

# EMR Digital Health Immunization Repository (DHIR) 1.1

## Business View

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## Table of Contents

<b>TABLE OF CONTENTS .....</b>	<b>2</b>
<b>1. INTRODUCTION .....</b>	<b>3</b>
1.1 OVERVIEW .....	3
1.2 BUSINESS DRIVERS.....	3
1.3 WHAT IS THE DHIR?.....	3
1.3.1 DHIR EHR Service Overview.....	3
<b>2. SYSTEM VIEW .....</b>	<b>5</b>
2.1 CANADIAN VACCINE CATALOGUE .....	5
2.2 SUBMIT IMMUNIZATIONS TO DHIR.....	5
2.2.1 Logic Flow – Submit Immunization .....	5
2.2.2 CVC – EMR Integration.....	5
2.3 RETRIEVE IMMUNIZATIONS FROM DHIR .....	6
2.3.1 DHIR - Patient Consent Directive.....	6
2.3.2 Logic Flow – Retrieve Immunization.....	7
2.3.3 DHIR EHR Views.....	8
2.3.3.1 Summary View .....	8
2.3.3.2 Comparative View.....	9
2.3.3.3 Forecast View - Generic.....	10
2.3.3.4 Forecast View - Disease .....	11
<b>3. APPENDIX A: GLOSSARY OF KEY TERMS AND DEFINITIONS .....</b>	<b>12</b>
3.1 ACRONYMS AND ABBREVIATIONS.....	12
3.2 DEFINITIONS .....	13

## 1. INTRODUCTION

### 1.1 Overview

The purpose of the Digital Health Immunization Repository (DHIR) EHR Service is to provide clinicians with access to view and update their patients' immunization records maintained in the DHIR as an integrated function within their EMR Offering.

### 1.2 Business Drivers

Currently, clinicians maintain their patients' immunization records using EMRs, but do not have direct access to sources of immunization information that were reported by other health care providers, agencies and organizations in the health care domain. To provide clinicians with a more comprehensive view of their patients' immunization history contributed by multiple sources, the provincial DHIR EHR Service facilitates communications between the EMR Offering and the DHIR.

Making DHIR information available as an integrated function within an EMR provides clinicians with a more comprehensive, on-demand view of their patients' immunization history contributed by multiple sources. This information can assist healthcare providers enhance clinical decision-making and enhance patient care.

### 1.3 What is the DHIR?

The DHIR is a provincial repository that maintains and provides various health care organizations and systems (e.g., health care providers, public health units, parents using Immunization Connect) with centralized access to view and update patients' immunization records.

The DHIR maintains Ontarian's immunization records that include publicly and privately funded immunizations for patients of all ages (e.g., school children and adults). This includes immunizations considered under the Immunization of School Pupils Act (ISPA) as well as immunizations outside of the scope of the ISPA. This data is contributed by various public health and health care agencies as well as individuals themselves (or by the families of a child).

#### 1.3.1 DHIR EHR Service Overview

The DHIR is a provincial digital health immunization repository that provides various health care organizations (e.g. EMR Offerings) and systems (e.g., Panorama, Immunization Connect Ontario /Digital Yellow Card) with centralized access to view and update patient's immunization records.

The DHIR maintains Ontarian's immunization records that include:

- publicly and privately funded immunizations for patients of all ages (e.g., school children and adults)

- immunizations considered under the Immunization of School Pupils Act (ISPA) as well as immunizations outside of the scope of the ISPA.

The DHIR EHR Service allows EMR Offerings to integrate the secured and authorized access to view a patient's immunization history stored in the DHIR, as well as access to record an immunization event for a patient.

## 2. SYSTEM VIEW

### 2.1 Canadian Vaccine Catalogue

The DHIR and DHIR EHR Service leverage the Canadian Catalogue Vaccine (CVC) to store immunization data and exchange immunization data with other systems (e.g. EMR Offerings). The CVC provides up-to-date immunization data and standard terminology that is updated periodically by CANImmunize. This allows for consistency in immunization data to be submitted by multiple sources. EMR Offerings need to integrate and leverage the CVC when submitting immunizations to the DHIR. The integration of the CVC may require a mapping between the CVC value sets and the value sets maintained by the EMR Offering.

### 2.2 Submit Immunizations to DHIR

#### 2.2.1 Logic Flow – Submit Immunization

The following diagram illustrates the logic flow for an EMR Offering that is recording an immunization and sending an immunization event via DHIR EHR Service to DHIR.

