 0113	The report date and time are both required. Should be identical for all OBX segments of the same report. If OBR-22-Results Date/Time exists it should be identical.

#	Field Name	DT	OPT	DICOM Tags	Comments
15	Producer ID	CE	O	N/A	N/A
16	Responsible Observer	XCN	R	4008, 0114	This field conveys the ID, name and other details of the radiologist who verified the report in the following format: |8765^Tom^JERRY|
17	Observation Method	CE	O	N/A	N/A

See the ORU message examples in Section 4.23 ORU R01 – Observational Results.

5.10 MSA – Message Acknowledgement Segment

This segment is used to convey information about a prior received message.

#	Field Name	DT	OPT	DICOM Tags	Comments
1	Acknowledgement code	ID	R	N/A	AA—Application Accept AE—Application Error
2	Message Control ID	ST	R	N/A	IS Link sends the Message Control ID (MSH-10) of the message received.
3	Text Message	ST	O	N/A	Not sent by IS Link.
4	Expected Sequence Number	NM	O	N/A	Not sent by IS Link.
5	Delayed Acknowledgement Type	ID	O	N/A	Not sent by IS Link.
6	Error Condition	CE	O	N/A	Not sent by IS Link.

Example:

MSH|^~\&|ALGOTEC_IM|ALGOTEC_PACS|CARESTREAM_OF|RAD_DEPARTMENT|20080319153406||ACK|8683|P|2.3|||||US

MSA|AA|131106

5.11 ZDS Segment

A custom ZDS segment is defined to convey information generated by the Order Filler. It is not currently defined in the HL7 standard, but is provided in the following table.

SEQ	LEN	DT	OPT	TBL#	ITEM#	ELEMENT NAME
1	200	RP	R	Z0001	Study Instance UID	N/A

Components of the Study Instance UID field must be encoded as shown in the following table.

Component Number	Component Name	Shall Contain
1	Reference Pointer	DICOM compliant Study Instance UID value
2	Application ID	Implementation specific

Component Number	Component Name	Shall Contain
3	Type of Data	“Application”
4	Subtype	“DICOM”

The ZDS segment updates the accession number in IS Link. IS Link examines the SIUID when updating the existing record with an accession number.

* The accession is updated only if the study belongs to the same patient as the order.

5.12 ZLK Segment

A custom ZLK Segment is defined to convey information generated by the Order Filler and not currently defined in the HL7 standard and is given in the following table.

#	Field Name	DT	OPT	DICOM Tags	Comments
1	External workitem ID	ID	O	N/A	Linked studies; Each ORM message tagged with the link ID will result in the corresponding studies being grouped
2	Order link ID	ID	O	N/A	Linked orders; Each ORM message tagged with the link ID will be added to the order group. Loading of any of the orders (using accession number) will display the same images

5.13 ZAO Segment

A custom ZAO Segment is defined to convey information generated by the Order Filler and not currently defined in the HL7 standard and is given in the following table.

#	Field Name	DT	OPT	DICOM Tags	Comments
1	Order Additional details	Base 64 ST	O	N/A	XML encoded in base64 holding key-value in the following format <GenericData Type="Map"> <key_name Type="String">value</key_name> </GenericData>
2	Order with no images	ST	O	N/A	Y if the order will have no images or N otherwise; Default is N
3	Modality	ST	O	N/A	N/A
4	Body part	ST	O	N/A	N/A
5	Result Transfer Status	ST	O	N/A	Optional values - NR (not ready); IP (in progress); DV (delivered); FL (failed)
6	Department ID	ID	O	N/A	N/A
8	Device	ST	O	N/A	N/A
9	Section	ST	O	N/A	Body part group
10	Order Custom String 1	ST	O	N/A	N/A
11	Order Custom String 2	ST	O	N/A	N/A

