Technical Interface Specification
For
eHR Birth Record

Version 1.3.1

Sep 2016

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DOCUMENT SUMMARY

Document Item	Current Value
Document Title	Technical Interface Specification for eHR Birth Record
Creation Date	30 Jun 2012
Date Last Modified	15 Sep 2016
Current Document Issue	Version 1.3.1
Document Description	The paper explains the technical interface for implementing Health Level Seven (HL7) version 2.5 standards messaging and Clinical Document Architecture (CDA) for transferring Birth 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	11 Mar 2013
1.2.0	• Added the remarks in XML PREDEFINED ENTITIES: 'The prefix of namespace in XML in HL7 message is not expected.' • Updated the validation range of ' Birth weight (gm)' to '300-7000gm' • Update the wording of notes applied in: o 'Maturity at birth (week)' o 'Maturity at birth (day)' o Transaction Type • Updated the validation rule of ' Last Update Datetime' from 'Optional' to 'Mandatory' • Align the terms used in eHR Sharing System (eHRSS) Bill: o Participant -> eHR Healthcare Recipient • Update the template of cover page and descriptions in footer • Update the contents in section 'Intellectual Property Rights Notice'	19 Jun 2014
1.3.0	• Fix on MSH.8 • Section 7 Data Upload Requirement is added to state the 3 message upload mode • Section 14.1.4 Re-materialisation message is added to provide the re-materialisation message example • Update Section 9.4.3 OBX - Observation/Result Segment	30 Jan 2015

	OBX.4's remarks • Update Section 14 CDA samples - <text/> tag is put after </clinicalDoc> - Transaction type in update scenario is "U" - Last update datetime is mandatory for delete scenario	
1.3.1	• Sep 2016 Release	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 and Clinical Document Architecture (CDA) for transferring Birth 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 of Hong Kong.

2 SCOPE

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

This document is referring to the health data defined in the eHR sharable dataset domain "Birth" 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 Birth 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. CDA, which contains structured clinical data, can be embedded in the HL7 message for transmission.

To learn more about the HL7 organisation and standard, please refer to the official HL7 website.

4.2 ABBREVIATIONS

Term	Description
BIRTH	Birth Record
CDA	Clinical Document Architecture
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"
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 it 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 Birth 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 and CDA release 2.0 will be implemented for delivering Birth event messages defined by eHR.

- The sharable dataset domain Birth 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 Birth 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 are three major components used to carry the clinical information related to the Birth records when transferring data from healthcare providers to eHR. The three components are:

- HL7 version 2.5 ORU – Unsolicited Observation Message (Event R01)
  ORU^R01 event includes 3 mandatory segments
  - MSH – Message Header Segment
  - OBR – Observation Request Segment
  - OBX – Observation related to OBRs

- Clinical Document Architecture (CDA) Document
- XML Signature:
  In order to ensure the integrity, reputation and authenticity of the message exchange, a XML digital signature is required to digitally sign the whole HL7 document. The eHR system will not accept messages that are not digitally signed.

HL7 version 2.5 ORU will be described in detail in Section 8 *HL7 v2.5 Unsolicited Observation Message* and Clinical Document Architecture will be described in Section 9 *CDA Document*.

8.2 OVERVIEW OF HL7 ORU - UNSOLICITED OBSERVATION MESSAGE

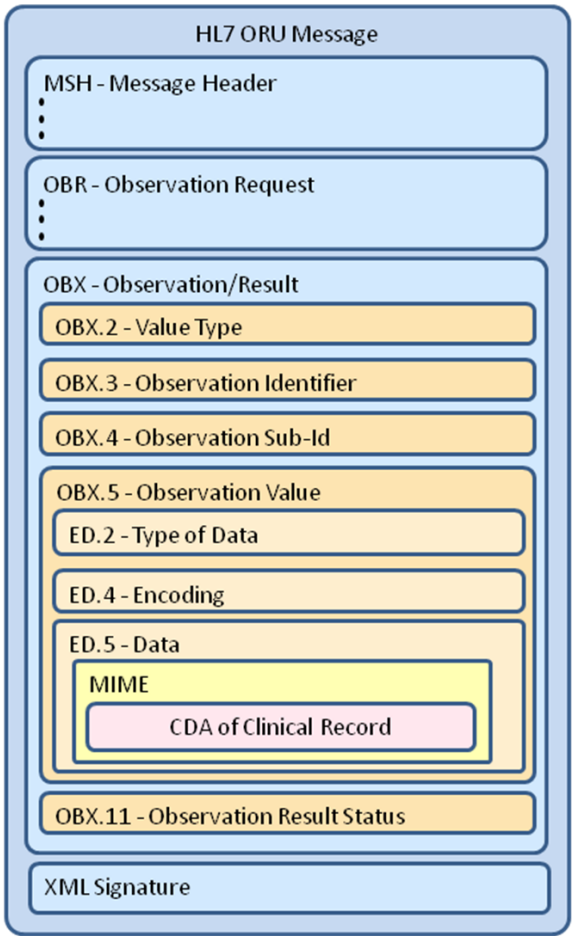

Figure 1 - *HL7 v2.5 Unsolicited Observation Message for Birth Record Transfer*

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

And for the clinical information, the CDA is first Base64-encoded and embedded in MIME format, and then mapped to OBX.5 - ED.5 of ORU Message. In the following section, CDA will be explained in detail.

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 and CDA release 2.0 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 Birth 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.

CDA is used to contain most of the data elements required in 'Birth' domain. Then, the CDA containing structured data 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 Birth records from healthcare provider to eHR. Under HL7-HK Message Standards, clinical data 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	

9.4 DATA MAPPING IN UNSOLICITED OBSERVATION MESSAGE

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

9.4.1 MSH - Message Header

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
#<MSH.7> <TS.1>	26	TS			Date/Time Of Message Time	Message generation datetime	In format: YYYYMMDDhhmmss

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<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	
<MSH.14>	180	ST			Continuation Pointer	NOT USE	
<MSH.15>	2	ID		0155	Accept Acknowledgment Type	"NE"	• Fixed value • **NE**: Never
<MSH.16>	2	ID		0155	Application Acknowledgment Type	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<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>	427	EI	Y		Message Profile Identity	NOT USE	

9.4.2 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>	22	EI			Placer Order Number	NOT USE	
<OBR.3>	22	EI			Filler Order Number	NOT USE	
#<OBR.4> <CE.1>	250	CE			Universal Service Identifier Identifier	 “BIRTH”	 Fixed value
<OBR.5>	2	ID			Priority – OBR	NOT USE	
<OBR.6>	26	TS			Requested Date/Time	NOT USE	
<OBR.7>	26	TS			Observation Date/Time #	NOT USE	
<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	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<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	
<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 –	NOT USE	
<OBR.23>	40	MOC			Charge to Practice +	NOT USE	
<OBR.24>	10	ID		0074	Diagnostic Serv Sect ID	NOT USE	
<OBR.25>	1	ID		0123	Result Status +	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<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	
<OBR.32>	200	NDL			Principal Result Interpreter +	NOT USE	
<OBR.33>	200	NDL	Y		Assistant Result Interpreter +	NOT USE	
<OBR.34>	200	NDL	Y		Technician +	NOT USE	
<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	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<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	
<OBR.43>	250	CE	Y		Planned Patient Transport Comment	NOT USE	
<OBR.44>	250	CE		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	

9.4.3 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	"ED"	• Fixed value • This field defines the datatype of OBX.5 **ED**: Encapsulated Data
#<OBX.3> <CE.1>	250	CE			Observation Identifier Identifier	"BIRTH"	Fixed value
<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.

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<OBX.5> <ED.2> <ED.4> <ED.5>	99999	Varies	Y		Observation Value Type of Data Encoding Data	 “multipart” “A” MIME package	 Fixed value Fixed value **A**: ASCII text Encapsulated data values of embedded CDA and image file
<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 Result
<OBX.12>	26	TS			Effective Date of Reference Range	NOT USE	
<OBX.13>	20	ST			User Defined Access Checks	NOT USE	
<OBX.14>	26	TS			Date/Time of the Observation	NOT USE	
<OBX.15>	250	CE			Producer's ID	NOT USE	

Tag	Len	HL7 Data Type	RP/#	TBL#	Element Name	Fields	Remarks
<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"

No.	XML Tag	XPath	Attribute	Element Name	Mandatory (M) / Optional(O)	Remarks
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
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

No.	XML Tag	XPath	Attribute	Element Name	Mandatory (M) / Optional(O)	Remarks
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	
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 CDA DOCUMENT

The HL7 Clinical Document Architecture (CDA) is a document mark-up standard that specifies the structure and semantics of "clinical documents" for the purpose of exchanging clinical information. It can be exchanged as a Multipurpose Internet Mail Extensions (MIME, RFC 2046) package, encoded as an encapsulated data type (ED). For the preparation of encoded MIME, please refer to Section 11 – *Preparation of Message for Data Transfer*.