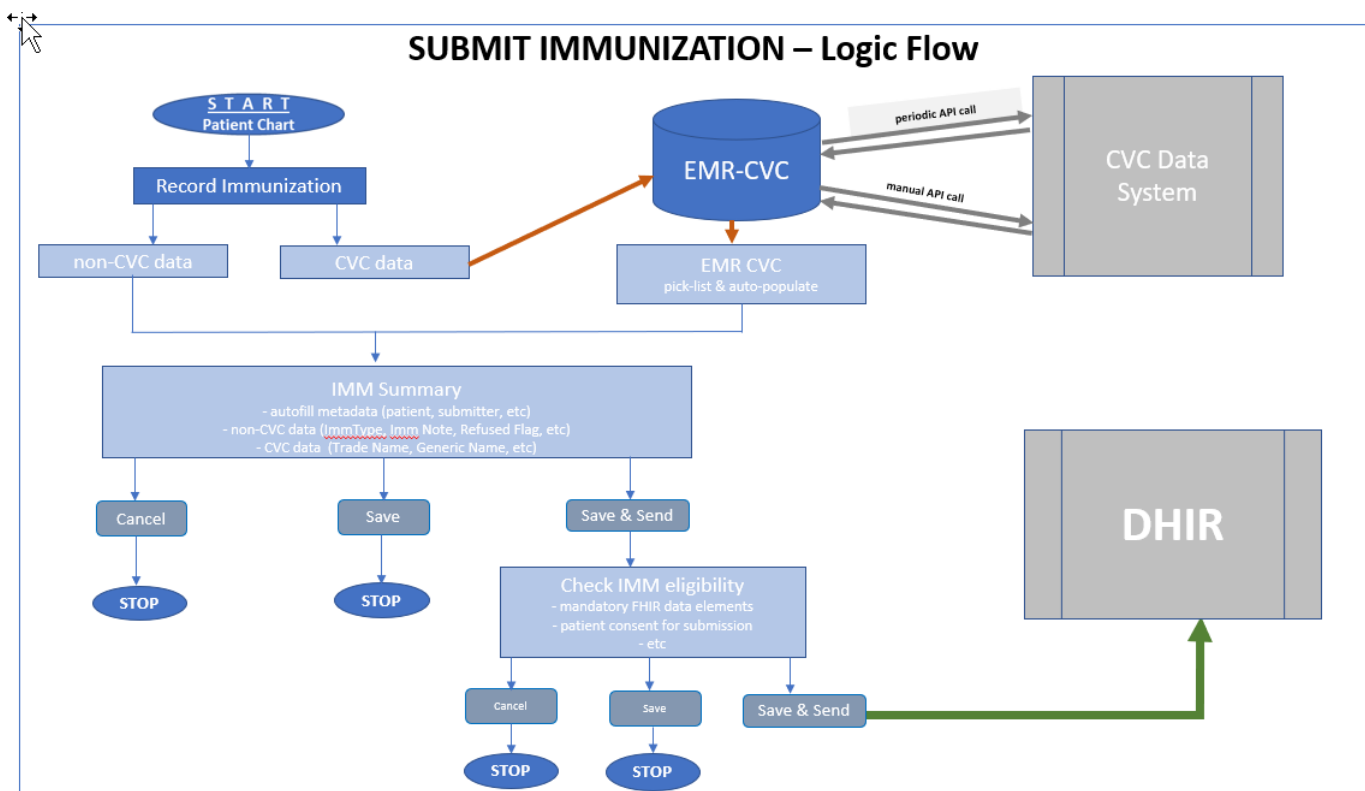


Figure 1 - Workflow of EMR Offering using CVC

#### 2.2.2 CVC – EMR Integration

The DHIR EHR Service uses the FHIR standard terminology and code sets along with code sets defined by/in the CVC. As such, when submitting an immunization event to the DHIR the DHIR EHR Service, the EMR Offering needs to follow the same CVC terminology.

The EMR Offering will need to ensure that its internal immunization value sets align/map to the CVC terminology and ensure that the EMR Offering uses the most current version of the CVC terminology.

EMR Vendors must ensure that integration of the CVC values set will not affect current functionalities implemented in their EMR Offerings (e.g., Preventive Care, Chronic Disease Management, etc.).

### **Important Note:**

Immunization events submitted to the DHIR EHR Service are subject to a manual review process by the local Public Health Unit PHU. The PHU review may result in the immunization being rejected or updated before being committed to the DHIR. As a result, immunizations submitted by EMR Offerings using the DHIR EHR Service may not be immediately available for retrieval.