#	Field Name	DT	OPT	DICOM Tags	Comments
12	Order Custom String 3	ST	O	N/A	N/A
13	Order Custom String 4	ST	O	N/A	N/A
14	Order Custom String 5	ST	O	N/A	N/A
15	Order Custom String 6	ST	O	N/A	N/A
16	Order Custom String 7	ST	O	N/A	N/A
17	Order Custom Number 1	NM	O	N/A	N/A
18	Order Custom Number 2	NM	O	N/A	N/A
19	Order Custom Date 1	DT	O	N/A	N/A
20	Order Custom Date 1	DT	O	N/A	N/A
21	Order Custom Date 1	DT	O	N/A	N/A
22	Technician Family Name	ST	O	N/A	N/A
23	Technician Given Name	ST	O	N/A	N/A
24	Technician Middle Name	ST	O	N/A	N/A
25	Technician ID	ST	O	N/A	N/A
26	Radiologist Familiy Name	ST	O	N/A	N/A
27	Radiologist Given Name	ST	O	N/A	N/A
28	Radiologist Middle Name	ST	O	N/A	N/A
29	Radiologist ID	ST	O	N/A	N/A
30	Order created by	ACT	O	N/A	Private data type
31	Order updated by	ACT	O	N/A	Private data type; Repeated
32	Acquisition status	ST	O	N/A	Optional values – NA (not available); IP (in progress); CM (available)

5.14 ZEB Segment

A custom ZEB Segment is defined to convey information generated by the patient Filler and not currently defined in the HL7 standard and is given in the following table.

#	Field Name	DT	OPT	DICOM Tags	Comments
1	Encrypted Patient Info	Base 64 ST	O	N/A	Encrypted Blob of patient information

5.15 ZAP Segment

A custom ZAP Segment is defined to convey information generated by the patient Filler and not currently defined in the HL7 standard and is given in the following table.

#	Field Name	DT	OPT	DICOM Tags	Comments
1	Patient Additional details	Base 64 ST	O	N/A	XML encoded in base64 holding key-value in the following format: <GenericData Type="Map"> <key_name Type="String">value</key_name> </GenericData>
3	Patient Custom String 1	ST	O	N/A	N/A
4	Patient Custom String 2	ST	O	N/A	N/A
5	Patient Custom String 3	ST	O	N/A	N/A
6	Patient Custom String 4	ST	O	N/A	N/A
7	Patient Custom String 5	ST	O	N/A	N/A
8	Patient Custom String 6	ST	O	N/A	N/A
9	Patient Custom String 7	ST	O	N/A	N/A
10	Patient Custom Number 1	NM	O	N/A	N/A
11	Patient Custom Number 2	NM	O	N/A	N/A
12	Patient Custom Date 1	DT	O	N/A	N/A
13	Patient Custom Date 1	DT	O	N/A	N/A
14	Patient Custom Date 1	DT	O	N/A	N/A

5.16 ZAV Segment

A custom ZAV Segment is defined to convey information generated by the Visit Filler and not currently defined in the HL7 standard and is given in the following table.

#	Field Name	DT	OPT	DICOM Tags	Comments
1	Visit Additional details	Base 64 ST	O	N/A	XML encoded in base64 holding key-value in the following format <GenericData Type="Map"> <key_name Type="String">value</key_name> </GenericData>

6 Queries

6.1 QBP Q23 – Get Corresponding Identifiers

The Request for Corresponding Patient Identifiers transaction is conducted by the HL7 QBP^Q23 message. The Patient Identifier Cross-reference Consumer generates the query message whenever it needs to obtain a corresponding patient identifier(s) from other Patient Identification Domain(s). The segments of the message listed in the following section are required and their detailed descriptions are provided in the following subsection.

MSH—Message Header

QPD—Query Parameter Definition

RCP—Response Control Parameter

6.1.1 QPD Segment

#	Field Name	DT	OPT	DICOM Tags
1	Message Query Name	CE	R	NA
2	Query Tag	ST	R	NA
3	Person Identifier	CX	R	NA
4	What Domains Returned	CX	O	NA

Note: The information in the table is adapted from the HL7 Standard, version 2.5.

6.2 RSP K23 – Corresponding Patient Identifiers

MSH Message Header 2

MSA Message Acknowledgement 2

[ERR] Error segment 2

QAK Query Acknowledgement 5

QPD Query Parameter Definition 5

[PID] Patient Identification 3

Philips Medical Systems Nederland B.V.

Veenpluis 6, 5684 PC Best, The Netherlands

HA1669_A/ * 2021-03-26 en-US

End of Document