



Riyati Program Integration, Terminology and Coding Standards

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Document History

Change / Version No.	Date Change Approved	Description of Changes (including section numbers)	Impacted Supporting Document(s)	Supporting Document Change / Version No.	Authors
1.0	08-June-20	Initial Release version	N/A	N/A	MOHAP
1.1	26-Apr-21	Update for Healthshare requirements	N/A	N/A	MOHAP
2.0	26-Apr-21	Reviewed and Approved changes and baselined Version	N/A	N/A	MOHAP
2.1	29-June-22	<p>Section 2.2.2: Added Social History, Family History Removed Problems, QBP, RSP, QCN Added A60</p> <p>Section 2.1.4: Updated from PRB to PPR</p> <p>Section 2.1.7: Removed Functional Status, Social History, Family History, Plan of Care and Assessment of Plan</p> <p>Section 2.1.9: Removed Plan of Care</p>	N/A	N/A	MOHAP

Table 1 Document Version History



1 Introduction

1.1 Document Purpose

This document provides Messaging and Terminology standards used for interoperability in the Riayati program Healthcare Interoperability Exchange (HIE).

1.2 Intended Audience

This document is useful for:

- All healthcare provider organizations (Govt., public and private) intending to connect to the Riayati HIE Platform
 - Authorities
 - Hospitals
 - Clinics
 - Poly Clinics
 - Diagnostic Centers
 - Pharmacies
 - Medical Centers
- All healthcare systems and solution providers, contractors, subcontractors, system integrators and vendors already active or aspiring to be active in the northern Emirates

1.3 Background – Interoperability in Healthcare Systems

Healthcare organizations are inclining more and more towards value-based care than cost-based care. This brings in an opportunity for healthcare governing bodies such as Ministry of Health and Prevention to provide a platform that allows clinicians to access patient's healthcare records across healthcare facilities using disparate systems.

In order to share data seamlessly across multiple care settings (primary care, secondary care, social care etc.), various solutions, systems, applications, it becomes imperative to follow certain standards. Therefore, Riayati is defining certain standards that will be supported on the platform.

Benefits of using defined standards:

- Flexibility to choose right solution supporting the standards
- It brings coherence of data (structurally and with respect to its basic semantically defined basis) so this data can continue to be used in future applications and supporting future healthcare management

The key considerations for finalizing the standards are based on

- International perspective on standards
- Futuristic trends in interoperability
- Popular standards in use

This document outlines the interoperability standards that will underpin the Riayati Healthcare Information Exchange.



2 HIE Message standards

HL7V2 is the most common integration standard followed by healthcare organizations in the UAE. This will be the recommended standard to follow for accessing the data and submitting the data to HIE. In addition to the HL7V2 Riayati HIE platform will also support FHIR and IHE messaging standard which are the latest advancement in healthcare data interoperability

2.1 HL7 Message standards

2.1.1 Patient Demographic and visit /Encounter Information

Data Element	HL7 V2 Messages
Patient Demographics Encounter Allergies Diagnosis (Generic Diagnosis, Psychiatric) Procedures and Services Next of Kin Insurance Physician information (Attending, Referring, Consulting, Admitting) Social History Family History	ADT (Admission Discharge Transfer)

Table 2: HL7 V2 - Patient Demographic and Encounter

Message Trigger Events

- Admit/visit - A01
- Transfer a patient - A02
- Discharge/end visit - A03
- Register a patient - A04
- Pre-admit a patient - A05
- Update patient information - A08
- Cancel admit/visit notification - A11
- Cancel transfer - A12
- Cancel discharge/end visit - A13
- Add patient information - A28
- Update patient information - A31
- Cancel pre-admit - A38
- Merge Patient - A40
- Move visit information - A45
- Change visit number - A50
- Update Adverse Reaction Information - A60



2.1.2 Laboratory/Radiology orders and results

Data Element	HL7 V2 Messages
Laboratory Results Laboratory Reports Radiology Reports	ORU

Table 3: HL7 V2 - Laboratory/Radiology Orders and Results

Message Trigger Events

- Unsolicited Observation Message – ORU^R01

2.1.3 Medication management

Data Element	HL7 V2 Messages
Prescription Medication. Administration Medication. Treatment dispense	OMP RAS RDS

Table 4: HL7 V2 - Medication

Message Trigger Events

- Pharmacy/Treatment Order – OMP^O09
- Pharmacy/Treatment Administration – RAS^O017
- Pharmacy/treatment dispense - RDS^O13
-