## **2.3 Retrieve Immunizations from DHIR**

### **2.3.1 DHIR - Patient Consent Directive**

Patients have the right to withhold or withdraw consent for the disclosure of their immunization information stored in the DHIR. Confidentiality of a patient's immunization records is determined by the patient's Consent Directives maintained by the DHIR. The DHIR maintains the patient's Consent Directive blocking at the patient level. As of this writing, less than 0.01% of patients exist in the DHIR that have a Consent Directive blocking in place.

When an EMR Offering requests a patient's immunization history from the DHIR, if a patient Consent Directive blocking exists then the DHIR will prevent clinician access to patient's immunization history. The DHIR Service will return a warning/information message; no immunization records will be returned. The EMR Offering must process the warning/information message and inform the clinician about the patient's Consent Directive blocking.

## 2.3.2 Logic Flow – Retrieve Immunization

The following diagram illustrates the logic flow for an EMR Offering that is launching a DHIR search for patient immunization and processing the DHIR-FHIR received from DHIR Service.

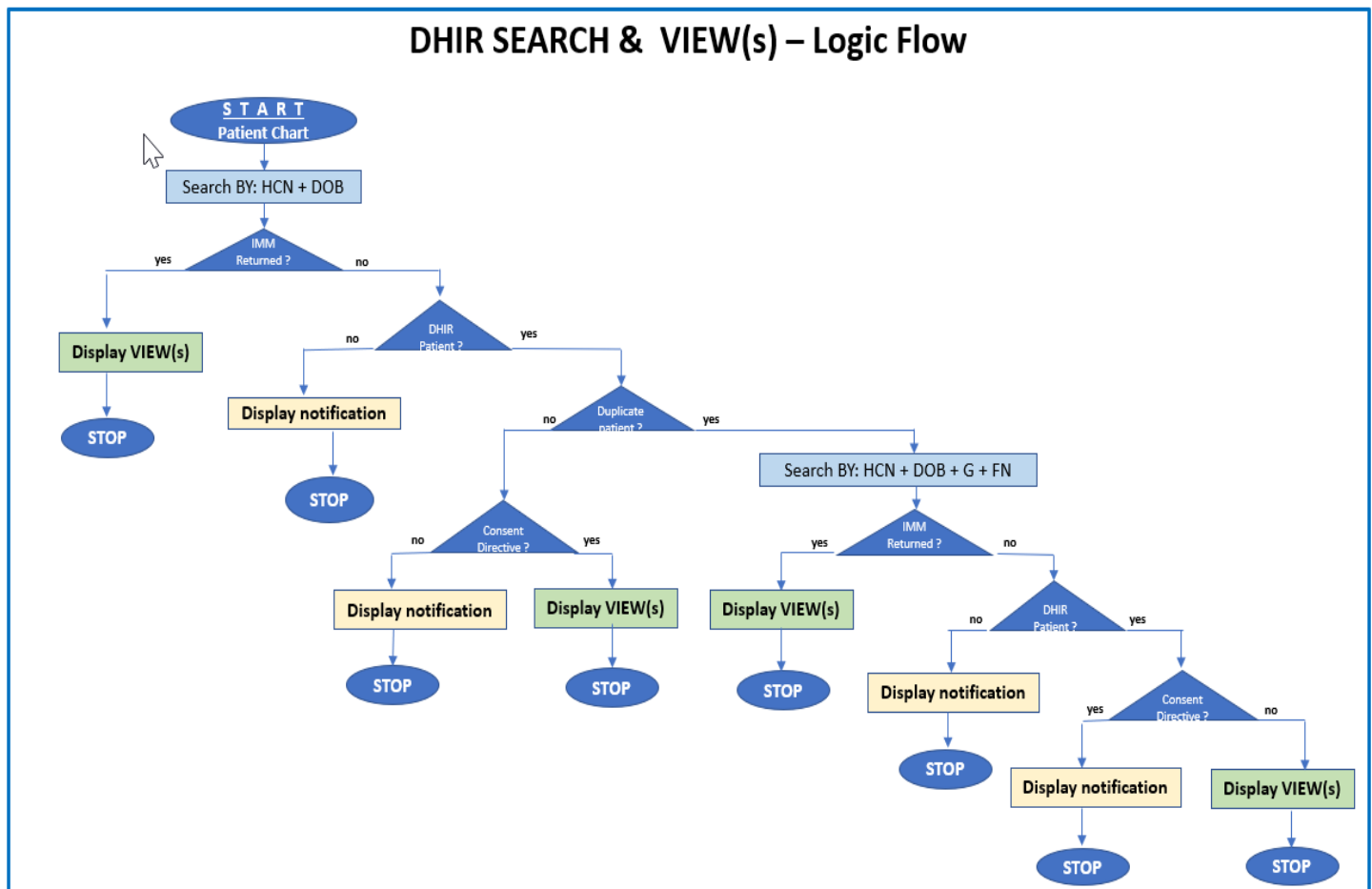


Figure 2 – Logic Flow Diagram

### 2.3.3 DHIR EHR Views

The following figures illustrate the distinction between the different Views. The EMR Offering is required to provide and display information about a patient's immunization events retrieved from the DHIR EHR Service. These examples contain fictitious patient data and are intended for illustrative purposes only; implementation of these views in different EMR Offerings may vary. For a list of the minimum set of data elements to display, refer to the EMR DHIR requirements.

#### 2.3.3.1 Summary View

The following diagram illustrates an example of a Summary View of a patient's immunization events retrieved from the DHIR EHR Service and displayed in an EMR Offering

SUMMARY VIEW [DHIR]

COMPARATIVE VIEW

FORECAST VIEW - Generic

FORECAST VIEW - Disease

DHIR Retrieved Immunizations

Retrieve Date: Mar 30, 2020

Patient: FN MN LN

DOB: Jan 20, 2005

HCN: 1112223333

Gender: Female

Date Range: Jan 20, 2005 – Mar 30, 2020

Year [Mths]: 14 years [2 mths]

Total Count: 6

DHIR Disclaimer:

