Technical Interface Specification
For
eHR Radiology Examination Record

Version 1.4.0

Sep 2016

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DOCUMENT SUMMARY

Document Item	Current Value
Document Title	Technical Interface Specification for eHR Radiology Examination Record
Creation Date	30 Jun 2012
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Current Document Issue	Version 1.4.0
Document Description	The paper explains the technical interface for implementing Health Level Seven (HL7) version 2.5 standards messaging for transferring eHR Radiology Examination Record from healthcare providers (HCP) to eHR system for Hong Kong Special Administrative Region eHR. The document should be read in conjunction with other related documents suggested by the eHR Information Standards Office.
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AMENDMENT HISTORY

Version No.	Summary of Changes	Date
1.0.0	Original version	30 Jun 2012
1.1.0	Enhanced according to the dataset as of Feb 2013 defined by eHR Information Standards Office	07 Mar 2013
1.2.0	• Updated the column 'Remarks' of the following field: - <PID.3><CX.5> • Updated the column 'Maximum Length' of the following field: - Radiology request number extend to 20 • Updated MESSAGE STRUCTURE OF UNSOLICITED OBSERVATION MESSAGE to use OBSERVATION - OBX instead of SPECIMEN Section • Added the remarks in XML PREDEFINED ENTITIES: 'The prefix of namespace in XML in HL7 message is not expected.' • Updated image file name embeded in the CDA samples to match with the image naming convention • Update the template of cover page and descriptions in footer • Update the contents in section 'Intellectual Property Rights Notice' • Updated data requirement of 'Last update datetime' from '0..1' to '1..1' • Added remarks in data field 'Transaction type' in section 'HL7 V2.5 UNSOLICITED OBSERVATION MESSAGE' • Updated data requirement of following data fields: - Radiology examination datetime - Radiology modality code - Radiology examination name - Radiology examination performing institution identifier - Radiology examination performing institution long name - Radiology examination performing institution local name - Radiology examination healthcare staff English name - Radiology examination healthcare staff Chinese name - Radiology examination healthcare staff type code - Radiology examination healthcare staff type description - Radiology examination healthcare staff type local description • Aligned the terms used in eHR Sharing System (eHRSS) Bill: - Participant -> eHR Healthcare Recipient	20 Jun 2014
1.3.0	• Fix on MSH.8	30 Jun 2015

	• Section 7 Data Upload Requirement is added to state the 3 message upload mode • Section 14.2 Re-materialisation message is added to provide the re-materialisation message example • Update Section 9.4.6 OBX - Observation/Result Segment OBX.4's remarks • Update Section 10.2.1 Radiology examination performing institution local name XPath from PV1.39/CE.2 to PV1.39/CE.5 • Add modality code in message sample in Section 14	
1.4.0	• Rename the Radiology request number to Radiology referring number • Add field Radiology registration number • Add version number mapping in MSH.21 EI.1	15 Sep 2016

1 PURPOSE

1.1 OBJECTIVE

This document describes the technical interface for implementing Health Level Seven (HL7) version 2.5 standards messaging for transferring Radiology Examination records from healthcare providers to eHR system.

There are TWO data exchange standards for uploading clinical records to eHR system:

- HL7-HK Message Standards
- HL7-HK Localised Bulk Load Standards

HL7-HK Message Standards will be described in detail in this document. For the HL7-HK Localised Bulk Load Standards, please refer to 'Bulk Load Standards Specification for eHR Record'.

1.2 INTENDED READERS

This document is intended for all parties involving the interface development of EMR and eHR in Hong Kong.

2 SCOPE

This reference defines the implementation of HL7 version 2.5 messaging for the communication of HL7-HK Message Standards between EMR applications and eHR system. The structure of a HL7 message, data mapping specification of eHR Healthcare Recipient (HCR) identity data, healthcare provider data, clinical data and functional data and the mechanism of creating a HL7 message for transferring Radiology Examination record data will be covered in this document.

This document is referring to the health data defined in the eHR sharable dataset domain "Radiology Examination" mentioned in **eHR Content Standards Guidebook** in eHR Office website. It provides interpretation and guidance to which HL7 trigger event and data elements are required for interfacing to eHR system.

3 REFERENCES

- Data Interface Requirement Document
  - Data Requirement Specification for eHR Radiology Examination Record
  - Communication Protocol Specification

- eHR Information Standards Document
  - eHR Content Standards Guidebook
  - eHR Data Interoperability Standards
  - eHR Contents
  - eHR Codex

4 DEFINITIONS AND CONVENTIONS

4.1 HL7 MESSAGE STANDARDS

Health Level Seven (HL7) version 2.5 message standards will be implemented for healthcare records exchange under eHR programme. HL7 provides a framework and related standards for the exchange, integration, sharing, and retrieval of electronic health-related information. Each HL7 message contains information about a particular event such as patient admission, laboratory records, etc.

To learn more about the HL7 organization and standard, please refer to the official HL7 websites.

4.2 ABBREVIATIONS

Term	Description
CDR	Clinical Data Repository
eHR	Electronic Health Record
EMR	Electronic Medical Record
HCP	Healthcare Provider
HL7	Health Level Seven
ORU	HL7 message type of "Unsolicited Observation Message"
RAD	Radiology Examination
HCR	eHR Healthcare Recipient

4.3 NOTATIONS

Value	Description
#	HL7 Mandatory Field
✓	Required HL7 Segment
0..1	Zero to One occurrence
1..1	Exact One occurrence
0..*	Zero to Many occurrence

1..*	One to Many occurrence
“quoted”	Fixed value
N/A	Not Applicable
S0 - S99	Scenario numbering
RP/#	Repeatable Indicator [Y:Yes N: No] of HL7 element
TBL#	HL7 Table Reference Number
[]	Optional
{}	Repeatable
YYYY	Year
MM	Month
DD	Day
hh	Hour (24-Hour)
mm	Minute
ss	Second
.sss	Millisecond

5 ASSUMPTIONS

- HCP is responsible for ensuring the integrity, accuracy and completeness of structured data when sending data to eHR.
- It is recommended that HCP should send the updated clinical record to eHR as soon as possible when there are any changes or new records of the eHR Healthcare Recipient (HCR).
- To ensure the integrity of the "Radiology Examination" record, the complete set of structured data should be sent for any amendment.

6 DELIVERY REQUIREMENTS

- HL7 version 2.5 message standards in XML format will be implemented for delivering Radiology Examination event messages defined by eHR.
- The sharable dataset domain "Radiology Examination" supports eHR Data Compliance Level 1, 2 and 3. Before sending clinical record to eHR, HCP has to register which data compliance levels she can comply to.
- A complete set of updated Radiology Examination data with an unique record key of the record is expected to be uploaded to eHR. eHR will use the HCP unique record key for subsequence data amendments in eHR repository.
- HCP must make sure the data submitted to eHR is complied with the data compliance levels she declared in the message. The detail definition of the Data Compliance Level is stated in eHR Content Standards Guidebook posted in eHR Office website.

7 DATA UPLOAD REQUIREMENTS

7.1 TYPES OF FILE UPLOAD MODE

There are three types of file upload mode:

1. **Incremental mode** is the format for HCP to upload sharable data in ONE batch.
2. **Materialisation mode** is the format for HCP to upload a HCR's specific sharable dataset that exists in EMR, e.g. new registered HCR and re-registered HCR.
3. **Re-materialisation mode** is the format for HCP to clear the clinical data uploaded in eHR. It is required to upload the re-materialisation message before HCP next materialisation message for same HCR.

The following table shows the files required for different upload mode and its schedule:

	HCR information	**Clinical Data**	**Schedule**
Incremental Mode	Required	Required	Within agreed period
Materialisation Mode	Required	Required	Within agreed period
Re-materialisation Mode	Required	Not required	

Remarks:
For Materialisation Mode, 'Update' and 'Delete' transaction types are not accepted. If 'Update' or 'Delete' transaction type is uploaded using materialisation mode, the record will be rejected by eHR.

8 MESSAGE FORMAT OVERVIEW

8.1 DATA COMPONENTS FOR HL7-HK MESSAGE STANDARDS

According to HL7-HK Message Standards, there is a component used to carry the clinical information related to the Radiology Examination record when transferring data from healthcare providers to eHR. The component is:

- HL7 version 2.5 ORU – Unsolicited Observation Message (Event R01)

HL7 version 2.5 ORU will be described in detail in Section 8.

8.2 OVERVIEW OF HL7 ORU - UNSOLICITED OBSERVATION MESSAGE

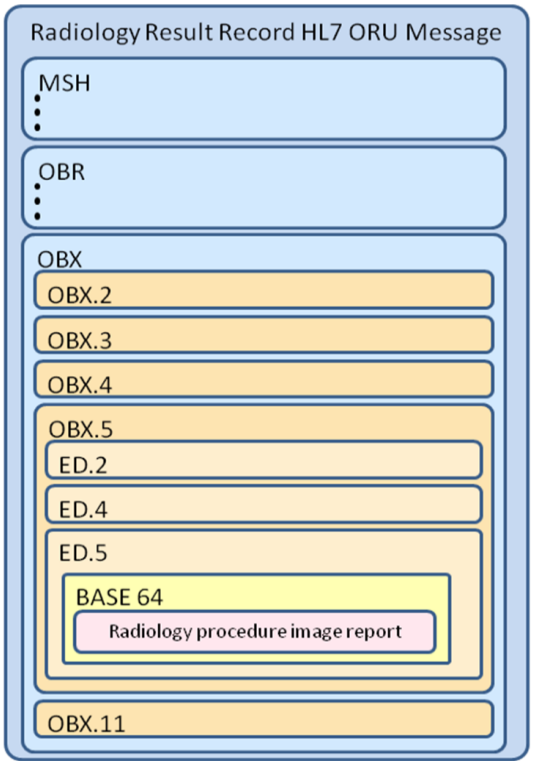

Figure 1- *HL7 v2.5 Unsolicited Observation Message for Radiology Examination Transfer*

Figure 1 describes the overview structure of a Radiology Examination HL7 v2.5 ORU Message. In order to exchange a Radiology Examination record, data mapping in the HL7 v2.5 Unsolicited Observation Message has to be complied.

And for the document reports, PDF if any, are firstly Base64-encoded and then mapped to OBX.5 - ED.5 of ORU Message.

XML digital signature must be applied in eHR message communication. Since XML Signature is not the element in the schema of HL7 v2.5 ORU Message, it should be applied and located in the last section of the message. The components and example of XML signature are explained in *Section 8.5 - XML Digital Signature on HL7*.

(Please refer to 'eHR Data Interoperability Standards' in eHealth Record Office website for further elaboration.)

9 HL7 V2.5 UNSOLICITED OBSERVATION MESSAGE

9.1 HL7 MESSAGE

In eHR environment, HL7 v2.5 message in XML format will be used for message interchange. An HL7 message is composed of 'Message Type', 'Message Event' and 'Message Structure'. 'Message Type' identifies the business purpose of a message. 'Message Event' is a unique identifier to the context in which message is generated. And 'Message Structure' is a data structure used to express an association of a message type with an event for a class of messages.

For eHR Radiology Examination Record exchange, the following message event will be applied:

Message Type	ORU (Unsolicited Observation Message)
Message Event	R01
Message Structure	ORU_R01
Usage	To carry structured HCR-oriented clinical data from local EMR system to eHR.

ORU_R01 is used to contain most of the data elements required in 'Radiology Examination' dataset. Then, the data field mapping containing structured data and the document image in PDF format can be attached in the HL7 V2.5 messages for data exchange.

9.2 ORU - UNSOLICITED OBSERVATION MESSAGE (EVENT R01)

The ORU message is for transmitting Radiology Examination record from healthcare provider to eHR. Under HL7-HK Message Standards, clinical data, clinical images and transaction data are embedded in the three segments of the ORU Message. They are: Message Header (MSH), Observation Request (OBR) and Observation/Result (OBX). In the following sections, the message structure of ORU Message and the data mapping of ORU message among clinical and functional information will be shown.

