



Digital Health Drug Repository (DHDR)

Point of Care Systems Access

HL7 FHIR Implementation Guide

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Significant Contributors

Organization	Contact
Ministry of Health	DHDRSupport@ontario.ca
Architecture and Standards, Ontario Health Digital Services	architecture@ehealthontario.on.ca

Version History

Version No.	Date	Summary of Change	Changed By
0.1	2016-08-18	Initial Draft, based on DHDR v0.3.3 Specification	Ontario Health Digital Services MOH
0.2	2016-08-23	Updated content for Use Cases,	Ontario Health Digital Services
0.3	2016-08-24	Completed content for Use Cases Formatting Consistency	Ontario Health Digital Services
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2.0.0	2017-06-22	Updated to align with FHIR STU3 (v3.0.1) - Renamed MedicationOrder resource to MedicationRequest - Replaced Contract resource (ConsentDirective profile) with Consent resource - Replaced DUR related extensions with DetectedIssue profiles - Added fax numbers to practitioner and organization - Updated and validated examples - Separated dispense Practitioner profile into separate Prescriber and Dispenser profiles	Ontario Health Digital Services MOH

		- Additional Details available in Appendix B: DHDR R2 Change Log	
2.0.1	2017-08-09	Updates in accordance with the dispositions of the comments received during the open review.	Ontario Health Digital Services MOH
2.0.2	2017-09-28	Changed cardinality of patient & practitioner names for consent unblock from optional to required. Added a text RelatedPerson relationship element when consent unblock is provided by an extended family member.	MOH
2.0.3	2018-03-16	Updated value set and examples of MedicationDispense.category to distinguish between dispenses of drugs/devices and pharmacy services. Updated mime format from "json+fhir" & "xml+fhir" to "fhir+json" & "fhir+xml" (FHIR DSTU2 to STU3 change). Updated sorting syntax from ":desc" qualifier to "-" prefix (STU3 change). Updated Patient Id search parameter from patient:patient.identifier to patient.identifier. Changed whenhandedover search parameter to lowercase (the element is still whenHandedOver in the resource). Added a note that DetectedIssue.implicated is not used in the current release. Added a note that DetectedIssue.severity (for DetectedIssue-7.25-message-nms profile) is not used in the current release. Relaxed cardinality of MedicationDispense.performer from 1..2 to 0..2 to accommodate dispense records where pharmacy is unknown, e.g. HNS Receipt. Updated RelatedPerson.relationship.text element to be used for Extended Family or Sibling (previously only Extended Family) Updated section title for 4.4.3.2 to Patient Demographics Profile, to match the profile name	MOH
2.0.4	2018-08-10	For Consent, relaxed cardinality of Practitioner.identifier and Organization.name from 1..1 to 0..1 with a note describing when these elements are supposed to be populated. Added an example of OperationOutcome indicating that some information is presented due to a temporary consent unblock.	MOH
2.0.5	2018-10-30	Removed Patient Demographics profile: only patient information from the dispense record would be returned (DHDR consumers would get patient demographics information from PCR or from their own database). Changed the way 3-point validation is performed: gender & date of birth parameters are matched against PCR rather than against historical dispense records.	MOH
3.0.0	2019-03-29	Updated to FHIR R4. Updated to address requirements for new data elements. Added search by POST in addition to GET. Added "whenprepared" search parameter (and removed "whenhandedover" search parameter). Replaced references to the Terminology Worksheet with links to Infoway's Terminology Gateway Value Sets for codes and to the Canadian URI Registry for URIs. Added "source" extension to meta data to indicate a source of MedicationDispense. MedicationDispense profile changes: added mandatory "whenPrepared" (a dispense date), changed cardinality of "whenHandedOver" to optional and changed definition of whenHandedOver to indicate that this is a pickup date rather than a dispense date; added "refillsRemaining" & "quantityRemaining" extensions; updated "identifier" to contain the Current Rx number; added optional "unit", "system" & "code" sub-elements to "quantity" for records that have this information; added "dosageInstruction" element with sub-elements for: Dosage Specification, Patient Dosage Instruction, Frequency, PRN (asNeeded) Indicator, Administrable Route, Administrable Dose. Medication profile changes: added an option of using CCDD terminology in addition to DIN/PIN codes; added an optional coded drug dosage form in addition to the textual one for records that have coded information, added compound-indicator extension. MedicationRequest profile changes: added original Rx "identifier" to replace the "identifier" definition from the previous version; added an option of having SNOMED CT "reasonCode" codes from the Canadian "indication for use" value set in addition to ODB reason codes for limited use drugs. OperationOutcome profile changes: added "expression" element, deprecated "location" element. Removed	MOH

		DUR information (DetectedIssue). Added Bundle.timestamp. Updated Consent purpose code. Updated examples.	
3.0.1	2019-06-11	Removed references to requirements documents in section 1.5. Corrected previous wording of MedicationRequest profile changes in the change log – “identifier” is not sliced.	MOH
3.0.2	2019-08-26	Updated Ontario logo. Corrected OperationOutcome search example. Added Appendix E Integration Traceability.	MOH
3.0.3	2019-09-12	Corrected severity in OperationOutcome consent block example in section 5.3.2.	MOH
3.0.4	2020-01-08	Replaced Instances of “eHealth Ontario” with “Ontario Health Digital Services”, and “eHO” with “OHDS” Changed “HL7 FHIR R4 (Dec 2018 Build, v4.0.0)” → “HL7 FHIR R4 (First Normative Content, v4.0.1)” – Page 9, Table 1 Added “EMPI” to Acronyms table Replaced instances of “eHealth Ontario Gateway” with “Ontario Health Provider Gateway”, and “eHO Gateway” with “OH Provider Gateway” Changed refills remaining and quantity remaining extensions to the [base-structure] namespace, as all other extensions are defined, i.e. http://ehealthontario.ca/fhir/StructureDefinition – Pages 36, 53, 73 Added Example with Contained Resources in Appendix F Editorial clarification on Page 19 and 22 Removed HTTP codes that are not specific to the DHDR on page 66. Changed value set for route of administration – Pages 38,54 Edited the OperationOutcome example in section 5.3.1 due to malformed JSON; Changed display name in Medication Dispense resource example in section 5.1.2	MOH
3.0.5	2020-02-11	Changed DHDR extensions namespace for quantity and refill remaining to “[base-structure]/ca-on-medications-ext-quantity-remaining and “[base-structure]/ca-on-medications-ext-refills-remaining” for consistency – Table 17,33,34 and Section 5.2 Minor Edits to the fill contained resource example on pages 48 and 78 POST search – removed query string parameters from URL definition to help ensure personal health information is not captured in logs – Page 19 (Table 5)	MOH
3.0.6	2020-02-12	The following changes have been made to support the implementation of the Provincial Consent Override Interface (PCOI) by Ontario Health Digital Services (OHDS). PCOI documentation will be available by contacting OHDS (architecture@ehealthontario.on.ca): Updated 2.1 Use Care Diagram to include PCOI Viewlet Updated Temporary Consent Unblock Use Case (section 2.3) to reference the Ontario Health Provincial Consent Override User Interface Updated acronyms to add “PCOI” Updated Figure 4 to include PCOI Viewlet Updated 2.3.2 Use Case Category: Temporary Consent Unblock to include PCOI Viewlet flow Updated resource list in 3.4 to reflect use of PCOI Viewlet Removed Consent interaction from 3.5 Summary of Supported Operations Updated 3.7 Create Temporary Consent Unblock to reference PCOI Viewlet documentation. Updated list of resources and profiles in Section 4: FHIR Resources to reflect use of PCOI Viewlet Removed section 4.5 Consent Profiles Removed Section 5.2 Consent Operation Examples Appendix A: removed Response Codes related to Consent operation Appendix D: updated extension titles to match extension names Replaced instances of “MOHLTC” with “MOH” Changed [id-system-local-base] to http://ehealthontario.ca/fhir/NamingSystem Changed [id-system-global-base] to https://fhir.infoway-inforoute.ca/NamingSystem	OHDS

		Changed [code-system-local-base] to http://ehealthontario.ca/fhir/NamingSystem	
3.0.7	2020-05-11	Fix documentation error Section 4.4.1 Table 17 extension URIs (Refills Remaining, Quantity Remaining)	OHDS
3.0.8	2020-11-04	Appendix G: Added a table that contains a mapping of the DHDR data elements to the FHIR resources	MOH

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1 Introduction

1.1 Summary and Scope

This document serves as a technical specification for implementing HL7 Fast Healthcare Interoperability Resources (FHIR) messages in order to interact with Ontario's Digital Health Drug Repository and Web Services (DHDR) solution. Sufficient business rationale is provided to illustrate the scenarios that the specification aims to fulfill. Storyboards, interactions, message types, vocabulary, data types, object identifiers, and FHIR message examples are included to facilitate the implementation process.

1.2 Intended Audience

The intended audiences of this document are business and technical implementers who are interested in retrieving dispensed medication information from DHDR. The readers are expected to have an understanding of the business and technical requirements for querying and receiving dispensed medication and pharmacy service information from the DHDR.

1.3 Background

The Digital Health Drug Repository (DHDR) was established to improve the quality of care Ontarians receive by providing frontline clinicians with integrated clinical access to a comprehensive dispensed medication and pharmacy service profile for their patients. Having an electronic, comprehensive medication profile at their fingertips empowers clinicians to deliver the best possible health care, and the health system is more digitally-enabled to operate more efficiently.

The records currently available include dispensing information about publicly funded drugs and pharmacy services, as well as all dispensed monitored drugs, regardless of payor. The DHDR will be expanded to include dispensing information contributed directly from Pharmacy Management Systems, regardless of whether the drugs were publicly funded, paid for directly by patients or by private insurers.

The DHDR offers web services for integration through Clinical Viewers, and plans will continue to develop to integrate the DHDR with other Point of Care systems, such as Electronic Medical Records and Hospital Information Systems.

The DHDR supports the long-term vision of 'All Drugs, All People' to provide a comprehensive record for all Ontarians that assists health care providers in establishing the Best Possible Medication History for their patients. Through this vision, health care providers can improve clinical decision making and provide better patient care.

More information regarding health care provider access to drug and pharmacy service information can be found at: www.ontario.ca/mydruginfo

1.4 Package Content

1.4.1 DHDR FHIR Implementation Guide

This document illustrates the use cases supported by DHDR solution, along with the content and data standard for the DHDR FHIR interfaces. To describe the structure of resources, we use the FHIR structure definition (<http://hl7.org/fhir/R4/structuredefinition.html>) format. Each resource type has its definition and schema on the hl7.org/fhir site, linked via the [FHIR resource list](#), along with examples in both XML and JSON formats.