Warning: Limited to Immunization Information available in the Digital Health Immunization Repository (DHIR) EHR Service. To ensure a Best Possible Immunization History, please review this information with the patient/family and use other available sources of Immunization information in addition to the DHIR EHR Service.

LEGEND: DATE Estimated; Forecast FLAG; Administered Flag; Total Count; Year [Mths]; Date Range; etc

Immunization DATE <del>Y</del> <del>M</del> <del>D</del>	DATE Estimated	Forecast FLAG	Patient AGE	Immunization Type [Generic Name] <del>Y</del> <del>M</del> <del>D</del>	Immunization Brand Name [Trade Name]	LOT #	LOT Expiration DATE	Administered BY <del>Y</del> <del>M</del> <del>D</del>	PHU
Mar 25, 2020	FALSE		14 years [2 mths]	Men-C Meningococcal conjugate				Sandra Saputo	Grey Bruce Health Unit
Apr 26, 2007	FALSE		15 mths	Men-C Meningococcal conjugate				Sandra Saputo	Peel Public Health
Feb 2, 2007	TRUE		12 mths	MMR Measles + Mumps + Rubella	Priorix®		Apr 28, 209	James Bond	Peel Public Health
May 26, 2006	TRUE		4 mths	DTaP-IPV-Hib Diphtheria + Tetanus + Pertussis + Hepatitis B + Polio	Pediacel®	012345X	Apr 26, 2008	James Bond	Grey Bruce Health Unit
Mar 25, 2006	FALSE		2 mths	Pneu-C-7 Pneumococcal conjugate 7	Prevnar®	B000111	Apr 26, 2007	James Bond	Brant County Health Unit
Mar 25, 2006	FALSE		2 mths	DTaP-IPV-Hib Diphtheria + Tetanus + Pertussis + Hepatitis B + Polio	Infanrix®-IPV/Hib	A01B0002	Feb 26, 2007	James Bond	Brant County Health Unit

Figure 3 - Illustration of the Summary View in the EMR Offering

### 2.3.3.2 Comparative View

The following diagram illustrates an example of a Comparative View. The patient's immunization events are retrieved from the DHIR EHR Service and displayed alongside immunization records stored and maintained in the EMR Offering.

**COMPARATIVE VIEW [DHIR & EMR]**
SUMMARY VIEW
FORECAST VIEW - Generic
FORECAST VIEW - Generic

**DHIR Retrieved Immunizations**
Retrieve Date: Mar 30, 2020

Patient: **FN MN LN** HCN: 111223333 Date Range: Jan 20, 2005 – Mar 30, 2020  
DOB: Jan 20, 2005 Gender: Female Year [Mths]: 15 years [2 mths]  
Total Count: 6

**DHIR Disclaimer:**  
"Warning: Limited to Immunization Information available in the Digital Health Immunization Repository (DHIR) EHR Service. To ensure a Best Possible Immunization History, please review this information with the patient/family and use other available sources of Immunization information in addition to the DHIR EHR Service."