10.1 CDA DOCUMENT STRUCTURE OVERVIEW

Under HL7-HK Message Standards, two types of information will be included in CDA document, which are:

- CDA General Information
- Clinical Information related to HCR Identity Information, Healthcare Provider Information and Birth record data

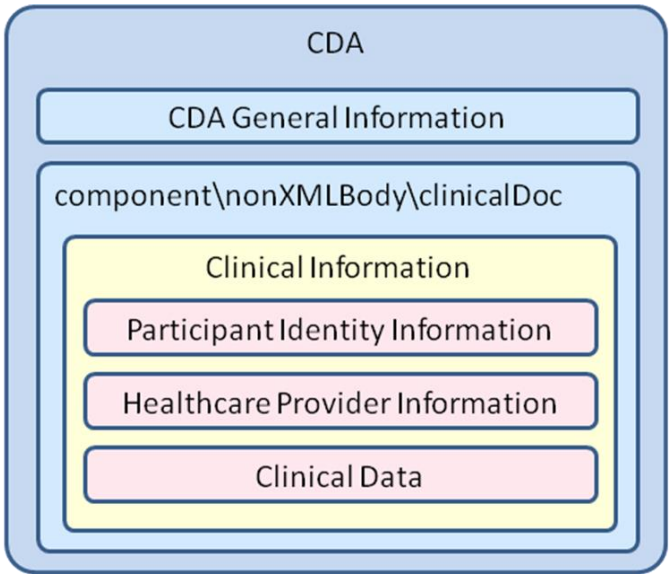

Figure 2 - *Overview of CDA for Birth*

Clinical data of subject domain will be wrapped by the <nonXMLBody> element within the <component> element. In *Section 9.3 - CDA Document Skeleton* will introduce the structure and contents required in Birth.

10.2 BIRTH DATASET

Birth record may be constituted of Birth data. Each Birth record will have a unique record key.

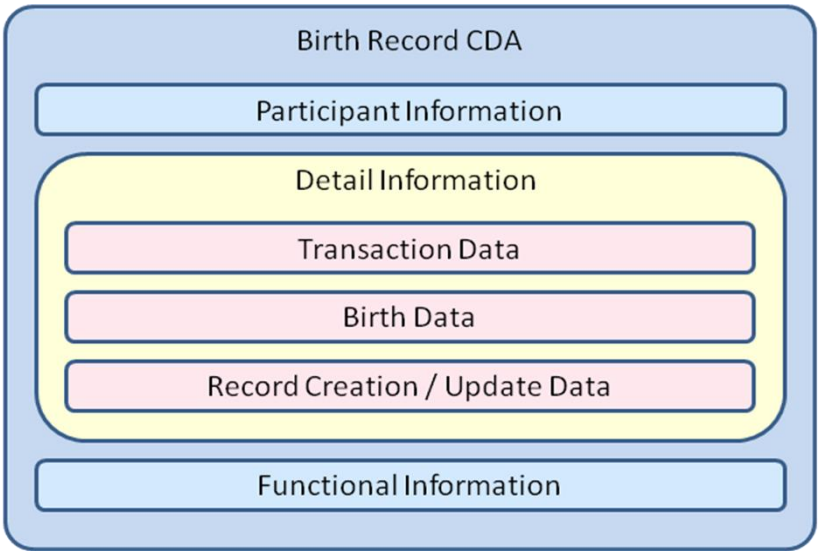

Figure 3 - *Overview of an Birth record CDA*

Final Birth record will be accepted by eHR for data exchange and uploaded to eHR within a single ORU HL7 Message in the OBX.5 segments. Please refer to Figure 1 - *HL7 v2.5 Unsolicited Observation Message for Birth Record Transfer* for the message structure.

10.3 CDA DOCUMENT SKELETON

```
<ClinicalDocument xmlns="…" xmlns:xsi="…" xsi:schemaLocation="…">

  … Start of CDA Header …
  <typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/>
  <id/>
  <code code="BIRTH"/>
  <title>Birth Record</title>
  <effectiveTime/>
  <confidentialityCode/>
  <recordTarget>
    <patientRole>
      <id/>
    </patientRole>
  </recordTarget>
  <author>
    <time/>
    <assignedAuthor>
      <id/>
    </assignedAuthor>
  </author>
  <custodian>
    <assignedCustodian>
      <representedCustodianOrganization>
        <id/>
      </representedCustodianOrganization>
    </assignedCustodian>
  </custodian>
  … Start of CDA Body …
  <component>
    <nonXMLBody>
      <clinicalDoc>
        <participant>
          <ehr_no/>
          <hkid/>
          <doc_type/>
          <doc_no/>
          <person_eng_surname/>
          <person_eng_given_name/>
          <person_eng_full_name/>
          <sex/>
          <birth_date/>
        </participant>
        <detail>
            <record_key>BIRTH001</record_key>
            <transaction_dtm/>
            <transaction_type/>
            <last_update_dtm/>
            <episode_no/>
            <attendance_inst_id/>
            <birth_datetime/>
            <birth_inst_cd/>
            <birth_inst_desc/>
            <birth_inst_lt_desc/>
            <birth_loc_cd/>
            <birth_loc_desc/>
            <birth_loc_lt_desc/>
            <birth_maturity_week/>
```

CDA General Information

HCR Identity

Transaction Data

Birth Data

```
            <birth_maturity_day/>
            <birth_mode/>
            <birth_membrane_ruptured_duration/>
            <birth_apgar_score_1min/>
            <birth_apgar_score_5min/>
            <birth_apgar_score_10min/>
            <birth_weight/>
            <birth_note/>
            <record_creation_dtm/>
            <record_creation_inst_id/>
            <record_creation_inst_name/>
            <record_update_dtm/>
            <record_update_inst_id/>
            <record_update_inst_name/>
        </detail>
      </clinicalDoc>
     <text/>
    </nonXMLBody>
  </component>
</ClinicalDocument>
```

Birth Data

Record Creation / Update Data

10.4 DATA MAPPING IN CDA FOR HL7-HK MESSAGE STANDARDS

The CDA document is divided into 2 sections: 'CDA General Information' and 'Clinical Information'. The data mapping of each CDA component will be described in following sections:

10.4.1 CDA General Information

A CDA document is wrapped by the <ClinicalDocument> element. Under HL7-HK Message Standards, same set of 'CDA General Information' of CDA is required for ALL Subject Domains. The following table shows the data requirements of CDA document requested by eHR. All the following tag elements and information are necessary to be present in the CDA.

Number	XML Tag	XPath	Attribute	Definition	Maximum Length	Cardinality	Remarks
1	ClinicalDocument	ClinicalDocument		A CDA document is wrapped by the <ClinicalDocument> element		1..1	
1.1			@xmlns	Message namespace	string(500)	1..1	Fixed value: xmlns="urn:hl7-org:v3"
1.2			@xmlns:xsi	XML schema instance namespace	string(500)	1..1	Fixed value: xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
1.3			@xsi:schemaLocation	Physical location of schema documents	string(500)	1..1	Fixed value: xsi:schemaLocation="urn:hl7-org:v3 CDA.xsd"
2	typeId	ClinicalDocument		A technology-neutral explicit		1..1	

Number	XML Tag	XPath	Attribute	Definition	Maximum Length	Cardinality	Remarks
		/ typeId		reference to the CDA, Release 2 specification			
2.1			@root	The OID for HL7 Registered models	string(500)	1..1	Fixed value: “2.16.840.1.113883.1.3”
2.2			@extension	The unique identifier for the CDA, Release 2 Hierarchical description	string(255)	1..1	Fixed value: “POCD_HD000040”
3	id	ClinicalDocument /id		It represents the unique instance identifier (UID) of a clinical document		1..1	Leave the tag blank, i.e. <id/>. Please refer to Section *9.5 Additional Mandatory Elements in CDA for HL7-HK Message Standards.*
4	code	ClinicalDocument /code		It represents the unique code of the document type		1..1	
4.1			@code	The code specifying the particular kind of document	string(20)	1..1	Fixed value: “BIRTH”
5	title	ClinicalDocument /title		It represents the title of the document	string(30)	1..1	Fixed value: “Birth Record”
6	effectiveTime	ClinicalDocument /effectiveTime				1..1	Leave the tag blank, i.e. <effectiveTime/>. Please refer to

