Japanese Extension for Transactions based on HL7 in IHE Radiology Domain

Rev.1.0

2007/01/09

IHE-Japan Technical Committee

INDEX

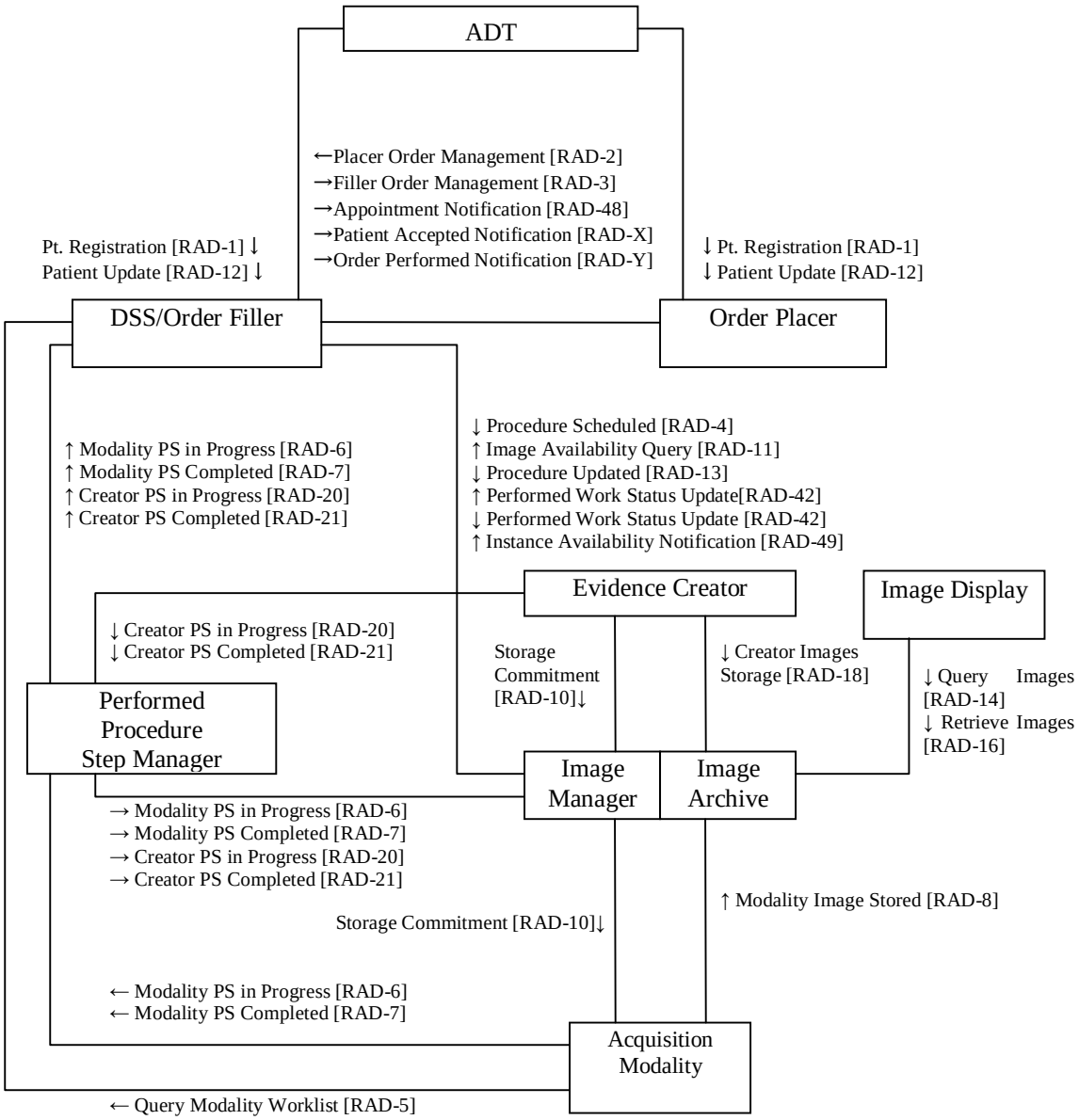
X.7 Japanese Extension for Transactions based on HL7

There are some differences on HL7 messages between IHE-NA and IHE-J by reason that the medical information systems in Japan have been developed from the conventional system configurations and HL7 Ver2.5 is used for HL7 transactions in IHE-J. For example, the patient information is usually transferred with examination request order message. And generally speaking, the information used for medical account system is transferred from DSS/Order Filler to Order placer as performed procedure information, and then is transferred from Order placer to medical account system. OMG and OMI are used instead of ORM because of supporting HL7 V2.5. That is why IHE-J expands the specification of the Technical framework.

X.7.0 Outline: Japanese Extension for Applied to HL7 Messages

X.7.0.1 Japanese extension for SWF integration profile

In Japan, it is very important that the system detects when the patient arrive radiology department. So the Patient Accepted Notification [RAD-X] is used for patient arrival notice.
And the information used for medical account system is transferred from DSS/Order Filler to Order placer as performed procedure information, and then is transferred from Order placer to medical account system. So the Order Performed Notification [RAD-Y] is used for the notice from DSS/Order Filler to Order Placer.