**LEGEND:** DATE Estimated; Forecast FLAG; Administered FLAG; Total Count; Year [Mths]; Date Range; etc

Immunization DATE	DATE Estimated	Forecast FLAG	Patient AGE	Immunization Type [Generic Name]	Immunization Brand Name [Trade Name]	LOT #	LOT Expiration DATE	Administered BY	PHU
Mar 25, 2020	FALSE		14 years [2 mths]	Men-C Meningococcal conjugate	----	----	----	Sandra Saputo	Grey Bruce Health Unit
Apr 26, 2007	FALSE		15 mths	Men-C Meningococcal conjugate	----	----	----	Sandra Saputo	Peel Public Health
Feb 2, 2007	TRUE		12 mths	MMR Measles + Mumps + Rubella	Priorix®	ABC001	Apr 28, 209	James Bond	Peel Public Health

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**EMR Recorded Immunizations**

Immunization DATE	Refuse FLAG	Patient AGE	Immunization Type	Immunization Brand Name	Dose	DIN	LOT #	LOT Expiration DATE	Administered BY	DHIR Submission STATUS	DHIR Eligibility STATUS	ACTION
Feb 25, 2020	yes	15 years [1 mth]	HPV	----	----	----	----	----	----	Saved	Non-Eligible	<button>UPDATE</button>
2011	no	5 years [1 mth]	VAR	----	----	----	----	----	----		Non-Eligible	<button>UPDATE</button>
Feb 2, 2007	no	12 mths	MMR	Priorix®	7 ml	02239208	ABC001	Apr 28, 209	James Bond	Saved	Eligible	<button>UPDATE</button>
May 26, 2006	no	4 mths	DTaP-IPV-Hib	Pediacel®	0.5 ml	02243167	012345X	Apr 26, 2008	James Bond	Submitted	Eligible	<button>UPDATE</button>
Mar 25, 2006	no	2 mths	Pneu-C-7	Prevnar®	5 ml	02244081	B000111	Apr 26, 2007	James Bond	Submitted	Eligible	<button>UPDATE</button>
Mar 25, 2006	no	2 mths	DTaP-IPV-Hib	Infanrix®-IPV/Hib	5 ml	02257122	A01B0002	Feb 26, 2007	James Bond	Submitted	Eligible	<button>UPDATE</button>

Figure 4 - Illustration of the Comparative in the EMR Offering

### 2.3.3.3 Forecast View - Generic

The following diagram illustrates an example of a Forecast View - Generic of a patient's immunization events retrieved from the DHIR EHR Service and displayed in an EMR Offering.

**FORECAST VIEW - GENERIC**

SUMMARY VIEW

COMPARATIVE VIEW

FORECAST VIEW - Disease

**DHIR – FORECAST**

Retrieve Date: Mar 30, 2020

Patient: **FN MN LN**
HCN: 1112223333

DOB: Jan 20, 2005
Gender: Female

FORECAST Date: **Mar 25, 2020**

**LEGEND:** FORECAST Date; Forecast DUE DATE; Patient AGE; etc

Forecast DUE DATE	Forecast STATUS	Patient AGE	Immunization Type [Generic Name]	Immunization Brand Name [Trade Name]
Dec 5, 2019	OVERDUE	14 years [11 mths]	Var	----
Feb 15, 2020	DUE	15 years [1 mth]	Men-C-C	----
Mar 25, 2020	DUE	15 years [2 mth]	HPV	Gardasil®
Jul 25, 2021	ELIGIBLE	15 years [6 mth]	Men-C-C	----
Jul 25, 2021	ELIGIBLE	15 years [6 mth]	TDap	----
Jul 25, 2031	UP TO DATE	31 years [6 mths]	Td	----

DHIR Disclaimer:  
Warning: Limited to Immunization Information available in the Digital Health Immunization Repository (DHIR) EHR Service. To ensure a Best Possible Immunization History, please review this information with the patient/family and use other available sources of Immunization information in addition to the DHIR EHR Service.

Figure 3 - Illustration of the Forecast View - Generic in the EMR Offering

### 2.3.3.4 Forecast View - Disease

The following diagram illustrates an example of a Forecast View – Disease for a patient’s immunization events retrieved from the DHIR EHR Service and displayed in an EMR Offering.