Number	XML Tag	XPath	Attribute	Definition	Maximum Length	Cardinality	Remarks
							Section *9.5 Additional Mandatory Elements in CDA for HL7-HK Message Standards.*
6.1			@value	Document creation datetime	string(14)	1..1	In format: YYYYMMDDhhmmss
7	confidentialityCode	ClinicalDocument/confidentialityCode		Confidentiality of the clinical document		1..1	Leave the tag blank, i.e. <confidentialityCode/>. Please refer to Section *9.5 Additional Mandatory Elements in CDA for HL7-HK Message Standards.*
8	recordTarget	ClinicalDocument/recordTarget		The recordTarget represents the medical record that this document belongs to		1..1	Please refer to Section *9.5 Additional Mandatory Elements in CDA for HL7-HK Message Standards.*
9	patientRole	ClinicalDocument/recordTarget/patientRole		A recordTarget is represented as a relationship between a person and an organisation, where the person is in a patient role		1..1	Please refer to Section *9.5 Additional Mandatory Elements in CDA for HL7-HK Message Standards.*
10	id	ClinicalDocument/recordTarget/patientRole/id		Unique identifier of the patient role		1..1	Leave the tag blank, i.e. <id/>. Please refer to Section *9.5 Additional Mandatory Elements in CDA for HL7-HK Message Standards.*

Number	XML Tag	XPath	Attribute	Definition	Maximum Length	Cardinality	Remarks
11	author	ClinicalDocument /author		It represents the humans and/or machines that authored the document		1..1	Please refer to Section *9.5 Additional Mandatory Elements in CDA for HL7-HK Message Standards.*
12	time	ClinicalDocument /author/time		It represents the day and time of the authoring of the original content		1..1	Please refer to Section *9.5 Additional Mandatory Elements in CDA for HL7-HK Message Standards.*
13	assignedAuthor	ClinicalDocument /author/assignedA uthor		An author is a person in the role of an assigned author		1..1	Please refer to Section *9.5 Additional Mandatory Elements in CDA for HL7-HK Message Standards.*
14	id	ClinicalDocument /author/assignedA uthor/id		Unique identifier of the assigned author		1..1	Leave the tag blank, i.e. <id/>. Please refer to Section *9.5 Additional Mandatory Elements in CDA for HL7-HK Message Standards.*
15	custodian	ClinicalDocument /custodian		The custodian is the steward that is entrusted with the care of the document		1..1	Please refer to Section *9.5 Additional Mandatory Elements in CDA for HL7-HK Message Standards.*
16	assignedCustodi an	ClinicalDocument /custodian/assigne dCustodian		A custodian is a scoping organisation in the role of an assigned custodian. The steward organisation is an		1..1	Please refer to Section *9.5 Additional Mandatory Elements in CDA for HL7-HK Message Standards.*

Number	XML Tag	XPath	Attribute	Definition	Maximum Length	Cardinality	Remarks
				entity scoping the role of AssignedCustodian.			
17	representedCustodianOrganization	ClinicalDocument/custodian/assignedCustodian/representedCustodianOrganization		It is the represented custodian organisation that is entrusted with the care of the document.		1..1	Please refer to Section *9.5 Additional Mandatory Elements in CDA for HL7-HK Message Standards.*
18	id	ClinicalDocument/custodian/assignedCustodian/representedCustodianOrganization/id		Unique identifier of represented custodian organisation		1..1	Leave the tag blank, i.e. <id/>. Please refer to Section *9.5 Additional Mandatory Elements in CDA for HL7-HK Message Standards.*
19	text	ClinicalDocument/component/nonXMLBody/text		It is used to reference data that is stored externally to the CDA document or to encode the data directly inline		1..1	Leave the tag blank, i.e. <text/>. Please refer to Section *9.5 Additional Mandatory Elements in CDA for HL7-HK Message Standards.*

10.4.2 Clinical Information

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

In the 'HCR' section, information includes:

- HCR Identity

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

- Transaction Data
- Birth Data
- Birth Record Creation Data
- Birth Record Update Data

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

- Uploading New Birth Record (S1)
- Overriding Existing Birth Record (S2)
- Deletion Existing Birth Record (S3)

For details of these scenarios, please refer to *Data Requirement Specification for Birth Record*.

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

<HCR> Section

Number	Data Field	XML Tag	XPath (prefix:ClinicalDocument/component/nonXMLBody/clinicalDoc/)	Maximum Length	Cardinality			Remarks
					S1	S2	S3	
1.1	eHR number	ehr_no	participant/ehr_no	string(12)	1..1			Fixed length
1.2	HKIC number	hkid	participant/hkid	string(30)	0..1 if [Identity document number] is given 1..1 if [Identity document number] is blank			
1.3	Type of identity document	doc_type	participant/doc_type	string(6)	0..1 if [Identity document number] is blank 1..1 if [Identity document number] is given			Refer to the code set of "Type of identity document" in eHR Office website.
1.4	Identity document number	doc_no	participant/doc_no	string(30)	0..1 if [HKIC number] is given 1..1 if [HKIC number] is blank			
1.5	English surname	person_eng_surname	participant/person_eng_surname	string(40)	0..1 if [English full name] is not blank 1..1 if [English full name] is blank			
1.6	English given name	person_eng_given_name	participant/person_eng_given_name	string(40)	0..1 if [English full name] is not blank 1..1 if [English full name] is blank			

Number	Data Field	XML Tag	XPath (prefix:ClinicalDocument/component/nonXMLBody/clinicalDoc/)	Maximum Length	Cardinality			Remarks
					S1	S2	S3	
1.7	English full name	person_eng_full_name	participant/person_eng_full_name	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.*			Format: [Surname]+[,]+ 1 white space +[Given Name] e.g. CHAN, TAI MAN
1.8	Sex	sex	participant/sex	string(1)	1..1			Refer to the code set of "Sex" in eHR Office website.

Number	Data Field	XML Tag	XPath (prefix:ClinicalDocument/component/nonXMLBody/clinicalDoc/)	Maximum Length	Cardinality			Remarks
					S1	S2	S3	
1.9	Date of birth	birth_date	participant/birth_date	string(23)	1..1			In format: YYYY-MM-DD hh:mm:ss.sss If birth time cannot be provided, the time should be in fixed value “00:00:00.000”. e.g. 2010-01-31 00:00:00.000 Remarks: • If date is exact to ‘Year’ (e.g. 2010), the unknown month and day is suggested to be set as ’01-01’ e.g. 2010-**01-01** 00:00:00.000 • If date is exact to ‘Month’(e.g. 2010-12), the unknown day is suggested to be set as ‘01’ e.g. 2010-12-**01** 00:00:00.000

<Detail> Section

The table below shows the data mapping of clinical information for Birth Record shown in Section 9.3 CDA Document Skeleton.
In general, there are three data compliance levels (Level 1, Level 2, and Level 3).

No.	Data Field	XML Tag	XPath (prefix:ClinicalDocument/component/nonXMLBody/clinicalDoc/)	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	record_key	detail/record_key	string(50)	1..1			1..1			1..1			
2	Transaction datetime	transaction_dtm	detail/transaction_dtm	string(23)	1..1			1..1			1..1			In format: YYYY-MM-DD hh:mm:ss.sss e.g. 2010-01-31 16:30:05.005
3	Transaction type	transaction_type	detail/transaction_type	string(1)	1..1			1..1			1..1			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 (prefix:ClinicalDocument/component/nonXMLBody/clinicalDoc/)	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	last_update_dtm	detail/last_update_dtm	string(23)	1..1			1..1			1..1			In format: YYYY-MM-DD hh:mm:ss.sss e.g. 2010-01-31 16:30:05.005
5	Episode number	episode_no	detail/episode_no	string(20)	0..1			0..1			0..1			
6	Attendance institution identifier	attendance_inst_id	detail/attendance_inst_id	string(10)	0..1			0..1			0..1			Fixed length
7	Birth datetime	birth_datetime	detail/birth_datetime	string(23)	1..1		N/A	1..1		N/A	1..1		N/A	In format: YYYY-MM-DD hh:mm:ss.sss If birth time cannot be provided, the time should be in fixed value “00:00:00.000”. e.g. 2010-01-31 00:00:00.000
8	Birth institution code	birth_inst_cd	detail/birth_inst_cd	string(5)	N/A			N/A			1..1		N/A	Refer to the code set of “Birth institution” in eHR Office website