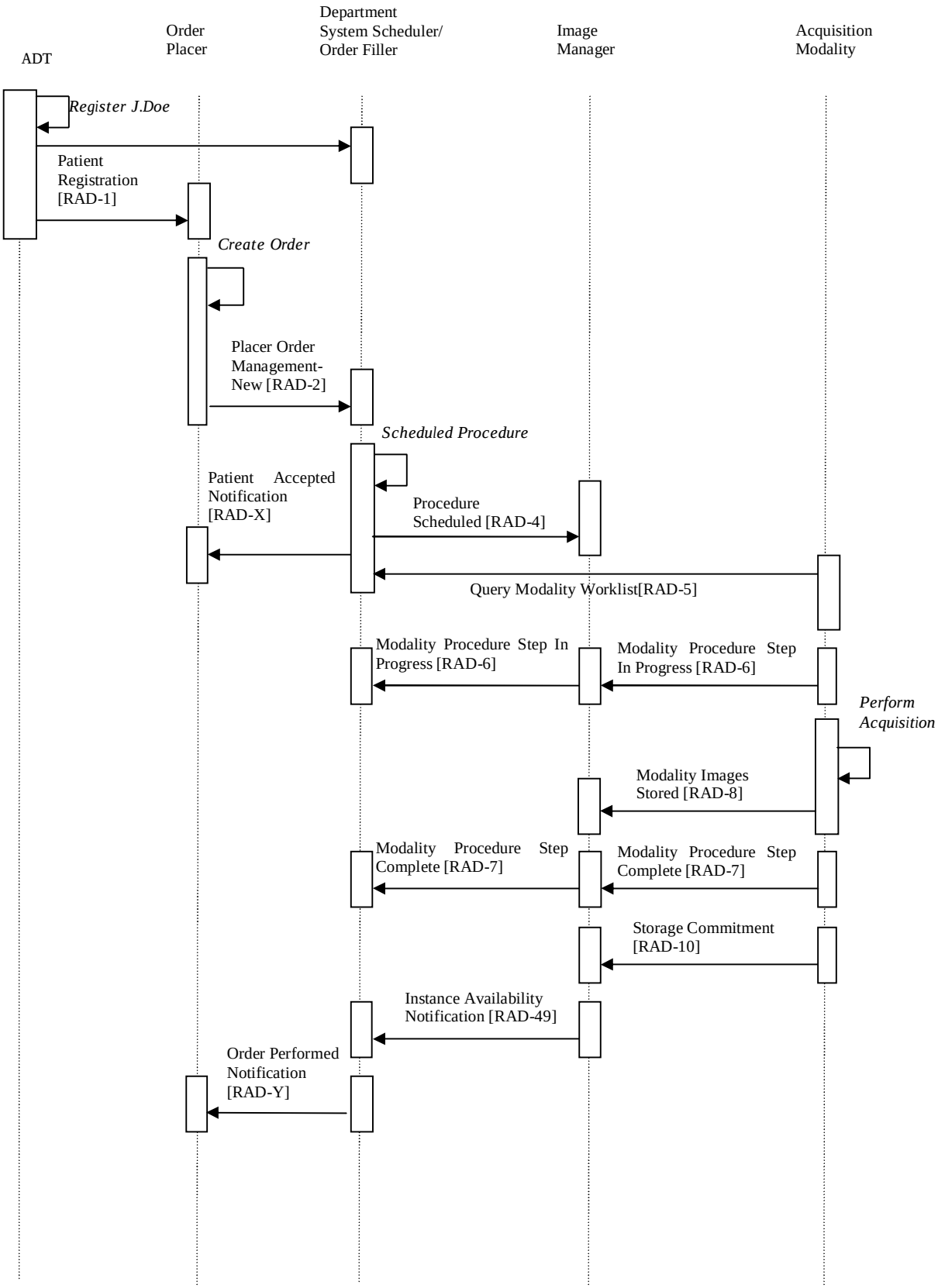


Scheduled Workflow Diagram

Scheduled Workflow - Actors and Transactions

Actors	Transactions	Optionality
ADT Patient Registration	Patient Registration [RAD-1]	R
	Patient Update [RAD-12]	R
Order Placer	Patient Registration [RAD-1]	R
	Patient Update [RAD-12]	R
	Placer Order Management [RAD-2]	R
	Filler Order Management [RAD-3]	O
	Appointment Notification [RAD-48]	O
	Patient Accepted Notification [RAD-X]	R
	Order Performed Notification [RAD-Y]	R
Department System Scheduler/ Order Filler	Patient Registration [RAD-1]	R
	Patient Update [RAD-12]	R
	Placer Order Management [RAD-2]	R
	Filler Order Management [RAD-3]	O
	Procedure Scheduled [RAD-4]	R
	Query Modality Worklist [RAD-5]	R
	Modality Procedure Step In Progress [RAD-6]	R
	Modality Procedure Step Completed [RAD-7]	R
	Images Availability Query [RAD-11]	O
	Procedure Updated [RAD-13]	R
	Creator Procedure Step in Progress [RAD-20]	R
	Creator Procedure Step Completed [RAD-21]	R
	Performed Work Status Update [RAD-42]	O
	Appointment Notification [RAD-48]	O
	Instance Availability Notification [RAD-49]	O
	Patient Accepted Notification [RAD-X]	R
	Order Performed Notification [RAD-Y]	R
Acquisition Modality	Query Modality Worklist [RAD-5]	R
	Modality Procedure Step In Progress [RAD-6]	R
	Modality Procedure Step Completed [RAD-7]	R
	Modality Images Stored [RAD-8]	R
	Storage Commitment [RAD-10]	R
Image Manager/ Image Archive	Procedure Scheduled [RAD-4]	R
	Modality Procedure Step In Progress [RAD-6]	R

	Modality Procedure Step Completed [RAD-7]	R
	Modality Images Stored [RAD-8]	R
	Storage Commitment [RAD-10]	R
	Images Availability Query [RAD-11]	R
	Procedure Updated [RAD-13]	R
	Query Images [RAD-14]	R
	Retrieve Images [RAD-16]	R
	Creator Images Stored [RAD-18]	R
	Creator Procedure Step in Progress [RAD-20]	R
	Creator Procedure Step Completed [RAD-21]	R
	Performed Work Status Update [RAD-42]	R
	Instance Availability Notification [RAD-49]	R
Performed Procedure Step Manager	Modality Procedure Step In Progress [RAD-6]	R
	Modality Procedure Step Completed [RAD-7]	R
	Creator Procedure Step in Progress [RAD-20]	R
	Creator Procedure Step Completed [RAD-21]	R
Image Display	Query Images [RAD-14]	R
	Retrieve Images [RAD-16]	R
Evidence Creator	Creator Images Stored [RAD-18]	R
	Creator Procedure Step in Progress [RAD-20]	R
	Creator Procedure Step Completed [RAD-21]	R
	Storage Commitment [RAD-10]	R


ADT
Order Placer
Department System Scheduler/ Order Filler
Image Manager
Acquisition Modality
Register J.Doe
Patient Registration [RAD-1]
Create Order
Placer Order Management-New [RAD-2]
Scheduled Procedure
Patient Accepted Notification [RAD-X]
Procedure Scheduled [RAD-4]
Query Modality Worklist[RAD-5]
Modality Procedure Step In Progress [RAD-6]
Modality Procedure Step In Progress [RAD-6]
Perform Acquisition
Modality Images Stored [RAD-8]
Modality Procedure Step Complete [RAD-7]
Modality Procedure Step Complete [RAD-7]
Storage Commitment [RAD-10]
Instance Availability Notification [RAD-49]
Order Performed Notification [RAD-Y]

X.7.0.2 Affected Existing Transactions

The extensions, restrictions and translations specified apply to the following IHE Integration Profile Transactions:
Patient Registration [RAD-1]
Placer Order Management [RAD-2]
Filler Order Management [RAD-3]
Procedure Scheduled [RAD-4]
Patient Update [RAD-12]
Procedure Update [RAD-13]

X.7.0.3 Use of Start Block Control Characters like 0b

There is some confusion in the use of HL7 in IHE community. The use of start block control characters is one of them. An implementation example describes a case which uses a start block character ahead of MSH segment. However, this example is for the case where the physical layer is RS232C, and this is not proper to the case where the lower layer is TCP/IP. It is normal that implementation of HL7 in Japan does not append these start block character like 0x0b.

X.7.0.4 Use of HL7 Messages

(1) Use of ADT/ACK Messages
The consistency of patient information between Order Placer and DSS/Order Filler is kept by message transfer from Order Placer to DSS/Order Filler that is triggered by patient information change as ADT message. And as trigger of patient information change on DSS/Order Filler, compatibility of patient information between DSS/Order Filler and Image Manager/Image Archive is kept by message from DSS/Order Filler to Image Manager/Image Archive. In this way, change of patient information is transferred by ADT message to keep compatibility of patient information. And ACK message is transferred as corresponding response.
The HL7 Japan technical committee considers that EVN segment is optional, because Chapter 2.13 in HL7 V2.4 has following description. That is to say that EVN segment is needed only for backward compatibility.

The event code in the second component of MSH-9-message type is redundantly shown elsewhere in some messages. For example, the same information is in the EVN segment of the ADT message. This is for compatibility with prior versions of the HL7 protocol. Newly-defined messages should only show the event code in MSH-9-message type.

The event code in the second component of MSH-9-message type is redundantly shown elsewhere in some messages. For example, the same information is in the EVN segment of the ADT message. This is for compatibility with prior versions of the HL7 protocol. Newly-defined messages should only show the event code in MSH-9-message type.

(2) Use of OMG/ORG Messages
OMG messages are used for transmission of the requested messages for radiology exam from HIS to RIS. And ORG messages are used for the reply. The HL7 V 2.3.1 does not meet the demand of Japanese requirement for all orders of exam but the radiology exam. That is why OMG/ORG messages of HL7 V 2.5 are used by IHE-J.

(3) Use of OMI/ORI Messages
The exam and procedure information between systems in the radiology department is transmitted by using OMI message. And ORI messages are used for the reply.

(4) Use of ORU/ACK Messages
ORU messages are used for the patient arrival and ACK message is used for the reply.

X.7.0.5 Use of HL7 Message Segments

(1) MSH Segment
MSH segment is required for each message of requested order. See X.7.1.4.1 for detail information about this message.

(2) EVN Segment
In HL7 V2.4 2.13 and HL7 V2.5 2.9, there are following statements:
The event code in the second component of MSH-9-message type is redundantly shown elsewhere in some messages.
For example, the same information is in the EVN segment of the ADT message.

This is for compatibility with prior versions of the HL7 protocol.
Newly-defined messages should only show the event code in MSH-9-message type.
According to these statements, the EVN Segment is judged omissible.
The EVN Segment is used for backward compatibility.

The event code in the second component of MSH-9-message type is redundantly shown elsewhere in some messages.
For example, the same information is in the EVN segment of the ADT message.
This is for compatibility with prior versions of the HL7 protocol.
Newly-defined messages should only show the event code in MSH-9-message type.

(3) PID Segment
According to HL7 V2.5, PID segment in OMG message is optional. But IHE-J requests PID segment in each order information for one patient. See X.7.1.4.2 for detail.