1.4.2 Terminology Value Sets

Infoway's Terminology Gateway will host value sets used within the DHDR Implementation Guide. The value sets and code systems define the allowable values for each field and element in the DHDR FHIR specification, along with each value's definition and alignment with established standards.

The terminology is considered dynamic in nature and will require periodic updates and publications.

1.5 Reference Materials

Table 1 Reference Materials

Artifact	Location, Name of file
HL7 FHIR R4 (First Normative Content, v4.0.1))	http://hl7.org/fhir/R4/index.html
DHDR FHIR Specification	DHDR HL7 FHIR Implementation Guide V2.0.0 2017-06-11.docx Description: The DHDR FHIR Specification was developed jointly by the Ontario Health Digital Services and the Ontario Ministry of Health .The specification is the basis for this DHDR FHIR Implementation Guide.

1.6 Acronyms

Table 2 Acronyms

Acronym	Full Name
CPhA	Canadian Pharmacists Association
CPSO	College of Physicians and Surgeons of Ontario
DHDR	Digital Health Drug Repository
DIN	Drug Identification Numbers
EMPI	Enterprise Master Patient Index
FHIR	Fast Healthcare Interoperability Resources
HCN	Health Card Number
HL7	Health Level Seven
HNS	Health Network System
JSON	JavaScript Object Notation
MOH	Ministry of Health
NMS	Narcotics Monitoring System
ODB	Ontario Drug Benefit
OID	Object Identifier
PCOI	Provincial Consent Override Interface

Acronym	Full Name
PIN	Product Identification Numbers
Regex	Regular Expression
STU	Standard for Trial Use
UAO	Under the Authority Of
UPI	Unique Provider Identifier number
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
UUID	Universal Unique Identifier
XML	Extensible Markup Language

1.7 Identifier Policy

The DHDR project uses URIs whenever Object Identifiers are required. URIs (Uniform Resource Identifiers) are globally unique identifiers for individual objects, as well as for value sets, code systems, profiles, namespaces, and more. URIs are the preferred object identifiers for FHIR objects and are usually represented as URLs. All OIDs and URIs used in Ontario Health Digital Services projects must conform to Ontario Health Digital Service's OID and URI Management Policy

For more information, or to obtain the proper OIDs and URLs for use in this project, contact the Ontario Health Digital Services Standards Team at architecture@ehealthontario.on.ca

These identifiers capture the URI specific to an implementation/environment, such as the URL for resources and extensions used in the DHDR solution.

The base URL for DHDR FHIR interface will be referred to as "[base]" in the sections and examples below. Please note that base URL might change over time.

The base for global identifier namespaces will be referred to as "[id-system-global-base]" in the sections and examples below.

The base for local identifier namespaces (e.g. dispense identifiers, prescription numbers, etc.) will be referred to as "[id-system-local-base]" in the sections and examples below.

The base for local code systems (e.g. Ontario drug types) will be referred to as "[code-system-local-base]" in the sections and examples below.

Due to the evolving FHIR standard and its developing framework and governance, implementers should recognize that these identifiers may change if identifier registration becomes governed nationally or internationally. Implementers are recommended to implement URIs using configurable variables.

Table 3 Identifier Variables

Variable	Value
[base]	Please refer to Ontario Health Provider Gateway documentation
[base-structure]	http://ehealthontario.ca/fhir/StructureDefinition
[id-system-global-base]	https://fhir.infoway-inforoute.ca/NamingSystem

[id-system-local-base]	http://ehealthontario.ca/fhir/NamingSystem
[code-system-local-base]	http://ehealthontario.ca/fhir/NamingSystem

2 Use Cases

2.1 Use Case Diagram

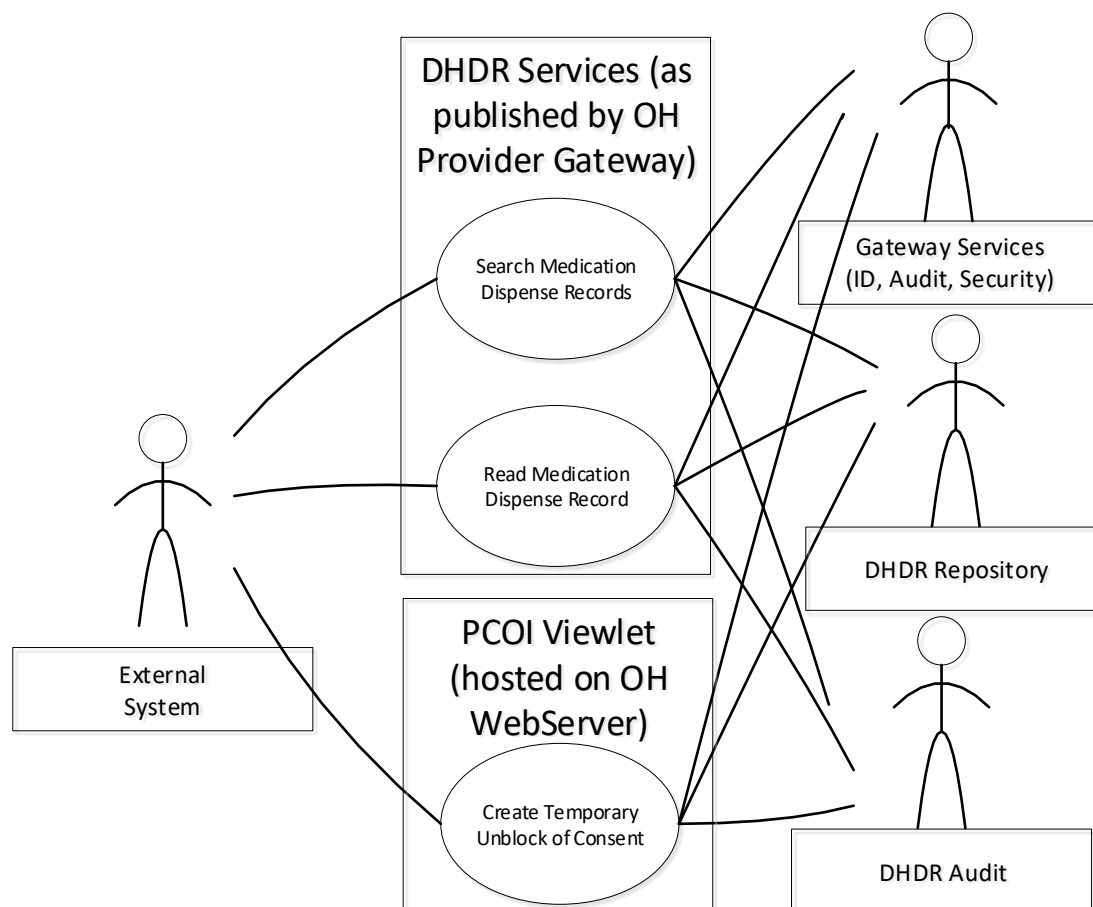


Figure 1 Ontario Health Digital Services DHDR Services Use Case Diagram

2.2 Business Scenario Category: Search and Read Medication Dispense Records

When an access request is made to the DHDR solution for a patient's dispensed drug event history, the DHDR solution uniquely identifies the patient based on the supplied patient identifiers and returns that patient's drug and pharmacy service events history to the calling system. The calling system can then use the results to create a drug and pharmacy service profile for the patient.

2.2.1 Transaction: Search Medication Dispense Request/Response

Medication Dispense Search

The transactions will:

- Allow a client application to search the DHDR repository for MedicationDispense records matching the search criteria
- Allow the DHDR solution to return an appropriate set of MedicationDispense records

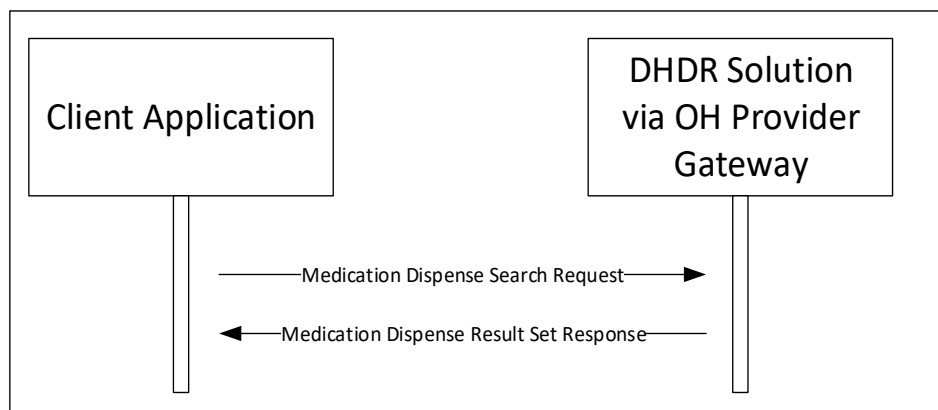


Figure 2 Search Medication Transaction

Use Case Category: Search Medication Dispense

This describes the use case category for searching for medication dispense information, based on a patient's Health Number, and optional search criteria. Please note that in the current release, Health Number is the only patient identifier supported for searches, but in the future releases, multiple identifier types might be allowed as query parameters, e.g. a point of care system might get all identifiers associated with a patient from the Provincial Client Registry or from a local EMPI and then search DHDR for all dispenses of a patient using these identifiers.

Search Types: Search by Health Number (and optional Gender, Date of Birth & range of dispense dates)

Scenario Details: The User of the client application requests retrieval of medication dispense information, using Health Number and optional search criteria as query parameters.

Message Flow:

1. "GET" or "POST" MedicationDispense search request is sent from the client application to DHDR (via the Gateway), containing query criteria in the URL string.
2. DHDR (via the Gateway) responds with the search results, in the form of a FHIR Bundle response.

Alternate Flow of Events:

1. Unable to process the request due to a system-related or business-related issue, the Gateway responds with an HTTP status code, and optionally an OperationOutcome resource.
2. If no MedicationDispense records are found within the default or the specified date range, then the Gateway will return a bundle with zero search results.
3. Some or all search results are blocked by a patient Consent Directive. The response message will include non-blocked search results, and additionally indicate that that blocked records may be available. See Section 2.3 for handling of Consent Directives and Temporary Consent Unblock.

2.2.2 Transaction: Read Medication Dispense Request/Response

Medication Dispense Read

The transactions will:

- Allow a client application to request a specific medication dispense record by specifying a Dispense ID
- Allow the DHDR solution to return the appropriate MedicationDispense record

The medication dispense record that is returned will contain the information about the type of medication dispensed, the prescriber, the fulfilling pharmacist and the name of the pharmacy that dispensed it.