2.1.4 Patient Problem

Data Element	HL7 V2 Messages
Patient Medical Problem	PPR

Table 5: HL7 V2 - Patient Problem

Message Trigger Events

- Add New Problem - PC1
- Update Problem - PC2
- Delete Problem - PC3

2.1.5 Immunization

Data Element	HL7 V2 Messages
Patient Immunization	VXU

Table 6: HL7 V2 - Immunization

Message Trigger Events

- Unsolicited Vaccination Record Update – VXU^V04



2.1.6 Medical Document

Data Element	HL7 V2 Messages
Clinical documents like External Referral Letter, Mental Health Notes, Surgical Notes, Nurses Notes, Discharge Summary, Patient Consent Forms, etc.,	MDM

Table 7: HL7 V2 - Medical Document

Message Trigger Events

- Original document notification and content MDM^T02
- Document status change notification and content MDM^T04
- Document edit notification and content MDM^T08
- Original document notification MDM^T11

2.1.7 Virtual Medical Record Data

Data Element	HL7 V2 Messages
Observations Vital Signs	ORU

Table 8: HL7 V2 – Virtual Medical Record

Message Trigger Events

- Unsolicited Observation Message – ORU^R01

2.1.8 Master File Notification

Data Element	HL7 V2 Messages
Physician Registry	MFN

Table 9: HL7 V2 – Master File Notification

Message Trigger Events

- Master File Notification– MFN^M13



2.1.9 CDA

The Healthcare Provider system can use CDA XML Document to submit Patient Demographic and Clinical Data in batch mode.

Data Element	HL7 CDA Messages
Patient Demographics Encounter Observations Vital Signs Allergies Problems Diagnosis Procedures and Services Physician information (Attending, Referring, Consulting, Admitting) Laboratory Orders Laboratory Results Laboratory Reports Radiology Orders Radiology Reports Prescription Medication. Administration Medication Patient Medical Problem Patient Immunization Social History Functional Status Assessment of Plan	CDA (XML)

Table 10: CDA Message



2.2 IHE Profiles

Following are the IHE profiles that will be supported by Riayati Program. Healthcare Provider system or external HIE system can use these profiles to communicate with Riayati HIE

Patient Identifier Cross-referencing (PIX)

The PIX Profile is for the cross-referencing of patient identifiers from multiple Patient Identifier Domains. The patient demographic information received from different participating organizations will be used for referencing local MRN's of healthcare provider system to master patient index of HIE.

Patient Demographics Query (PDQ)

Patient Demographics Query provides ways for healthcare provider system to query Riayati HIE for a list of matching patients, based on user-defined search criteria, and retrieve patient's demographic information directly into the healthcare provider system.

Cross-Enterprise Document Sharing (XDS.b)

Cross-Enterprise Document Sharing enables healthcare provider system to send granular clinical data, like Allergies, Immunizations, Medications, Problems, Procedures, Results, Vital Signs, Social History, Functional Status, Plan of Care, Assessment of Plan and other clinical information into HIE.

Scanned Documents Integration Profile (XDS-SD)

Clinical documents that are only available in binary file format like PDF and not granular like External Referral Letter, Mental Health Notes, Surgical Notes, Nurses Notes, Discharge Summary, Patient Consent Forms, etc., can be sent to HIE using this profile.

Cross-enterprise Document Sharing for Imaging (XDS-I.b)

Using this profile radiology Images stored in healthcare provider PACS system can be registered with HIE by sending metadata of the image and URL to access image remotely, for purpose of displaying external images in HIE Image viewer.

Cross-Community Access (XCA)

The external HIE systems can access the Clinical data and Documents from Riayati HIE using this profile.

Cross-Community Patient Discovery (XCPD)

The external HIE systems can query Riayati HIE for a list of required patients, based on user-defined search criteria, and retrieve a patient's demographic and identify information directly into the external HIE system.

Patient Demographics Query for Mobile (PDQm)

Patient Demographics Query provides ways for healthcare provider system to query Riayati HIE for a list of matching patients, based on user-defined search criteria, and retrieve patient's demographic information directly into the healthcare provider system using FHIR standard.

Patient Identifier Cross-reference for Mobile Profile (PIXm)



The PIXm Profile supports the lookup of cross-referenced patient identifiers from multiple Patient Identifier Domains using FHIR Standard.

Mobile access to Health Documents (MHD)

The healthcare provider system can send the Clinical Documents to HIE using FHIR Standard using this profile.

The following table lists all the Transactions supported for each IHE profile listed above along with the Messaging Standard and protocols.