(4) PV1 Segment
According to HL7 V2.5, PV1 segment in OMG message is optional. But the PV1 segment is used for distinction between outpatient and inpatient. See X.7.1.4.3 for detail.

(5) PV2 Segment
IHE-J does not use PV2 segment.

(6) AL1 Segment
Basically the allergy information is described in OBX segment as patient profile. The allergy information is used as contraindication information for radiology exam. So it should be described in OBX segment with other contraindication information (e.g. Lab result information). The reason of this is that all contraindication information should be kept in one place (OBX segment) in the message.

(7) TQ1 Segment
According to HL7 V2.5, TQ1 segment in OMG message is optional. But the TQ1 segment is used for priority of message. So TQ1 segment is required. See X.7.2.4.3 for detail.

(8) TQ2 Segment

TQ2 segment is newly defined in HL7 V2.5. However, IHE-J does not use this segment.

(9) DSC Segment
IHE-J does not use DSC segment.

(10) ZE1 Segment (Billing Segment)
In Japan, the performed procedure information of radiology exam requests accounting information. But it is difficult to put accounting information as performed procedure information in segment structure according to HL7 V2.5 standard. So JAHIS Radiology Data Exchange Standard defines new segment, ZE1 segment that is used to transmit accounting information with performed procedure information. Some essential items are described in the ZE1 segment, procedures, drugs, instrument, additional accounting items, films and practitioners (radiological technologists, doctors and nurses).

(11) ZE2 Segment (Radiation Dose Segment)
In Japan, since before IHE, the exposure information usually has been transmitted from RIS to HIS. So transmitting this information from RIS to HIS is required to IHE. But it is difficult to describe the exposure information in standard HL7 V2.5 message structure. That is why the JAHIS Radiology Data Exchange Standard defines new segment, ZE2 that is used only for exposure information for radiology exam. The exposure information is usually transmitted from modality to RIS by using DICOM MPPS. That information is described in HL7 message structure by using ZE2 segment.

X.7.0.6 Data Type
(1) ZRD Data Type
JAHIS Radiology Data Exchange Standard introduces a new and radiology exam specific data type “ZRD”. This is used to describe amount of quantities like medicine, film, film segment, etc. For example, the number of sheets of film taken in an examination is specified with ZRD.
The standard also introduces a new suffix “ZFM”. HL7 permits to define code suffixes to generate an exam ID that is used in a common component in a descriptive report. ZFM is used to be attached to information on film. OBX-3 Observation Identifier attached with ZFM includes information on film that will be used in the

examination. If an order for a patient requests multiple sheets of film, each OBX segment shall contain a description of the information on a procedure for each sheet of film specified in related OBR segment. Types, sizes, and/or number of sheets are described with a data type ZRD.

X.7.1 Register Patient

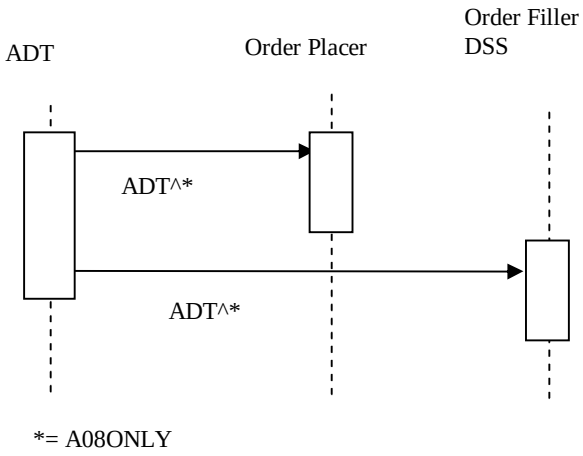
X.7.1.1 Referenced Standards

HL7 V2.5 Chapter 2-4

JAHIS Radiology Data Exchange Standard V2.0 Chapter 6-7

X.7.1.2 Interaction Diagram

IHE-J requires only event A08. Other events are optional for patient updates.



X.7.1.2.1 Patient Management –Register Patient

If this transaction is used, event A08 substitutes for it.

X.7.1.2.2 Patient Management – Cancel Register Patient

IHE-J does not use this transaction.

X.7.1.3 Message Semantics

ADT^A08	Patient Administration Message	Chapter in HL7 2.5	Chapter in JAHIS Radiology Data Exchange Standard
MSH	Message Header	2	7.1
PID	Patient Identification	3	7.3
PV1	Patient Visit	3	7.4

X.7.1.4 Segments

X.7.1.4.1 MSH Segment

SEQ	LEN	DT	OPT	Japan	RP/#	ITEM #	ELEMENT NAME	NOTE
1	1	ST	R	R		00001	Field Separator	
2	4	ST	R	R		00002	Encoding Characters	
3	227	HD	O	O		00003	Sending Application	
4	227	HD	O	O		00004	Sending Facility	
5	227	HD	O	O		00005	Receiving Application	
6	227	HD	O	O		00006	Receiving Facility	
7	26	TS	O	R		00007	Date/Time Of Message	
8	40	ST	O	O		00008	Security	
9	15	MSG	R	R		00009	Message Type	
10	20	ST	R	R		00010	Message Control ID	
11	3	PT	R	R		00011	Processing ID	
12	60	VID	R	R		00012	Version ID	
13	15	NM	O	O		00013	Sequence Number	
14	180	ST	O	O		00014	Continuation Pointer	
15	2	ID	O	O		00015	Accept Acknowledgment Type	
16	2	ID	O	O		00016	Application Acknowledgment Type	
17	3	ID	O	N		00017	Country Code	
18	16	ID	O	R	Y	00692	Character Set	
19	250	CE	O	O		00693	Principal Language of Message	
20	20	ID	O	O		01317	Alternate Character Set Handling Scheme	
21	427	EI	O	O		01598	Message Profile Identifier	

Optionality
R - required
O - optional
C - conditional on the trigger event or on some other field(s)
X - not used with this trigger event
B - left in for backward compatibility with previous versions of HL7
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Repetition
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 in the integer

The field MSH-9 Message Type has to have 3 components.
The first component is ‘ADT’, the second component is ‘A08’ and the third component is ‘ADT_A08’.

X.7.1.4.2 PID Segment

SEQ	LEN	DT	OPT	Japan	RP/#	ITEM #	ELEMENT NAME	NOTE
1	4	SI	O	O		00104	Set ID - Patient ID	
2	20	CX	B	B		00105	Patient ID (External ID)	
3	250	CX	R	R	Y	00106	Patient ID (Internal ID)	
4	20	CX	B	B	Y	00107	Alternate Patient ID – PID	
5	250	XPN	R	R	Y	00108	Patient Name	
6	250	XPN	O	N	Y	00109	Mother's Maiden Name	
7	26	TS	O	R		00110	Date/Time of Birth	
8	1	IS	O	R		00111	Sex	
9	250	XPN	B	N	Y	00112	Patient Alias	
10	250	CE	O	N	Y	00113	Race	
11	250	XAD	O	O	Y	00114	Patient Address	
12	4	IS	B	N		00115	County Code	
13	250	XTN	O	O	Y	00116	Phone Number – Home	
14	250	XTN	O	O	Y	00117	Phone Number – Business	
15	250	CE	O	N		00118	Primary Language	
16	250	CE	O	O		00119	Marital Status	
17	250	CE	O	N		00120	Religion	
18	250	CX	O	O		00121	Patient Account Number	
19	16	ST	B	N		00122	SSN Number - Patient SSN	
20	25	DLN	B	N		00123	Driver's Lic Num – Patient	
21	250	CX	O	O	Y	00124	Mother's Identifier	
22	250	CE	O	N	Y	00125	Ethnic Group	
23	250	ST	O	N		00126	Birth Place	
24	1	ID	O	N		00127	Multiple Birth Indicator	
25	2	NM	O	N		00128	Birth Order	
26	250	CE	O	N	Y	00129	Citizenship	
27	250	CE	O	N		00130	Veterans Military Status	
28	250	CE	B	B		00739	Nationality	
29	26	TS	O	O		00740	Patient Death Date and Time	
30	1	ID	O	O		00741	Patient Death Indicator	

SEQ	LEN	DT	OPT	Japan	RP/#	ITEM #	ELEMENT NAME	NOTE
31	1	ID	O	O		01535	Identity Unknown Indicator	
32	20	IS	O	O	Y	01536	Identity Reliabillty Code	
33	26	TS	O	O		01537	Last Update Date/Time	
34	241	HD	O	O		01538	Last Update Facility	
35	250	CE	C	N		01539	Species Code	
36	250	CE	C	N		01540	Breed Code	
37	80	ST	O	N		01541	Strain	
38	250	CE	O	N	2	01542	Production Class Code	
39	250	CWE	O	N	Y	01840	Tribal Citizenship	

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Repetition
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 in the integer

The first element of Field PID-13 is defined as ST data type.
For example, following expression should be used here.