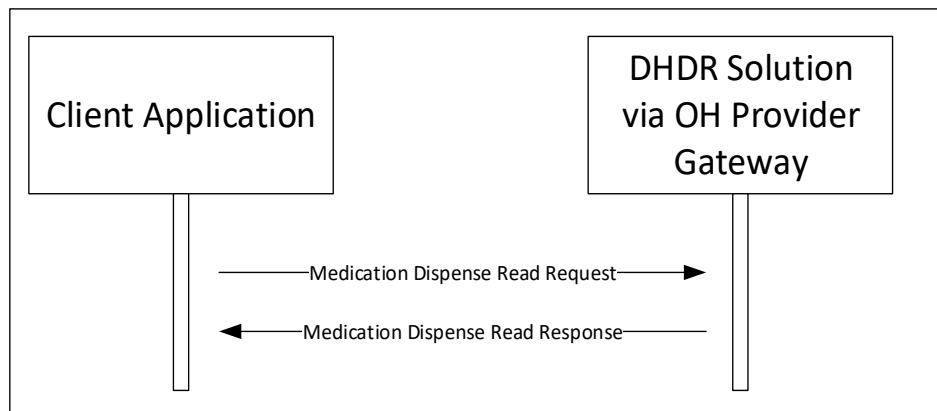


Figure 3 Retrieve Medication Transaction

Use Case Category: Read Medication Dispense

This describes the use case category for reading a specific medication dispense record, based on the DHDR Resource ID of the Medication Dispense (typically captured from a prior search operation).

Scenario Details: The User of the client application requests retrieval of a specific medication dispense information, using the DHDR Resource ID of the Medication Dispense.

Message Flow:

1. "GET" MedicationDispense is sent from the client application to DHDR (via the Gateway), containing the query criteria in the URL string.
2. DHDR (via the Gateway) responds with the read result, in the form of a FHIR Resource response.

Alternate Flow of Events:

1. Unable to process the request due to a system-related or business-related issue, the Ontario Health Provider Gateway responds with an HTTP status code, and optionally an OperationOutcome resource.

2.3 Business Scenario Category: Create Temporary Consent Unblock

A Patient who has a consent withdrawal in place, visits a participating Health Care Provider and authorizes complete and full access to their dispensed drug event history to that health information custodian. Please note that there is no masking in DHDR as a dispense record can be blocked or allowed but cannot be partially masked.

2.3.1 Transaction: Create Temporary Consent Unblock for Medication Dispenses Blocked by Consent Directives

Consent Unblock Request:

After receiving a Medication Dispense Response identifying the existence of records blocked by a consent directive, the user may request access to those blocked records by using the client application to send a Temporary Consent Unblock Request to the Gateway. The request is submitted under the user's "Under Authority Of" (UAO) organization and allows all users of the UAO organization access to the patient's blocked records for the subsequent four hours.

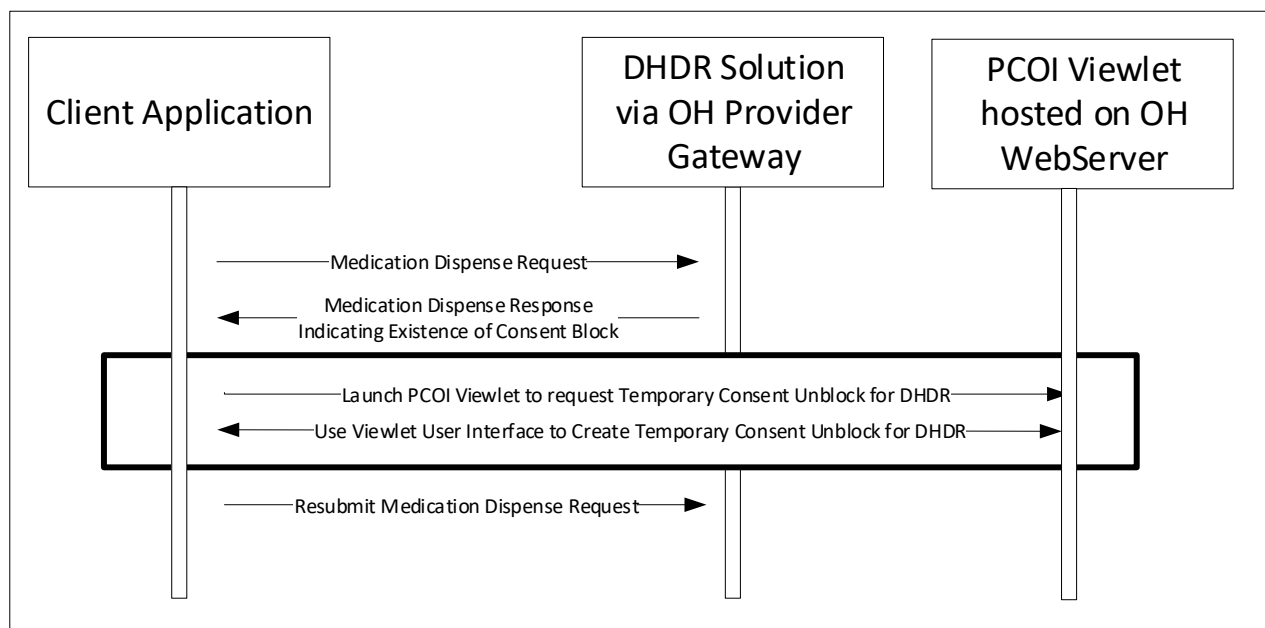


Figure 4 Create Temporary Consent Unblock

2.3.2 Use Case Category: Create Temporary Consent Unblock

Scenario Details: The User of the client application requests retrieval of medication dispense information. The response from DHDR indicates additional records are available but are blocked by the patient's consent directive. The User obtains permission from the patient or the patient's substitute decision maker (SDM) to temporarily unblock their record, captures approval via the official DHDR Temporary Unblocking of Access form, then stores the paper form securely for audit. The client application will prompt the User to confirm that permission has been obtained.

Message Flow:

1. A "GET" or "POST" MedicationDispense search request is sent from the client application to the Gateway, containing query criteria in the URL string.

2. The DHDR solution (via the Gateway) responds with a FHIR Bundle response, with zero or more search results. The response indicates records are available but are blocked by the patient's consent directives.
3. The client application launches the Provincial Consent Override Interface (PCOI) Viewlet (hosted on an Ontario Health webserver), returning a web-based user interface.
4. The user follows the prompts on the PCOI Viewlet, which include a PDF form for audit, and will receive a confirmation of successful temporary consent unblock through the viewlet.
5. The client application resubmits the retrieval of medication dispense information.

Alternate Flow of Events:

1. A User tries to access drug information when another user from the same organization had already obtained temporary consent unblock from the patient or SDM within the past four-hour time frame. The point of care system displays a notification to the user that consent has temporarily been unblock (messaging mechanism to identify MedicationDispense records as "temporarily consent unblocked" being finalized).

3 FHIR Specification

3.1 Introduction

This DHDR FHIR specification defines the FHIR profiles (constraints) and extension elements that are used in the DHDR project. All FHIR-based specifications rely on an underlying set of base “resources”.

Resources

Resources are the building blocks of the FHIR standard. These resources convey the content of clinical records, identify patients or providers, or otherwise support messaging between systems. These resources have been developed by several working groups at HL7, based on members’ experience and subject expertise. These resources are intended to capture and support 80% of all implementation use case requirements; projects are encouraged to meet the remaining 20% of requirements through extensions and profile constraints. The list of all available resources in the FHIR standard can be found at <https://hl7.org/fhir/resourcelist.html>, with additional details at <https://hl7.org/fhir/resourceguide.html>.

Profiles

Resources defined in the FHIR standard are intended to support a wide variety of use cases, resulting in a large number of available elements, and very few constraints. Implementers are encouraged to create and apply FHIR Profiles, which places constraints on the defined FHIR resources – tightening cardinality, identifying unused/unsupported elements, defining value sets for elements, and adding extension elements.

Transmission Specification

The formal MIME-type for FHIR resources is application/fhir+json or application/fhir+xml. The correct mime type SHALL be used by clients and servers:

- JSON (preferred): application/fhir+json
- XML (optional): application/fhir+xml

FHIR uses UTF-8 for all request and response bodies. Since the HTTP specification defines a default character encoding of ISO-8859-1, requests and responses SHALL explicitly set the character encoding to UTF-8 using the charset parameter of the MIME-type in the Content-Type header. Requests MAY also specify this charset parameter in the Accept header and/or use the Accept-Charset header.

Accept-Language field in HTTP header will be used to set the language of the search in the future releases. The allowed values are “en-CA” and “fr-CA”. If this field is not set by the requestor, the default is “en-CA”. In the current release, only “en-CA” is supported.

3.2 HL7.org FHIR Alignment

This DHDR FHIR specification is based on the draft FHIR R4 (December 2018).

Implementers should be aware of the stability of the FHIR standard, and that the DHDR may be subject to change to remain aligned with the international published FHIR standard.

3.3 DHDR Specification Alignment

This DHDR Implementation Guide is based on the Ontario DHDR FHIR Implementation Guide R 2 (v2.0.5). For implementers who developed their interface based on the DHDR Release 2 Implementation Guides, the changelog and differences are listed in Appendix B.

3.4 Resource Types

The DHDR solution implements a subset of all FHIR resources. For a complete list of FHIR resources (FHIR R4), visit <http://www.hl7.org/fhir/R4/resourceindex.html>. Resources related to this project are listed below, with their corresponding maturity levels in parentheses. The maturity level reflects the number of tested implementations for a resource, and provides implementers with an indication of its stability. The FHIR Maturity Model (FMM) gives values from zero to five, with FMM-zero as draft status and FMM-five having greater than five production implementations. The definitions for each FMM level are abbreviated in the table below, and fully defined in Appendix C. Additional details on the FHIR Maturity Model are available at <http://www.hl7.org/fhir/R4/versions.html#maturity>.

Table 4 Identifier Variables

FMM Level	FMM Definition
FMM0	This level is synonymous with Draft
FMM1	the responsible WG consider the artifact substantially complete and ready for implementation
FMM2	the artifact has been successfully exchanged between at least three independently developed systems leveraging at least 80% of the core data elements
FMM3	the artifact meets Conformance Resource Quality Guidelines has been subject to formal balloting; has 10+ distinct implementer comments from 3+ organizations resulting in at least one substantive change
FMM4	the artifact has been tested across its scope, formally published (e.g. Trial-Use), and implemented in multiple prototype projects
FMM5	the artifact has been formally published twice and has been implemented in 5+ independent production systems in more than one country
Normative	the artifact is now considered stable

The following resources are needed for the DHDR solution:

- Infrastructure Resources:
 - Resource (Normative)
 - DomainResource (Normative)
 - Bundle (Normative)
 - OperationOutcome (Normative)
- Clinical and Identification Resources:
 - MedicationDispense (FMM2)
 - Patient (Normative)
 - Medication (FMM3)
 - MedicationRequest (FMM3)
 - Practitioner (FMM3)

- Organization (FMM3)

The DHDR solution uses DHDR FHIR profiles to constrain value sets and cardinality of data elements in the resources listed above. Where FHIR R4 does not support requirements for this project, extensions will be introduced; rationale for extensions are documented in the appendix.