9.3 MESSAGE STRUCTURE OF UNSOLICITED OBSERVATION MESSAGE

Required eHR Segment	ORU^R01^ORU_R01	ORU Message	Chapter in HL7 Specification
✓	**MSH**	Message Header	2
	[{ SFT }]	Software Segment	2
	{	--- PATIENT_RESULT begin	
	[	--- PATIENT begin	
✓	**PID**	Patient Identification	3
	[PD1]	Additional Demographics	3
	[{NTE}]	Notes and Comments	2
	[{NK1}]	Next of Kin/Associated Parties	3
	[	--- VISIT begin	
✓	**PV1**	Patient Visit	3
	[PV2]	Patient Visit – Additional Info	3
	]	--- VISIT end	
	]	--- PATIENT end	
	{	--- ORDER_OBSERVATION begin	
✓	[**ORC**]	Order common	4
✓	**OBR**	Observations Request	7
	{[NTE]}	Notes and comments	2
	[{	--- TIMING_QTY begin	
	TQ1	Timing/Quantity	4
	[{TQ2}]	Timing/Quantity Order Sequence	4
	}]	--- TIMING_QTY end	
	[CTD]	Contact Data	11
	[{	--- OBSERVATION begin	
✓	**OBX**	Observation related to OBR	7
	{[NTE]}	Notes and comments	2
	}]	--- OBSERVATION end	
	[{FT1}]	Financial Transaction	6
	{[CTI]}	Clinical Trial Identification	7
	[{	--- SPECIMEN begin	
	SPM	Specimen	
	[{OBX}]	Observation related to Specimen	
	}]	--- SPECIMEN end	
	}	--- ORDER_OBSERVATION end	
	}	--- PATIENT_RESULT end	

	[DSC]	Continuation Pointer	2
✓	[Signature]	XML Digital Signature	

A general acknowledgement would be returned to the Sender upon the message is successfully received.

Required eHR Segment	ORU^R01^ORU_R01	ORU Message	Chapter in HL7 Specification
✓	**MSH**	Message Header	2
	[{ SFT }]	Software Segment	2
✓	MSA	Message Acknowledgment	2
	ERR	Error	2

✓*denotes the segment is being utilized in this project*

9.4 DATA MAPPING IN UNSOLICITED OBSERVATION MESSAGE

In order to exchange Radiology Examination record, data mapping in the HL7 v2.5 Unsolicited Observation Message has to be complied.

9.4.1 MSH- Message Header Segment

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
#<MSH.1>	1	ST			Field Separator	"|"	• Fixed value
#<MSH.2>	4	ST			Encoding Characters	"^~\&"	• Fixed value
<MSH.3> <HD.1>	227	HD		0361	Sending Application Namespace ID	System Version	HCP's system name and version for data exchange
<MSH.4> <HD.1>	227	HD		0362	Sending Facility Namespace ID	Healthcare Provider Identifier	A unique identifier assigned by eHR Healthcare Provider Index to each healthcare institution for participation in eHR Sharing System
<MSH.5> <HD.1>	227	HD		0361	Receiving Application Namespace ID	"EIF"	• Fixed value
<MSH.6> <HD.1>	227	HD		0362	Receiving Facility Namespace ID	"eHR"	• Fixed value

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
#<MSH.7> <TS.1>	26	TS DTM			Date/Time Of Message Time	Message generation datetime	In format: YYYYMMDDhhmmss
<MSH.8>	40	ST			Security	Data Compliance Level e.g. 1	Possible value: **1**: Level 1 **2**: Level 2 **3**: Level 3
#<MSH.9> <MSG.1> <MSG.2> <MSG.3>	15	MSG			Message Type Message Type Code Trigger Event Message Structure	 “ORU” “R01” “ORU_R01”	 • Fixed value • Fixed value • Fixed value
#<MSH.10>	20	ST			Message Control ID	Unique message identifier in sending application	Values can be in any combination of alphanumeric characters i.e. [A-Z][0-9][-_]
#<MSH.11> <PT. 1>	3	PT			Processing ID Processing ID	 “P”	 • Fixed value: **P**: Production
#<MSH.12> <VID .1>	60	VID			Version ID Version ID	 “2.5”	 • Fixed value
<MSH.13>	15	NM			Sequence Number	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<MSH.14>	180	ST			Continuation Pointer	NOT USE	For Radiology Image Sharing project : Transaction ID For Radiology Examination Sharable Dataset Upload project : Please ignore
<MSH.15>	2	ID		0155	Accept Acknowledgment Type	"NE"	• Fixed value **NE**: Never
<MSH.16>	2	ID		0155	Application Acknowledgment Type	NOT USE	
<MSH.17>	3	ID		0399	Country Code	NOT USE	
<MSH.18>	16	ID	Y	0211	Character Set	NOT USE	
<MSH.19>	250	CE			Principal Language Of Message	NOT USE	
<MSH .20>	20	ID		0356	Alternate Character Set Handling Scheme	NOT USE	
<MSH .21> <EI.1>	427	EI	Y		Message Profile Identity Entity Identifier	"eHRSS-1.4.0"	• Fixed value

9.4.2 PID – Patient Identification Segment

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<PID.1>	4	SI			Set ID - PID	NOT USE	
<PID.2>	20	CX			Patient ID		
<CX.1>		ST			ID Number	eHR number	Fixed length
#<PID.3>	250	CX	Y		Patient Identifier List		At most two sets of <PID.3> is allowed
<CX.1>		ST			ID Number	HKIC number/ Identity document number	The first occurrence of this field must be HKIC number. If HKIC number is not available, keep this field *<blank>*
<CX.5>		IS Localised			Identifier Type Code	Type of identity document	Please refer to the latest code set of 'Type of Document' in eHR Office website The first occurrence of this field must be fixed value "ID" or "BC"

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
							Example 1 If both HKIC number and other document number can be provided, the data should be presented as: <PID.3> <CX.1> **A1234567** </CX.1> <CX.5> **ID** <CX.5> </PID.3> <PID.3> <CX.1> **9876543** </CX.1> <CX.5> **AO** <CX.5> </PID.3>

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
							Example 2 If only other document number can be provided, the data should be presented as: <PID.3> **<CX.1></CX.1>** <CX.5> **ID** <CX.5> </PID.3> <PID.3> <CX.1> **9876543** </CX.1> <CX.5> **AO** <CX.5> </PID.3> *Remark: The XML tag for HKIC number with blank value must be given* Refer to *Section 16.4 - Localisation of the data type of <PID.3>/<CX.5> to 'IS'* for the HL7 localisation
<PID.4>	20	CX	Y		Alternate Patient ID	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
#<PID.5>	250	XPN	Y		Patient name		
<XPN.1>		FN			Family Name		
<FN.1>		ST			Surname	English surname	e.g. Chan
<XPN.2>		ST			Given name	English given name	e.g. Tai Man For Radiology Image Sharing : Length of surname and given name are 48
<XPN.9>		CE			Name Context	English full name	Full name should be in uppercase letters.
<CE.2>		ST			Text		In format of : [Surname]+[,]+ 1 white space +[Given Name] e.g CHAN, TAI MAN For Radiology Examination Sharable Dataset Upload project : Length of surname and given name are 40 ** If patient has either English surname or given name stored in local EMR system, full name should be filled.*
<PID.6>	250	XPN	Y		Mother' s Maiden Name	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<PID.7> <TS.1>	26	TS DTM			Date/time of birth Time	 Date of Birth	 In format: YYYYMMDD Remarks: • If date is exact to 'Year' (e.g. 2010), the unknown month and day is suggested to be set as '0101' E.g. 2010**0101** • If date is exact to 'Month'(e.g. 2010-12), the unknown day is suggested to be set as '01' E.g. 20101**01**
<PID.8>	1	IS		0001	Administrative Sex	Sex	Refer to the code set of "Sex" in eHR Office website
<PID.9>	250	XPN	Y		Patient Alias	NOT USE	
<PID.10>	250	CE	Y	0005	Race	NOT USE	
<PID.11>	250	XAD	Y		Patient Address	NOT USE	
<PID.12>	4	IS		0289	County Code	NOT USE	
<PID.13>	250	XTN	Y		Phone Number - Home	NOT USE	
<PID.14>	250	XTN	Y		Phone Number - Business	NOT USE	
<PID.15>	250	CE		0296	Primary Language	NOT USE	
<PID.16>	250	CE		0002	Marital Status	NOT USE	
<PID.17>	250	CE		0006	Religion	NOT USE	
<PID.18>	250	CX			Patient Account Number	NOT USE	
<PID.19>	16	ST			SSN Number - Patient	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<PID.20>	25	DLN			Driver's License Number – Patient	NOT USE	
<PID.21>	250	CX	Y		Mother's Identifier	NOT USE	
<PID.22>	250	CE	Y	0189	Ethnic Group	NOT USE	
<PID.23>	250	ST			Birth Place	NOT USE	
<PID.24>	1	ID		0136	Multiple Birth Indicator	NOT USE	
<PID.25>	2	NM			Birth Order	NOT USE	
<PID.26>	250	CE	Y	0171	Citizenship	NOT USE	
<PID.27>	250	CE		0172	Veterans Military Status	NOT USE	
<PID.28>	250	CE		0212	Nationality	NOT USE	
<PID.29>	26	TS			Patient Death Date and Time	NOT USE	
<PID.30>	1	ID		0136	Patient Death Indicator	NOT USE	
<PID.31>	1	ID		0136	Identity Unknown Indicator	NOT USE	
<PID.32>	20	IS	Y	0445	Identity Reliability Code	NOT USE	
<PID.33>	26	TS			Last Update Date/Time	NOT USE	
<PID.34>	241	HD			Last Update Facility	NOT USE	
<PID.35>	250	CE		0446	Species Code	NOT USE	
<PID.36>	250	CE		0447	Breed Code	NOT USE	
<PID.37>	80	ST			Strain	NOT USE	
<PID.38>	250	CE	2	0429	Production Class Code	NOT USE	
<PID.39>	250	CWE	Y	0171	Tribal Citizenship	NOT USE	