03-3506-8010^PRN^PH

X.7.1.4.3 PV1 Segment

SEQ	LEN	DT	OPT	Japan	RP/#	ITEM #	ELEMENT NAME	NOTE
1	4	SI	O	N		00131	Set ID - Patient Visit	
2	1	IS	R	R		00132	Patient Class	
3	80	PL	O	O		00133	Assigned Patient Location	
4	2	IS	O	O		00134	Admission Type	
5	250	CX	O	N		00135	Preadmit Number	

SEQ	LEN	DT	OPT	Japan	RP/#	ITEM #	ELEMENT NAME	NOTE
6	80	PL	O	N		00136	Prior Patient Location	
7	250	XCN	O	O	Y	00137	Attending Doctor	
8	250	XCN	O	O	Y	00138	Referring Doctor	
9	250	XCN	O	O	Y	00139	Consulting Doctor	
10	3	IS	O	N		00140	Hospital Service	
11	80	PL	O	N		00141	Temporary Location	
12	2	IS	O	N		00142	Pre-admit Test Indicator	
13	2	IS	O	N		00143	Readmission Indicator	
14	6	IS	O	N		00144	Admit Source	
15	2	IS	O	O	Y	00145	Ambulatory Status	
16	2	IS	O	O		00146	VIP Indicator	
17	250	XCN	O	N	Y	00147	Admitting Doctor	
18	2	IS	O	N		00148	Patient Type	
19	250	CX	O	N		00149	Visit Number	
20	50	FC	O	N	Y	00150	Financial Class	
21	2	IS	O	N		00151	Charge Price Indicator	
22	2	IS	O	N		00152	Courtesy Code	
23	2	IS	O	N		00153	Credit Rating	
24	2	IS	O	N	Y	00154	Contract Code	
25	8	DT	O	N	Y	00155	Contract Effective Date	
26	12	NM	O	N	Y	00156	Contract Amount	
27	3	NM	O	N	Y	00157	Contract Period	
28	2	IS	O	N		00158	Interest Code	
29	4	IS	O	N		00159	Transfer to Bad Debt Code	
30	8	DT	O	N		00160	Transfer to Bad Debt Date	
31	10	IS	O	N		00161	Bad Debt Agency Code	
32	12	NM	O	N		00162	Bad Debt Transfer Amount	
33	12	NM	O	N		00163	Bad Debt Recovery Amount	
34	1	IS	O	N		00164	Delete Account Indicator	
35	8	DT	O	N		00165	Delete Account Date	
36	3	IS	O	N		00166	Discharge Disposition	
37	47	DLD	O	N		00167	Discharged to Location	
38	250	CE	O	N		00168	Diet Type	
39	2	IS	O	N		00169	Servicing Facility	
40	1	IS	O	N		00170	Bed Status	

SEQ	LEN	DT	OPT	Japan	RP/#	ITEM #	ELEMENT NAME	NOTE
41	2	IS	O	N		00171	Account Status	
42	80	PL	O	N		00172	Pending Location	
43	80	PL	O	N		00173	Prior Temporary Location	
44	26	TS	O	O		00174	Admit Date/Time	
45	26	TS	O	O		00175	Discharge Date/Time	
46	12	NM	O	N		00176	Current Patient Balance	
47	12	NM	O	N		00177	Total Charges	
48	12	NM	O	N		00178	Total Adjustments	
49	12	NM	O	N		00179	Total Payments	
50	250	CX	O	N		00180	Alternate Visit ID	
51	1	IS	O	N		01226	Visit Indicator	
52	250	XCN	O	N	Y	01224	Other Healthcare Provider	

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Repetition
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(integer)- the field may repeat up to the number of times specified in the integer

Field PV1-3 is for assigned patient location (PL data type).

Inpatient: <ward>^<room>^<bed>^^^N

Outpatient: <department>^^^^^C

So person location type must be specified.

In the Japanese hospital, both the department and the ward for inpatient are important information.

But this usage of PL data type is decided to be subjected to HL7 specification.

So PV1-13 is used for the location, and PV1-10 is used for the department.

PV1-10 is set department for inpatient and outpatient.

The department in PV1-3 is same as this department for outpatient.

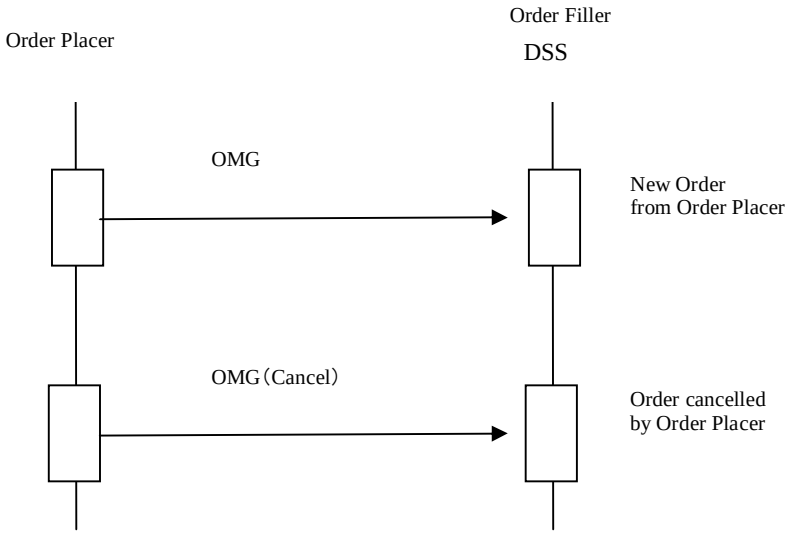
X.7.2 Placer Order Management

X.7.2.1 Referenced Standards

HL7 V2.5 Chapter 2-4

JAHIS Radiology Data Exchange Standard V2.0 Chapter 6-7

X.7.2.2 Interaction Diagram



X.7.2.3 Message Semantics

Information on a patient profile will be transferred by an OMG message and conveyed in OBX segment. Required segments are listed below.

OMG	General Clinical Order Message	Chapter in HL7 2.5	Chapter in JAHIS Radiology Data Exchange Standard
MSH	Message Header	2	7.1
PID	Patient Identification	3	7.3
PV1	Patient Visit	3	7.4
ORC	Order Common	4	7.5
TQ1	Timing/Quantity	4	7.8
OBR	Observation Request	4	7.6
OBX	Observation/Results	4	7.7

ORC-1 Order Control Code for Placer Order management can use following codes:

Value	Description	Originator
NW	New Order	OP

PA	Parent Order	OP
CH	Child Order	OP
CA	Cancel Order	OP

X.7.2.4 Segments

X.7.2.4.1 MSH Segment

The field MSH-9 Message Type has to have 3 components.

The first component is 'OMG', the second component is 'O19' and the third component is 'OMG_O19'.

In case of 'MRG message' for reply, there are 3 components, 'ORG','O20' and 'ORG_O20'

X.7.2.4.2 ORC Segment

JAHIS Radiological Data Exchange Standard specifies to use ORC segment to describe an imaging exam request in hierarchical structure. A request is described in two layers. It consists of a parent order with 16 byte-code and a sequence of two children codes. Each child code has 16 byte-code. As explained in section X.5, an imaging examination request has JJ1017-16M and JJ1017-16S in JJ1017 version 3.0. The request is conveyed on an HL7 message. When OP issues a request, OP shall form a message that has the parent code followed by the sequence of two children codes. The parent code, JJ1017-16P, is prepared to identify one request. JJ1017-16P in standardized format includes the first three bytes of JJ1017-16M which are codes for modality and major portion of procedure code. The rest of the code is embedded with "0". However, it can be modified, for example, to fill with one byte code of designating modality or entire procedure code of seven bytes according to the specific situation of a facility. OBR-4 segment in a child sequence is filled with 32 bytes of JJ1017-16M and JJ1017-16S.