3.5 Summary of Supported Resource Operations

The table below shows the allowed transactions on FHIR resources and their corresponding HTTP operations:

Table 5 DHDR FHIR HTTP Operations

Resource	Transaction	HTTP Verb	URL	Content Type	Request Body	Response Body	Document Section
Medication Dispense	Search	GET	[base]/[type]?[searchExpression]		None	<u>Bundle</u>	Section 4.4
Medication Dispense	Search (alternative to GET)	POST	[base]/[type]/_search?{_format=[mime-type]}	application/x-www-form-urlencoded	Form data	<u>Bundle</u>	Section 4.4
Medication Dispense	Read	GET	[base]/[type]/[id]		None	<u>Medication Dispense</u>	Section 4.4

See [Appendix A](#) for the full list of HTTP response codes.

3.6 Search Medication and Pharmacy Service Dispenses

This interaction searches a set of resources based on some filter criteria. The interaction can be performed by using either GET or POST HTTP commands.

```
GET [base]/[type]{?[parameters]}&_format=[mime-type]}
```

This searches all resources of a particular type using the criteria represented in the parameters.

Because of the way that some user agents and proxies treat GET and POST requests, in addition to the GET based search method above, DHDR also supports a POST based search:

```
POST [base]/[type]/_search{?_format=[mime-type]}
Content-Type: application/x-www-form-urlencoded
param1=value&param2=value
```

This has exactly the same semantics as the equivalent GET command.

Note: Supporting GET means that PHI (Personal health information) might appear in search parameters, and therefore in HTTP logs. For this reason logs should be regarded as being as sensitive as the resources themselves. This is a general requirement irrespective of the use of GET.

All these search interactions take a series of parameters that are a series of name=value pairs encoded in the URL (or as an application/x-www-form-urlencoded submission for a POST).

The AND search operator allows any combination of parameter expressions using “&”, and will create a valid search expression. For example:

```
GET [base]/MedicationDispense?patient.identifier=[id-system-global-base]/ca-on-patient-
hcn|12345678&whenprepared=ge2019-02-24
```

If the search fails (cannot be executed, not that there is no matches), the return value is a status code 4xx or 5xx, usually with an OperationOutcome. If the search succeeds, DHDR returns a 200 OK HTTP status code and the return content is a Bundle with type = searchset containing the results of the search as a collection of resources in a defined order. The result collection can be long, so server may use paging (adapted from RFC 5005 Feed Paging and Archiving) for breaking the collection into pages if appropriate (see Paging section below). The server may also return an OperationOutcome resource within the searchset Bundle entries that contains additional information about the search.

This project does not implement all FHIR search capabilities as they are not needed for this project. For more information about FHIR search capabilities refer to this page: <https://www.hl7.org/fhir/search.html>.

3.6.1 Search Parameter Types

Each search parameter is defined by a type that specifies how the search parameter behaves. These are the defined parameter types:

Table 6 General FHIR Search Parameters

Parameter Type	Description	Parameter Expression Structure	Example
number	Search parameter SHALL be a number (a whole number, or a decimal).	parameter=[comparator][number]	length=27// equal to 27 length=27,28//equal to 27 or 28 length=lt27// less than 27 length=le27.6 length=gt27
date	Search parameter is on a date/time. The date format is the standard XML format.	parameter=[comparator][date]	birthdate=2010-10-01 birthdate=gt2010-10-01
string	Search parameter is a simple string, like a name part. Search is case-insensitive and accent-insensitive. May match just the start of a string. String parameters may contain spaces.	parameter=[value]	name=john name=john,jack//john or jack
token	Search parameter on a coded element or identifier. May be used to search through the text, displayname, code and code/codesystem (for codes) and label, system and key (for identifier). Its value is either a string or a pair of namespace and value, separated by a " ", depending on the modifier used.	parameter=[system] [code]	reference=www.url.com 123
reference	Search parameter on a reference element. Allows identification of resources where a referenced resource matches the query ID. Not used in the current release	parameter=[type]/[id]	requester=practitioner/123

3.6.2 Parameter Prefixes & Modifiers

For the ordered parameter types of **number**, **date**, and **quantity**, a prefix to the parameter value may be used to control the nature of the matching. To avoid URL escaping and visual confusion, the following prefixes are used:

Table 7 FHIR Search Numeric Parameter Modifiers

eq	the value for the parameter in the resource is equal to the provided value	the range of the search value fully contains the range of the target value
gt	the value for the parameter in the resource is greater than the provided value	the range above the search value intersects (i.e. overlaps) with the range of the target value
lt	the value for the parameter in the resource is less than the provided value	the range below the search value intersects (i.e. overlaps) with the range of the target value

ge	the value for the parameter in the resource is greater or equal to the provided value	the range above the search value intersects (i.e. overlaps) with the range of the target value, or the range of the search value fully contains the range of the target value
le	the value for the parameter in the resource is less or equal to the provided value	the range below the search value intersects (i.e. overlaps) with the range of the target value or the range of the search value fully contains the range of the target value

If no prefix is present, the prefix eq is assumed.

3.6.3 Server Conformance

In order to allow the client to be confident about what search parameters were used as criteria by the server, the server will return the parameters that were actually used to process the search. Applications processing search results SHALL check these returned values where necessary. For example, if the server did not support some of the filters specified in the search, a client might manually apply those filters to the retrieved result set, display a warning message to the user or take some other action.

In the case of a RESTful search, these parameters are encoded in the self link in the bundle that is returned:

```
<link>
  <relation value="self"/>
  <url value="[base]/MedicationDispense?patient.identifier=[id-system-global-
base]/ca-on-patient-hcn|12345678"/>
</link>
```

In other respects, servers have considerable discretion with regards to supporting search:

- Server will declare additional parameter search-id in the profiles referenced from their conformance statements. This search-id will be generated for each search request, logged in audit database along with the search request & search response and returned to the client, who is expected to log this in their audit database too.
- Parameter names and URLs are case-sensitive.
- Server will choose how many results to return, though the client can use `_count` as above.
- Server will choose how to sort the return results, though it will honor the `_sort` parameter.

3.6.4 Supported Search Parameters

GET MedicationDispense

- Patient ID parameter : patient.identifier
 - Only Ontario Health Number is allowed as a Patient ID parameter in the current release.
 - Please note that Health Number Version is not supported. DHDR uses Ontario Health Number for unique identification of a patient while a version number is usually used for verification of the provincial coverage eligibility, which is out of scope for DHDR.
 - Example: patient.identifier=[id-system-global-base]/ca-on-patient-hcn|12345678
 - In future releases, multiple identifiers might be allowed as query parameters, e.g. a point of care system might get all identifiers associated with a patient from the Provincial Client Registry or from local EMPI and then search DHDR for all dispenses of a patient using these identifiers, e.g. “patient.identifier=[id-system-global-base]/ca-on-license-driver|23456789,[id-system-global-base]/ca-on-license-hunting|65432”.
- Optional gender and/or birthdate: for more precise identification of a patient for which it searches for dispenses, a point of care system is advised to use three-point patient identity verification, which includes gender and/or date of birth in addition to identifier. This would filter out search requests with not-matching gender or date of birth. The dispenses will be returned if Patient’s gender and/or birth date in PCR (Provincial Client Registry) match the values in the request parameters.
 - Considerations for choosing between 1 point and 3 point matching:
 - 1 point matching runs a risk of wrong identity information if the identifier is not validated against the same source
 - 3 point matching reduces the risk of misidentification, but increases the risk of not including relevant data
 - In the case that there is a question about the alignment of identity data, the three point approach is advised for identity verification.
- Optional Dates parameter: whenprepared
 - Example 1: whenprepared=gt2018-02-24
 - Example 2: whenprepared=ge2018-02-25&whenprepared=le2019-02-27
 - If there is no lower limit in the search request, the server will use a configured default, e.g. 120 days back.
- Sort order: _sort: only by whenprepared
 - Example: "_sort=whenprepared" (ascending) or "_sort=-whenprepared" (descending)
 - If not indicated in the request, the default sort order is by whenprepared descending.
- Size limit (for response paging): _count
 - Example: _count=10
 - If there is no _count in the search request, the server will use a configurable default page size, e.g. 50.
 - DHDR has a configurable maximal page size value, which is used if the requested page size is greater than this value. For example, if the page size in the request is "_count=2000" and the maximal page size is 1000, DHDR will return 1000 dispense records per page.
- Count of records (no records would be returned): _summary=count
- Server will generate and return an additional parameter search-id as per Server Conformance section above.

- Example: search-id=76395924-28c2-4cb1-93c1-608fb6eea979
- Format: JSON (default) or XML
 - format=[mime-type]:_format=application/fhir+json or _format=application/fhir+xml

3.6.5 Paging

The server provides paging for the results of a search interaction, and conforms to method adapted from [RFC 5005 \(Feed Paging and Archiving\)](#) for sending continuation links to the client when returning a Bundle.

This example shows the third page of a search result:

```
<Bundle xmlns="http://hl7.org/fhir">
  <!-- snip metadata -->
  <!-- This Search url starts with base search, and adds the effective
       parameters, and additional parameters for search state. All searches
       SHALL return this value.

       In this case, the search continuation method is that the server
       maintains a state, with page references into the stateful list.
  -->
  <link>
    <relation value="self">
      <url value="[base]/MedicationDispense?patient.identifier=[id-system-global-base]/c
a-on-patient-hcn|12345678&whenprepared=ge2018-02-24&whenprepared=le2019-02-26&_sort=-w
henprepared&_count=10&search-id=76395924-28c2-4cb1-93c1-608fb6eea979&page=3"/>
    </link>

    <link>
      <relation value="next"/>
      <url value="[base]/MedicationDispense?patient.identifier=[id-system-global-base]/c
a-on-patient-hcn|12345678&whenprepared=ge2018-02-24&whenprepared=le2019-02-26&_sort=-w
henprepared&_count=10&search-id=76395924-28c2-4cb1-93c1-608fb6eea979&page=4"/>
    </link>

    <!-- then the search results... -->
</Bundle>
```

A server will inform the client of the total number of resources returned by the interaction for which the results are paged using the Bundle.total. Please refer to the "Bundle Example" section, which shows use of Total and to the text in "Bundle Resource" section, which provides detailed explanation of Total.