9.4.3 PV1 – Patient Visit Segment

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<PV1.1>	4	SI			Set ID - PV1	NOT USE	
#<PV1.2>	1	IS		0004	Patient Class	Field required by HL7 Patient Type	Possible value: **I**: In patient **O**: Out patient **N**: Not applicable For Radiology Image Sharing project: I or O only
<PV1.3> <PL.1>	80	PL IS			Assigned Patient Location Point of care	NOT USE	For Radiology Image Sharing : Specialty : Sub specialty For Radiology Examination Sharable Dataset Upload project : Please ignore
<PV1.4>	2	IS		0007	Admission Type	NOT USE	
<PV1.5>	250	CX			Preadmit Number	NOT USE	
<PV1.6>	80	PL			Prior Patient Location	NOT USE	
<PV1.7>	250	XCN	Y	0010	Attending Doctor	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<PV1.8>	250	XCN	Y	0010	Referring Doctor	NOT USE	For Radiology Image Sharing : Referring Doctor For Radiology Examination Sharable Dataset Upload project : Please ignore
<PV1.9>	250	XCN	Y	0010	Consulting Doctor	NOT USE	
<PV1.10>	3	IS		0069	Hospital Service	NOT USE	
<PV1.11>	80	PL			Temporary Location	NOT USE	
<PV1.12>	2	IS		0087	Preadmit Test Indicator	NOT USE	
<PV1.13>	2	IS		0092	Re-Admission Indicator	NOT USE	
<PV1.14>	6	IS		0023	Admit Source	NOT USE	
<PV1.15>	2	IS	Y	0009	Ambulatory Status	NOT USE	
<PV1.16>	2	IS		0099	VIP Indicator	NOT USE	
<PV1.17>	250	XCN	Y	0010	Admitting Doctor	NOT USE	
<PV1.18>	2	IS		0018	Patient Type	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<PV1.19>	250	CX			Visit Number		
<CX.1>		ST			ID Number	Episode number	For Radiology Image Sharing project : Case Number
<CX.6>		HD			Assigning Facility		
<HD.1>		IS			Namespace ID	Attendance institution identifier	Fixed length
<PV1.20>	50	FC	Y	0064	Financial Class	NOT USE	
<PV1.21>	2	IS		0032	Charge Price Indicator	NOT USE	
<PV1.22>	2	IS		0045	Courtesy Code	NOT USE	
<PV1.23>	2	IS		0046	Credit Rating	NOT USE	
<PV1.24>	2	IS	Y	0044	Contract Code	NOT USE	
<PV1.25>	8	DT	Y		Contract Effective Date	NOT USE	
<PV1.26>	12	NM	Y		Contract Amount	NOT USE	
<PV1.27>	3	NM	Y		Contract Period	NOT USE	
<PV1.28>	2	IS		0073	Interest Code	NOT USE	
<PV1.29>	4	IS		0110	Transfer to Bad Debt Code	NOT USE	
<PV1.30>	8	DT			Transfer to Bad Debt Date	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<PV1.31>	10	IS		0021	Bad Debt Agency Code	NOT USE	
<PV1.32>	12	NM			Bad Debt Transfer Amount	NOT USE	
<PV1.33>	12	NM			Bad Debt Recovery Amount	NOT USE	
<PV1.34>	1	IS		0111	Delete Account Indicator	NOT USE	
<PV1.35>	8	DT			Delete Account Date	NOT USE	
<PV1.36>	3	IS		0112	Discharge Disposition	NOT USE	
<PV1.37>	47	CM		0113	Discharged to Location	NOT USE	
<PV1.38>	250	CE		0114	Diet Type	NOT USE	
<PV1.39> <CE.1> <CE.2> <CE.5>	520	CE Localised		0115	Servicing Facility	 Radiology examination performing institution identifier Radiology examination performing institution long name Radiology examination performing institution local name	Refer to Section 16.3 - Localisation of the data type of <PV1.39> to 'CE'
<PV1.40>	1	IS		0116	Bed Status	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<PV1.41>	2	IS		0117	Account Status	NOT USE	
<PV1.42>	80	PL			Pending Location	NOT USE	
<PV1.43>	80	PL			Prior Temporary Location	NOT USE	
<PV1.44>	26	TS			Admit Date/Time	NOT USE	
<PV1.45>	26	TS	Y		Discharge Date/Time	NOT USE	
<PV1.46>	12	NM			Current Patient Balance	NOT USE	
<PV1.47>	12	NM			Total Charges	NOT USE	
<PV1.48>	12	NM			Total Adjustments	NOT USE	
<PV1.49>	12	Nm			Total Payments	NOT USE	
<PV1.50>	250	CX		0203	Alternate Visit ID	NOT USE	
<PV1.51>	1	IS		0326	Visit Indicator	NOT USE	
<PV1.52>	250	XCN	Y	0010	Other Healthcare Provider	NOT USE	

9.4.4 ORC – Common Order Segment

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
#<ORC.1>	2	ID		0119	Order Control	"NW"	Fixed Value
<ORC.2> <EI.1>	22	EI ST			Placer Order Number Entity Identifier	Radiology referring number	For Radiology Image Sharing project : Order Number
<ORC.3> <EI.1>	120 localised	EI ST			Filler Order Number Entity Identifier	Radiology Image Accession Number	Please refer to Section 14 - Appendix A the accession number format For Radiology Image Sharing project : Reference Number
<ORC.4>	22	EI			Placer Group Number	NOT USE	
<ORC.5>	2	ID		0038	Order Status	NOT USE	
<ORC.6>	1	ID		0121	Response Flag	NOT USE	
<ORC.7>	200	TQ	Y		Quantity/Timing	NOT USE	
<ORC.8>	200	EIP			Parent	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<ORC.9> <TS.1>	26	TS DTM			Date/Time of Transaction Time	 Transaction datetime	 In format: YYYYMMDDhhmmss[.s[s[s]]] e.g. 20100131 163005.005 For Radiology Image Sharing project : Create Datetime
<ORC.10> <XCN.1> <XCN.19> <TS.1> <XCN.23> <CWE.1>	250	XCN ST TS DTM CWE ST	Y		Entered By ID Number Effective Date Time Assigning Agency or Department Identifier	 “Creation”/”Update” Record creation/ last update datetime Record creation/ update institution identifier	 If ORC.10 is data creation detail, then XCN.1 = “Creation” If ORC.10 is data update detail , then XCN.1 = “Update” In format: YYYYMMDDhhmmss[.s[s[s]]] e.g. 20100131 163005.005 Fixed length

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<CWE.2>		ST			Text	Record creation/ update institution name	
<ORC.11>	250	XCN	Y		Verified By	NOT USE	
<ORC.12> <XCN.1> <XCN.2> <FN.1> <FN.3>	250	XCN ST FN ST ST	Y		Ordering Provider ID Number Family Name Surname Own Surname	 Radiology request institution identifier Radiology request institution description Radiology request institution local description	 For Radiology Image Sharing project : Referring Hospital
<ORC.13>	80	PL			Enterer's Location	NOT USE	
<ORC.14>	250	XTN	Y/2		Call Back Phone Number	NOT USE	
<ORC.15> <TS.1>	26	TS DTM			Order Effective Date/Time Time	 NOT USE	 For Radiology Image Sharing project :Update Datetime For Radiology Examination Sharable Dataset Upload project : Please ignore

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<ORC.16>	250	CE			Order Control Code Reason	NOT USE	
<ORC.17>	250	CE			Entering Organization	NOT USE	
<ORC.18>	250	CE			Entering Device	NOT USE	
<ORC.19>.	250	XCN	Y		Action By	NOT USE	
<ORC.20>	250	CE		0339	Advanced Beneficiary Notice Code	NOT USE	
<ORC.21>	250	XON	Y		Ordering Facility Name	NOT USE	
<ORC.22>	250	XAD	Y		Ordering Facility Address	NOT USE	
<ORC.23>	250	XTN	Y		Ordering Facility Phone Number	NOT USE	
<ORC.24>	250	XAD	Y		Ordering Provider Address	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<ORC.25> <CWE.1>	250	CWE ST			Order Status Modifier Identifier	 Transaction Type	 For Radiology Image Sharing project : Transaction Type Possible value: **I**: Upload new record **U**: Override existing record **D**: Delete existing record ***Remarks:*** ***'U' and 'D' are not accepted in materialisation mode.***
<ORC.26>	60	CWE		0552	Advanced Beneficiary Notice Override Reason	NOT USE	
<ORC.27>	26	TS	Y		Filler's Expected Availability Date/Time	NOT USE	
<ORC.28>	250	CWE		0177	Confidentiality Code	NOT USE	
<ORC.29>	250	CWE		0482	Order Type	NOT USE	
<ORC.30>	250	CNE		0483	Enterer Authorization Mode	NOT USE	

9.4.5 OBR - Observation Request Segment

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<OBR.1>	4	SI			Set ID – OBR	NOT USE	
<OBR.2> <EI.1>	22	EI ST			Placer Order Number Entity Identifier	 Record Key	 For Radiology Image Sharing project : Order Number
<OBR.3> <EI.1>	22	EI ST			Filler Order Number Entity Identifier	 NOT USE	 For Radiology Image Sharing project : Reference Number For Radiology Examination Sharable Dataset Upload project : Please ignore
#<OBR.4> <CE.1> <CE.5>	250	CE ST ST			Universal Service Identifier Alternate Text	 Radiology examination name “RAD”	 For Radiology Image Sharing project : Site • Fixed value • An unique identifier of the Radiology Examination sharable dataset • Sharable Dataset Code (eHR Record Type)

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<OBR.5>	2	ID			Priority – OBR	NOT USE	
<OBR.6>	26	TS			Requested Date/Time	NOT USE	
<OBR.7> <TS.1>	26	TS DTM			Observation Date/Time # Time	Radiology report date	For Radiology Image Sharing project :Study Datetime In format: YYYYMMDDhhmmss[.s[s[s]]] e.g. 20100131 163005.005
<OBR.8>	26	TS			Observation End Date/Time #	NOT USE	
<OBR.9>	20	CQ			Collection Volume *	NOT USE	
<OBR.10>	250	XCN	Y		Collector Identifier *	NOT USE	
<OBR.11>	1	ID		0065	Specimen Action Code *	NOT USE	
<OBR.12>	250	CE			Danger Code	NOT USE	
<OBR.13>	300	ST			Relevant Clinical Information	NOT USE	
<OBR.14>	26	TS			Specimen Received Date/Time *	NOT USE	
<OBR.15>	300	SPS			Specimen Source	NOT USE	
<OBR.16>	250	XCN	Y		Ordering Provider	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<OBR.17>	250	XTN	Y/2		Order Callback Phone	NOT USE	
<OBR.18>	60	ST			Placer Field 1	NOT USE	
<OBR.19>	60	ST			Placer Field 2	NOT USE	
<OBR.20>	60	ST			Filler Field 1 +	NOT USE	
<OBR.21>	60	ST			Filler Field 2 +	NOT USE	
<OBR.22>	26	TS			Results Rpt/Status Chng – Date/Time	NOT USE	
<OBR.23>	40	MOC			Charge to Practice +	NOT USE	
<OBR.24>	10	ID		0074	Diagnostic Serv Sect ID	Radiology modality code	For Radiology Image Sharing project : Type of Investigation Refer to the code set of “Radiology modality” in eHR Office website
<OBR.25>	1	ID		0123	Result Status +	NOT USE	
<OBR.26>	400	PRL			Parent Result +	NOT USE	
<OBR.27>	200	TQ	Y		Quantity/Timing	NOT USE	
<OBR.28>	250	XCN	Y		Result Copies To	NOT USE	
<OBR.29>	200	EIP			Parent	NOT USE	
<OBR.30>	20	ID		0124	Transportation Mode	NOT USE	
<OBR.31>	250	CE	Y		Reason for Study	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<OBR.32>	200	NDL			Principal Result Interpreter +		
<NDL.1>		CNN					
<CNN.2>		ST			Name		
					Family Name	Radiology report - reported by healthcare staff English name	
<CNN.4>		ST			Second and Further Given Names or Initials Thereof	Radiology report - reported by healthcare staff Chinese name	Maximum 10 Chinese characters
<OBR.33>	200	NDL	Y		Assistant Result Interpreter +	NOT USE	
<OBR.34>	200	NDL	Y		Technician +		
<NDL.1>		CNN			Name		
<CNN.1>		ST			ID Number	Radiology examination healthcare staff identifier *(Retained for backward compatibility to v1.0.0)*	
<CNN.2>		ST			Family Name	Radiology examination healthcare staff English Name	
<CNN.3>		ST			Given Name	Radiology examination healthcare staff English given name *(Retained for backward compatibility to v1.0.0)*	
<CNN.4>		ST			Second and Further Given Names or	Radiology examination healthcare staff Chinese name	Maximum 10 Chinese characters

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
					Initials Thereof		
<CNN.5>		ST			Suffix	Radiology examination healthcare staff Chinese name suffix *(Retained for backward compatibility to v1.0.0)*	Refer to the code set of "Practitioner Chinese name suffix" in eHR Office website
<CNN.6>		ST			Prefix	Radiology examination healthcare staff English name prefix *(Retained for backward compatibility to v1.0.0)*	Refer to the code set of "Practitioner name prefix" in eHR Office website
<CNN.8>		IS			Source Table	Radiology examination healthcare staff type code: Radiology examination healthcare staff type description	
<CNN.10>		ST			Assigning Authority - Universal ID	Radiology examination healthcare staff type local description	
<OBR.35>	200	NDL	Y		Transcriptionist +	NOT USE	
<OBR.36>	26	TS			Scheduled Date/Time +	NOT USE	
<OBR.37>	4	NM			Number of Sample Containers *	NOT USE	
<OBR.38>	250	CE	Y		Transport Logistics of Collected Sample *	NOT USE	
<OBR.39>	250	CE	Y		Collector's Comment *	NOT USE	
<OBR.40>	250	CE			Transport Arrangement Responsibility	NOT USE	
<OBR.41>	30	ID		0224	Transport Arranged	NOT USE	
<OBR.42>	1	ID		0225	Escort Required	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<OBR.43>	250	CE	Y		Planned Patient Transport Comment	NOT USE	
<OBR.44>	250	CE	Y	0088	Procedure Code	NOT USE	
<OBR.45>	250	CE	Y	0340	Procedure Code Modifier	NOT USE	
<OBR.46>	250	CE	Y	0411	Placer Supplemental Service Information	NOT USE	
<OBR.47>	250	CE	Y	0411	Filler Supplemental Service Information	NOT USE	
<OBR.48>	250	CWE		0476	Medically Necessary Duplicate Procedure Reason	NOT USE	
<OBR.49>	2	IS		0507	Result Handling	NOT USE	