No.	Data Field	XML Tag	XPath (prefix:ClinicalDocument/component/nonXMLBody/clinicalDoc/)	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	
9	Birth institution description	birth_inst_desc	detail/birth_inst_desc	string(255)	N/A			N/A			1..1		N/A	Refer to the code set of “Birth institution” in eHR Office website
10	Birth institution local description	birth_inst_lt_desc	detail/birth_inst_lt_desc	string(255)	1..1		N/A	1..1		N/A	0..1		N/A	
11	Birth location code	birth_loc_cd	detail/birth_loc_cd	string(3)	N/A			N/A			0..1		N/A	Refer to the code set of “Birth location” in eHR Office website
12	Birth location description	birth_loc_desc	detail/birth_loc_desc	string(255)	N/A			N/A			1..1 if [Birth location code] is given N/A if [Birth location code] is blank		N/A	Refer to the code set of “Birth location” in eHR Office website

No.	Data Field	XML Tag	XPath (prefix:ClinicalDocument/component/nonXMLBody/clinicalDoc/)	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	Birth location local description	birth_loc_lt_desc	detail/birth_loc_lt_desc	string(255)	N/A			0..1		N/A	1..1 if [Birth location code] is given N/A if [Birth location code] is blank		N/A	
14	Maturity at birth (week)	birth_maturity_week	detail/birth_maturity_week	string(2)	N/A			0..1		N/A	0..1		N/A	Value within 20 to 44
15	Maturity at birth (day)	birth_maturity_day	detail/birth_maturity_day	string(1)	N/A			0..1 if [Maturity at birth (week)] is given N/A if [Maturity at birth (week)] is blank		N/A	0..1 if [Maturity at birth (week)] is given N/A if [Maturity at birth (week)] is blank		N/A	Value within 1 to 6
16	Mode of birth	birth_mode	detail/birth_mode	string(255)	N/A			0..1		N/A	0..1		N/A	

No.	Data Field	XML Tag	XPath (prefix:ClinicalDocument/component/nonXMLBody/clinicalDoc/)	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	
17	Duration of membrane ruptured (hour)	birth_membrane_ruptured_duration	detail/birth_membrane_ruptured_duration	string(3)	N/A			0..1		N/A	0..1		N/A	
18	Apgar score (1 min)	birth_apgar_score_1min	detail/birth_apgar_score_1min	string(2)	N/A			0..1		N/A	0..1		N/A	value within 0 to 10
19	Apgar score (5 min)	birth_apgar_score_5min	detail/birth_apgar_score_5min	string(2)	N/A			0..1		N/A	0..1		N/A	value within 0 to 10
20	Apgar score (10 min)	birth_apgar_score_10min	detail/birth_apgar_score_10min	string(2)	N/A			0..1		N/A	0..1		N/A	value within 0 to 10
21	Birth weight (gm)	birth_weight	detail/birth_weight	string(4)	N/A			0..1		N/A	0..1		N/A	value between 300 to 7000
22	Birth note	birth_note	detail/birth_note	string(2000)	0..1		N/A	0..1		N/A	0..1		N/A	
23	Record creation datetime	record_update_dtm	detail/record_creation_dtm	string(23)	0..1		N/A	0..1		N/A	0..1		N/A	In format: YYYY-MM-DD hh:mm:ss.sss e.g. 2010-01-31 16:30:05.005
24	Record creation institution identifier	record_creation_inst_id	detail/record_creation_inst_id	string(10)	0..1		N/A	0..1		N/A	0..1		N/A	Fixed length

No.	Data Field	XML Tag	XPath (prefix:ClinicalDocument/component/nonXMLBody/clinicalDoc/)	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	
25	Record creation institution name	record_creation_inst_name	detail/record_creation_inst_name	string(255)	0..1		N/A	0..1		N/A	0..1		N/A	
26	Record last update datetime	record_update_dtm	detail/record_update_dtm	string(23)	0..1		N/A	0..1		N/A	0..1		N/A	In format: YYYY-MM-DD hh:mm:ss.sss e.g. 2010-01-31 16:30:05.005
27	Record update institution identifier	record_update_inst_id	detail/record_update_inst_id	string(10)	0..1		N/A	0..1		N/A	0..1		N/A	Fixed length
28	Record update institution name	record_update_inst_name	detail/record_update_inst_name	string(255)	0..1		N/A	0..1		N/A	0..1		N/A	

10.5 ADDITIONAL MANDATORY ELEMENTS IN CDA FOR HL7-HK MESSAGE STANDARDS

A CDA document is wrapped by the <ClinicalDocument> element. From Section 9.3 *CDA Document Skeleton*, tag elements which are mandatory under CDA schema but NOT REQUIRED by eHR are highlighted. Required tag elements of CDA under HL7-HK Message Standards will be introduced in Section 9.4 *Data Mapping in CDA under HL7-HK Message Standards*.

For the tag elements which are mandatory under CDA schema but not required by eHR, the value of this tag is allowed to be 'Blank'. For example, tag element "id" is allowed to be 'Blank' in HL7-HK Message Standards, the tag element should be presented as "<id/>" in the CDA.

The table below shows the tag elements which is mandatory under CDA schema but NOT REQUIRED by eHR.

XML Tag	XPath	Definition	Cardinality	Remarks
id	ClinicalDocument/id	It represents the unique instance identifier (UID) of a clinical document	1..1	
confidentialityCode	ClinicalDocument/ confidentialityCode	Confidentiality of the clinical document	1..1	
recordTarget	ClinicalDocument/recordTarget	The recordTarget represents the medical record that this document belongs to	1..1	
patientRole	ClinicalDocument/recordTarget/patientRole	A recordTarget is represented as a relationship between a person and an organisation, where the person is in a patient role	1..1	
id	ClinicalDocument/recordTarget/patientRole/id	Unique identifier of the patient role	1..1	
author	ClinicalDocument/author	It represents the humans and/or machines that authored the document	1..1	
time	ClinicalDocument/author/time	It represents the day and time of the authoring of the original content	1..1	
assignedAuthor	ClinicalDocument/author/a	An author is a person in the role	1..1	

XML Tag	XPath	Definition	Cardinality	Remarks
	ssignedAuthor	of an assigned author		
id	ClinicalDocument/author/assignedAuthor/id	Unique identifier of the assigned author	1..1	
custodian	ClinicalDocument/custodian	The custodian is the steward that is entrusted with the care of the document	1..1	
assignedCustodian	ClinicalDocument/custodian/assignedCustodian	A custodian is a scoping organisation in the role of an assigned custodian. The steward organisation is an entity scoping the role of AssignedCustodian.	1..1	
representedCustodianOrganization	ClinicalDocument/custodian/assignedCustodian/representedCustodianOrganization	It is the represented custodian organisation that is entrusted with the care of the document.	1..1	
id	ClinicalDocument/custodian/assignedCustodian/representedCustodianOrganization/id	Unique identifier of represented custodian organisation	1..1	
text	ClinicalDocument/component/nonXMLBody/text	It is used to reference data that is stored externally to the CDA document or to encode the data directly inline	1..1	

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
CDA in MIME package	UTF-8 base64	MIME 1.0

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

- CDA XSD
- CDA document
- MIME encoder or 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 CDA

1. Prepare CDA document with clinical data according to the message structure and data mapping in this Technical Interface Specification for Birth and Data Requirement for Birth.

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

3. Use MIME encoder or base64 encoder to encode the CDA in Base64.

4. Embed the encoded CDA data in MIME format into OBX.5.5 – ED.5 of the ORU Message. *(Refer to Section 11.4 - Data Mapping for MIME Package for the details of MIME standards)*

5. Save the file of HL7 message, CDA document complying with the file naming convention defined in Section 12 - File Naming Convention.