3.6.6 Managing Returned Resources

In order to allow the client to be confident about what search parameters were used as criteria by the server, the server will return the parameters that were actually used to process the search. Applications processing search results SHALL check these returned values where necessary. For example, if the server did not support some of the filters specified in the search, a client might manually apply those filters to the retrieved result set, display a warning message to the user or take some other action.

In the case of a RESTful search, these parameters are encoded in the self link in the bundle that is returned:

```
<link>
  <relation value="self"/>
  <url value="[base]/MedicationDispense?patient.identifier=[id-system-global-base]/ca-on-patient-
hcn|12345678"/>
</link>
```

In other respects, servers have considerable discretion with regards to supporting search:

- Server will declare additional parameter search-id in the profiles referenced from their conformance statements. This search-id will be generated for each search request, logged in audit database along with the search request & search response and returned to the client, who is expected to log this in their audit database too.
- Parameter names and URLs are case-sensitive.
- Server will choose how many results to return, though the client can use `_count` as described below.
- Server will choose how to sort the return results, though it will honor the `_sort` parameter.

Sorting

The client can indicate which order to return the results by using the parameter `_sort`, which can have a value of one of the search parameters. The `_sort` parameter can repeat to indicate sort order, with the repeats indicating a lower sort priority sequentially. In the current release, only sorting by whenprepared (dispense date) is supported.

Each item in the comma separated list is a search parameter, optionally with a '-' prefix. The prefix indicates decreasing order; in its absence, the parameter is applied in increasing order. E.g.: `sort=-whenprepared`

Note:

- The server returns the sort it performs as part of the returned search parameters (see below).
- A search parameter can refer to an element that repeats, and therefore there can be multiple values for a given search parameter for a single resource. In this case, the sort is based on the item in the set of multiple parameters that comes earliest in the specified sort order when ordering the returned resources.
- When sorting on string search parameters, sorting will be performed on a case-insensitive basis. Accents will be ignored.

Page Count

In order to keep the load on clients, server and the network minimized, the server may choose to return the results in a series of pages. The search result set contains the URLs that the client uses to request additional pages from the search set. Page links are contained in the returned bundle as links.

Server will provide its own parameters in the links that it uses to manage the state of the search as pages are retrieved. These parameters do not need to be understood or processed by the client.

The parameter `_count` is defined as a hint to the server regarding how many resources should be returned in a single page. Server will not return more resources than requested, but is allowed to return less than the client requested. The

server might define a configurable default and maximal values for count in the future release. The server will repeat the original `_count` parameter in its returned page links so that subsequent paging requests honor the original `_count`.

Note: The combination of `_sort` and `_count` can be used to return only the latest resource that meets a particular criteria - set the criteria, and then sort by date in descending order, with `_count=1`. This way, the last matching resource will be returned.

Summary

The client can request the server to return a portion of the resources by using the parameter `_summary`:

```
GET [base]/MedicationDispense/12345?_summary=true
```

The `_summary` parameter requests the server to return a subset of the resource. It can contain one of the following values:

Table 8 Supported FHIR Summary parameters

true	Return only those elements marked as "summary" in the base definition of the resource(s)	Not used in the current release
text	Return only the "text" element, and any mandatory elements	Not used in the current release
data	Remove the text element	Not used in the current release
count	Search only: just return a count of the matching resources, without returning the actual matches	
false	Return all parts of the resource(s)	Default

The intent of the `_summary` parameter is to reduce the total processing load on server, client, and resources between them such as the network. The purpose of the summary form is to allow a client to quickly retrieve a large set of resources, and let a user pick the appropriate one. The summary for an element is defined to allow a user to quickly sort and filter the resources, and typically omit important content on the basis that the entire resource will be retrieved when the user selects a resource.

Server will mark the resources with the tag `SUBSETTED` to ensure that the incomplete resource is not accidentally used to overwrite a complete resource

3.6.7 Search Examples

Search by patient identifier & dates

GET [base]/MedicationDispense?patient.identifier=[id-system-global-base]/ca-on-patient-hcn|12345678&whenprepared=ge2018-02-24&whenprepared=le2019-02-26&_sort=-whenprepared&_count=10

In the returned Bundle, bundle.link (self) will contain an URL with a server-generated search-id value:
[base]/MedicationDispense?patient.identifier=[id-system-global-base]/ca-on-patient-hcn|12345678&whenprepared=ge2018-02-24&whenprepared=le2019-02-26&_sort=-whenprepared&_count=10&search-id=76395924-28c2-4cb1-93c1-608fb6eea979

Search with date of birth and gender

GET [base]/MedicationDispense?patient.identifier=[id-system-global-base]/ca-on-patient-hcn|12345678&patient.birthdate=1971-11-28&patient.gender=female&whenprepared=ge2018-02-24&whenprepared=le2019-02-26&_sort=-whenprepared&_count=10

Get the count of records

GET [base]/MedicationDispense?patient.identifier=[id-system-global-base]/ca-on-patient-hcn|12345678&whenprepared=ge2018-02-24&whenprepared=le2019-02-26&_summary=count

Search using POST

POST [base]/MedicationDispense/_search?_count=10&_format=application/fhir+json

Content-Type: application/x-www-form-urlencoded

patient.identifier=[id-system-global-base]/ca-on-patient-hcn|12345678& patient.birthdate=1971-11-28&patient.gender=female&whenprepared=ge2018-02-24&whenprepared=le2019-02-26&_sort=-whenprepared

* Please note that "OperationOutcome Example - Consent" section provides an example of the OperationOutcome resource that would appear in a bundle if there are any records blocked due to a consent directive.

3.7 Create Temporary Consent Unblock

To learn more about the requirements and specifications to launch the Provincial Consent Override Interface (PCOI) Viewlet, please contact Ontario Health Digital Services (architecture@ehealthontario.on.ca).

4 FHIR Resources

Resources in this section are constrained from FHIR R4 (version 4.0.0). Reminder: the sections below will use the URI variables defined in section 1.5, for maintainability purposes.

Note that some resources may not exist independently and be contained in another resource. For example, resource patient is always contained in a Consent or MedicationDispense instance. Section 4.4 displays the containments and relationships between resources.

Table 9 shows the allowed transactions on resources in this server.

Table 9 Supported FHIR Operations, by Resource

Resource	Create	Update	Read	Search
MedicationDispense	-	-	✓	✓
Medication	-	-	-	-
Patient	-	-	-	-
MedicationRequest	-	-	-	-
Practitioner	-	-	-	-
Organization	-	-	-	-
Bundle	-	-	-	-
OperationOutcome	-	-	-	-

4.1 How to Read this Section

4.1.1 Supported Attributes

The point of care systems consuming the DHDR API are expected to support all data elements defined in FHIR R4 for the resources listed above. However, only data elements described in the subsections below will be supported by DHDR in the current release. For some elements, cardinality has a superscripted asterisk symbol to the right, e.g. O..1^{*}: it means that this element has been constraint from “repeating” in the general FHIR spec (e.g. O..*) to a single instance, but despite this constraint, this element should still be represented as an array in a FHIR JSON message, e.g. “element [{}]”.

4.1.2 Format

DHDR will support JSON and XML formats. JSON is the preferred format.

4.1.3 Slicing

One common feature of constraining Structure Definitions is to take an element that may occur more than once (e.g. in a list), and split the list into a series of sublists, each with different restrictions on the elements in the sublist with associated additional meaning. In FHIR, this operation is known as "Slicing" a list. It is common to "slice" a list into sub-lists each containing just one element, effectively putting constraints on each element in the list. This technique can also be used on elements that do not repeat, but that have a choice of data types.

A number in the brackets after the element name refers to its slicing number.

4.2 Data Type Notes

4.2.1 Date

A date, or partial date (e.g. just year or year + month) as used in human communication. There is no time zone. Dates SHALL be valid dates. Regex: `-?[0-9]{4}(-(0[1-9]|1[0-2])(-(0[0-9]|1[1-2][0-9]|3[0-1]))?)?`

Examples: "2017-11-29"; "2017-09-03"

4.2.2 DateTime

A date, date-time or partial date (e.g. just year or year + month) as used in human communication. If hours and minutes are specified, a time zone SHALL be populated. Seconds must be provided due to schema type constraints but may be zero-filled and may be ignored. Dates SHALL be valid dates. The time "24:00" is not allowed.

Regex: `-?[0-9]{4}(-(0[1-9]|1[0-2])(-(0[0-9]|1[1-2][0-9]|3[0-1])(T([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-9](\.[0-9]+)?(Z|(\+|-(0[0-9]|1[0-3]):[0-5][0-9]|14:00)))?)?)?`

Examples: "2017-11-13T14:10:50-04:00"; "2017-07-09T08:04:03.817-05:00"

4.2.3 Time

A time during the day, with no date specified (can be converted to a Duration since midnight). Seconds must be provided due to schema type constraints but may be zero-filled and may be ignored. The time "24:00" is not allowed, and neither is a time zone.

Regex: `([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-9](\.[0-9]+)?`

Examples: "14:10:50"; "08:04:03.817"

4.2.4 URI

A Uniform Resource Identifier Reference (RFC 3986). Note: URIs are case sensitive. For UUID (urn:uuid:53fefa32-fcbb-4ff8-8a92-55ee120877b7) use all lowercase. URIs can be absolute or relative, and may have an optional fragment identifier.

4.3 Infrastructure Resources

4.3.1 Resource - Base Resource Definitions

Table 10 Base Resource Definition

Based on <http://hl7.org/fhir/R4/resource.html>

Name	Card	Type	Value/Vocab	Description	Comments
id	0..1	id	Unique ID set by FHIR server	Logical id of this artifact	
meta	0..1	Meta		Metadata about the resource	Only for MedicationDispense
lastUpdated	0..1	instant		This value changes each time the content of the resource changes.	
source	0..1	uri	HNS: http://ehealthontario.ca/hns NMS: http://ehealthontario.ca/nms Pharmacy: http://ehealthontario.ca/pharmacy	A uri that identifies the source system of the resource.	
language	0..1	code	ValueSet: http://hl7.org/fhir/ValueSet/languages 4.0.0 Current release: used only for Bundle; fixed to “en”	Language of the resource content	

4.3.2 DomainResource Resource

Based on <http://hl7.org/fhir/R4/domainresource.html>

A resource with narrative, extensions, and contained resources

- If a resource is contained in another resource, it SHALL NOT have a meta.versionId or a meta.lastUpdated
- If the resource is contained in another resource, it SHALL be referred to from elsewhere in the resource
- If the resource is contained in another resource, it SHALL NOT contain nested Resources
- If the resource is contained in another resource, it SHALL NOT contain any narrative

Most resources are derived from Domain Resources - so they also can contain text, contained resources, extensions, and data elements specific to the particular domain of the resource.