SEQ	LEN	DT	OPT	Japan	RP/#	ITEM #	ELEMENT NAME	NOTE
1	2	ID	R	R		00215	Order Control	
2	22	EI	C	R		00216	Placer Order Number	
3	22	EI	C	O		00217	Filler Order Number	
4	22	EI	O	O		00218	Placer Group Number	
5	2	ID	O	O		00219	Order Status	
6	1	ID	O	O		00220	Response Flag	
7	200	TQ	B	X	Y	00221	Quantity/Timing	

SEQ	LEN	DT	OPT	Japan	RP/#	ITEM #	ELEMENT NAME	NOTE
8	200	EIP	O	C		00222	Parent	
9	26	TS	O	R		00223	Date/Time of Transaction	
10	250	XCN	O	O	Y	00224	Entered By	
11	250	XCN	O	O	Y	00225	Verified By	
12	250	XCN	O	R	Y	00226	Ordering Provider	
13	80	PL	O	O		00227	Enterer's Location	
14	250	XTN	O	O	Y/2	00228	Call Back Phone Number	
15	26	TS	O	O		00229	Order Effective Date/Time	
16	250	CE	O	O		00230	Order Control Code Reason	
17	250	CE	O	O		00231	Entering Organization	R
18	250	CE	O	O		00232	Entering Device	
19	250	XCN	O	O	Y	00233	Action By	
20	250	CE	O	O		01310	Advanced Beneficiary Notice Code	
21	250	XON	O	O	Y	01311	Ordering Facility Name	
22	250	XAD	O	O	Y	01312	Ordering Faciloity Address	
23	250	XTN	O	O	Y	01313	Ordering Facility Phone Number	
24	250	XAD	O	O	Y	01314	Ordering Provider Address	
25	250	CWE	O	O		01473	Order Status Modifier	
26	60	CWE	C	C		01641	Advanced Beneficiary Notice Override Reason	
27	26	TS	O	O		01642	Filler's Expected Availability Date/Time	
28	250	CWE	O	O		00615	Confidentiality Code	
29	250	CWE	O	O		01643	Order Type	
30	250	CNE	O	O		01644	Enterer Authorization Mode	

Optionality
R - required
O - optional
C - conditional on the trigger event or on some other field(s)
X - not used with this trigger event
B - left in for backward compatibility with previous versions of HL7
Japan
R - required
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Repetition
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 in the integer

Field ORC-13 is for enterer's location (data type PL). So in the order information entered by a doctor, the person location type must be specified as follows:.

Inpatient: <ward>^<room>^<bed>^^^N

Out patient: <department>^^^^^C

In the Japanese hospital, both the department and the ward for inpatient are important information.

But this usage of PL data type is decided to be subjected to HL7 specification.

So ORC-13 is used for enterer's location, and ORC-17 is used for department.

'Entering Organization'(CWE type) is described in ORC-17, so medical department is set in order information that is entered by medical doctor.

X.7.2.4.3 TQ1 Segment

SEQ	LEN	DT	OPT	Japan	RP/#	ITEM #	ELEMENT NAME	NOTE
1	4	SI	O	R		01627	Set ID - TQ1	
2	20	CQ	O	O		01628	Quantity	
3	540	RPT	O	O	Y	01629	Repeat Pattern	
4	20	TM	O	O	Y	01630	Explicit Time	
5	20	CQ	O	O	Y	01631	Relative Time and Units	
6	20	CQ	O	O		01632	Service Duration	
7	26	TS	O	O		01633	Start date/time	
8	26	TS	O	O		01634	End date/time	
9	250	CWE	O	R	Y	01635	Priority	
10	250	TX	O	O		01636	Condition text	
11	250	TX	O	O		01637	Text instruction	
12	10	ID	C	C		01638	Conjunction	
13	20	CQ	O	O		01639	Occurrence duration	
14	10	NM	O	O		01640	Total occurrence's	

Optionality

R - required

O - optional

C - conditional on the trigger event or on some other field(s)

X - not used with this trigger event

B - left in for backward compatibility with previous versions of HL7

Japan

R - required
O - optional
C - conditional on the trigger event or on some other field(s)
X - not used with this trigger event
B - left in for backward compatibility with previous versions of HL7
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Repetition
N - no repetition
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(integer)- the field may repeat up to the number of times specified in the integer

TQ1 segment is used for assignment for complicated timing information of events and actions. But in radiology domain, it is used for priority information. Even if priority information is not needed, default 'R' should be assigned. It is not optional.

X.7.2.4.4 OBR Segment

SEQ	LEN	DT	OPT	Japan	RP/#	ITEM #	ELEMENT NAME	NOTE
1	4	SI	O	R		00237	Set ID – Observation Request ID	
2	22	EI	C	R		00216	Placer Order Number	
3	22	EI	C	O		00217	Filler Order Number	
4	250	CE	R	R		00238	Universal Service ID	
5	2	ID	X	B		00239	Priority	N
6	26	TS	X	O		00240	Requested Date/time	N
7	26	TS	C	O		00241	Observation Date/Time	C
8	26	TS	O	O		00242	Observation End Date/Time	
9	20	CQ	O	N		00243	Collection Volume	
10	250	XCN	O	N	Y	00244	Collector Identifier	
11	1	ID	O	N		00245	Specimen Action Code	
12	250	CE	O	O		00246	Danger Code	
13	300	ST	O	O		00247	Relevant Clinical Info.	
14	26	TS	B	N		00248	Specimen Received Date/Time	
15	300	SPS	B	N		00249	Specimen Source	
16	250	XCN	O	O	Y	00226	Ordering Provider	
17	250	XTN	O	O	2	00250	Order Callback Phone Number	
18	60	ST	O	O		00251	Placer field 1	
19	60	ST	O	O		00252	Placer field 2	
20	60	ST	O	O		00253	Filler Field 1	
21	60	ST	O	O		00254	Filler Field 2	

SEQ	LEN	DT	OPT	Japan	RP/#	ITEM #	ELEMENT NAME	NOTE
22	26	TS	C	O		00255	Results Rpt/Status Change – Date/Time +	C
23	40	MOC	O	O		00256	Charge to Practice	N
24	10	ID	O	O		00257	Diagnostic Serve Sect ID	
25	1	ID	C	O		00258	Result Status	
26	400	PRL	O	O		00259	Parent Result	
27	200	TQ	B	B	Y	00221	Quantity/Timing	N
28	250	XCN	O	O	Y	00260	Result Copies To	
29	200	EIP	O	C		00261	Parent Number	
30	20	ID	O	O		00262	Transportation Mode	
31	250	CE	O	O	Y	00263	Reason for Study	
32	200	NDL	O	O		00264	Principal Result Interpreter	
33	200	NDL	O	O	Y	00265	Assistant Result Interpreter	
34	200	NDL	O	O	Y	00266	Technician	
35	200	NDL	O	O	Y	00267	Transcriptionist	N
36	26	TS	O	O		00268	Scheduled Date/Time	
37	4	NM	O	N		01028	Number of Sample Containers	
38	250	CE	O	N	Y	01029	Transport Logistics of Collected Sample	
39	250	CE	O	N	Y	01030	Collector's Comment	
40	250	CE	O	O		01031	Transport Arrangement Responsibility	
41	30	ID	O	O		01032	Transport Arranged	
42	1	ID	O	O		01033	Escort Required	
43	250	CE	O	O	Y	01034	Planned Patient Transport Comment	
44	250	CE	O	O	N	00393	Procedure Code	
45	250	CE	O	O	Y	01316	Procedure Code Modifier	
46	250	CE	O	O	Y	01474	Placer Supplemental Service Information	
47	250	CE	O	O	Y	01475	Filler Supplemental Service Information	
48	250	CWE	C	C	N	01646	Medically Necessary Duplicate Procedure Reason	
49	2	IS	O	O	N	01647	Result Handling	

Optionality
R - required
O - optional
C - conditional on the trigger event or on some other field(s)
X - not used with this trigger event
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Japan
R - required
O - optional

C - conditional on the trigger event or on some other field(s)
X - not used with this trigger event
B - left in for backward compatibility with previous versions of HL7
N - not used usually. use only on the site
Repetition
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 in the integer

In case of child record, parent order number is required in field OBR-29.

