

EMR Core Data Set (CDS) 6.1

Business View

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1. INTRODUCTION

1.1 Purpose

This document describes the business context for the EMR Core Data Set (CDS), which consists of a logical representation of the minimum set of data that EMR Offerings functionally support. The EMR CDS references the Fast Healthcare Interoperability Resources (FHIR) standard to express these logical data as physical data elements to facilitate the interoperability between systems by standardizing the exchange of physical data into and out of an EMR Offering.

1.2 Business Context

Clinicians use EMR Offerings as valuable tools to enhance how patient care is delivered and to efficiently administer the business of the clinical practice, regardless of the practice model (e.g., sole practitioner, Family Health Organization).

Clinicians routinely work with other health care professionals operating in different clinic practices to deliver care to patients, which is one of the primary business drivers for clinicians to be able to use their EMR Offerings to exchange data with the health care professionals that comprise a patient's circle of care. Data exchange between health care professionals increasingly relies on the systems that interact with Ontario's electronic health record (EHR).

As pressures are placed on the health care system to reduce costs and improve patient outcomes, clinicians have increasing needs to enhance the use of EMR Offerings to coordinate patient care and decrease administrative costs. To accomplish this, the systems that clinicians use need to be able to communicate and exchange information together. The FHIR standard establishes the foundation for these systems to interact together to exchange information. Adopting the Fast Healthcare Interoperability Resources (FHIR) as the standard to describe the EMR CDS provides a means for EMR Offerings to represent data between an EMR Offering and the systems with which they interact.

1.3 Business Driver

EMR Offering functions and capabilities have evolved in lockstep with the changes in clinicians' provision and administration of patient care. This has created business drivers for a common set of logical data elements that support:

1. **Data Interoperability and Exchange** – There is a business need to ensure EMR data can be transferred into, and out of, EMRs to support a variety of use cases, such as exchanging or migrating patient health records from one EMR Offering to another, or exchanging patient data with EHR assets that provide key clinical information using standard definitions of data across multiple care domains.
2. **EHR Products and Services** – Clinicians' use of their EMR Offerings to enhance the provision of care requires extended functionality such as health indicator dashboards, or access to dispensed drug information available from EHR products and services, or other functionality offered by other external sources – all of which require the exchange of data between the EMR Offering and other systems.
3. **Core Business** – There is a common set of data required for functions within an EMR that clinicians need in order to provide care, administer practices, and maintain compliance with legislation and regulatory policies. These core EMR functions that need to be able to reference information within an EMR Offering.

EMR data exchange is increasingly needed to support clinicians' core business and enhance the use of EMRs. The following section expands on EMR data concepts and provides additional insight into the business and technical needs for the EMR CDS.

2. EMR DATA EXCHANGE

The term “EMR data portability” has traditionally referred to the migration of data between EMR Offerings when a clinic practice moves from one EMR Offering to another. Over time, EMR data portability has expanded to encompass all data exchange in and out of EMR Offerings. The exchange of data supports and helps drive the mature use of an EMR for clinicians by integrating, for example, provincial EHR products and services into an EMR, enabling clinicians to have access to clinical information at the point of service.

As EMR use continues to advance, EMR data exchange now refers to the ability to transfer data in and out of EMR Offerings, regardless of the type of data (e.g., patient data, practice data), means of transfer (e.g., batch export, HL7 message, FHIR resources), or direction of transfer (e.g., data in, data out). Examples of data exchange use cases include:

- connecting an EMR Offering with a provincial EHR product or service such as the Ontario Laboratories Information System (OLIS), and the Digital Health Drug Repository (DHDR) EHR Service.
- migrating data from one EMR Offering into another when a clinician changes their EMR product

EMR data exchange requires several components to transfer data in or out of an EMR Offering:

- **Transport Layer** – Used to transmit data between an EMR Offering and another system
- **Application Layer** – The EMR application code used for everything from the user interface and various functions to the transformation of data into different formats for transmission or persistence
- **Data Layer** – The data that is persisted as part of the EMR Offering which can broadly cover data persisted in databases, file servers, or any other means of storing data

EMR data exchange covers many different use cases, and therefore EMR Offerings have to be able to support different approaches to transmit data (e.g., networking protocols like HTTP and FTP, different interface approaches like Web Services and RESTful, etc.), different approaches to transforming and encrypting data, and persisting data in different formats (e.g., different data model and physical database structures, different storage formats such as free text and coded values, different file types such as PDF and JPEG).



Figure 1 - Conceptual EMR System Layers

2.1.1 Data Exchange Scope – Data Input to EMR Offerings

EMR data exchange includes situations where the EMR Offering receives data from an external system and persists the data in the EMR Offering. It is important to note that the EMR Offering may need to transform the data and persist a sub-set of the data originally sent from the external system. For example, an EMR Offering may receive an HL7 v2 message which contains metadata about the message required for machine processing (e.g., type of message, name of the sending system, unique identifiers for code systems) or data that the EMR Offering already has (e.g., patient name, health card number). Leveraging FHIR as the standard for data exchange can streamline or reduce the effort to ensure that the EMR Offering can translate or transform data from EHR services.