Table 11 DomainResource Resource Definition

Name	Card	Type	Value/Vocab	Description	Comments
text	0..1	Narrative		Text summary of the resource, for human interpretation	Not used in the current release.
contained	0..*	Resource		Contained, inline Resources	
extension	0..*	Extension		Additional Content defined by implementations	
modifierExtension	0..*	Extension		Extensions that cannot be ignored	

4.3.3 Bundle Resource

Based on <http://hl7.org/fhir/R4/bundle.html>

A special type of resource for collections of resources.

A set of search results (type = "searchset") consists of a series of zero or more entries. Each entry element will contain a resource.

Bundle.total may be used to return the total number of resources that match the search, and that may be returned by following the "next" link.

Table 12 Bundle Resource Definition

Name	Card	Type	Value/Vocab	Description	Comments
type	1..1	code	Fixed to “searchset”	Type of bundle	
timestamp	0..1	instant		When the bundle was assembled	
total	0..1	unsignedInt		The total number of matches	
link	0..*	BackboneElement		Links related to this Bundle	Optional element, might be returned by a server.
relation	1..1	string	“self” for the link to the this Bundle “next” for the link to the next page	ValueSet: http://www.iana.org/assignments/link-relations/link-relations.xhtml	
url	1..1	uri		Reference details for the link	
entry	0..*	BackboneElement		Entry in the bundle - will have a resource, or information.	
fullUrl	0..1	uri	The fullUrl element must be present when a resource is present, and not present otherwise	Absolute URL for resource (server address, or UUID/OID).	
resource	0..1	Resource		A resource in the bundle	

4.3.4 OperationOutcome Resource

Based on <http://hl7.org/fhir/R4/operationoutcome.html>

Operation Outcomes are sets of error, warning and information messages that provide detailed information about the outcome of some attempted system operation. They are provided as a direct system response, or component of one, where they provide information about the outcome of the operation.

OperationOutcomes are used in the following circumstances:

- When an RESTful operation fails
- As the response on a validation operation, to provide information about the outcomes
- As part of a message response, usually when the message has not been processed correctly

Table 13 OperationOutcome Resource Definition

Name	Card	Type	Value/Vocab	Description	Comments
issue	1..*	BackboneElement		A single issue associated with the action	
severity	1..1	code	ValueSet: http://hl7.org/fhir/ValueSet/issue-severity 4.0.0	fatal error warning information	
code	1..1	code	ValueSet: http://hl7.org/fhir/ValueSet/issue-type 4.0.0	Error or warning code	
details	0..1	CodeableConcept		Additional details about the error	

coding	0..1*	Coding		A reference to a code defined by a terminology system	
system	0..1	uri		Identity of the terminology system	
code	0..1	code		Symbol in syntax defined by the system	
display	0..1	string		Representation defined by the system	
text	0..1	string		Plain text representation of the concept	
diagnostics	0..1	string		Additional diagnostic information about the issue	
location	0..*	string		XPath of element(s) related to issue	Deprecated (not used)
expression	0..*	string		FHIRPath of element(s) related to issue	

Using Operation Outcome Resources

On the RESTful interface, operation outcome resources are only relevant when a level of computable detail is required that is more granular than that provided by the HTTP response codes. This granularity could include:

- more detail about the location of an issue
- the ability to identify multiple distinct issues
- provision of finer error codes that connect to known business failure states

Consent Indicator in OperationOutcome

The OperationOutcome resource may be included in the DHDR response bundle, in response to a MedicationDispense search request. This may indicate that MedicationDispense records were not included due to a patient privacy consent directive. The OperationOutcome resource will have the following values:

- severity = warning
- code = suppressed

Table 14 OperationOutcome.issue.code ValueSet for a consent directive

Code	Display	Definition
suppressed	Information Suppressed	Some information was not or may not have been returned due to business rules, consent or privacy rules, or access permission constraints. This information may be accessible through alternate processes.

Temporary Consent Unblock Indicator in OperationOutcome

The OperationOutcome resource may be included in the DHDR response bundle, in response to a MedicationDispense search request. This may indicate that there is a patient privacy consent directive, but MedicationDispense records were included due to a patient's temporary unblock directive. The OperationOutcome resource will have the following values:

- severity = informational
- code = information

Table 15 OperationOutcome ValueSet.issue.code for a temporarily unblocked consent directive

Code	Display	Definition
information	Informational Note	Patient has temporarily unblocked access to view and use dispense information.

Reporting Errors in the HTTP Headers

Server may also need to report errors in the HTTP headers - especially query parameters when processing searches. Errors are reported using a case sensitive location that has two parts, a fixed "http" and the header or query parameter name separated by a ".". Some examples:

Table 16 HTTP Header Parameters.

Location	Description
http.name:exact	A reference to the search parameter "name" with the modifier ":exact"
http.Authorization	A reference to the Authorization header - perhaps to indicate that it is missing, and some form of authentication is required.

4.4 MedicationDispense Profiles

The MedicationDispense resource contains several references to other resources, e.g. the originating prescription (MedicationRequest resource), the prescriber (Practitioner resource), the patient (Patient resource), etc. The diagram below illustrates the resources that are referenced by the MedicationDispense resource, which are contained in the DHDR MedicationDispense response.

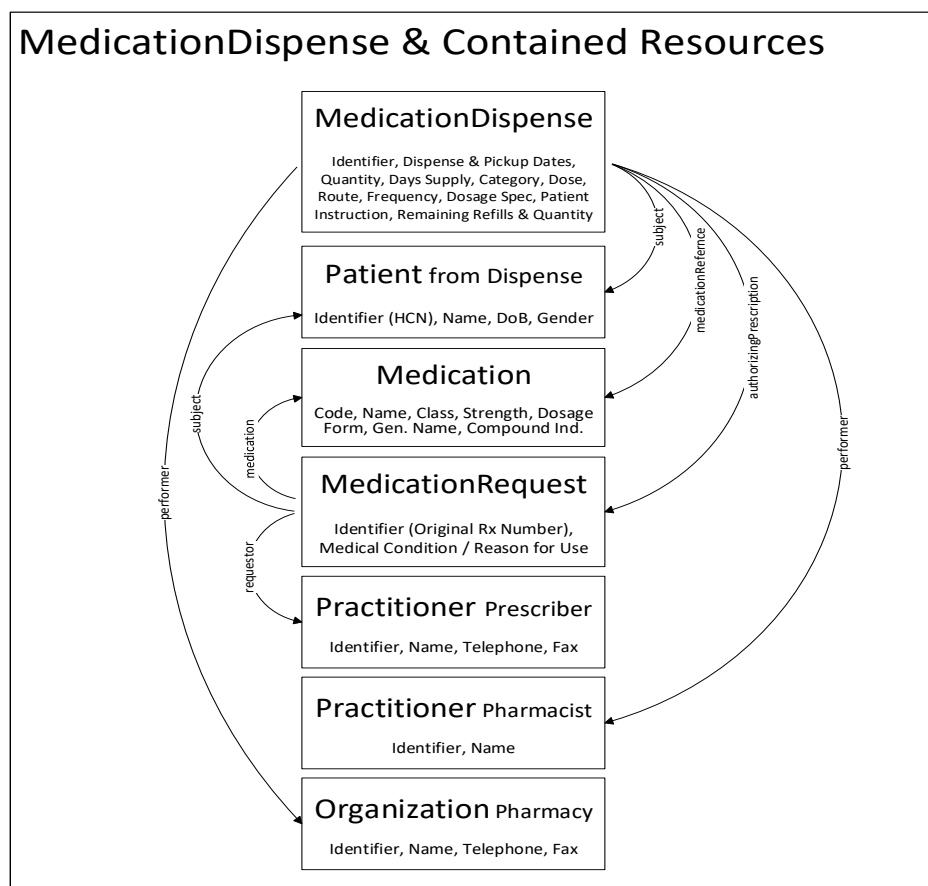


Figure 5 MedicationDispense Resource Model

4.4.1 MedicationDispense Profile

ca-on-medications-profile-MedicationDispense profile based on <http://hl7.org/fhir/R4/medicationdispense.html>

Table 17 MedicationDispense Profile

Name	Card	Type	Value/Vocab	Description	Comments
extension	0..2	Element	Sliced element, discriminator: url		
extension[1] (refillsRemaining)	0..1		Slice 1: refillsRemaining	Refills Remaining. Number of authorized refills/repeats remaining after this dispense.	
url	1..1	uri	"[base-structure]/ca-on-medications-ext-refills-remaining"	Identifies the meaning of the extension.	
valueInteger	1..1	integer		Value of extension.	
extension[2] (quantityRemaining)	0..1		Slice 2: quantityRemaining	Quantity Remaining. Total quantity remaining on a prescription after this dispense.	
url	1..1	uri	"[base-structure]/ca-on-medications-ext-quantity-remaining"	Identifies the meaning of the extension.	
valueQuantity	1..1	SimpleQuantity		Value of extension.	
value	1..1	decimal		The value of the measured amount. The value includes an implicit precision in the presentation of the value.	
unit	0..1	string		A human-readable form of the unit.	
system	0..1	uri		The identification of the system that provides the coded form of the unit.	
code	0..1	code	ValueSet: https://gateway.infoway-inforoute.ca/vs/prescribedquantityunit	A computer processable form of the unit in some unit representation system.	ValueSet: TBC
identifier	1..1	Identifier		Current Rx Number. Identifier assigned by the dispensing pharmacy.	
system	0..1	uri	e.g. "[id-system-local-base]/ca-on-pharmacy-[Pharmacy ID]-rx-number"	The namespace for the identifier value. This might be unknown for some dispenses that get loaded to DHDR from non-pharmacy feeds, e.g. ODB or NMS.	
value	1..1	string		Current Rx Number (assigned by a pharmacy). The unique identifier of the data source record.	
status	1..1	code	Value set: http://hl7.org/fhir/ValueSet/medication-dispense-status	A code specifying the state of the dispense event.	
category	0..1	CodeableConcept		Type of the dispense event	