6. Send out the ORU Message via ebMS to the eHR system.

12.4 DATA MAPPING FOR MIME PACKAGE (CDA)

Below shows the eHR standards structure of a MIME Package. And explanation of the elements inside the MIME package will be shown in the following table.

```
MIME-Version: 1.0
Content-Type: multipart/mixed; boundary=<boundary_value>

--<boundary_value>
Content-Type: text/xml; charset=UTF-8;
name="8088450656.BRANCHA. BIRTH.CDA.20110702084530"
Content-Disposition: attachment;
filename="8088450656.BRANCHA.BIRTH.CDA.20110702084530"
Content-Transfer-Encoding: base64

<base64 encoded string of CDA>
```

CDA Part

Header		Attribute	Mandatory (M) / Optional(O)	Default Value	Remarks
MIME-Version			M	1.0	
Content-Type			M	multipart/mixed	
		boundary	M	*<boundary string>*	*<boundary string>*: typically a long random string that doesn't clash with the body text
<blank line>					
CDA Document	*--<boundary_value>*				
	Content-Type		M	text/xml	
		charset	M	UTF-8	
		name	O	*<file name>*	*<file name>:* The file's original name Format of the file name should be complied with the naming convention specified in Section 12.2 CDA Document Name
	Content-Disposition		M	attachment	
		filename	M	*<file name>*	*<file name>:* The file's original name Format of the file name should be complied with the naming convention specified in Section 12.2 CDA Document Name
	Content-Transfer-Encoding		M	base64	
	<blank line>				
	<BASE64 Content String>				

Remarks:

1. There will be only one CDA Document which must be the first attachment of the MIME.

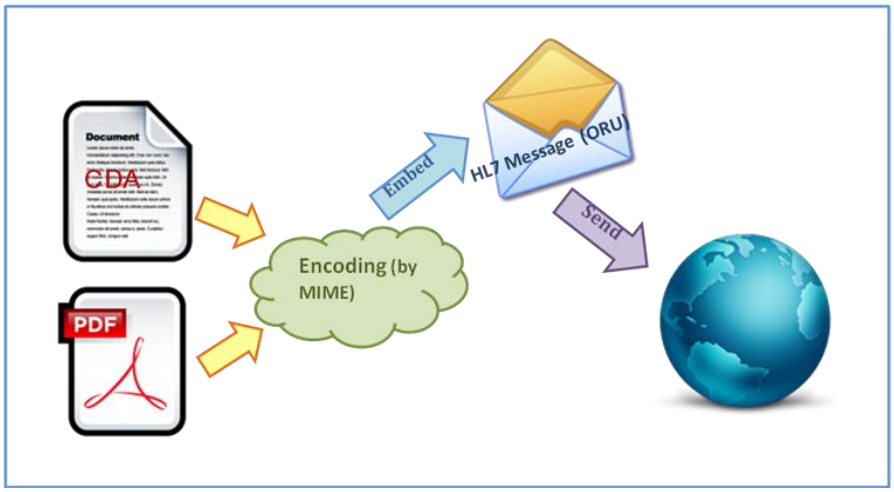

Figure 4 - CDA Document Exchange in HL7 Message

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
- CDA Document

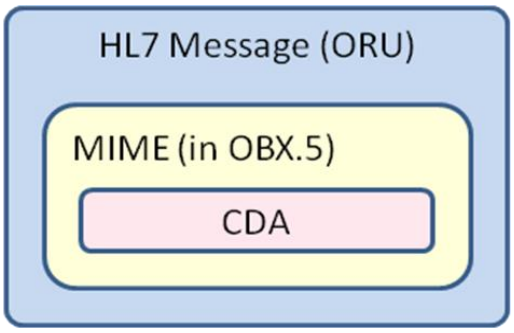

Figure 5- *File Components in HL7 Message*

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.BIRTH.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	Remarks

			Length	
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: BIRTH
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 CDA DOCUMENT NAME

The naming convention of the file which is carrying the CDA document is specified as below:

Format

With Sending Location Code,

<HCP ID>.<Sending Location Code>.<Record Type>.CDA.<Generation Date>

Example
e.g. 8088450656.BRANCHA.BIRTH.CDA.20110702084530

Naming Convention

1. The file name should be in capital letters.
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*>** 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: BIRTH
4	CDA	CDA File	string(3)	Fixed value: CDA
5	Generation Date	File generation date	string(14)	• In format: YYYYMMDDhhmmss

14 EXAMPLE OF HL7-HK MESSAGE STANDARDS

14.1 CDA AND MESSAGE EXAMPLE FOR EACH SCENARIO

14.1.1 Uploading New Birth Record (S1)

Example Data

Data Field	Sample Value
eHR number	201000000001
HKIC number	A1234563
Type of document	ID *(Refer to 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
Record key	BIRTH001
Transaction datetime	2009-12-12 08:00:00.000
Transaction type	I
Last update datetime	2009-12-12 08:00:00.000
Episode number	EP-12345
Attendance institution identifier	1735455950
Birth datetime	2009-01-01 15:18:00.000
Birth institution code	PMH
Birth institution description	Princess Margaret Hospital
Birth institution local description	Princess Margaret Hospital
Birth location code	BBA
Birth location description	Born before arrival
Birth location local description	Born in taxi
Maturity at birth (week)	38
Maturity at birth (day)	5
Mode of birth	LSCS
Duration of membrane ruptured (hour)	2
Apgar score (1 min)	6
Apgar score (5 min)	10
Apgar score (10 min)	10
Birth weight (gm)	3150
Birth note	abc

Record creation datetime	2009-12-12 08:00:00.000
Record creation institution identifier	1735455950
Record creation institution name	Princess Margaret Hospital
Record last update datetime	*N/A*
Record update institution identifier	*N/A*
Record update institution name	*N/A*

CDA Example

```
<?xml version="1.0" encoding="UTF-8"?>
<ClinicalDocument xmlns="urn:hl7-org:v3"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:hl7-org:v3 CDA.xsd">
  <!--
  ************************************
  CDA General Information
  ************************************
  -->
  <typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/>
  <id/>
  <code code="BIRTH"/>
  <title>Birth Record</title>
  <effectiveTime/>
  <confidentialityCode/>
  <recordTarget>
    <patientRole>
      <id/>
    </patientRole>
  </recordTarget>
  <author>
    <time/>
    <assignedAuthor>
      <id/>
    </assignedAuthor>
  </author>
  <custodian>
    <assignedCustodian>
      <representedCustodianOrganization>
        <id/>
      </representedCustodianOrganization>
    </assignedCustodian>
  </custodian>
  <!--
  ************************************
  Clinical Information
  ************************************
  -->
  <component>
    <nonXMLBody>
      <clinicalDoc>
      <participant>
        <ehr_no>201000000001</ehr_no>
        <hkid>A1234563</hkid>
        <doc_type>ID</doc_type>
        <doc_no>A1234563</doc_no>
        <person_eng_surname>CHAN</person_eng_surname>
        <person_eng_given_name>TAI MAN</person_eng_given_name>
```



```
        <person_eng_full_name>CHAN, TAI MAN</person_eng_full_name>
        <sex>M</sex>
        <birth_date>2009-01-01 00:00:00.000</birth_date>
      </participant>
      <detail>
        <record_key>BIRTH001</record_key>
        <transaction_dtm>2009-12-12 08:00:00.000</transaction_dtm>
        <transaction_type>I</transaction_type>
        <last_update_dtm>2009-12-12 08:00:00.000</last_update_dtm>
        <episode_no>EP-12345</episode_no>
        <attendance_inst_id>1735455950</attendance_inst_id>
        <birth_datetime>2009-01-01 15:18:00.000</birth_datetime>
        <birth_inst_cd>PMH</birth_inst_cd>
        <birth_inst_desc>Princess Margaret Hospital</birth_inst_desc>
        <birth_inst_lt_desc>Princess Margaret Hospital</birth_inst_lt_desc>
        <birth_loc_cd>BBA</birth_loc_cd>
        <birth_loc_desc>Born before arrival</birth_loc_desc>
        <birth_loc_lt_desc>Born in taxi</birth_loc_lt_desc>
        <birth_maturity_week>38</birth_maturity_week>
        <birth_maturity_day>5</birth_maturity_day>
        <birth_mode>LSCS</birth_mode>
        <birth_membrane_ruptured_duration>
        2
        </birth_membrane_ruptured_duration>
        <birth_apgar_score_1min>6</birth_apgar_score_1min>
        <birth_apgar_score_5min>10</birth_apgar_score_5min>
        <birth_apgar_score_10min>10</birth_apgar_score_10min>
        <birth_weight>3150</birth_weight>
        <birth_note>abc</birth_note>
        <record_creation_dtm>2009-12-12 08:00:00.000</record_creation_dtm>
        <record_creation_inst_id>1735455950</record_creation_inst_id>
        <record_creation_inst_name>
        Princess Margaret Hospital
        </record_creation_inst_name>
        <record_update_dtm/>
        <record_update_inst_id/>
        <record_update_inst_name/>
      </detail>
      </clinicalDoc>
      <text/>
    </nonXMLBody>
  </component>
</ClinicalDocument>
```