Data exchange does include situations where the EMR Offering only displays data residing in another system (e.g., from an external portal). This situation is excluded from the concept of data exchange because the data from the external system is not persisted in the EMR and is therefore not available for re-use to support other data exchange use cases.

2.1.2 Data Exchange Scope – Data Output from EMR Offerings:

Data exchange includes situations where the EMR Offering sends data to an external system. Due to the variability in how different EMR Offerings persist data and the different methods of sending data to an external system, the EMR Offering will often be expected to transform the data to support the data exchange standards supported by each respective external system. As more EHR products and services leverage FHIR, EMR Offerings that adopt and leverage FHIR as a standard for data exchange can more seamlessly translate, transform and map data from EHR services.

2.1.3 Data Exchange Scope – Types of EMR Data

Conceptually, data exchange includes essentially any data that persists in an EMR Offering that is required to support use cases for data exchange. Examples of data categories range from data required for the provision of care (e.g., diagnoses, prescriptions, laboratory test results), to data required for the administration of care (e.g., billing, scheduling).

3. EMR CDS

3.1 What is the EMR CDS?

The EMR CDS is a logical representation of a *minimum* set of data elements that EMR Offerings support to display to EMR users and persist in the EMR Offering's data layer.

A	B	C	D	E	F	G	H	I	J
FINAL	DRAFT CDS LOGICAL DATA DICTIONARY v1.0								
	Production Date: TBD								
DE	DATA ELEMENT NAME	DATA ELEMENT DEFINITION	CODE SETS	MIN	MAX	YR	Year	Logical Model	Entity
ONGOING HEALTH CONDITIONS									
DE001.001	Date of Onset	The date when the patient was diagnosed or had symptoms of a problem.		M	P			Diagnosis-Problem	
DE001.002	Life Stage	The stage of life the patient was at the onset of the condition (problem or diagnosed disease).	Table CT-016: Life Stage	M	P			Diagnosis-Problem	
DE001.003	Resolution Date	The date when the problem or the diagnosed disease was resolved or controlled.		M	P			Diagnosis-Problem	
DE001.004	Diagnosis/Problem	A description (in g. name, label) that identifies the patient's problem or diagnosed disease (e.g. Asthma, Diabetes Mellitus, etc.).		M	P			Diagnosis-Problem	
DE001.005	Problem Description	A description of the problem reported. Used to express express a synopsis of progress or additional details about the health concern, problem or diagnosis.		M	P			Diagnosis-Problem	
DE001.006	Problem Status	The status of the problem or the diagnosed disease, often using only a few words (e.g. active, in remission, etc.).		M	P			Diagnosis-Problem	
DE001.007	Notes	Additional notes about the problem or the diagnosed disease.		M	P			Diagnosis-Problem	
PAST MEDICAL & SURGICAL HISTORY									
DE002.001	Date of Onset	The date the patient was diagnosed or had the symptoms of a problem.		M	P			Diagnosis-Problem	
DE002.002	Life Stage	The life stage the patient is at the onset of the	CT-016: Life Stage	M	P			Diagnosis-Problem	
LEGEND DataDictionary Sheet 1									

Figure 2 - Data Dictionary

3.2 Evolution of the EMR CDS

The number of systems with which EMR Offerings can exchange data will continue to grow. These external systems are developed by different organizations where some will choose different data exchange standards for their systems. EMR Offerings that exchange data with these systems will have to support those specific standards of physically expressing their data. However, as the value of exchanging health data between different systems grows, organizations are moving away from an isolated description of health data used for specific purposes, and towards adopting a standardized definition of health data that can be leveraged across disparate systems and among different organizations. The EMR CDS bridges this gap between EMR Offerings and the different EHR products and services to which they connect by leveraging FHIR to define the standard to describe the EMR CDS. The benefit is the interoperability of health data among multiple systems

4. EMR CDS and FHIR

4.1 FHIR and the EMR CDS

The EMR CDS leverages FHIR as the standard terminology to describe the physical data elements that are currently represented in the EMR CDS. This creates a consistent way to exchange and describe data between disparate health systems such as different EMR Offerings, and the various EHR products and services to which they may connect.

4.1.1 EMR CDS to FHIR Physical Data Mapping

The EMR CDS – Data Dictionary maps the EMR CDS logical data elements to physical data elements using FHIR terminology. Introducing FHIR as part of the EMR CDS *does not* re-define the existing data elements in the EMR CDS or necessarily introduce any new physical data elements. Instead, it provides a mapping of the existing physical data set to identify the FHIR data elements for exchange.

The following diagram illustrates data exchange between EMR Offerings and EHR products and services. The arrows represent physical data exchange between systems.

EMR Offerings (i.e., EMR A, EMR B) which *are* aligned with the FHIR standard:

- are able to easily exchange data with other FHIR-aligned systems like EHR products and services
- do not need to map the physical data exchanged with FHIR-aligned systems like EHR products and services

EMR Offerings (i.e., EMR C) which *are not* aligned with the FHIR standard:

- effectively need to map their physical data to the respective physical data exchange specifications to transform and transmit data in and out of the EMR Offering to interact with each respective system.