OBR-27 is only for backward compatibility.

X.7.2.4.5 OBX Segment

SEQ	LEN	DT	OPT	Japan	RP/#	ITEM #	ELEMENT NAME	NOTE
1	4	SI	O	O		00569	Set ID – Observational Simple	
2	2	ID	C	R		00570	Value Type	
3	250	CE	R	R		00571	Observation Identifier	
4	20	ST	C	C		00572	Observation Sub-ID	
5	65536	*	C	C	Y	00573	Observation Value	
6	250	CE	O	O		00574	Units	
7	60	ST	O	N		00575	References Range	
8	5	IS	O	O	5	00576	Abnormal Flags	
9	5	NM	O	N		00577	Probability	
10	2	ID	O	N	Y	00578	Nature of Abnormal Test	
11	1	ID	R	R		00579	Observ Result Status	
12	26	TS	O	N		00580	Date Last Obs Normal Values	
13	20	ST	O	N		00581	User Defined Access Checks	
14	26	TS	O	O		00582	Date/Time of the Observation	
15	250	CE	O	O		00583	Producer's ID	
16	250	XCN	O	O	Y	00584	Responsible Observer	
17	250	CE	O	N	Y	00936	Observation Method	
18	22	EI	O	O	Y	01479	Equipment Instance Identifier	
19	26	TS	O	O		01480	Date/Time of the Analysis	

Optionality
R - required
O - optional
C - conditional on the trigger event or on some other field(s)

X - not used with this trigger event
B - left in for backward compatibility with previous versions of HL7
Japan
R - required
O - optional
C - conditional on the trigger event or on some other field(s)
X - not used with this trigger event
B - left in for backward compatibility with previous versions of HL7
N - not used usually. use only on the site
Repetition
N - no repetition
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(integer)- the field may repeat up to the number of times specified in the integer

Field OBX-5 Observation Value holds the value of a result examined by an operator. The value of the result is described in a data type defined in the value type in the field of OBX-2. This field is required in the OBX segment. The description is made in text with ASCII characters.

When you use this segment to report on a logically independent examination result, the main part of the descriptive report on a radiological examination or “patient history and physical measurements” shall be reported in a separate OBX segment.

Field OBX-11- Observation Result Status holds a current status on an examination.

For the radiological examination, only the value “O” is used. In case of that the requested information is such as profiling one, even if the information is requesting message the field shall hold the value “P”.

X.7.3 Filler Order Management

X.7.3.1 Filler Order Management – New Order from Order Filler
This transaction is optional in IHE-J

X.7.3.2 Filler Order Management – Order Cancelled by the Order Filler
IHE-J does not use this transaction.

X.7.4 Procedure Scheduled

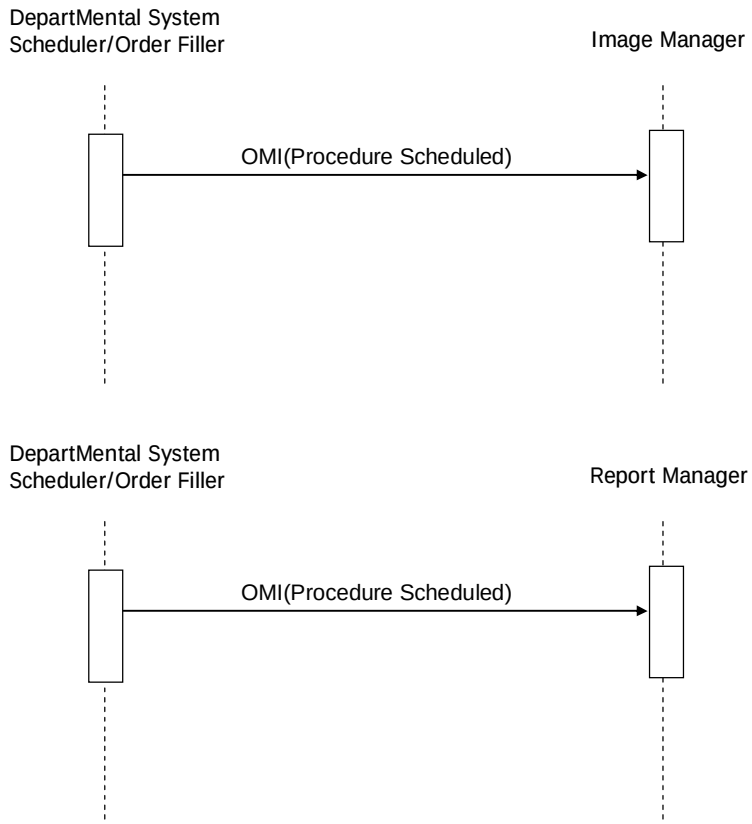
HL7 V2.5 OMI is used in RAD-4 Procedure Scheduled between DSS/OF actor and IM/RM actor by IHE-J.

X.7.4.1 Referenced Standards

HL7 V2.5 Chapter 2-4

JAHIS Radiology Data Exchange Standard V2.0 Chapter 6-7

X.7.4.2 Interaction Diagram



X.7.4.3 Message Semantics

HL7 V2.5 Standard has defined that PID segment, PV1 segment and TQ1 segment in OMI message are optional segments, but these segments are required by IHE-J. And also OBR segment that is optional in ORM message is required in OMI message.

OMI	Imaging Order Message	Chapter in HL7 2.5	Chapter in JAHIS Radiology Data Exchange Standard
MSH	Message Header	2	7.1

PID	Patient Identification	3	7.3
PV1	Patient Visit	3	7.4
ORC	Order Common	4	7.5
TQ1	Timing/Quantity	4	7.8
OBR	Observation Request	4	7.6
IPC	Imaging Procedure Control	4	7.9

ORI message is used for reply from IM/RM actor to DSS/OF actor. In case of ERROR or REJECT, ERR segment should be used to describe the detail reason for that.

ORI	Imaging Order Acknowledgement Message	Chapter in HL7 2.5	Chapter in JAHIS Radiology Data Exchange Standard
MSH	Message Header	2	7.1
MSA	Message Acknowledgement	2	7.10
[ERR]	Error Comments	2	7.11

The following codes are used in ORC-1 Order Control Code for Procedure Scheduled:

Value	Description	Originator
NW	New Order	DSS
PA	Parent Order	DSS
CH	Child Order	DSS

X.7.4.4 Segments

X.7.4.4.1 MSH Segment

The field MSH-9 Message Type has to have 3 components.

The first component is ‘OMI’, the second component is ‘O23’ and the third component is ‘OMI_O23’.

In case of ‘ORI message’ for reply, there are 3 components, ‘ORI’,’O24’ and ‘ORI_O24’

X.7.4.4.2 IPC Segment

IPC segment that is added in OMI has to have the Accession Identifier, the Study Instance UID and the Modality. The ZDS segment that is extension should not be used for transmission of the Study Instance UID.