**FORECAST VIEW - DISEASE**

SUMMARY VIEW
COMPARATIVE VIEW
FORECAST VIEW - GENERIC

**DHIR – FORECAST**
Retrieve Date: Mar 30, 2020

Patient: **FN MN LN**    HCN: 1112223333    FORECAST Date: Mar 25, 2020  
DOB: Jan 20, 2005    Gender: Female

DHIR Disclaimer:  
"Warning: Limited to Immunization Information available in the Digital Health Immunization Repository (DHIR) EHR Service. To ensure a Best Possible Immunization History, please review this information with the patient/family and use other available sources of Immunization information in addition to the DHIR EHR Service."

LEGEND: FORECAST Date; Forecast DUE DATE, Patient AGE; etc

Forecast DUE DATE	Forecast STATUS	Patient AGE	D I S E A S E
Dec 5, 2019	OVERDUE	14 years [11 mths]	Varicella
Feb 15, 2020	DUE	15 years [1 mth]	Meningococcal disease
Mar 25, 2020	DUE	15 years [2 mth]	Human papilloma virus infection
Jul 25, 2021	ELIGIBLE	15 years [6 mth]	Meningococcal disease
Jul 25, 2021	ELIGIBLE	15 years [6 mth]	Tetanus
Jul 25, 2021	ELIGIBLE	15 years [6 mth]	Diphtheria
Jul 25, 2021	ELIGIBLE	15 years [6 mth]	Pertussis
Jul 25, 2031	UP TO DATE	31 years[6 mths]	Tetanus
Jul 25, 2031	UP TO DATE	31 years[6 mths]	Diphtheria

Figure 4 - Illustration of the Forecast View - Generic in the EMR Offering

### 3. APPENDIX A: GLOSSARY OF KEY TERMS AND DEFINITIONS

#### 3.1 Acronyms and Abbreviations

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

ACRONYM	DEFINITION
API	Application Programming Interface
BPIH	Best Possible Immunization History
CPP	Cumulative Patient Profile
CVC	Canadian Vaccine Catalogue
DHIR	Digital Health Immunizations Repository
EHR	Electronic Health Record
EMR	Electronic Medical Record
FHIR	Fast Healthcare Interoperability Resources
HCN	Health Card Number
HL7	Health Level Seven
ISPA	Immunization of School Pupils Act
MOH	Ministry of Health
PHI	Personal health information
PHIPA	Personal Health Information Protection Act
PHU	Public Health Unit
ReST	Representational State Transfer
SDM	Substitute decision-maker
HTTP	HyperText Transfer Protocol
UAO	Under the Authority of
URI	Uniform Resource Identifier
URL	Uniform Resource Locator

## 3.2 Definitions

TERM	DEFINITION
Administering Provider	The provider who performed the immunization. This may or may not be the same individual as the Submitting Provider.
Generic Name	This is the generic name of the vaccine, as defined by the CVC. The Generic Name may be referenced as agent, immunizing agent, or immunization type in other documentations.
Immunization record	A single immunization recorded in the EMR Offering.
Immunization event	A single immunization recorded in the EMR Offering for the patient and submitted to DHIR via DHIR EHR Service. This may include data about the patient, the immunization, the practitioner who administered that immunization, the organization to which the practitioner belongs, and other system information as it relates this immunization.
Immunization history	The complete set of immunization for a patient that is maintained by a system (eg EMR Offering, DHIR, etc)
Patient chart	Patient cumulative profile as represented in the EMR Offering.
Submitting Provider	The provider who submitted the immunization event to the DHIR EHR Service. This may or may not be the same individual as the Administering Provider. For example, the nurse may have administered the immunization, but the physician is submitting the immunization event to the EHIR EHR Service.
Trade Name	This is the trade name of the vaccine, as defined by the CVC. The Trade Name may be referenced as a vaccine brand in other documentations.
Metadata	Metadata refers to any attribute (data element) that defines a concept. In the context of the EMR-DHIR specification, metadata is used along with the following concepts: <ul style="list-style-type: none"> <li>• Patient Metadata: HCN, DOB, G, LN</li> <li>• Immunization metadata: all data elements defined in CDS and DHIR-FHIR profiles</li> <li>• Submitter metadata: all data elements defined in CDS and as required in DHIR-FHIR profiles</li> <li>• Performer metadata: all data elements defined in CDS and as required in DHIR-FHIR profiles</li> <li>• Organization metadata: as required by the DHIR-FHIR profiles</li> </ul>