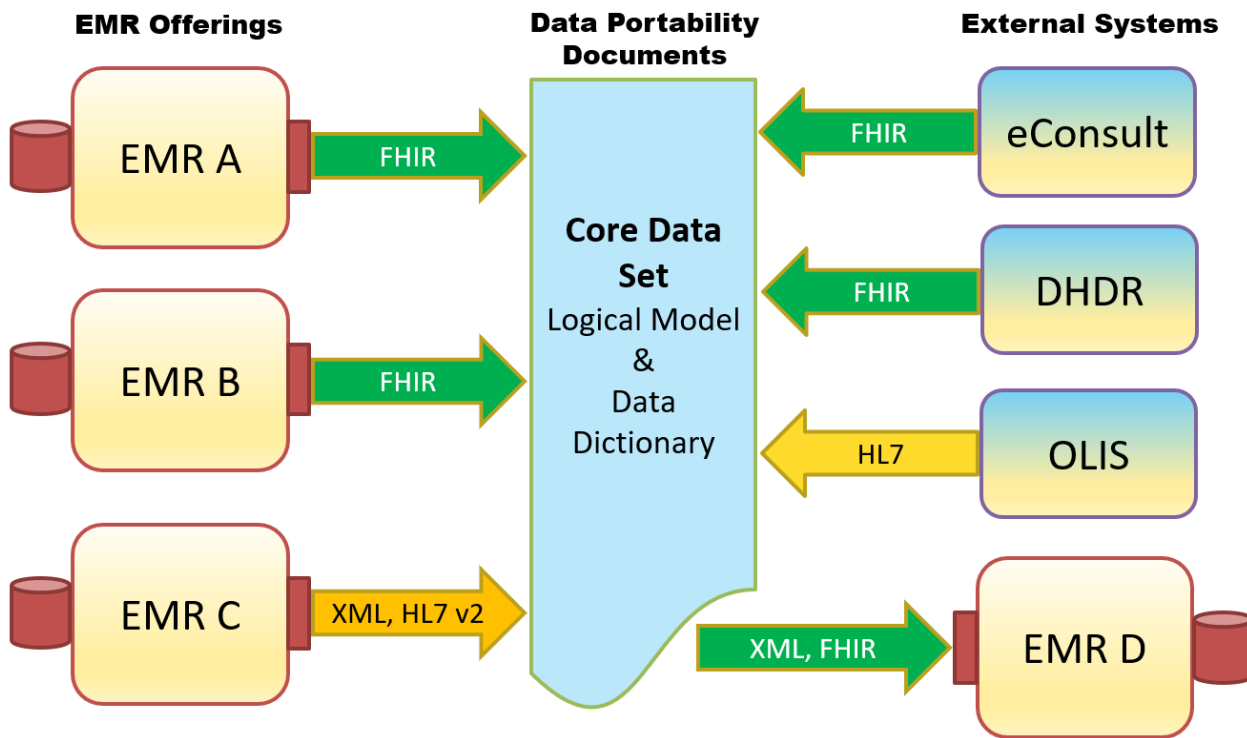


Figure 3 - Logical Data Model and Data Dictionary

The EMR CDS provides a mapping between the CDS and the FHIR standard that implementers can reference. In cases where the EMR Offering leverages the FHIR standard to describe physical data, the CDS can provide the following benefits:

- **Standardized and streamlined data exchange** – EMR Offerings following the FHIR standard are aligned to exchange data with existing EHR products and services without needing to map the data to exchange.
- **Accelerated design and development** – As more EHR products and services become available, there is a reduced need to re-define common data elements that may be referenced by multiple EHR services.

4.2 Relationship to Other EMR Specifications

The goal of the EMR CDS Specification is to provide a logical representation of EMR data that can be considered a ‘core’ or ‘minimum’ data set of required clinical data. There may be data elements in the EMR CDS that are not represented in other OntarioMD EMR Specifications. The rationale for inclusion is that there is a business driver for the data and EMR Offerings are well-positioned to provide or consume the data.

Conversely, there may be data elements that are physically or logically represented in other OntarioMD EMR Specifications that are not included in the EMR CDS - Data Dictionary. This is because some OntarioMD EMR Specifications have scopes that are specific to types of provider (e.g., specialists), types of EMR Offering (e.g., local, hosted), types of care settings (e.g., public health, community health) and therefore have data element needs that are not considered common to all EMR Offerings.

5. APPENDIX A: GLOSSARY OF KEY TERMS AND DEFINITIONS

5.1 Acronyms and Abbreviations

This table identifies definitions for terms used within or that are relevant to this EMR specification.

ACRONYM	DEFINITION
API	Application Programming Interface
CDS	Core Data Set
EHR	Electronic health record
EMR	Electronic medical record
FHIR	Fast Healthcare Interoperability Resources
HCN	Health Card Number
HL7	Health Level Seven
RESTful or REST	Representational state transfer
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
W3C	World Wide Web Consortium