9.4.6 OBX - Observation/Result Segment

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<OBX.1>	4	SI			Set ID – OBX	NOT USE	
<OBX.2>	2	ID		0125	Value Type	e.g. "ED"	• This field defines the datatype of OBX.5 • Possible values: **ED**: Encapsulated Data **ST:** String Data
#<OBX.3> <CE.1> <CE.2>	250	CE ST ST			Observation Identifier Identifier Text	 File indicator Radiology report title	 • For Radiology Image Sharing Project : File ID and File Description • *The first occurance of <OBX> segment should be File indicator in <OBX.3><CE.1>, Radiology report title in <OBX.3><CE.2> and Radiology report (PDF) in <OBX.5><ED>* • *And for the occurance of the next <OBX> segment(s), please refer to code table in Section 17.1 – OBX.3 Possible Value* • *Each data value in <OBX.3> can only occur once*

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<OBX.4>	20	ST			Observation Sub-Id	e.g. NBL	Possible value of data upload format: **NBL**: Non-Bulk load; **NBL-M**: Non-Bulk load for materialisation; **NBL-R:** Non-Bulk load for re-materialisation *Remarks:* ***Materialisation*** **-** HCP upload a HCR's specific sharable dataset that exists in EMR
<OBX.5>	99999	Varies	Y		Observation Value		
<ED.1>		HD			Source Application		
<HD.1>		IS			Namespace ID	File Name	
<ED.2>		ID			Type of Data	"multipart"	• Fixed value
<ED.3>		ID			Data Subtype	"PDF"	• Fixed value
<ED.4>		ID			Encoding	"Base64"	• Fixed value
<ED.5>		TX			Data	Base 64 data	• Encapsulated data values of image report if applicable

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
						Value of Radiology report (Text)/ Value of Radiology remark / Value of Last Update datetime/ Value of Radiolog registration number *Remarks : Each data value in <OBX.3> can only occur once.*	In format: YYYYMMDDhhmmss[.s[s[s]]] e.g. 20100131 163005.005 For Radiology Image Sharing project : Document Create Datetime/Last Update Datetime
<OBX.6>	250	CE			Units	NOT USE	
<OBX.7>	60	ST			References Range	NOT USE	
<OBX.8>	5	IS	Y	0078	Abnormal Flags	NOT USE	
<OBX.9>	5	NM			Probability	NOT USE	
<OBX .10>	2	ID	Y	0080	Nature of Abnormal Test	NOT USE	
#<OBX.11>	1	ID		0085	Observation Result Status	“F”	Fixed Value : **F**: Final results
<OBX .12>	26	TS			Effective Date of Reference Range	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<OBX .13>	20	ST			User Defined Access Checks	NOT USE	
<OBX .14> <TS.1>	26	TS DTM			Date/Time of the Observation Time	Radiology examination datetime	In format: YYYYMMDDhhmmss[.s[s[s]]] e.g. 20100131 163005.005 For Radiology Image Sharing Project: Exam datetime
<OBX .15>	250	CE			Producer's ID	NOT USE	
<OBX .16>	250	XCN	Y		Responsible Observer	NOT USE	
<OBX .17>	250	CE	Y		Observation Method	NOT USE	
<OBX .18>	22	EI	Y		Equipment Instance Identifier	NOT USE	
<OBX .19>	26	TS			Date/Time of the Analysis	NOT USE	

9.5 XML DIGITAL SIGNATURE ON HL7

The components of XML digital signature are listed below:

No.	XML Tag	XPath	Attribute	Element Name	Mandatory (M) / Optional(O)	Remarks
1	Signature	Signature		Signature	M	Sign the HL7 message *(Please refer to "XML Signature Syntax and Processing (Second Edition)" provided by W3C Recommendation 10 June 2008)*
			@xmlns		M	Fixed Value: "http://www.w3.org/2000/09/xmldsig#"
2	SignedInfo	Signature/SignedInfo		Signed Information	M	
2.1	CanonicalizationMethod	Signature/SignedInfo/ CanonicalizationMethod		Canonicalization Method	M	
			@Algorithm	Algorithm	M	Fixed Value: "http://www.w3.org/TR/2001/REC-xml-c14n-20010315"
2.2	SignatureMethod	Signature/SignedInfo/ SignatureMethod		Signature Method	M	
			@Algorithm	Algorithm	M	Fixed Value: "http://www.w3.org/2001/04/xmldsig-more#rsa-sha256"
2.3	Reference	Signature/SignedInfo/ Reference		Reference element for the whole HL7 document	M	
			@ URI	URI	M	Fixed Value: "" *(Empty String).* Apply the signature to the whole HL7 document

No.	XML Tag	XPath	Attribute	Element Name	Mandatory (M) / Optional(O)	Remarks
2.3.1	Transforms	Signature/SignedInfo/ Reference/Transforms		Transforms	M	
2.3.1.1	Transform	Signature/SignedInfo/ Reference/Transforms/ Transform		Transform	M	
			@Algorithm	Algorithm	M	Fixed Value: “http://www.w3.org/2000/09/xmldsig#enveloped-signature”
2.3.2	DigestMethod	Signature/SignedInfo/ Reference/DigestMethod			M	
			@Algorithm	Algorithm	M	Fixed Value: “http://www.w3.org/2001/04/xmlenc#sha256”
2.3.3	DigestValue	Signature/SignedInfo/ Reference/DigestValue		Digest Value	M	Message’s Digest Value
3	SignatureValue	Signature/SignatureValue		Signature value	M	Canonicalize and then calculate the SignatureValue over SignedInfo based on algorithms specified in SignedInfo as specified in XML Signature [XMLDSIG]
4	KeyInfo	Signature/KeyInfo		Key Info	M	

No.	XML Tag	XPath	Attribute	Element Name	Mandatory (M) / Optional(O)	Remarks
4.1	X509Data	Signature/KeyInfo/ X509Data		X509 Data	M	
4.1.1	X509SubjectName	Signature/KeyInfo/ X509Data/ X509SubjectName		X509 Subject Name	M	Distinguished name (DN) that contains the information for both the owner or requestor of the certificate (called the Subject DN) and the CA that issues the certificate (called the Issuer DN)
4.1.2	X509Certificate	Signature/KeyInfo/ X509Data/ X509Certificate		Certificate	M	base64-encoded [X509v3] certificate *(Please refer to the content of X509Data in "XML Signature Syntax and Processing (Second Edition)" provided by W3C Recommendation 10 June 2008)*

Example

```
<?xml version="1.0" encoding="UTF-8"?>
<ORU_R01 xmlns="..." xmlns:xsi="..." xsi:schemaLocation="...">
  <MSH>...</MSH>
  <ORU_R01.PATIENT_RESULT>
    <ORU_R01.ORDER_OBSERVATION>
      <OBR>...</OBR>
      <ORU_R01.OBSERVATION>
        <OBX>...</OBX>
      </ORU_R01.OBSERVATION>
    </ORU_R01.ORDER_OBSERVATION>
  </ORU_R01.PATIENT_RESULT>
  <Signature xmlns="http://www.w3.org/2000/09/xmldsig#">
    <SignedInfo>
      <CanonicalizationMethod Algorithm="http://www.w3.org/TR/2001/REC-xml-c14n-20010315"/>
      <SignatureMethod Algorithm="http://www.w3.org/2001/04/xmldsig-more#rsa-sha256"/>
      <Reference URI="">
        <Transforms>
          <Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature"/>
        </Transforms>
        <DigestMethod Algorithm="http://www.w3.org/2001/04/xmlenc#sha256"/>
        <DigestValue>xxxxx</DigestValue>
      </Reference>
    </SignedInfo>
    <SignatureValue>xxxxxxxxxx</SignatureValue>
    <KeyInfo>
      <X509Data>
        <X509SubjectName>xxxxx</X509SubjectName>
        <X509Certificate>xxxxxxxxxx</X509Certificate>
      </X509Data>
    </KeyInfo>
  </Signature>
</ORU_R01>
```

XML Digital Signature

10 ENCAPSULATED DATA

Radiology procedure image report is a PDF file that contains the Radiology Examination records. The file should be encoded in Base64 format and encapsulated in an OBX segment of HL7 message. The encoded Base64 string should be put in the component <ED5> of <OBX.5>. The file type of the encoded string must be specified in <OBX.2>. In eHR Radiology Examination, the supported file type is listed in the Localised HL7 Table 0291 (Refer to Section 16.1 - Extend HL7 Table 0291 – Subtype of referenced data).

When multiple files are being encapsulated into the HL7 message, the <OBX.4> field is used for grouping OBX segments that are related to the same data file. That is, each set of segments should have one unique number (starting from “1” and increment by one for every data file)

10.1 GENERAL RADIOLOGY EXAMINATION DATASET

Radiology Examination may be constituted of radiology request and result details data and procedure detail. Each Radiology Examination record will have a unique record key.

Final Radiology Examination record will be accpeted by eHR for data exchange and uploaded to eHR within a single ORU HL7 Message in the OBX.5 segments.

10.2 DATA MAPPING FOR HL7-HK MESSAGE STANDARDS

10.2.1 Clinical Information

In general, the clinical information can be divided into two sections: 'HCR', 'Detail'.

In the 'HCR' section, information includes:

- HCR Identity Data

In the 'Detail' section, clinical information of the subject domain will be included:

- Transaction Data
- Radiology Examination Details

Both HCR and Detail Information are mapped to HL7 v.2.5 in XML format

It is assumed that only three scenarios will trigger the transfer of Radiology Examination data. They are:

- Uploading New Radiology Examination Record (S1)
- Overriding Existing Radiology Examination Record (S2)
- Deletion of Existing Radiology Examination Record (S3)

For details of scenarios, please refer to Data Requirement Specification for eHR Radiology Examination Record.

The data mappings of elements in ‘HCR’ and ‘Detail’ sections will be described as below:

<HCR> Section

No.	Data Field	XML Tag	XPath	Maximum Length	Cardinality			Remarks
					S1 (New)	S2 (Override)	S3 (Delete)	
1	**“HCR Identity Data” Related Tags**							
1.1	eHR number	PID.2	PID.2	string(12)	1..1			Fixed length
1.2	HKIC number	PID.3	PID.3/CX.1	string(12)	0..1 if [Identity document number] is given 1..1 if [Identity document number] is blank			
1.3	Type of identity document	PID.3	PID.3/CX.5	string(6)	0..1 if [Identity document number] is blank 1..1 if [Identity document number] is given			Refer to Section 16.4 - Localisation of the data type of <PID.3>/<CX.5> to ‘IS’ for the HL7 localisation Refer to the code set of “Type of identity document” in eHR Office website
1.4	Identity document number	PID.3	PID.3/CX.1	string(30)	0..1 if [HKIC number] is given 1..1 if [HKIC number] is given			

No.	Data Field	XML Tag	XPath	Maximum Length	Cardinality			Remarks
					S1 (New)	S2 (Override)	S3 (Delete)	
1.5	English surname	PID.5	PID.5/XPN.1/FN.1	string(40)	0..1 if [English full name] is not blank 1..1 if [English full name] is blank			
1.6	English given name	PID.5	PID.5/XPN.2	string(40)	0..1 if [English full name] is not blank 1..1 if [English full name] is blank			
1.7	English full name	PID.5	PID.5/XPN.9/CE.2	string(100)	0..1 if [English surname] and [English given name] are not blank 1..1 if [English surname] and [English given name] are blank ** If patient has either English surname or given name stored in local EMR system, full name should be filled.*			Full name should be in uppercase letters. Format: [Surname]+[,]+ 1 white space +[Given Name] e.g CHAN, TAI MAN
1.8	Sex	PID.8	PID.8	string(1)	1..1			Refer to the code set of “Sex” in eHR Office website
1.9	Date of birth	PID.7	PID.7/TS.1	string(23)	1..1			In format: YYYYMMDD Remarks: • If date is exact to ‘Year’ (e.g. 2010), the

No.	Data Field	XML Tag	XPath	Maximum Length	Cardinality			Remarks
					S1 (New)	S2 (Override)	S3 (Delete)	
								unknown month and day is suggested to be set as ’0101’ E.g. 2010**0101** • If date is exact to ‘Month’(e.g. 2010-12), the unknown day is suggested to be set as ‘01’ E.g. 20101**2**01

<Detail> Section

The table below shows the data mapping of clinical information for Radiology Examination Record. In general, there are three data compliance levels (Level 1, 2 and 3).