Message Example (with CDA)


```
<?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>8088450656</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>
  <ORU_R01.PATIENT_RESULT>
    <ORU_R01.ORDER_OBSERVATION>
      <OBR>
        <OBR.4>
          <CE.1>BIRTH</CE.1>
        </OBR.4>
      </OBR>
      <ORU_R01.OBSERVATION>
        <OBX>
          <OBX.2>ED</OBX.2>
          <OBX.3>
            <CE.1>BIRTH</CE.1>
          </OBX.3>
          <OBX.4>NBL</OBX.4>
          <OBX.5>
            <ED.2>multipart</ED.2>
            <ED.4>A</ED.4>
            <ED.5>
MIME-Version: 1.0
Content-Type: multipart/mixed; boundary=00163630f5f354355b046be66f6d

--00163630f5f354355b046be66f6d
```



```
Content-Type: text/xml; charset=UTF-8;
name="8088450656.BRANCHA.BIRTH.CDA.20110702084530"
Content-Disposition: attachment;
filename="8088450656.BRANCHA.BIRTH.CDA.20110702084530"
Content-Transfer-Encoding: base64

PD94bWwgdmVyc2lvbj0iMS4wIiBlbmNvZGluZz0iVVRGLTgiPz4NCjwhLS0gQ0RBIFNhbXBs
ZSBmb3IgSEtlSFIgSW50ZXJvcGVyYWJpbGl0eSAtLT4NCg0KPCEtLSBDb3B5cmlnaHQ6IFRo
ZSBvd25lcnNoaXAgb2YgdGhpcyBkb2N1bWVudCBzaG91bGQgYmUgUHJlcGFyYXRvcnkgR3Jv
dXAgb24gZUhSIENvbnRlbnQgJiBTdGFuZGFyZHMgdW5kZXIgZUhSIENvbnRlbnQgYW5kIElu
Zm9ybWF0aW9uIFN0YW5kYXJkcyBXb3JraW5nIEdyb3VwIGFuZCBmdXR1cmUgZUhSIG9mZmlj
ZS4gQWxsIFJpZ2h0cyBSZXNlcnZlZC4gLS0+DQo8IS0tIERpc2NsYWltZXI6IFRoZSBJbmZv
IGZvciBFcGlzb2RlIFN1bW1hcnkgd2hpY2ggYXR0YWNoZWQgdGhlIFBERiAgLS0+DQoNCjxDF0
aW9uPSJ1cm46aGw3LW9yZzp2MyBDREEueHNkIiBjbGFzc0NvZGU9IkRPQ0NMSU4iIG1vb2RD
b2RlPSJFVk4iPg0KDQo8IS0tIA0KKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioq
KioqKg0KSGVhZGVyIEluZm9ybWF0aW9uDQoqKioqKioqKioqKioqKioqKioqKioqKioqKioq
KioqKioqDQotLT4JDQoNCgk8dHlwZUlkIHJvb3Q9IjIuMTYuODQwLjEuMTEzODgzLjEu
MyIgZXh0ZW5zaW9uPSJQT0NEX0hEMDAwMDQwIi8+DQoJPCEtLSB0ZW1wbGF0ZUlkIHJvb3Q9
IjIuMTYuODQwLjEuMTEzODgzLjEwLjIwLjEiLyAtLT4NCgkNCgk8IS0tIERvY3VtZW50IElE
OyB1bmlxdWUsIGFzc2lnbmVkIGJ5IFByb3ZpZGVyL0N1c3RvZGlhbiwgcm9vdCBjb2RlIG9m
ICBQcm92aWRlci9DdXN0b2RpYW4gdG8gYmUgZGVmaW5lZC0tPg0KCTxpZCByb290PSIyLjE2
Ljg0MC4xLjExMzg4My42LjEiIGV4dGVuc2lvbj0iMTIzNDU2NzgiLz4NCgkNCgk8Y29kZSBj
b2RlPSIzNDEzMy05IiBjb2RlU3lzdGVtPSIyLjE2Ljg0MC4xLjExMzg4My42LjEiIGRpc3Bs
dW1lbnQ+DQo=
            </ED.5>
          </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 Birth Record (S2)

Example Data

Data Field	Sample Value
eHR number	201000000001
HKIC number	A1234563
Type of document	ID *(Refer to 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
Record key	BIRTH002
Transaction datetime	2009-12-12 08:00:00.000
Transaction type	U
Last update datetime	2009-12-12 08:00:00.000

Data Field	Sample Value
Episode number	EP-12345
Attendance institution identifier	1735455950
Birth datetime	2009-01-01 15:18:00.000
Birth institution code	PMH
Birth institution description	Princess Margaret Hospital
Birth institution local description	Princess Margaret Hospital
Birth location code	BBA
Birth location description	Born before arrival
Birth location local description	Born in taxi
Maturity at birth (week)	38
Maturity at birth (day)	5
Mode of birth	LSCS
Duration of membrane ruptured (hour)	2
Apgar score (1 min)	5
Apgar score (5 min)	9
Apgar score (10 min)	9
Birth weight (gm)	3144
Birth note	defhgt
Record creation datetime	*N/A*
Record creation institution identifier	*N/A*
Record creation institution name	*N/A*
Record last update datetime	2009-12-12 08:00:00.000
Record update institution identifier	1735455950
Record update institution name	Princess Margaret Hospital

CDA Example

```
<?xml version="1.0" encoding="UTF-8"?>
<ClinicalDocument xmlns="urn:hl7-org:v3"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:hl7-org:v3 CDA.xsd">
  <!--
  ************************************
  CDA General Information
  ************************************
  -->
  <typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/>
  <id/>
  <code code="BIRTH"/>
  <title>Birth Record</title>
  <effectiveTime/>
  <confidentialityCode/>
  <recordTarget>
    <patientRole>
      <id/>
    </patientRole>
  </recordTarget>
```



```
  <author>
    <time/>
    <assignedAuthor>
      <id/>
    </assignedAuthor>
  </author>
  <custodian>
    <assignedCustodian>
      <representedCustodianOrganization>
        <id/>
      </representedCustodianOrganization>
    </assignedCustodian>
  </custodian>
  <!--
  ************************************
  Clinical Information
  ************************************
  -->
  <component>
    <nonXMLBody>
      <clinicalDoc>
        <participant>
          <ehr_no>201000000001</ehr_no>
          <hkid>A1234563</hkid>
          <doc_type>ID</doc_type>
          <doc_no>A1234563</doc_no>
          <person_eng_surname>CHAN</person_eng_surname>
          <person_eng_given_name>TAI MAN</person_eng_given_name>
          <person_eng_full_name>CHAN, TAI MAN</person_eng_full_name>
          <sex>M</sex>
          <birth_date>2009-01-01 00:00:00.000</birth_date>
        </participant>
        <detail>
          <record_key>BIRTH002</record_key>
          <transaction_dtm>2009-12-12 08:00:00.000</transaction_dtm>
          <transaction_type>U</transaction_type>
          <last_update_dtm>2009-12-12 08:00:00.000</last_update_dtm>
          <episode_no>EP-12345</episode_no>
          <attendance_inst_id>1735455950</attendance_inst_id>
          <birth_datetime>2009-01-01 15:18:00.000</birth_datetime>
          <birth_inst_cd>PMH</birth_inst_cd>
          <birth_inst_desc>Princess Margaret Hospital</birth_inst_desc>
          <birth_inst_lt_desc>Princess Margaret
Hospital</birth_inst_lt_desc>
          <birth_loc_cd>BBA</birth_loc_cd>
          <birth_loc_desc>Born before arrival</birth_loc_desc>
          <birth_loc_lt_desc>Born in taxi</birth_loc_lt_desc>
          <birth_maturity_week>38</birth_maturity_week>
          <birth_maturity_day>5</birth_maturity_day>
          <birth_mode>LSCS</birth_mode>
          <birth_membrane_ruptured_duration>
          2
          </birth_membrane_ruptured_duration>
          <birth_apgar_score_1min>5</birth_apgar_score_1min>
          <birth_apgar_score_5min>9</birth_apgar_score_5min>
          <birth_apgar_score_10min>9</birth_apgar_score_10min>
          <birth_weight>3144</birth_weight>
          <birth_note>defhgt</birth_note>
          <record_creation_dtm/>
          <record_creation_inst_id/>
          <record_creation_inst_name/>
```