	coding	1..1	Coding	ValueSet:https://tgateway.infoway-inforoute.ca/vs/medicationdispensecategory	Dispense type, e.g. drug, device or pharmacy service. A reference to a code defined by a terminology system.	ValueSet: TBC
	system	1..1	uri	Fixed: [code-system-local-base]/ca-on-medication-dispense-category	Identity of the terminology system.	
	code	1..1	code		Symbol in syntax defined by the system.	
	display	1..1	string		Representation defined by the system.	
	medicationReference	1..1	Reference (Medication)	Contained ca-on-medications-profile-Medication (Medication) resource	What medication or pharmacy service was supplied.	
	reference	1..1	string		A reference to a location at which the other resource is found.	
	subject	1..1	Reference (Patient)	Contained ca-on-medications-profile-Patient (Patient) resource	A link to a resource representing the person to whom the medication or pharmacy service was supplied.	
	reference	1..1	string		A reference to a location at which the other resource is found.	
	performer	0..2	BackboneElement	Sliced element, discriminator: reference	Indicates who or what performed the event.	
	performer[1] (performerOrganization)	0..1		Slice 1: performerOrganization	Dispensing Pharmacy.	
	actor	1..1	Reference (Organization)	Contained ca-on-medications-profile-Organization (Organization) resource	The organization who performed the action.	
	reference	1..1	string		A reference to a location at which the other resource is found.	
	performer[2] (performerPractitioner)	0..1		Slice 2: performerPractitioner	Dispenser (Dispensing Pharmacist).	
	actor	1..1	Reference (Practitioner)	Contained ca-on-medications-profile-Practitioner (Practitioner) resource	The practitioner (dispenser) who performed the action.	
	reference	1..1	string		A reference to a location at which the other resource is found.	
	authorizingPrescription	0..1*	Reference (MedicationRequest)	Contained ca-on-medications-profile-MedicationRequest (MedicationRequest) resource	Medication / pharmacy service order.	
	reference	1..1	string		A reference to a location at which the other resource is found.	
	quantity	1..1	SimpleQuantity		Dispensed Quantity. Quantity of medication dispensed (dosage units or metric weights).	
	value	1..1	decimal		The value of the measured amount. The value includes an implicit precision in the presentation of the value.	
	unit	0..1	string		A human-readable form of the unit.	

	system	0..1	uri		Identity of the terminology system.	
	code	0..1	code	ValueSet:https://tgateway.infoway-inforoute.ca/vs/prescribedquantityunit	Symbol in syntax defined by the system.	ValueSet: TBC
daysSupply		0..1	SimpleQuantity		Days' Supply. Estimated number of days of treatment based on the directions for use on the prescription and the pharmacists judgment on usage	
	value	1..1	decimal		The value of the measured amount. The value includes an implicit precision in the presentation of the value.	
whenPrepared		1..1	dateTime		Dispense Date. When product was packaged and reviewed.	
whenHandedOver		0..1	dateTime		Pickup Date. When product was given out (picked up by a patient or their representative).	
dosageInstruction		0..1*	Dosage		How the medication is to be used by the patient or administered by the caregiver	
	text	0..1	string		Dosage Specification. Free text dosage instructions.	
	patientInstruction	0..1	string		Patient Dosage Instruction. The instructions to the patient on how to take the medication (e.g. with food)	
	timing	0..1	Timing		Frequency. A timing schedule that specifies an event that may occur multiple times	
	repeat	1..1	Element		A set of rules that describe when the event is scheduled.	
	frequency	1..1	positiveInt		The number of times to repeat the action within the specified period.	
	period	1..1	decimal		Indicates the duration of time over which repetitions are to occur; e.g. to express "3 times per day", 3 would be the frequency and "1 day" would be the period.	
	periodMax	0..1	decimal		The upper limit of the period. This field is used when the dosage is a range, for example, every 4-6 hours.	
	periodUnit	1..1	code	ValueSet:http://hl7.org/fhir/ValueSet/units-of-time 4.0.0	The units of time for the period in UCUM units	
	asNeededBoolean	0..1	boolean		PRN Indicator. Indicates whether the Medication is only taken when needed within a specific dosing schedule	
	route	0..1	CodeableConcept		Route. A code specifying the route or physiological path of administration of a therapeutic agent into or onto a patient's body.	
	coding	1..1*	Coding	ValueSet: "https://terminology.hl7.org/CodeSystem/v3-RouteOfAdministration"	A reference to a code defined by a terminology system.	ValueSet: TBC
	system	1..1	uri		Identity of the terminology system.	
	code	1..1	code		Symbol in syntax defined by the system	

	text	0..1	string		Plain text representation of the concept	
	doseAndRate	0..1*	Element		Amount of medication administered	
	doseQuantity	0..1	SimpleQuantity		Dose. Amount of medication per dose	
	value	1..1	decimal		The value of the measured amount. The value includes an implicit precision in the presentation of the value.	
	unit	0..1	string		A human-readable form of the unit.	
	system	0..1	uri		The identification of the system that provides the coded form of the unit.	
	code	0..1	code	ValueSet:https://gateway.infoway-inforoute.ca/vs/prescriptiondosequantityunit	A computer processable form of the unit in some unit representation system.	ValueSet: TBC

4.4.2 Medication Profile

Note: Medication profile is also used to capture pharmacy services.

ca-on-medications-profile-Medication profile based on <http://hl7.org/FHIR/R4/medication.html>

Table 18 Medication Profile

Name	Card	Type	Value/Vocab	Description	Comments
extension	0..2	Element	Sliced element, discriminator: url	Dispensed Drug Strength	
extension[1] (medicationStrength)	0..1		Slice 1: medicationStrength	Dispensed Drug Strength	
url	1..1	uri	"[base-structure]/ca-on-medications-ext-medication-strength"	Identifies the meaning of the extension.	
valueString	1..1	string		Value of extension.	
extension[2] (compoundIndicator)	0..1		Slice 2: compoundIndicator	Compound Indicator	
url	1..1	uri	"[base-structure]/ca-on-medications-ext-compound-indicator"	Identifies the meaning of the extension.	
valueBoolean	1..1	boolean		Value of extension.	
code	1..1	Codeable Concept		Code that identifies the medication / pharmacy service	
coding	1..8	Coding	Sliced element, discriminator: system, code	Code defined by a terminology system	

	coding[1] (drugIdentifier)	1..1		Slice 1: drugIdentifier	Drug Identification Number (DIN). Number issued by Health Canada for drugs that can be legally marketed in Canada. In absence of DINs, Product Identification Numbers (PINs) may be provided instead.	A future release would also support CCDD Manufactured Product codes
	system	1..1	uri	http://hl7.org/fhir/NamingSystem/ca-hc-din or "[id-system-local-base]/ca-on-provincial-pin" or "[id-system-local-base]/ca-on-local-pin"	The identification of the code system that defines the meaning of the symbol in the code. URI of Health Canada DIN or Ontario Provincial PIN or Local Insurance PIN	In a future release, also URI of CCDD Manufactured Product
	code	1..1	code		DIN/PIN of the dispensed drug or pharmacy service. Symbol in syntax defined by the system	In a future release, also Manufactured Product code from CCDD.
	display	1..1	string		Brand name. Brand/display name of the dispensed drug or pharmacy service.	
	coding[2] (drugGeneric)	0..1		Slice 2: drugGeneric	Drug Name (Generic). Non-proprietary name or generic name of the drug dispensed.	
	system	1..1	uri	Fixed: [code-system-local-base]/ca-drug-gen-name	The identification of the code system that defines the meaning of the symbol in the code.	
	display	1..1	string		A representation of the meaning of the code in the system, following the rules of the system.	
	coding[3] (drugClass)	0..3		Slice 3: drugClass	Therapeutic Classification Name. Pharmacologic-therapeutic classification of the dispensed drug or pharmacy service, used to group interchangeable drug products.	Based on American Hospital Formulary Service (AHFS)
	system	1..1	uri	Fixed: [code-system-local-base]/ca-on-drug-class-ahfs	The identification of the code system that defines the meaning of the symbol in the code	
	code	1..1	code	ValueSet: https://tgateway.infoway-inforoute.ca/vs/drugclassification	Symbol in syntax defined by the system	
	display	1..1	string		A representation of the meaning of the code in the system, following the rules of the system.	
	coding[4] (drugSubclasses)	0..3		Slice 4: drugSubclass	Therapeutic Sub-Classification Name. Pharmacologic-therapeutic sub-classification of the dispensed drug or pharmacy service	Based on American Hospital Formulary Service (AHFS)
	system	1..1	uri	[code-system-local-base]/ca-on-drug-subclass-ahfs	The identification of the code system that defines the meaning of the symbol in the code.	
	code	1..1	code	ValueSet: https://tgateway.infoway-inforoute.ca/vs/drugsubclassification	Symbol in syntax defined by the system	
	display	0..1	string		A representation of the meaning of the code in the system, following the rules of the system.	
form		0..1	Codeable Concept		Drug Dosage Form. Form of the drug dispensed (e.g. tablet, capsule, injection). Dosage information is presented as a text rather than a code/system pair.	

	coding	0..1*	Coding	ValueSet: https://tgateway.infoway-inforoute.ca/vs/prescriptiondrugform		ValueSet: TBC
	system	1..1	uri		The identification of the code system that defines the meaning of the symbol in the code.	
	code	1..1	code		Symbol in syntax defined by the system	
	display	0..1	string		Representation defined by the system.	
	text	1..1	string		Plain text representation of the concept as seen/selected/uttered by the user who entered the data and/or which represents the intended meaning of the user, e.g. "Inj Sol"	E.g., a combination of abbreviations: https://tgateway.infoway-inforoute.ca/vs/drugdosageformabbreviations

4.4.3 Patient Profile

Patient information captured on the drug dispense record. This is not a source of truth for the current patient information. The point of care system should retrieve the current patient information from its own database or from the Provincial Client Registry.

ca-on-medications-profile-Patient-dispense profile based on <http://hl7.org/FHIR/R4/patient.html>

Table 19 Patient Profile

Name	Card	Type	Value/Vocab	Description	Comments
identifier	1..*	Identifier	Sliced element, discriminator: system	An identifier for this patient.	
identifier[1] (onHcn)	1..1		Slice 1: onHcn	Ontario Health Number.	
system	1..1	uri	Fixed: "[id-system-global-base]/ca-on-patient-hcn"	Patient Identifier Type. Namespace in which set of possible id values is unique.	
value	1..1	string		Patient Identifier Number. The portion of the identifier typically displayed to the user and which is unique within the context of the system.	
identifier[2..*] (otherId)	0..*		Slice 2: otherId. Not used in the current release.	Demographics Patient table: Other permitted patient identifiers.	Not used in the current release.
system	1..1	uri		Patient Identifier Type. Namespace in which set of possible id values is unique.	
value	1..1	string		Patient Identifier Number. The portion of the identifier typically displayed to the user and which is unique within the context of the system.	
name	0..1*	HumanName		A name associated with the individual.	
family	0..1	string		Patient Last Name	

	given	0..2	string		Patient First Name	Second repetition of given is a middle name if known
gender		0..1	code	"male", "female", "other", "unknown" (http://hl7.org/fhir/ValueSet/administrative-gender 4.0.0)	The gender of a person used for administrative purposes.	
birthDate		0..1	date		The date of birth for the individual.	