No.	Data Field	XML Tag	XPath	Maximum Length	Cardinality Not Applicable (N/A – Data field should not be submitted)									Remarks
					Level 1			Level 2			Level 3			
					S1	S2	S3	S1	S2	S3	S1	S2	S3	
1	Record key	OBR.2	OBR.2/EI.1	string(50)	1..1									
2	Transaction datetime	ORC.9	ORC.9/TS.1	string(23)	1..1									In format: YYYYMMDDhhmmss[.s[s[s]]] e.g. 20100131163005.005
3	Transaction type	ORC.25	ORC.25/CWE.1	string(1)	1..1									Possible value: **I** : Insert operation **U** : Update operation **D** : Delete operation ***Remarks:*** ***'U' and 'D' are not accepted in materialisation mode.***

No.	Data Field	XML Tag	XPath	Maximum Length	Cardinality Not Applicable (N/A – Data field should not be submitted)									Remarks
					Level 1			Level 2			Level 3			
					S1	S2	S3	S1	S2	S3	S1	S2	S3	
4	Last update datetime	OBX.5	OBX.5	string(23)	1..1									In format: YYYYMMDDhhmmss[.s[s[s]]] e.g. 20100131163005.005
5	Episode number	PV1.19	PV1.19/CX.1	string(20)	0..1									
6	Attendance institution identifier	PV1.19	PV1.19/CX.6/HD.1	string(10)	0..1									Fixed length
7	Radiology image accession number	ORC.3	ORC.3/EI.1	string(100)	0..1		N/A	0..1		N/A	0..1		N/A	
8	Radiology referring number	ORC.2	ORC.2/EI.1	string(20)	0..1		N/A	0..1		N/A	0..1		N/A	
9	Radiology request healthcare institution identifier	ORC.12	ORC.12/XCN.1	string(10)	N/A						1..1 if [Radiology request institution description] is given		N/A	

No.	Data Field	XML Tag	XPath	Maximum Length	Cardinality Not Applicable (N/A – Data field should not be submitted)									Remarks
					Level 1			Level 2			Level 3			
					S1	S2	S3	S1	S2	S3	S1	S2	S3	
10	Radiology request healthcare institution long name	ORC.12	ORC.12/XCN.2/FN.1	string(255)	N/A						1..1 if [Radiology request institution identifier] is given		N/A	
11	Radiology request healthcare institution local name	ORC.12	ORC.12/XCN.2/FN.3	string(255)	N/A						1..1 if [Radiology request institution description] is given		N/A	
12	Radiology examination datetime	OBX.14	OBX.14/TS.1	string(23)	1..1		N/A	1..1		N/A	1..1		N/A	In format: YYYYMMDDhhmmss[.s[s[s]]] e.g. 20100131163005.005

No.	Data Field	XML Tag	XPath	Maximum Length	Cardinality Not Applicable (N/A – Data field should not be submitted)									Remarks
					Level 1			Level 2			Level 3			
					S1	S2	S3	S1	S2	S3	S1	S2	S3	
13	Radiology modality code	OBR.24	OBR.24/CE.1	string(10)	1..1		N/A	1..1		N/A	1..1		N/A	Refer to ection 12.2 - Localisation of HL7 Table 0074 for the HL7 localisation Refer to the code set of "Radiology modality" in eHR Office website
14	Radiology examination name	OBR.4	OBR.4/CE.1	string(2000)	0..1		N/A	0..1		N/A	0..1		N/A	
15	Radiology examination performing institution identifier	PV1.39	PV1.39/CE.1	string(10)	N/A		N/A	N/A		N/A	0..1		N/A	Refer to Section 16.3 - Localisation of the data type of <PV1.39> to 'CE'

No.	Data Field	XML Tag	XPath	Maximum Length	Cardinality Not Applicable (N/A – Data field should not be submitted)									Remarks
					Level 1			Level 2			Level 3			
					S1	S2	S3	S1	S2	S3	S1	S2	S3	
16	Radiology examination performing institution long name	PV1.39	PV1.39/CE.2	string(255)	N/A		N/A	N/A		N/A	1.1. if [Radiology performing institution identifier] is given N/A if [Radiology performing institution identifier] is blank		N/A	
17	Radiology examination performing institution local name	PV1.39	PV1.39/CE.5	string(255)	N/A		N/A	0..*		N/A	1.1. if [Radiology performing institution identifier] is given 0..1 if [Radiology performing institution identifier] is blank		N/A	

No.	Data Field	XML Tag	XPath	Maximum Length	Cardinality Not Applicable (N/A – Data field should not be submitted)									Remarks
					Level 1			Level 2			Level 3			
					S1	S2	S3	S1	S2	S3	S1	S2	S3	
18	Radiology examination healthcare staff identifier *(Retained for backward compatibility to v1.0.0)*	OBR.34	OBR.34/NDL.1/CNN.1	string(10)	N/A									
19	Radiology examination healthcare staff English name prefix *(Retained for backward compatibility to v1.0.0)*	OBR.34	OBR.34/NDL.1/CNN.6	string(10)	N/A									Refer to the code set of "Healthcare staff English name prefix" in eHR Office website
20	Radiology examination healthcare staff English name	OBR.34	OBR.34/NDL.1/CNN.2	string(100)	N/A			0..1		N/A	0..1		N/A	
21	Radiology examination healthcare staff English given name *(Retained for backward compatibility to v1.0.0)*	OBR.34	OBR.34/NDL.1/CNN.3	string(40)	N/A									
22	Radiology examination healthcare staff Chinese name	OBR.34	OBR.34/NDL.1/CNN.4	string(10)	N/A			0..1		N/A	0..1		N/A	Maximum 10 Chinese characters

No.	Data Field	XML Tag	XPath	Maximum Length	Cardinality Not Applicable (N/A – Data field should not be submitted)									Remarks
					Level 1			Level 2			Level 3			
					S1	S2	S3	S1	S2	S3	S1	S2	S3	
23	Radiology examination healthcare staff Chinese name suffix *(Retained for backward compatibility to v1.0.0)*	OBR.34	OBR.34/NDL.1/CNN.5	string(10)	N/A									Refer to the code set of "Healthcare staff Chinese name suffix" in eHR Office website
24	Radiology examination healthcare staff type code	OBR.34	OBR.34/NDL.1/CNN.8	string(10)	N/A						1..1 if [radiology examination healthcare staff type description] is given		N/A	Refer to the code set of "Procedure healthcare staff type" in eHR Office website
25	Radiology examination healthcare staff type description	OBR.34	OBR.34/NDL.1/CNN.8	string(255)	N/A						1..1 if [radiology examination healthcare staff type code] is given N/A if [radiology examination healthcare staff type code] is blank		N/A	

No.	Data Field	XML Tag	XPath	Maximum Length	Cardinality Not Applicable (N/A – Data field should not be submitted)									Remarks
					Level 1			Level 2			Level 3			
					S1	S2	S3	S1	S2	S3	S1	S2	S3	
26	Radiology examination healthcare staff type local description	OBR.34	OBR.34/NDL.1/CNN.10	string(255)	N/A			0..1		N/A	1..1 if [radiology examination healthcare staff type code] is given N/A if [radiology examination healthcare staff type code] is blank		N/A	
27	Radiology examination remark	OBX.5	OBX.5	string(2000)	0..1		N/A	0..1		N/A	0..1		N/A	
28	Radiology report title	OBX.3	OBX.3/CE.2	string(255)	0..1		N/A	0..1		N/A	0..1		N/A	
29	Radiology report date	OBR.7	OBR.7/TS.1	string(23)	0..1		N/A	0..1		N/A	0..1		N/A	In format: YYYYMMDDhhmmss[.s[s[s]]] e.g. 20100131163005.005
30	Radiology report - reported by healthcare staff English name	OBR.32	OBR.32/NDL.1/CNN.2	string(100)	N/A		N/A	0..1		N/A	0..1		N/A	e.g. Dr Chan Tai Man

No.	Data Field	XML Tag	XPath	Maximum Length	Cardinality Not Applicable (N/A – Data field should not be submitted)									Remarks
					Level 1			Level 2			Level 3			
					S1	S2	S3	S1	S2	S3	S1	S2	S3	
31	Radiology report - reported by healthcare staff Chinese name	OBR.32	OBR.32/NDL.1/CNN.4	string(10)	N/A		N/A	0..1		N/A	0..1		N/A	e.g. 陳大文教授 Maximum 10 Chinese characters
32	Radiology report (PDF)	OBX.5	OBX.5/ED.5	image	1..1 f [Radiology report (Text)] is blank		N/A	0..1		N/A	0..1		N/A	
33	Radiology report (Text)	OBX.5	OBX.5	string(2000)	1..1 if [Radiology report (PDF)] is blank		N/A	0..1		N/A	0..1		N/A	
34	File indicator	OBX.3	OBX.3/CE.1	string(1)	1..1		N/A	1..1		N/A	1..1		N/A	
35	File name	OBX.5	OBX.5/ED.1	string(255)	1..1 if [File Indicator] = 1		N/A	1..1 if [File Indicator] = 1		N/A	1..1 if [File Indicator] = 1		N/A	

No.	Data Field	XML Tag	XPath	Maximum Length	Cardinality Not Applicable (N/A – Data field should not be submitted)									Remarks
					Level 1			Level 2			Level 3			
					S1	S2	S3	S1	S2	S3	S1	S2	S3	
36	Record creation datetime	ORC.10	ORC.10/XCN.19/TS.1	string(23)	0..1		N/A	0..1		N/A	0..1		N/A	In format: YYYYMMDDhhmmss[.s[s[s]]] e.g. 20100131163005.005
37	Record creation institution identifier	ORC.10	ORC.10/XCN.23/CWE.1	string(10)	0..1		N/A	0..1		N/A	0..1		N/A	Fixed length
38	Record creation institution name	ORC.10	ORC.10/XCN.23/CWE.2	string(255)	0..1		N/A	0..1		N/A	0..1		N/A	
39	Record last update datetime	ORC.10	ORC.10/XCN.19/TS.1	string(23)	0..1		N/A	0..1		N/A	0..1		N/A	In format: YYYYMMDDhhmmss[.s[s[s]]] e.g. 20100131163005.005
40	Record update institution identifier	ORC.10	ORC.10/XCN.23/CWE.1	string(10)	0..1		N/A	0..1		N/A	0..1		N/A	Fixed length
41	Record update institution name	ORC.10	ORC.10/XCN.23/CWE.2	string(255)	0..1		N/A	0..1		N/A	0..1		N/A	
42	Radiology registration number	OBX.5	OBX.5	string(20)	0..1		N/A	0..1		N/A	0..1		N/A	

11 OTHER REQUIREMENTS

11.1 CHARACTER SET AND ENCODING

Unicode Transformation Format – 8 bit (UTF-8) will be used in eHR Clinical Data Sharing data exchange. HCP is required to ensure the file that sent to eHR should use UTF-8 encoding as below:

Data File Type	Charset and Encoding	Version
HL7 message (e.g. ORU^R01)	UTF-8	XML 1.0
PDF	UTF-8 base64	

11.2 XML PREDEFINED ENTITIES

Extensible Markup Language (XML) is adopted in eHR Clinical Data Sharing data exchange using HL7 messages. The XML specification defines five "predefined entities" representing special characters, and requires that all XML processors honor them. To render the character, the format `&name;` must be used. For example, `&` renders as the character `&` . The table below lists the 5 predefined entities in XML:

Name	Character	Entity Reference	Description
Gt	>	>	Greater than
Lt	<	<	Less than
Amp	&	&	Ampersand
Apos	‘	'	Apostrophe
Quot	“	"	Quotation mark

The prefix of namespace in XML in HL7 message is not expected.