```
          <record_update_dtm>2009-12-12 08:00:00.000</record_update_dtm>
          <record_update_inst_id>1735455950</record_update_inst_id>
          <record_update_inst_name>
          Princess Margaret Hospital
          </record_update_inst_name>
        </detail>
      </clinicalDoc>
      <text/>
    </nonXMLBody>
  </component>
</ClinicalDocument>
```

Message Example (with CDA)

```
<?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>8088450656</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>
  <ORU_R01.PATIENT_RESULT>
    <ORU_R01.ORDER_OBSERVATION>
      <OBR>
        <OBR.4>
          <CE.1>BIRTH</CE.1>
        </OBR.4>
      </OBR>
      <ORU_R01.OBSERVATION>
        <OBX>
          <OBX.2>ED</OBX.2>
```



```
          <OBX.3>
            <CE.1>BIRTH</CE.1>
          </OBX.3>
          <OBX.4>NBL</OBX.4>
          <OBX.5>
            <ED.2>multipart</ED.2>
            <ED.4>A</ED.4>
            <ED.5>
MIME-Version: 1.0
Content-Type: multipart/mixed; boundary=00163630f5f354355b046be66f6d

--00163630f5f354355b046be66f6d
Content-Type: text/xml; charset=UTF-8;
name="8088450656.BRANCHA.BIRTH.CDA.20110702084530"
Content-Disposition: attachment;
filename="8088450656.BRANCHA.BIRTH.CDA.20110702084530"
Content-Transfer-Encoding: base64

PD94bWwgdmVyc2lvbj0iMS4wIiBlbmNvZGluZz0iVVRGLTgiPz4NCjwhLS0gQ0RBIFNhbXBs
ZSBmb3IgSEtlSFIgSW50ZXJvcGVyYWJpbGl0eSAtLT4NCg0KPCEtLSBDb3B5cmlnaHQ6IFRo
ZSBvd25lcnNoaXAgb2YgdGhpcyBkb2N1bWVudCBzaG91bGQgYmUgUHJlcGFyYXRvcnkgR3Jv
dXAgb24gZUhSIENvbnRlbnQgJiBTdGFuZGFyZHMgdW5kZXIgZUhSIENvbnRlbnQgYW5kIElu
Zm9ybWF0aW9uIFN0YW5kYXJkcyBXb3JraW5nIEdyb3VwIGFuZCBmdXR1cmUgZUhSIG9mZmlj
ZS4gQWxsIFJpZ2h0cyBSZXNlcnZlZC4gLS0+DQo8IS0tIERpc2NsYWltZXI6IFRoZSBJbmZv
IGZvciBFcGlzb2RlIFN1bW1hcnkgd2hpY2ggYXR0YWNoZWQgdGhlIFBERiAgLS0+DQoNCjxDF0
aW9uPSJ1cm46aGw3LW9yZzp2MyBDREEueHNkIiBjbGFzc0NvZGU9IkRPQ0NMSU4iIG1vb2RD
b2RlPSJFVk4iPg0KDQo8IS0tIA0KKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioq
KioqKg0KSGVhZGVyIEluZm9ybWF0aW9uDQoqKioqKioqKioqKioqKioqKioqKioqKioqKioq
KioqKioqDQotLT4JDQoNCgk8dHlwZUlkIHJvb3Q9IjIuMTYuODQwLjEuMTEzODgzLjEu
MyIgZXh0ZW5zaW9uPSJQT0NEX0hEMDAwMDQwIi8+DQoJPCEtLSB0ZW1wbGF0ZUlkIHJvb3Q9
IjIuMTYuODQwLjEuMTEzODgzLjEwLjIwLjEiLyAtLT4NCgkNCgk8IS0tIERvY3VtZW50IElE
OyB1bmlxdWUsIGFzc2lnbmVkIGJ5IFByb3ZpZGVyL0N1c3RvZGlhbiwgcm9vdCBjb2RlIG9m
ICBQcm92aWRlci9DdXN0b2RpYW4gdG8gYmUgZGVmaW5lZC0tPg0KCTxpZCByb290PSIyLjE2
Ljg0MC4xLjExMzg4My42LjEiIGV4dGVuc2lvbj0iMTIzNDU2NzgiLz4NCgkNCgk8Y29kZSBj
b2RlPSIzNDEzMy05IiBjb2RlU3lzdGVtPSIyLjE2Ljg0MC4xLjExMzg4My42LjEiIGRpc3Bs
dW1lbnQ+DQo=
            </ED.5>
          </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 Birth Record (S3)

Example Data

Data Field	Sample Value
eHR number	201000000001
HKIC number	A1234563
Type of document	ID *(Refer to the "Document Type" published in eHealth Record Office website)*
Identity document number	A1234563
English surname	CHAN

Data Field	Sample Value
English given Name	TAI MAN
English full name	CHAN, TAI MAN
Sex	M
Date of birth	2009-01-01 00:00:00.000
Record key	BIRTH003
Transaction datetime	2009-12-12 08:00:00.000
Transaction type	D

CDA Example

```
<?xml version="1.0" encoding="UTF-8"?>
<ClinicalDocument xmlns="urn:hl7-org:v3"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:hl7-org:v3 CDA.xsd">
  <!--
  ************************************
  CDA General Information
  ************************************
  -->
  <typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/>
  <id/>
  <code code="BIRTH"/>
  <title>Birth Record</title>
  <effectiveTime/>
  <confidentialityCode/>
  <recordTarget>
    <patientRole>
      <id/>
    </patientRole>
  </recordTarget>
  <author>
    <time/>
    <assignedAuthor>
      <id/>
    </assignedAuthor>
  </author>
  <custodian>
    <assignedCustodian>
      <representedCustodianOrganization>
        <id/>
      </representedCustodianOrganization>
    </assignedCustodian>
  </custodian>
  <!--
  ************************************
  Clinical Information
  ************************************
  -->
  <component>
    <nonXMLBody>
      <clinicalDoc>
        <participant>
          <ehr_no>201000000001</ehr_no>
          <hkid>A1234563</hkid>
          <doc_type>ID</doc_type>
          <doc_no>A1234563</doc_no>
```



```
          <person_eng_surname>CHAN</person_eng_surname>
          <person_eng_given_name>TAI MAN</person_eng_given_name>
          <person_eng_full_name>CHAN, TAI MAN</person_eng_full_name>
          <sex>M</sex>
          <birth_date>2009-01-01 00:00:00.000</birth_date>
        </participant>
        <detail>
          <record_key>BIRTH003</record_key>
          <transaction_dtm>2009-12-12 08:00:00.000</transaction_dtm>
          <transaction_type>D</transaction_type>
          <last_update_dtm>2009-12-12 08:00:00.000</last_update_dtm>
        </detail>
      </clinicalDoc>
      <text/>
    </nonXMLBody>
  </component>
</ClinicalDocument>
```