IPC Attribute

SEQ	LEN	DT	OPT	Japan	RP/#	ITEM #	ELEMENT NAME	NOTE
1	80	EI	R	R		01330	Accession Identifier	
2	22	EI	R	O		01658	Requested Procedure ID	
3	70	EI	R	R		01659	Study Instance UID	
4	22	EI	R	O		01660	Scheduled Procedure Step ID	
5	16	CE	O	R		01661	Modality	
6	250	CE	O	O		01662	Protocol Code	
7	22	EI	O	O		01663	Scheduled Station Name	
8	250	CE	O	O		01664	Scheduled Procedure Step Location	
9	16	ST	O	O		01665	Scheduled AE Title	

Optionality
R - required
O - optional
C - conditional on the trigger event or on some other field(s)
X - not used with this trigger event
B - left in for backward compatibility with previous versions of HL7
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R - required
O - optional
C - conditional on the trigger event or on some other field(s)
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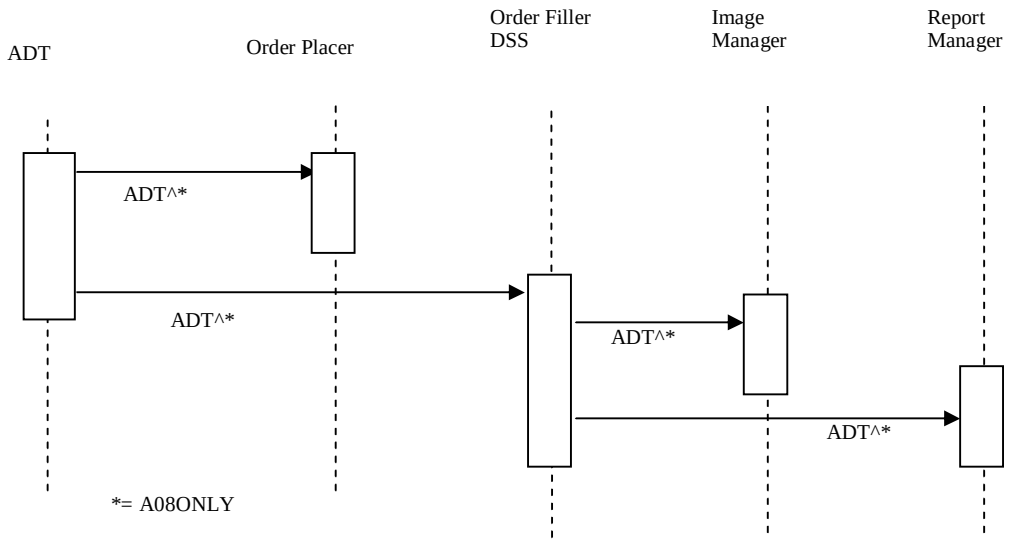
Repetition
N - no repetition
Y - the field may repeat an indefinite or site determined number of times
(integer)- the field may repeat up to the number of times specified in the integer

X.7.5 Patient Update

X.7.5.1 Referenced Standards
HL7 V2.5 Chapter 2-4
JAHIS Radiology Data Exchange Standard V2.0 Chapter 6-7

X.7.5.2 Interaction Diagram
IHE-J requires only event A08. Other events are optional for patient updates.



X.7.5.2.1 Patient Management – Patient Information Update
This transaction should be used in normal case.

X.7.5.2.2 Patient Management – Patient Merge
IHE-J does not adopt this transaction now.
This feature is necessary in Japanese clinical sites. But, there still remain technical and operational issues. Because what kind of technique would be matched to the requirement of data integrity and how a facility should operate the department are not clarified yet.

X.7.5.3 Message Semantics

ADT^A08	Patient Update Message	Chapter in HL7 2.5	Chapter in JAHIS Radiology Data Exchange Standard
MSH	Message Header	2	7.1
PID	Patient Identification	3	7.3
PV1	Patient Visit	3	7.4

X.7.5.4 Segments

X.7.5.4.1 MSH Segment

The field MSH-9 Message Type has to have 3 components.

The first component is ‘ADT’, the second component is ‘A08’ and the third component is ‘ADT_A08’.

X.7.6 Procedure Update

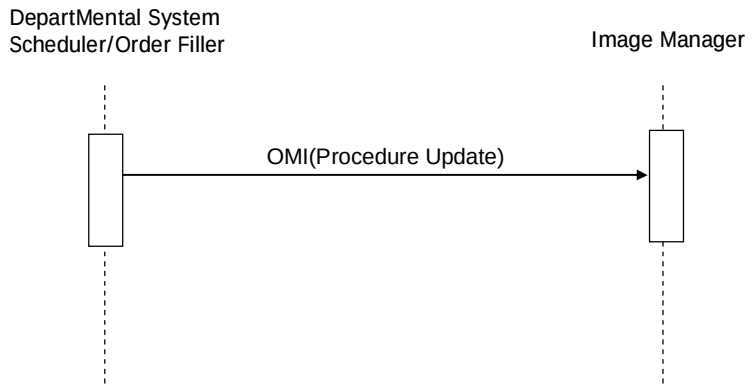
HL7 V2.5 OMI is used for RAD-13 Procedure Update from DSS/OF actor to IM/RM actor by IHE-J.

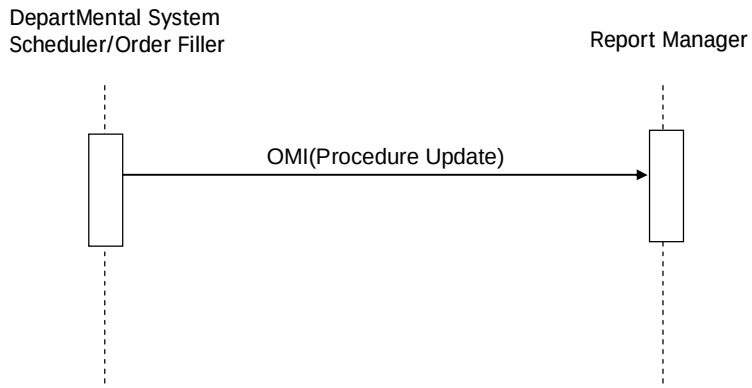
X.7.6.1 Referenced Standards

HL7 V2.5 Chapter 2-4

JAHIS Radiology Data Exchange Standard V2.0 Chapter 6-7

X.7.6.2 Interaction Diagram





X.7.6.3 Message Semantics

The following codes are used in ORC-1 Order Control Code for the Procedure Update:

Value	Description	Originator
CA	Cancel Order Request	DSS
XO	Change Orader Request	DSS
PA	Parent Order	DSS
CH	Child Order	DSS

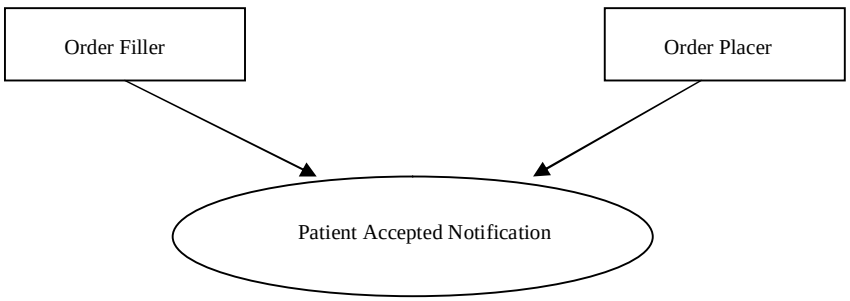
X.7.7 Patient Accepted Notification

Japanese users claim the importance of tracking the progress of a study such as arrival of a patient to the imaging department. In order to attain this feature, IHE-J assumes traceability of the progress of a study as an order management is necessary.

X.7.7.1 Scope

This transaction transfers status changes of the progress of a study. Statuses referred here will be a notification of patient arrival to imaging department.

X.7.7.2 Use Case Roles

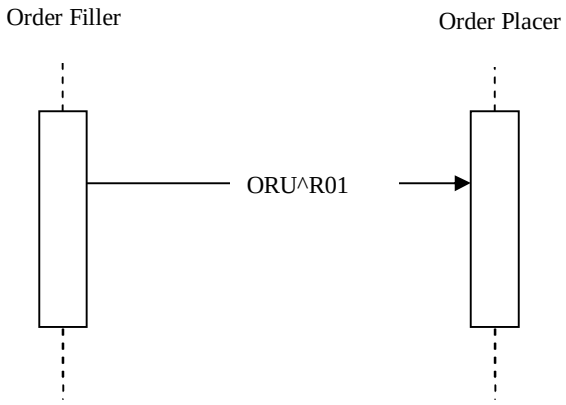


X.7.7.3 Referenced Standards

JAHIS Radiology Data Exchange Standard V2.0　Chapter 6-7

X.7.7.4 Interaction Diagram

ORU message conveys status information about the status changes of a study from Order Filler to Order Placer.



X.7.7.5 Trigger Event

R01 - Patient arrival to the department, Image availability, Report availability, or Availability of part of results

X.7.7.6 Message Semantics

ORU	Patient Accepted Message	Chapter in JAHIS Radiology Data Exchange Standard
MSH	Message Header	7.1
PID	Patient Identification	7.3
ORC	Order Common	7.5
TQ1	Timing/Quantity	7.8
OBR	Observation Request	7.6

X.7.7.7 Segments

X.7.7.7.1 MSH Segment

The field MSH-9 Message Type has to have 3 components.