12 PREPARATION OF MESSAGE FOR DATA TRANSFER

12.1 BASIC REQUIREMENTS

- base64 encoder
- HL7 version 2.5 ORU Message

12.2 HL7 MESSAGE STRUCTURE APPLIED

- Event Type: ORU
- Event Code: R01
- Event Name: Unsolicited Observation Message
- Usage: It provides structured HCR-oriented clinical data between systems.

12.3 PREPARE A HL7 ORU MESSAGE WITH IMAGE DOCUMENTS

1. Prepare HL7 ORU Message complying to HL7 message structure and data mapping specified in this specification.

2. Use base64 encoder to encode the image report in Base64.

3. Embed the encoded report image in BASE64 format into OBX.5.5 – ED.5 of the ORU Message.

4. Save the file of HL7 message and Image files (if exists) complying with the file naming convention defined in Section 12 - File Naming Convention.

5. Send out the ORU Message via ebMS or sFTP to the eHR system.

13 FILE NAMING CONVENTION

This section describes the file naming standards of the files included in HL7 message under HL7-HK Message Standards. The file components include:

- HL7 Message File
- Image File

13.1 HL7 MESSAGE FILE NAME

The naming convention of the file which is carrying the HL7 message is specified as below:

Format

With Sending Location Code,

<HCP ID>.<Sending Location Code>.<Record Type>.HL7.<Message Control ID>

Example
e.g. 8088450656.BRANCHA.RAD.HL7.20110701230000

Naming Convention

1. The file name should be in capital letters.
2. The value of each file name component should not contain dot "."
3. Message Control ID refers to the value in MSH.10
4. If the ***<Sending Location Code>*** cannot be provided, its value can be set as same as ***<HCP ID>***.
5. The value of the <***Sending Location Code***> can be in any combination of alphanumeric characters i.e. [A-Z][0-9][-_]

The following table shows the components of file name and the respective definitions:

Sequence	Component	Definition	Maximum Length	Remarks
1	HCP ID	A unique identifier assigned by eHR Healthcare Provider Index to each healthcare institution for participation in eHR Sharing System	string(10)	
2	Sending Location Code	A code to indicate the location where the data is sending from. The format should be agreed before the interface is on production.	string(20)	
3	Record Type	A standardised short term to distinguish the sharable dataset	string(20)	Fixed value: “RAD”
4	HL7	HL7 File	string(3)	Fixed value: “HL7”
5	Message Control ID	Message Control ID refers to the value in MSH.10 of HL7 file	string(14)	Values can be in any combination of alphanumeric characters i.e. [A-Z][0-9][-_]

13.2 IMAGE FILE NAME

In all eHR sharable dataset, image file or plain text will be accepted in all level of data interoperability. As the file naming convention is different among institutes, the files should be renamed in standardised format.

Format

With file extension,

<HCP ID>.<Sending Location Code>.<Record Type>.<Record Key>.<Original File Name>.<File Extension>.<eHR Number>.<Generation Date>

Example

e.g. 8088450656.BRANCHA.RAD.PWH019999.123.pdf.201000000001.20110702084530

Naming Convention

1. The file name should be in capital letters except pdf extension.
2. Generation date provided in the file name should be in YYYYMMDDhhmmss format (YYYY:year; MM:month; DD:day; hh:hour; mm:minute; ss:second).
3. The value of each file name component should not contain dot "."
4. If the ***<Sending Location code>*** cannot be provided, its value can be set as same as ***<HCP ID>***.
5. The value of the ***<Sending Location Code>***, ***<Record Key>*** and ***<Original File Name>*** can be in any combination of alphanumeric characters i.e. [A-Z][0-9][-_]

The following table shows the components of file name and the respective definitions:

Sequence	Component	Definition	Maximum Length	Remarks
1	HCP ID	A unique identifier assigned by eHR Healthcare Provider Index to each healthcare institution for participation in eHR Sharing System	string(10)	
2	Sending Location Code	A code to indicate the location where the data is sending from. The format should be agreed before the interface is on production.	string(20)	
3	Record Type	A standardised short term to distinguish the sharable dataset	string(20)	Fixed value: “RAD”
4	Record Key	The key to identify and map the structured data record	string(50)	
5	Original File Name	The file name used in source institution	string(100)	
6	File Extension	pdf (Portable Document Format File)	string(3)	
7	eHR Number	A unique eHR healthcare recipient identifier assigned to each patient for each participation in the Hong Kong eHR	string(12)	Fixed length
8	Generation Date	File generation date	string(14)	In format: YYYYMMDDhhmmss

14 EXAMPLES OF HL7-HK MESSAGE STANDARDS

14.1 MESSAGE EXAMPLE FOR EACH SCENARIO

14.1.1 Uploading New Radiology Record (S1)

Example Data

Data Field	Sample Value
eHR number	201000000001
HKIC number	A1234563
Type of document	ID *(Refer the "Document Type" published in eHealth Record Office website)*
Identity document number	A1234563
English surname	Chan
English given name	Tai Man
English full name	Chan, Tai Man
Sex	M
Date of birth	2009-01-01
Transaction datetime	20100612000000.000
Transaction type	I
Last update datetime	20100612000000.000
Episode number	HN1234567
Attendance institute identifier	2134960588
eHR record type	RAD
Radiology examination record key	RAD001
Radiology image accession number	HKSXR0700000101H
Radiology referring number	123456
Radiology request healthcare institution identifier	3140834764
Radiology request healthcare institution long name	Kowloon Hospital
Radiology request healthcare institution local name	Kowloon Hospital
Radiology examination datetime	20100612000000.000
Radiology modality code	CT
Radiology examination name	Abdomen and pelvic
Radiology examination healthcare staff identifier *(Retained for backward compatibility to v1.0.0)*	
Radiology examination healthcare staff English name prefix *(Retained for backward compatibility to v1.0.0)*	
Radiology examination healthcare staff English name	Dr Chan Siu Ming
Radiology examination healthcare staff English given name	

(Retained for backward compatibility to v1.0.0)	
Radiology examination healthcare staff Chinese name	陳小明教授
Radiology examination healthcare staff Chinese name suffix *(Retained for backward compatibility to v1.0.0)*	
Radiology examination healthcare staff type code	C
Radiology examination healthcare staff type description	Chief procedure healthcare staff
Radiology examination healthcare staff type local description	Chief in-charge
Radiology remark	abc
Radiology report title	CT scan of abdomen report
Radiology report date	20100612000000.000
Radiology report - reported by healthcare staff English name	Dr Chan Siu Ming
Radiology report - reported by healthcare staff Chinese name	陳小明教授
Radiology report (Text)	abc
File indicator	1
File name of Radiology report (PDF)	8088450656.BRANCHA.RAD.RAD001.123.pdf.201000000001.20090702084530
Record creation datetime	20100612000000.000
Record creation institution identifier	7060899025
Record creation institution name	Princess Margaret Hospital
Record update datetime	*N/A*
Record update institution identifier	*N/A*
Record update institution name	*N/A*
Radiology registration number	23456

Message Example in Data Compliance Level 3

```
<?xml version="1.0" encoding="UTF-8"?>
<ORU_R01 xmlns="urn:hl7-org:v2xml"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:hl7-org:v2xml ORU_R01.xsd">
  <MSH>
   <MSH.1>|</MSH.1>
  <MSH.2>^~\&amp;</MSH.2>
  <MSH.3>
   <HD.1>CMS 3.0</HD.1>
  </MSH.3>
  <MSH.4>
   <HD.1>8658917541</HD.1>
  </MSH.4>
  <MSH.5>
   <HD.1>EIF</HD.1>
  </MSH.5>
  <MSH.6>
```



```
    <HD.1>eHR</HD.1>
   </MSH.6>
   <MSH.7>
    <TS.1>20110427181041</TS.1>
   </MSH.7>
   <MSH.8>3</MSH.8>
   <MSH.9>
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    <MSG.2>R01</MSG.2>
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   </MSH.9>
   <MSH.10>20110427181041</MSH.10>
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   </MSH.11>
   <MSH.12>
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   </MSH.12>
   <MSH.15>NE</MSH.15>
   <MSH.21>
    <EI.1>eHRSS-1.4.0</EI.1>
   </MSH.21>
  </MSH>
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```



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        <CNN.10>Chief in-charge</CNN.10>
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```



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       <ED.4>Base64</ED.4>
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    <ORU_R01.OBSERVATION>
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      <OBX.2>ST</OBX.2>
      <OBX.3>
       <CE.1>Radiology report (text)</CE.1>
      </OBX.3>
      <OBX.5>abc</OBX.5>
      <OBX.11>F</OBX.11>
```



```xml
     </OBX>
    </ORU_R01.OBSERVATION>
    <ORU_R01.OBSERVATION>
     <OBX>
      <OBX.2>ST</OBX.2>
      <OBX.3>
       <CE.1>Radiology remark</CE.1>
      </OBX.3>
      <OBX.5>abc</OBX.5>
      <OBX.11>F</OBX.11>
     </OBX>
    </ORU_R01.OBSERVATION>
    <ORU_R01.OBSERVATION>
     <OBX>
      <OBX.2>ST</OBX.2>
      <OBX.3>
       <CE.1>Last update datetime</CE.1>
      </OBX.3>
      <OBX.5>20100612000000.000</OBX.5>
      <OBX.11>F</OBX.11>
     </OBX>
     <OBX>
      <OBX.2>ST</OBX.2>
      <OBX.3>
       <CE.1>Radiology registration number</CE.1>
      </OBX.3>
      <OBX.5>23456</OBX.5>
      <OBX.11>F</OBX.11>
     </OBX>
    </ORU_R01.OBSERVATION>
   </ORU_R01.ORDER_OBSERVATION>
  </ORU_R01.PATIENT_RESULT>
 </ORU_R01>
```


14.1.2 Overriding Existing Radiology Record (S2)

Example Data

Data Field	Sample Value
eHR number	201000000001
HKIC number	A1234563
Type of document	ID *(Refer the "Document Type" published in eHealth Record Office website)*
Identity document number	A1234563
English surname	Chan
English given name	Tai Man
English full name	Chan, Tai Man
Sex	M
Date of birth	2009-01-01
Transaction datetime	20100612000000.000
Transaction type	U
Last update datetime	20100612000000.000
Episode number	HN1234567
Attendance institute identifier	2134960588
eHR record type	RAD
Radiology examination record key	RAD001
Radiology image accession number	HKSXR0700000101H
Radiology referring number	123456
Radiology request healthcare institution identifier	3140834764
Radiology request healthcare institution long name	Kowloon Hospital
Radiology request healthcare institution local name	Kowloon Hospital
Radiology examination datetime	20100612000000.000
Radiology modality code	CT
Radiology examination name	Abdomen and pelvic
Radiology examination healthcare staff identifier *(Retained for backward compatibility to v1.0.0)*	
Radiology examination healthcare staff English name prefix *(Retained for backward compatibility to v1.0.0)*	
Radiology examination healthcare staff English name	Dr Chan Siu Ming
Radiology examination healthcare staff English given name *(Retained for backward compatibility to v1.0.0)*	
Radiology examination healthcare staff Chinese name	陳小明教授
Radiology examination healthcare staff Chinese name suffix	

(Retained for backward compatibility to v1.0.0)	
Radiology examination healthcare staff type code	C
Radiology examination healthcare staff type description	Chief procedure healthcare staff
Radiology examination healthcare staff type local description	Chief in-charge
Radiology remark	abc
Radiology report title	CT scan of abdomen report
Radiology report date	20100612000000.000
Radiology report - reported by healthcare staff English name	Dr Chan Siu Ming
Radiology report - reported by healthcare staff Chinese name	陳小明教授
Radiology report (Text)	abc
File indicator	1
File name of Radiology report (PDF)	8088450656.BRANCHA.RAD.RAD001.123.pdf.201000000001.20090702084530
Record creation datetime	*N/A*
Record creation institution identifier	*N/A*
Record creation institution name	*N/A*
Record update datetime	20100612000000.000
Record update institution identifier	7060899025
Record update institution name	Princess Margaret Hospital
Radiology registration number	23456