IHE Profile	Profile Name	Transaction	Reference	Associated System	Standard	Protocol
PIX	Patient Identifier Cross Referencing	Patient Identity Feed	ITI-8	Healthcare Provider System	HL7v2	MLLP
		PIX Query	ITI-9	Healthcare Provider System	HL7v2	MLLP
		PIX Update Notification	ITI-10	Healthcare Provider System	HL7v2	MLLP
PDQ	Patient Demographics Query	Patient Demographics Query	ITI-21	Healthcare Provider System	HL7v2	MLLP
		Patient Demographics and Visit Query	ITI-22	Healthcare Provider System	HL7v2	MLLP
XCA	Cross-Community Access	Cross Gateway Query	ITI-38	External HIE	ebXML	SOAP
		Cross Gateway Retrieve	ITI-39	External HIE	ebXML	SOAP
XDS	Cross-Enterprise Document Sharing	Provider and Register Document Set-b	ITI-41	Healthcare Provider System	ebXML	SOAP
		Register Document Set	ITI-42	Healthcare Provider System	ebXML	SOAP
		Retrieve Document Set	ITI-43	Healthcare Provider System	ebXML	SOAP
		Register On-Demand Document Entry	ITI-61	Healthcare Provider System	ebXML	SOAP



		Registry Stored Query	ITI-18	Healthcare Provider System	ebXML	SOAP
		Patient Identity Feed	ITI-8	Healthcare Provider System	HL7v2	MLLP
XPCD	Cross-Community Patient Discovery	Cross Gateway Patient Discovery	ITI-55	External HIE	HL7v3	SOAP
		Patient Location Query	ITI-56	External HIE	HL7v3	SOAP
PDQm	Patient Demographics Query for Mobile	Mobile Patient Demographics Query	ITI-78	Healthcare Provider System	FHIR	REST
PIXm	Patient Identifier Cross-reference for Mobile	Mobile Patient Cross-Reference Query	ITI-83	Healthcare Provider System	FHIR	REST
MHD	Mobile access to Health Documents	Provide Document Bundle	ITI-65	Healthcare Provider System	FHIR	REST

Table 11: IHE - Transactional Standards



2.3 FHIR based Interfaces

Riayati provides FHIR Gateway to handle all the FHIR Resource based requests and responses. FHIR APIs to support the request and responses in API standard.

Functional area	APIs
Patient	Patient Registration Get Patient Details Patient Identifier Cross-reference Query
Encounter	Get Encounters Get Encounter Details
Allergies	Get Allergies Get Allergy Details
Condition	Get Conditions Get Condition Details
Procedure	Get Procedures Get Procedure Details Record Procedure Update a Procedure Withdraw a Procedure
Medications	Get Prescriptions Get Prescription Details Record Prescription
Immunizations	Get Immunizations Get Immunization Details
Observations	Get Observations Get Observation Details
Laboratory & Radiology Results	Get Results Get Result Details
Clinical Documents	Get Documents Get Document Details Send Clinical Document Get Document Collection Create Document Collection

Table 92: FHIR based Interfaces



3 Vocabulary / Terminology Standards

Following are the terminology and vocabulary standards will be supported by the Riayati Platform:

Category	Standard	
Diagnosis	ICD 10 CM 2018	The ICD-10-CM (International Classification of Diseases, Tenth Revision, Clinical Modification) is a system used by physicians and other healthcare providers to classify and code all diagnoses, and symptoms recorded in Patient Care. It provides a level of detail that is necessary for diagnostic specificity and morbidity classification by Healthcare Provider Systems.
Clinical Terminology Chronic Problems Allergies	SNOMED-CT	SNOMED CT (Clinical Terms) is a systematically organized computer processable collection of medical terms providing codes, terms, synonyms and definitions used in clinical documentation and reporting. The primary purpose of SNOMED CT is to encode the meanings that are used in health information and to support the effective clinical recording of data with the aim of improving patient care, it includes clinical findings, symptoms, body structures, organisms and other etiologies, substances, pharmaceuticals, devices and specimens.
Procedures	CPT 4 2018 January	Current Procedural Terminology code set describes medical, surgical, and diagnostic (radiology imaging and lab) services and is designed to communicate uniform information about medical services and procedures among physicians, coders, patients, accreditation organizations, and payers for administrative, financial, and analytical purposes
Dental	CDT 2011-2012 (ADA)	Current Dental Terminology (CDT) is a code set with descriptive terms for reporting dental services and procedures to dental benefits plans.
Laboratory	LOINC	Logical Observation Identifiers Names and Codes (LOINC) universal coding standard for identifying medical laboratory observations.
Medications	UAE Drug List	UAE Drug List is a comprehensive list of drugs, with each registered drug is assigned a unique code allowing for differentiation between drugs as per the structure which includes details such as route of administration (ROA), dosage, form, pack size, price, manufacturer, registered owner, and source.
DRG	IR – DRG 3.01.3	Diagnosis-related group (DRG) is a system to classify hospital cases into one of DRG group. DRGs are assigned by DRG system based on ICD (International Classification of Diseases) diagnoses, procedures, age, sex, discharge status, and the presence of complications or comorbidities.
Vaccinations	CVX	CVX codes indicate the product used in a vaccination
Dental Numbering	UNS	The Universal Numbering System is a dental notation system for associating information to a specific tooth.

Table 103: Terminology Standards

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