Message Example (with CDA)


```
<?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>8088450656</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>
  <ORU_R01.PATIENT_RESULT>
    <ORU_R01.ORDER_OBSERVATION>
      <OBR>
```



```
        <OBR.4>
          <CE.1>BIRTH</CE.1>
        </OBR.4>
      </OBR>
      <ORU_R01.OBSERVATION>
        <OBX>
          <OBX.2>ED</OBX.2>
          <OBX.3>
            <CE.1>BIRTH</CE.1>
          </OBX.3>
          <OBX.4>NBL</OBX.4>
          <OBX.5>
            <ED.2>multipart</ED.2>
            <ED.4>A</ED.4>
            <ED.5>
MIME-Version: 1.0
Content-Type: multipart/mixed; boundary=00163630f5f354355b046be66f6d

--00163630f5f354355b046be66f6d
Content-Type: text/xml; charset=UTF-8;
name="8088450656.BRANCHA.BIRTH.CDA.20110702084530"
Content-Disposition: attachment;
filename="8088450656.BRANCHA.BIRTH.CDA.20110702084530"
Content-Transfer-Encoding: base64

PD94bWwgdmVyc2lvbj0iMS4wIiBlbmNvZGluZz0iVVRGLTgiPz4NCjwhLS0gQ0RBIFNhbXBs
ZSBmb3IgSEtlSFIgSW50ZXJvcGVyYWJpbGl0eSAtLT4NCg0KPCEtLSBDb3B5cmlnaHQ6IFRo
ZSBvd25lcnNoaXAgb2YgdGhpcyBkb2N1bWVudCBzaG91bGQgYmUgUHJlcGFyYXRvcnkgR3Jv
dXAgb24gZUhSIENvbnRlbnQgJiBTdGFuZGFyZHMgdW5kZXIgZUhSIENvbnRlbnQgYW5kIElu
Zm9ybWF0aW9uIFN0YW5kYXJkcyBXb3JraW5nIEdyb3VwIGFuZCBmdXR1cmUgZUhSIG9mZmlj
ZS4gQWxsIFJpZ2h0cyBSZXNlcnZlZC4gLS0+DQo8IS0tIERpc2NsYWltZXI6IFRoZSBJbmZv
IGZvciBFcGlzb2RlIFN1bW1hcnkgd2hpY2ggYXR0YWNoZWQgdGhlIFBERiAgLS0+DQoNCjxDF0
aW9uPSJ1cm46aGw3LW9yZzp2MyBDREEueHNkIiBjbGFzc0NvZGU9IkRPQ0NMSU4iIG1vb2RD
b2RlPSJFVk4iPg0KDQo8IS0tIA0KKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioq
KioqKg0KSGVhZGVyIEluZm9ybWF0aW9uDQoqKioqKioqKioqKioqKioqKioqKioqKioqKioq
KioqKioqDQotLT4JDQoNCgk8dHlwZUlkIHJvb3Q9IjIuMTYuODQwLjEuMTEzODgzLjEu
MyIgZXh0ZW5zaW9uPSJQT0NEX0hEMDAwMDQwIi8+DQoJPCEtLSB0ZW1wbGF0ZUlkIHJvb3Q9
IjIuMTYuODQwLjEuMTEzODgzLjEwLjIwLjEiLyAtLT4NCgkNCgk8IS0tIERvY3VtZW50IElE
OyB1bmlxdWUsIGFzc2lnbmVkIGJ5IFByb3ZpZGVyL0N1c3RvZGlhbiwgcm9vdCBjb2RlIG9m
ICBQcm92aWRlci9DdXN0b2RpYW4gdG8gYmUgZGVmaW5lZC0tPg0KCTxpZCByb290PSIyLjE2
Ljg0MC4xLjExMzg4My42LjEiIGV4dGVuc2lvbj0iMTIzNDU2NzgiLz4NCgkNCgk8Y29kZSBj
b2RlPSIzNDEzMy05IiBjb2RlU3lzdGVtPSIyLjE2Ljg0MC4xLjExMzg4My42LjEiIGRpc3Bs
dW1lbnQ+DQo=
            </ED.5>
          </OBX.5>
          <OBX.11>F</OBX.11>
        </OBX>
      </ORU_R01.OBSERVATION>
    </ORU_R01.ORDER_OBSERVATION>
  </ORU_R01.PATIENT_RESULT>
</ORU_R01>
```


14.1.4 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

CDA Example

```
<?xml version="1.0" encoding="UTF-8"?>
<ClinicalDocument xsi:schemaLocation="urn:hl7-org:v3 CDA.xsd"
xmlns="urn:hl7-org:v3" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance">
  <!--
  ************************************
  CDA General Information
  ************************************
  -->
  <typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/>
  <id/>
  <code code="BIRTH"/>
  <title>Birth Record</title>
  <effectiveTime/>
  <confidentialityCode/>
  <recordTarget>
    <patientRole>
      <id/>
    </patientRole>
  </recordTarget>
  <author>
    <time/>
    <assignedAuthor>
      <id/>
    </assignedAuthor>
  </author>
  <custodian>
    <assignedCustodian>
      <representedCustodianOrganization>
        <id/>
      </representedCustodianOrganization>
    </assignedCustodian>
  </custodian>
  <!--
  ************************************
  Clinical Information
  ************************************
  -->
  <component>
    <nonXMLBody>
      <clinicalDoc>
        <participant>
          <ehr_no>201000000001</ehr_no>
          <hkid>A1234563</hkid>
          <doc_type>ID</doc_type>
```



```
            <doc_no>A1234563</doc_no>
            <person_eng_surname>CHAN</person_eng_surname>
            <person_eng_given_name>TAI MAN</person_eng_given_name>
            <person_eng_full_name>CHAN, TAI MAN</person_eng_full_name>
            <sex>M</sex>
            <birth_date>2009-01-01 00:00:00.000</birth_date>
          </participant>
        </clinicalDoc>
        <text/>
      </nonXMLBody>
    </component>
</ClinicalDocument>
```

Message Example (with CDA)

```
<?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>8088450656</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>
  <ORU_R01.PATIENT_RESULT>
    <ORU_R01.ORDER_OBSERVATION>
      <OBR>
        <OBR.4>
          <CE.1>BIRTH</CE.1>
        </OBR.4>
      </OBR>
      <ORU_R01.OBSERVATION>
```



```
        <OBX>
          <OBX.2>ED</OBX.2>
          <OBX.3>
            <CE.1>BIRTH</CE.1>
          </OBX.3>
          <OBX.4>NBL-R</OBX.4>
          <OBX.5>
            <ED.2>multipart</ED.2>
            <ED.4>A</ED.4>
            <ED.5>
MIME-Version: 1.0
Content-Type: multipart/mixed; boundary=00163630f5f354355b046be66f6d

--00163630f5f354355b046be66f6d
Content-Type: text/xml; charset=UTF-8;
name="8088450656.BRANCHA.BIRTH.CDA.20110702084530"
Content-Disposition: attachment;
filename="8088450656.BRANCHA.BIRTH.CDA.20110702084530"
Content-Transfer-Encoding: base64

PD94bWwgdmVyc2lvbj0iMS4wIiBlbmNvZGluZz0iVVRGLTgiPz4NCjwhLS0gQ0RBIFNhbXBs
ZSBmb3IgSEtlSFIgSW50ZXJvcGVyYWJpbGl0eSAtLT4NCg0KPCEtLSBDb3B5cmlnaHQ6IFRo
ZSBvd25lcnNoaXAgb2YgdGhpcyBkb2N1bWVudCBzaG91bGQgYmUgUHJlcGFyYXRvcnkgR3Jv
dXAgb24gZUhSIENvbnRlbnQgJiBTdGFuZGFyZHMgdW5kZXIgZUhSIENvbnRlbnQgYW5kIElu
Zm9ybWF0aW9uIFN0YW5kYXJkcyBXb3JraW5nIEdyb3VwIGFuZCBmdXR1cmUgZUhSIG9mZmlj
ZS4gQWxsIFJpZ2h0cyBSZXNlcnZlZC4gLS0+DQo8IS0tIERpc2NsYWltZXI6IFRoZSBJbmZv
IGZvciBFcGlzb2RlIFN1bW1hcnkgd2hpY2ggYXR0YWNoZWQgdGhlIFBERiAgLS0+DQoNCjxDF0
aW9uPSJ1cm46aGw3LW9yZzp2MyBDREEueHNkIiBjbGFzc0NvZGU9IkRPQ0NMSU4iIG1vb2RD
b2RlPSJFVk4iPg0KDQo8IS0tIA0KKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioq
KioqKg0KSGVhZGVyIEluZm9ybWF0aW9uDQoqKioqKioqKioqKioqKioqKioqKioqKioqKioq
KioqKioqDQotLT4JDQoNCgk8dHlwZUlkIHJvb3Q9IjIuMTYuODQwLjEuMTEzODgzLjEu
MyIgZXh0ZW5zaW9uPSJQT0NEX0hEMDAwMDQwIi8+DQoJPCEtLSB0ZW1wbGF0ZUlkIHJvb3Q9
IjIuMTYuODQwLjEuMTEzODgzLjEwLjIwLjEiLyAtLT4NCgkNCgk8IS0tIERvY3VtZW50IElE
OyB1bmlxdWUsIGFzc2lnbmVkIGJ5IFByb3ZpZGVyL0N1c3RvZGlhbiwgcm9vdCBjb2RlIG9m
ICBQcm92aWRlci9DdXN0b2RpYW4gdG8gYmUgZGVmaW5lZC0tPg0KCTxpZCByb290PSIyLjE2
Ljg0MC4xLjExMzg4My42LjEiIGV4dGVuc2lvbj0iMTIzNDU2NzgiLz4NCgkNCgk8Y29kZSBj
b2RlPSIzNDEzMy05IiBjb2RlU3lzdGVtPSIyLjE2Ljg0MC4xLjExMzg4My42LjEiIGRpc3Bs
dW1lbnQ+DQo=
            </ED.5>
          </OBX.5>
          <OBX.11>F</OBX.11>
        </OBX>
      </ORU_R01.OBSERVATION>
    </ORU_R01.ORDER_OBSERVATION>
  </ORU_R01.PATIENT_RESULT>
</ORU_R01>
```