Message Example in Data Compliance Level 3

```
<?xml version="1.0" encoding="UTF-8"?>
<ORU_R01 xmlns="urn:hl7-org:v2xml"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:hl7-org:v2xml ORU_R01.xsd">
  <MSH>
   <MSH.1>|</MSH.1>
  <MSH.2>^~\&amp;</MSH.2>
  <MSH.3>
   <HD.1>CMS 3.0</HD.1>
  </MSH.3>
  <MSH.4>
   <HD.1>8658917541</HD.1>
  </MSH.4>
  <MSH.5>
   <HD.1>EIF</HD.1>
  </MSH.5>
  <MSH.6>
   <HD.1>eHR</HD.1>
  </MSH.6>
  <MSH.7>
   <TS.1>20110427181041</TS.1>
  </MSH.7>
```



```
  <MSH.8>3</MSH.8>
  <MSH.9>
   <MSG.1>ORU</MSG.1>
   <MSG.2>R01</MSG.2>
   <MSG.3>ORU_R01</MSG.3>
  </MSH.9>
  <MSH.10>20110427181041</MSH.10>
  <MSH.11>
   <PT.1>P</PT.1>
  </MSH.11>
  <MSH.12>
   <VID.1>2.5</VID.1>
  </MSH.12>
  <MSH.15>NE</MSH.15>
  <MSH.21>
   <EI.1>eHRSS-1.4.0</EI.1>
  </MSH.21>
 </MSH>
 <ORU_R01.PATIENT_RESULT>
 <ORU_R01.PATIENT>
  <PID>
   <PID.2>
    <CX.1>201000000001</CX.1>
   </PID.2>
   <PID.3>
    <CX.1>A1234563</CX.1>
    <CX.5>ID</CX.5>
   </PID.3>
   <PID.5>
    <XPN.1><FN.1>Chan</FN.1></XPN.1>
    <XPN.2>Tai Man</XPN.2>
    <XPN.9><CE.2>CHAN, TAI MAN</CE.2></XPN.9>
   </PID.5>
   <PID.7>
    <TS.1>20090101</TS.1>
   </PID.7>
   <PID.8>M</PID.8>
  </PID>
  <ORU_R01.VISIT>
   <PV1>
    <PV1.2>I</PV1.2>
    <PV1.19>
     <CX.1>HN1234567</CX.1>
     <CX.6><HD.1>2134960588</HD.1></CX.6>
    </PV1.19>
   </PV1>
  </ORU_R01.VISIT>
 </ORU_R01.PATIENT>
  <ORU_R01.ORDER_OBSERVATION>
   <ORC>
    <ORC.1>NW</ORC.1>
    <ORC.2>
     <EI.1>123456</EI.1>
    </ORC.2>
    <ORC.3>
     <EI.1>HKSXR0700000101H</EI.1>
    </ORC.3>
    <ORC.9>
     <TS.1>20100612000000.000</TS.1>
    </ORC.9>
    <ORC.10>
```



```
      <XCN.1>Update</XCN.1>
      <XCN.19><TS.1>20100612000000.000</TS.1></XCN.19>
      <XCN.23>
       <CWE.1>7060899025</CWE.1>
       <CWE.2>Princess Margaret Hospital</CWE.2>
      </XCN.23>
     </ORC.10>
     <ORC.12>
      <XCN.1>3140834764</XCN.1>
      <XCN.2>
       <FN.1>Kowloon Hospital</FN.1>
       <FN.3>Kowloon Hospital</FN.3>
      </XCN.2>
     </ORC.12>
     <ORC.25>
      <CWE.1>U</CWE.1>
     </ORC.25>
    </ORC>
    <OBR>
     <OBR.2>
      <EI.1>RAD001</EI.1>
     </OBR.2>
     <OBR.4>
      <CE.1>Abdomen and pelvic</CE.1>
      <CE.5>RAD</CE.5>
     </OBR.4>
     <OBR.7>
      <TS.1>20100612000000.000</TS.1>
     </OBR.7>
     <OBR.24>CT</OBR.24>
     <OBR.32>
      <NDL.1>
       <CNN.2>Dr Chan Siu Ming</CNN.2>
       <CNN.4>陳小明教授</CNN.4>
      </NDL.1>
     </OBR.32>
     <OBR.34>
      <NDL.1>
       <CNN.1></CNN.1>
       <CNN.2>Dr Chan Siu Ming</CNN.2>
       <CNN.3></CNN.3>
       <CNN.4>陳小明教授</CNN.4>
       <CNN.5></CNN.5>
       <CNN.6></CNN.6>
       <CNN.8>C:Chief procedure healthcare staff</CNN.8>
       <CNN.10>Chief in-charge</CNN.10>
      </NDL.1>
     </OBR.34>
    </OBR>
    <ORU_R01.OBSERVATION>
     <OBX>
      <OBX.2>ED</OBX.2>
      <OBX.3>
       <CE.1>1</CE.1>
       <CE.2>CT scan of abdomen report</CE.2>
      </OBX.3>
      <OBX.4>NBL</OBX.4>
      <OBX.5>
       <ED.1>
        <HD.1>
8088450656.BRANCHA.RAD.RAD001.123.pdf.201000000001.20090702084530
```



```
        </HD.1>
      </ED.1>
      <ED.2>multipart</ED.2>
      <ED.3>PDF</ED.3>
      <ED.4>Base64</ED.4>
      <ED.5>
AJVBERi0xLjQNJeLjz9MNCjEwIDAgb2JqIDw8L0xpbmVhcml6ZWQgMS9MIDYzMzkxL08gMTMvRSA
1
NDc0NS9OIDEvVCA2MzE0NC9IIFsgNDE1NiA0NDldPj4NZW5kb2JqDSAgICAgICAgICAgICAgICAg
DQp4cmVmDQoxMCAxOTMNCjAwMDAwMDAwMTYgMDAwMDAgbg0KMDAwMDAwNDYwNSAwMDAwMCBuDQow
MDAwMDA0Njk1IDAwMDAwIG4NCjAwMDAwMDQ3MzUgMDAwMDAgbg0KMDAwMDAwNDg2MyAwMDAwMCBu
DQowMDAwMDA1MDc3IDAwMDAwIG4NCjAwMDAwMDU1NzkgMDAwMDAgbg0KMDAwMDAwNjA0NCAwMDAw
MCBuDQowMDAwMDA3OTExIDAwMDAwIG4NCjAwMDAwMDgzMTEgMDAwMDAgbg0KMDAwMDAwODU3NSAw
MDAwMCBuDQowMDAwMDA5MDY0IDAwMDAwIG4NCjAwMDAwMDk1MjUgMDAwMDAgbg0KMDAwMDAxMDAx
NCAwMDAwMCBuDQowMDAwMDEwMTQyIDAwMDAwIG4NCjAwMDAwMTAzMjMgMDAwMDAgbg0KMDAwMDAx
MDUxMyAwMDAwMCBuDQowMDAwMDEwODg4IDAwMDAwIG4NCjAwMDAwMTA5MjkgMDAwMDAgbg0KMDAw
MDAxMTA5OSAwMDAwMCBuDQowMDAwMDExMjYwIDAwMDAwIG4NCjAwMDAwMTE0ODUgMDAwMDAgbg0K
MDAwMDAxMTc2NiAwMDAwMCBuDQowMDAwMDExOTY0IDAwMDAwIG4NCjAwMDAwMTIyNzMgMDAwMDAg
bg0KMDAwMDAxMjUzMCAwMDAwMCBuDQowMDAwMDEyODE5IDAwMDAwIG4NCjAwMDAwMTMxNTQgMDAw
MDAgbg0KMDAwMDAxMzM5NyAwMDAwMCBuDQowMDAwMDEzNzExIDAwMDAwIG4NCjAwMDAwMTQwNTMg
MDAwMDAgbg0KMDAwMDAxNDIxNiAwMDAwMCBuDQowMDAwMDE0NTUzIDAwMDAwIG4NCjAwMDAwMTQ4
ICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAg
ICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAg
……
……
……
ICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAg
ICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAg
ICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAg
ICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAg
ICAgICAKPD94cGFja2V0IGVuZD0idyI/Pg0KZW5kc3RyZWFtDWVuZG9iag05IDAgb2JqPDwvQ3Jl
YXRpb25EYXRlKEQ6MjAwNjExMjgxOTI0MzcrMDgnMDAnKS9DcmVhdG9yKGR2aXBzXChrXCkgNS44
NiBDb3B5cmlnaHQgMTk5OSBSYWRpY2FsIEV5ZSBTb2Z0d2FyZSkvUHJvZHVjZXIoQWNyb2JhdCBE
aXN0aWxsZXIgNy4wIFwoV2luZG93c1wpKS9Nb2REYXRlKEQ6MjAwNjExMjgxOTI0MzcrMDgnMDAn
KS9UaXRsZShiYXRjaC4xMDQ0NS5kdmkpPj4NZW5kb2JqDXhyZWYNCjAgMTANCjAwMDAwMDAwMDAg
NjU1MzUgZg0KMDAwMDA1NDc0NSAwMDAwMCBuDQowMDAwMDU4OTc0IDAwMDAwIG4NCjAwMDAwNTkw
MDcgMDAwMDAgbg0KMDAwMDA1OTAzMCAwMDAwMCBuDQowMDAwMDU5MDgxIDAwMDAwIG4NCjAwMDAw
NTkxMTIgMDAwMDAgbg0KMDAwMDA1OTMzOSAwMDAwMCBuDQowMDAwMDU5NDIwIDAwMDAwIG4NCjAw
MDAwNjI5MTUgMDAwMDAgbg0KdHJhaWxlcg0KPDwvU2l6ZSAxMD4+DQpzdGFydHhyZWYNCjExNg0K
JSVFT0YNCg==
      </ED.5>
     </OBX.5>
     <OBX.11>F</OBX.11>
     <OBX.14>
      <TS.1>20100612000000.000</TS.1>
     </OBX.14>
    </OBX>
   </ORU_R01.OBSERVATION>
   <ORU_R01.OBSERVATION>
    <OBX>
     <OBX.2>ST</OBX.2>
     <OBX.3>
      <CE.1>Radiology report (text)</CE.1>
     </OBX.3>
     <OBX.5>abc</OBX.5>
     <OBX.11>F</OBX.11>
    </OBX>
   </ORU_R01.OBSERVATION>
   <ORU_R01.OBSERVATION>
    <OBX>
     <OBX.2>ST</OBX.2>
```

```
      <OBX.3>
       <CE.1>Radiology remark</CE.1>
      </OBX.3>
      <OBX.5>abc</OBX.5>
      <OBX.11>F</OBX.11>
     </OBX>
    </ORU_R01.OBSERVATION>
    <ORU_R01.OBSERVATION>
     <OBX>
      <OBX.2>ST</OBX.2>
      <OBX.3>
       <CE.1>Last update datetime</CE.1>
      </OBX.3>
      <OBX.5>20100612000000.000</OBX.5>
      <OBX.11>F</OBX.11>
     </OBX>
     <OBX>
      <OBX.2>ST</OBX.2>
      <OBX.3>
       <CE.1>Radiology registration number</CE.1>
      </OBX.3>
      <OBX.5>23456</OBX.5>
      <OBX.11>F</OBX.11>
     </OBX>
    </ORU_R01.OBSERVATION>
   </ORU_R01.ORDER_OBSERVATION>
  </ORU_R01.PATIENT_RESULT>
</ORU_R01>
```


14.1.3 Deletion of Existing Radiology Record (S3)

Example Data

Data Field	Sample Value
eHR number	201000000001
HKIC number	A1234563
Type of document	ID *(Refer the "Document Type" published in eHealth Record Office website)*
Identity document number	E1234567
English surname	Chan
English given name	Tai Man
English full name	Chan, Tai Man
Sex	M
Date of birth	20090101
Transaction datetime	20100612000000.000
Transaction type	D
Last update datetime	20100612000000.000
Episode number	HN1234567
Attendance institute identifer	2134960588
Radiology examination record key	RAD001