The first component is ‘ORU’, the second component is ‘R01’ and the third component is ‘ORU_R01’.

X.7.7.7.2 OBR Segment

OBR-25 field holds statuses of an examination process. “I” means arrival of a patient to the Imaging Department.

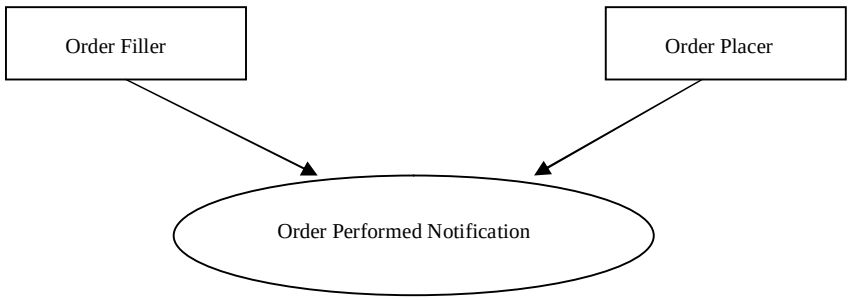
X.7.8 Order Performed Notification

In most of information systems in Japan, the Order Filler Actor sends the information that is used for hospital accounting from to the Order Placer Actor with the performed procedure information. And then the information is sent from the Order Placer Actor to the hospital accounting system. That is why the transaction of the performed procedure information with the information for hospital accounting is needed.

X.7.8.1 Scope

This transaction is used to transmit the performed procedure information with the information for hospital accounting.

X.7.8.2 Use Case Roles

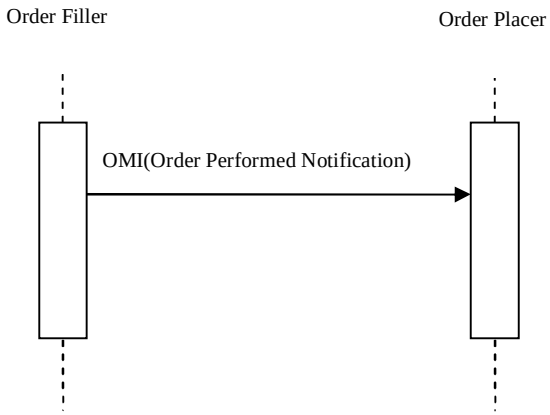


X.7.8.3 Referenced Standards

JAHIS Radiology Data Exchange Standard V2.0 Chapter 6-7

X.7.8.4 Interaction Diagram

OMI message sends the performed procedure information with the information for the hospital accounting from the Order Filler Actor to the Order Placer Actor.



X.7.8.5 Trigger Event

R02 is notification of the performed procedure information with the information for the hospital accounting.

X.7.8.6 Message Semantics

2 segments, ZE1 and ZE2, are added to OMI message to transmit the hospital accounting information.

OMI message sends image information, study instance UID etc., from the Order Filler actor to the Order Placer actor. So it is possible to access to DICOM images from the hospital information system (the Order Placer Actor).

And also added ZE1 segment can send the hospital accounting information to hospital accounting system. And added ZE2 segment is used for the exposure information.

OMI	Order Performed Message	Chapter in JAHIS Radiology Data Exchange Standard
MSH	Message Header	7.1
PID	Patient Identification	7.3
PV1	Patient Visit	7.4
ORC	Order Common	7.5
TQ1	Timing/Quantity	7.8
OBR	Observation Request	7.6
ZE1		7.7
ZE2		7.8
IPC	Imaging Procedure Control	7.9

X.7.8.7 Segments

X.7.8.7.1 MSH Segment

The field MSH-9 Message Type has to have 3 components.

The first component is ‘OMI’, the second component is ‘R02’ and the third component is ‘OMI_R02’.

X.7.8.7.2 ZE1 Segment

SEQ	LEN	DT	OPT	Japan	RP/#	ITEM #	ELEMENT NAME	NOTE
1	4	SI		R		ZE001	Set ID	
2	20	IS		R		ZE002	Control code	
3	483	CE		R		ZE003	Method	
4	16	NM		O		ZE004	The number of method	
5	483	CE		O		ZE005	Additional accounting	
6	292	JCC		C		ZE006	Staff category (Dr. Technician, Nurse)	
7	3002	XCN		O	Y	ZE007	Staff	
8	20	IS		C		ZE008	Material category (Film, Drug, Instrument)	
9	250	ZRD		O	Y	ZE009	Material	
10	850	XTN		O		ZE010	Point of contact	
11	199	ST		O		ZE011	Performed field	
12	199	ST		O		ZE012	Accounting field	

Optionality
R - required
O - optional
C - conditional on the trigger event or on some other field(s)
X - not used with this trigger event
B - left in for backward compatibility with previous versions of HL7
Japan
R - required
O - optional
C - conditional on the trigger event or on some other field(s)
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N - not used usually. use only on the site
Repetition
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 in the integer

ZE1 Field definition

ZE1-1 Set ID (SI) ZE001

Definition: Serial number from 1 is set in same ZE1 segment. It makes relation with ZE2 segment. See X.7.0.5(11) and X.7.8.7.3 for detail information about ZE2 segment.

ZE1-2 Control Code (IS) ZE002
Definition: Classification of scheduled information or performed information.

Table – Control code

Value	Description
PL	Place
RS	Result

ZE1-3 Method (CE) ZE004
Definition: Description of method for examination.

ZE1-4 the number of method (NM) ZE004
Definition: The number of method.

ZE1-5 Additional accounting (CE) ZE005
Definition: Additional information for the hospital accounting

ZE1-6 Staff category
Definition: Job title and employment system of medical staff

Table – Job title code

Value	Description
DR-01	Doctor who ordered
DR-02	Doctor who performed examination
DR-03	Anesthetist
TC-01	Technician
NS-01	Nurse
NS-02	Attendant nurse

Table – Employment system

Value	Description
EM-01	Regular employee
EM-02	Contract worker
EM-03	Temporary employee

ZE1-7 Staff (XCN) ZE007
Definition: Name of medical staff

ZE1-8 Material category (IS) ZE008
Definition: Category of materials for performed examination

Table – Material category

Value	Description
DE-01	Film
DE-02	Drug
DE-03	Instrument
DE-04	Material
DE-05	Modality equipment

ZE1-9 Material (ZRD) ZE009
Definition: Materials that is used for performed examination

ZE1-10 Point of contact (XTN) ZE010
Definition: Point of contact

ZE1-11 Performed Field (ST) ZE011
Definition: Comment for performed examination

ZE1-12 Accounting field (ST) ZE012
Definition: Comment for hospital accounting

X.7.8.7.3 ZE2 Segment

SEQ	LEN	DT	OPT	Japan	RP/#	ITEM #	ELEMENT NAME	NOTE
1	4	SI		R		ZE013	Set ID	
2	500	CQ		O		ZE014	Tube voltage	
3	500	CQ		O		ZE015	Tube current	
4	500	CQ		O		ZE016	Distance	
5	500	CQ		O		ZE017	Time	
6	16	NM		O		ZE018	Number of exposure	
7	199	ST		O		ZE019	Shoot field	

Optionality
R - required
O - optional
C - conditional on the trigger event or on some other field(s)
X - not used with this trigger event
B - left in for backward compatibility with previous versions of HL7
Japan
R - required
O - optional
C - conditional on the trigger event or on some other field(s)
X - not used with this trigger event
B - left in for backward compatibility with previous versions of HL7
N - not used usually. use only on the site
Repetition
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 in the integer

ZE2 Field definition

ZE2-1 Set ID (SI) ZE013
Definition: Set ID of associated ZE1 segment

ZE2-2 Tube voltage (CQ) ZE014
Definition: Tube voltage for performed shoot

ZE2-3 Tube current (CQ) ZE015
Definition: Tube current for performed shoot

ZE2-4 Distance (CQ) ZE016
Definition: Distance between tube and target

ZE2-5 Time (CQ) ZE017
Definition: Exposure time

ZE2-6 Number of exposure
Definition: Number of exposure

ZE2-7 Shoot field (ST) ZE019
Definition: Comment for exposure information