Message Example in Data Compliance Level 3

```
<?xml version="1.0" encoding="UTF-8"?>
<ORU_R01 xmlns="urn:hl7-org:v2xml"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:hl7-org:v2xml ORU_R01.xsd">
 <MSH>
  <MSH.1>|</MSH.1>
  <MSH.2>^~\&amp;</MSH.2>
  <MSH.3>
   <HD.1>CMS 3.0</HD.1>
  </MSH.3>
  <MSH.4>
   <HD.1>8658917541</HD.1>
  </MSH.4>
  <MSH.5>
   <HD.1>EIF</HD.1>
  </MSH.5>
  <MSH.6>
   <HD.1>eHR</HD.1>
  </MSH.6>
  <MSH.7>
   <TS.1>20110427181041</TS.1>
  </MSH.7>
  <MSH.8>3</MSH.8>
  <MSH.9>
   <MSG.1>ORU</MSG.1>
   <MSG.2>R01</MSG.2>
   <MSG.3>ORU_R01</MSG.3>
  </MSH.9>
```



```
  <MSH.10>20110427181041</MSH.10>
  <MSH.11>
   <PT.1>P</PT.1>
  </MSH.11>
  <MSH.12>
   <VID.1>2.5</VID.1>
  </MSH.12>
  <MSH.15>NE</MSH.15>
  <MSH.21>
   <EI.1>eHRSS-1.4.0</EI.1>
  </MSH.21>
 </MSH>
 <ORU_R01.PATIENT_RESULT>
 <ORU_R01.PATIENT>
  <PID>
   <PID.2>
    <CX.1>201000000001</CX.1>
   </PID.2>
   <PID.3>
    <CX.1>A1234563</CX.1>
    <CX.5>ID</CX.5>
   </PID.3>
   <PID.5>
    <XPN.1><FN.1>Chan</FN.1></XPN.1>
    <XPN.2>Tai Man</XPN.2>
    <XPN.9><CE.2>CHAN, TAI MAN</CE.2></XPN.9>
   </PID.5>
   <PID.7>
    <TS.1>20090101</TS.1>
   </PID.7>
   <PID.8>M</PID.8>
  </PID>
  <ORU_R01.VISIT>
   <PV1>
    <PV1.2>I</PV1.2>
    <PV1.19>
     <CX.1>HN1234567</CX.1>
     <CX.6><HD.1>2134960588</HD.1></CX.6>
    </PV1.19>
   </PV1>
  </ORU_R01.VISIT>
 </ORU_R01.PATIENT>
  <ORU_R01.ORDER_OBSERVATION>
   <ORC>
    <ORC.1>NW</ORC.1>
    <ORC.9>
     <TS.1>20100612000000.000</TS.1>
    </ORC.9>
    <ORC.25>
     <CWE.1>D</CWE.1>
    </ORC.25>
   </ORC>
   <OBR>
    <OBR.2>
     <EI.1>RAD001</EI.1>
    </OBR.2>
    <OBR.4>
     <CE.5>RAD</CE.5>
    </OBR.4>
   </OBR>
   <ORU_R01.OBSERVATION>
```



```
      <OBX>
       <OBX.2>ST</OBX.2>
       <OBX.3>
        <CE.1>Last update datetime</CE.1>
       </OBX.3>
       <OBX.4>NBL</OBX.4>
       <OBX.5>20100612000000.000</OBX.5>
       <OBX.11>F</OBX.11>
      </OBX>
     </ORU_R01.OBSERVATION>
    </ORU_R01.ORDER_OBSERVATION>
   </ORU_R01.PATIENT_RESULT>
  </ORU_R01>
```

14.2 RE-MATERIALISATION MESSAGE

Example Data

Data Field	Sample Value
eHR number	201000000001
HKIC number	A1234563
Type of document	ID *(Refer the "Document Type" published in eHealth Record Office website)*
Identity document number	A1234563
English surname	CHAN
English given name	TAI MAN
English full name	CHAN, TAI MAN
Sex	M
Date of birth	2009-01-01 00:00:00.000

Message Example

```
<?xml version="1.0" encoding="UTF-8"?>
<ORU_R01 xmlns="urn:hl7-org:v2xml"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:hl7-org:v2xml ORU_R01.xsd">
 <MSH>
  <MSH.1>|</MSH.1>
  <MSH.2>^~\&amp;</MSH.2>
  <MSH.3>
   <HD.1>CMS 3.0</HD.1>
  </MSH.3>
  <MSH.4>
   <HD.1>8658917541</HD.1>
  </MSH.4>
  <MSH.5>
   <HD.1>EIF</HD.1>
  </MSH.5>
  <MSH.6>
   <HD.1>eHR</HD.1>
  </MSH.6>
  <MSH.7>
   <TS.1>20110427181041</TS.1>
  </MSH.7>
```



```
  <MSH.8>1</MSH.8>
  <MSH.9>
   <MSG.1>ORU</MSG.1>
   <MSG.2>R01</MSG.2>
   <MSG.3>ORU_R01</MSG.3>
  </MSH.9>
  <MSH.10>20110427181041</MSH.10>
  <MSH.11>
   <PT.1>P</PT.1>
  </MSH.11>
  <MSH.12>
   <VID.1>2.5</VID.1>
  </MSH.12>
  <MSH.15>NE</MSH.15>
  <MSH.21>
   <EI.1>eHRSS-1.4.0</EI.1>
  </MSH.21>
 </MSH>
 <ORU_R01.PATIENT_RESULT>
 <ORU_R01.PATIENT>
  <PID>
   <PID.2>
    <CX.1>201000000001</CX.1>
   </PID.2>
   <PID.3>
    <CX.1>A1234563</CX.1>
    <CX.5>ID</CX.5>
   </PID.3>
   <PID.5>
    <XPN.1><FN.1>Chan</FN.1></XPN.1>
    <XPN.2>Tai Man</XPN.2>
    <XPN.9><CE.2>CHAN, TAI MAN</CE.2></XPN.9>
   </PID.5>
   <PID.7>
    <TS.1>20090101</TS.1>
   </PID.7>
   <PID.8>M</PID.8>
  </PID>
  <ORU_R01.VISIT>
   <PV1>
    <PV1.2></PV1.2>
   </PV1>
  </ORU_R01.VISIT>
 </ORU_R01.PATIENT>
  <ORU_R01.ORDER_OBSERVATION>
   <OBR>
    <OBR.4>
     <CE.5>RAD</CE.5>
    </OBR.4>
   </OBR>
   <ORU_R01.OBSERVATION>
    <OBX>
     <OBX.2>ST</OBX.2>
     <OBX.3>
      <CE.1></CE.1>
     </OBX.3>
     <OBX.4>NBL-R</OBX.4>
     <OBX.5></OBX.5>
     <OBX.11>F</OBX.11>
    </OBX>
   </ORU_R01.OBSERVATION>
```



```
  </ORU_R01.ORDER_OBSERVATION>
 </ORU_R01.PATIENT_RESULT>
</ORU_R01>
```


15 APPENDIX A

15.1 ACCESSION NUMBER FORMAT

In eHR Sharable Dataset, accession number is localised accession number while "Accession Number" is a 16-character string, in which it consists of hospital code, department code, year and a running number in Radiology Image Sharing Project.

Where

- Hospital code:
  - assigned by Hospital Authority (e.g. HKS)
  - Length: 3 chars

- Department Code:
  - assigned by Hospital Authority (e.g. XR for XRay)
  - Length: 2 chars

- Year:
  - 2 digits (e.g. 08, 09, 10, …)

- Running Number:
  - Fill leading '0' to the running number to 8 digits (e.g. 1234 -> 00001234)
  - 1 digit check digit (Please refer to the algorithm of Check Digit Calculation)

15.2 ACCESSION NUMBER EXAMPLE

HCP ID	HCP Code	HCP Name/Private Centre	HCP Type
302	HKS	H.K. Sanatorium and Hosp	Private

Department Code	Description	Accession Number
XR	Department of Radiology	HKSXR0700000101H

16 APPENDIX B

16.1 CHECK DIGIT CALCULATION

<table>
<tr><th>Steps</th><th>Procedure</th><th>Working result</th></tr>
<tr><td>1</td><td>Pad the running number with leading ‘0’ to 8 digits and add 2-digit year prefix</td><td>0700000101</td></tr>
<tr><td>2</td><td>Multiply each digit by 13 minus its position no and get the total sum.
<table>
<tr><th>Pos</th><th>Digit</th><th>Multiply (13 – Pos)</th><th>Result</th></tr>
<tr><td>1</td><td>0</td><td>12</td><td>0</td></tr>
<tr><td>2</td><td>7</td><td>11</td><td>77</td></tr>
<tr><td>3</td><td>0</td><td>10</td><td>0</td></tr>
<tr><td>4</td><td>0</td><td>9</td><td>0</td></tr>
<tr><td>5</td><td>0</td><td>8</td><td>0</td></tr>
<tr><td>6</td><td>0</td><td>7</td><td>0</td></tr>
<tr><td>7</td><td>0</td><td>6</td><td>0</td></tr>
<tr><td>8</td><td>1</td><td>5</td><td>5</td></tr>
<tr><td>9</td><td>0</td><td>4</td><td>0</td></tr>
<tr><td>10</td><td>1</td><td>3</td><td>3</td></tr>
<tr><td></td><td></td><td>Total</td><td>85</td></tr>
</table></td><td>85</td></tr>
<tr><td>3</td><td>Divide 11’s complement of the remainder of resultant value by 11.
i.e. 11 – Mod (value, 11)</td><td>3</td></tr>
<tr><td>4</td><td>Sum the resultant value with the “Hospital ID”.
Assume the number is generated from HKS, it’s Hospital ID = 302</td><td>305</td></tr>
<tr><td>5</td><td>Divide remainder of resultant values by 36 and then Plus 1</td><td>18</td></tr>
<tr><td>6</td><td>The result value is representing the position of the following string:
0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ</td><td>H</td></tr>
<tr><td>7</td><td>Result value: 0700000101H</td><td></td></tr>
</table>

17 APPENDIX C

17.1 OBX.3 Possible Value List

Value
Last update datetime
Radiology remark
Radiology report (text)
Radiology registration number

18 LOCALISATION OF HL7 ELEMENT

18.1 EXTEND HL7 TABLE 0291 – SUBTYPE OF REFERENCED DATA

Add a new Subtype item 'PDF'

Value	Description	Comment
PDF	Portable Document Format	

Extended HL7 Table 0291 - Subtype of referenced data

Value	Description	Comment
BASIC	ISDN PCM audio data	
DICOM	Digital Imaging and Communications in Medicine	
FAX	Facsimile data	
GIF	Graphics Interchange Format	
HTML	Hypertext Markup Language	
JOT	Electronic ink data (Jot 1.0 standard)	
JPEG	Joint Photographic Experts Group	
Octet-stream	Uninterpreted binary data	
PICT	PICT format image data	
PostScript	PostScript program	
RTF	Rich Text Format	
SGML	Standard Generalized Markup Language (HL7 (V2.3.1 and later)	
TIFF	TIFF image data	
x-hl7-cda-level-one	HL7 Clinical Document Architecture Level One document	
XML	Extensible Markup Language (HL7 V2.3.1 and later)	
PDF	***Portable Document Format***	• ***A new element is extended***

18.2 LOCALISATION OF HL7 TABLE 0074

- Apply the change ONLY in this Radiology Examination Dataset
- Refer to the code set of “Radiology Modality” in eHR Office website

18.3 LOCALISATION OF THE DATA TYPE OF <PV1-39> TO 'CE'

```
<Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^
<Alternate Identifier (ST)> ^ <Alternate Text (ST)> ^ <Name of
Alternate Coding System (ID)>
```

- Data Type of PV1-39 is changed to CE type
- Apply the change ONLY in this Radiology Examination Dataset

18.4 LOCALISATION OF THE DATA TYPE OF <PID.3>/<CX.5> TO 'IS'

- Data Type of PID.3/CX.5 is changed to IS type
- Apply the change ONLY in this Radiology Examination Dataset
- Refer to the code set of "Type of identity document" in eHR Office website