4.4.4 MedicationRequest (Prescription) Profile

ca-on-medications-profile-MedicationRequest profile based on <http://hl7.org/fhir/R4/medicationrequest.html>

Table 20 MedicationRequest Profile

Name	Card	Type	Value/Vocab	Description	Comments
identifier	0..1	Identifier		Identifier assigned by the ordering facility - this is an identifier assigned outside FHIR.	
system	0..1	uri		Namespace in which set of possible id values is unique.	https://simplifier.net/CanadianURIRegistry
value	1..1	string		Source system Original Rx Number (e.g. assigned by EMR or ePrescribing).	
status	1..1	code	"unknown"	A code specifying the current state of the order.	
intent	1..1	code	"original-order"	Whether the request is a proposal, plan, or an original order.	
medicationReference	1..1	Reference (Medication)	Contained ca-on-medications-profile-Medication (Medication) Resource	Medication to be taken.	
reference	1..1	string		A reference to a location at which the other resource is found.	
subject	1..1	Reference (Patient)	Contained ca-on-medications-profile-Patient-dispense (Patient) resource	Who medication request is for	
reference		string		A reference to a location at which the other resource is found.	
requester	0..1	Reference (Practitioner)		Prescriber. The practitioner (prescriber), organization or device that initiated the request and has responsibility for its activation.	
reference	1..1	string		A reference to a location at which the other resource is found.	

reasonCode	0..1*	CodeableConcept		Reason or indication for writing the prescription. Mandatory for dispenses of limited use drugs.	
coding	1..1	Coding	ValueSet: https://gateway.inforoute.ca/vs/prescriptionodbrasonforuse	A reference to a code defined by a terminology system. TBC future release: also codes from https://gateway.inforoute.ca/vs/prescriptionindicationforuse	
system	1..1	uri	e.g. "http://snomed.info/sct" or "[code-system-local-base]/ca-on-drug-odb-prescription-reason"	Identity of the terminology system.	
code	1..1	code		Symbol in syntax defined by the system.	
display	0..1	string		Representation defined by the system.	

4.4.5 Practitioner Profiles

There are two Practitioner resources used in the MedicationDispense operation: the dispenser (dispensing pharmacist) responsible for the MedicationDispense event, and the prescriber who authored the originating MedicationRequest (prescription) event.

4.4.5.1 Practitioner Prescriber Profile

ca-on-medications-profile-Practitioner-prescriber profile based on <http://hl7.org/fhir/R4/practitioner.html>

Table 21 Practitioner Profile

Name	Card	Type	Value/Vocab	Description	Comments
identifier	1..1*	Identifier		Practitioner ID (Licence): Prescriber, Pharmacist, other	
system	1..1	uri	URI of a licence regulating body or URI of MOH Billing Numbers	Namespace in which set of possible id values is unique.	See https://simplifier.net/CanadianURIRRegistry
value	1..1	string	Licence # or other business identifier	The portion of the identifier typically displayed to the user and which is unique within the context of the system.	E.g. This would be the CPSO License # for prescribers, or the CPHA License # for pharmacists.
name	0..1*	HumanName		A name associated with the practitioner (prescriber).	
family	0..1	string		Practitioner Last Name	
given	0..1*	string		Practitioner First Name	
telecom	0..2	ContactPoint	Sliced element, discriminator: system	Practitioner Phone and Fax	
telecom[1] (telecomPhone)	0..1		Slice 1: telecomPhone	Practitioner Phone Number	

system	0..1	code	Fixed: "phone"	Telecommunications form for contact point.	
value	0..1	string		The actual contact point details.	
use	0..1	code	ValueSet: http://hl7.org/fhir/ValueSet/contact-point-use 4.0.0	Use of contact point.	
telecom[2] (telecomFax)	0..1		Slice 2: telecomFax	Practitioner Fax Number	
system	0..1	code	Fixed: "fax"	Telecommunications form for contact point.	
value	0..1	string		The actual contact point details.	
use	0..1	code	ValueSet: http://hl7.org/fhir/ValueSet/contact-point-use 4.0.0	Use of contact point.	

4.4.5.2 Practitioner Dispenser Profile

ca-on-medications-profile-Practitioner-dispenser profile based on <http://hl7.org/fhir/R4/practitioner.html>

Table 22 Practitioner Profile

Name	Card	Type	Value/Vocab	Description	Comments
identifier	1..1*	Identifier		Practitioner ID (Licence)	
system	1..1	uri	URI of a licence regulating body	Namespace in which set of possible id values is unique.	E.g. [id-system-global-base]/ca-on-license-pharmacist See https://simplifier.net/CanadianURIRegistry
value	1..1	string	Licence # or other business identifier	The portion of the identifier typically displayed to the user and which is unique within the context of the system.	E.g. This would be the Ontario College of Pharmacists License # for pharmacists.
name	0..1*	HumanName		A name associated with the practitioner (dispenser).	
family	0..1	string		Practitioner Last Name	
given	0..1*	string		Practitioner First Name	

4.4.6 Organization (Dispensing Pharmacy) Profile

ca-on-medications-profile-Organization-dispenser profile based on <http://hl7.org/fhir/R4/organization.html>

Table 23 Organization Profile

Name	Card	Type	Value/Vocab	Description	Comments
identifier	1..1*	Identifier		Identifier for the organization.	
system	1..1	uri	Fixed to URI of Ontario College of Pharmacists Pharmacy ID	Namespace in which set of possible id values is unique.	
value	1..1	string		The portion of the identifier typically displayed to the user and which is unique within the context of the system.	
name	0..1	string		A name associated with the organization. Dispensing Pharmacy Name	
telecom	0..2	ContactPoint		Dispensing Pharmacy Phone & Fax Number	
telecom[1] (telecomPhone)	0..1		Slice 1: telecomPhone	Dispensing Pharmacy Phone Number	
system	0..1	code	Fixed: “phone”	Telecommunications form for contact point.	
value	0..1	string		The actual contact point details.	
use	0..1	code	ValueSet: http://hl7.org/fhir/ValueSet/contact-point-use 4.0.0	Use of contact point.	
telecom[2] (telecomFax)	0..1		Slice 2: telecomFax	Dispensing Pharmacy Fax Number	
system	0..1	code	Fixed: “fax”	Telecommunications form for contact point.	
value	0..1	string		The actual contact point details.	
use	0..1	code	ValueSet: http://hl7.org/fhir/ValueSet/contact-point-use 4.0.0	Use of contact point.	

5 FHIR Resource Examples

Reminder: Please note that in the examples below, the FHIR URIs have been replaced by [id-system-global-base] and other similar variables (see Section 1.5: Identifier Policy) for better readability and portability.

5.1 MedicationDispense Operation Examples

5.1.1 Medication Dispense (Complete) with Contained Resources Example

See Appendix F for a complete example of the MedicationDispense with contained resources.

5.1.2 Medication Dispense without Contained Resources Example

This is an example of the MedicationDispense resource, which references several other resources when returned in the DHDR response.

```
{
  "resourceType": "Bundle",
  "id": "1d5fded6-c7ee-41ce-a5c8-a219557df6f6",
  "language": "en",
  "type": "searchset",
  "timestamp": "2020-02-14T11:17:51.067-05:00",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url":
        "https://wsgateway.prod.ehealthontario.ca/API/FHIR/Medications/v3/MedicationDispense?patient.identifier=ht
        tps://fhir.inforoute.ca/NamingSystem/ca-on-patient-hcn%7C5259156783&whenprepared=eq2016-01-
        02&search-id=1d5fded6-c7ee-41ce-a5c8-a219557df6f6"
    }
  ],
  "entry": [
    {
      "fullUrl":
        "https://wsgateway.prod.ehealthontario.ca/API/FHIR/Medications/v3/MedicationDispense/8C66632E5A2E111B
        EO5400144FF84F18",
      "resource": {
        "resourceType": "MedicationDispense",
        "id": "8C66632E5A2E111BE05400144FF84F18",
        "meta": {
          "lastUpdated": "2019-06-28T13:13:16.000-04:00",
          "source": "http://ehealthontario.ca/hns"
        },
        "text": {
          "status": "generated",
          "div": "<div xmlns='\"http://www.w3.org/1999/xhtml\"'>Narrative is
          not implemented in this release</div>"
        },
        "extension": [
          {
            "url":
              "http://ehealthontario.ca/fhir/StructureDefinition/ca-on-medications-ext-refills-remaining",
            "valueInteger": 1
          }
        ]
      }
    }
  ]
}
```

```

        "url":
"http://ehealthontario.ca/fhir/StructureDefinition/ca-on-medications-ext-quantity-remaining",
        "valueQuantity": {
            "value": 20,
            "unit": "Tablet",
            "system": "http://snomed.info/sct",
            "code": "428673006"
        }
    },
    "identifier": [
        {
            "system":
"http://ehealthontario.ca/fhir/NamingSystem/ca-on-pharmacy-ON50533355-rx-number",
            "value": "509799785"
        }
    ],
    "status": "completed",
    "category": {
        "coding": [
            {
                "system":
"http://ehealthontario.ca/fhir/NamingSystem/ca-on-medication-dispense-category",
                "code": "product",
                "display": "Drug or Device"
            }
        ]
    },
    "medicationReference": {
        "reference": "#Medication8C66632E5A2E111BE05400144FF84F18"
    },
    "subject": {
        "reference": "#PatDisp8C66632E5A2E111BE05400144FF84F18"
    },
    "performer": [
        {
            "actor": {
                "reference":
"#OrgPharm8C66632E5A2E111BE05400144FF84F18"
            }
        },
        {
            "actor": {
                "reference":
"#PractDisp8C66632E5A2E111BE05400144FF84F18"
            }
        }
    ],
    "authorizingPrescription": [
        {
            "reference":
"#MedRequest8C66632E5A2E111BE05400144FF84F18"
        }
    ],
    "quantity": {
        "value": 20,
        "unit": "Tablet",
        "system": "http://snomed.info/sct",
        "code": "428673006"
    },
    "daysSupply": {
        "value": 20
    },
},

```

```

        "whenPrepared": "2016-01-02",
        "whenHandedOver": "2016-01-03",
        "dosageInstruction": [
          {
            "text": "Take 2 tablet Daily",
            "patientInstruction": "Take 2 tablet Daily",
            "timing": {
              "repeat": {
                "frequency": 2,
                "period": 1,
                "periodMax": 12,
                "periodUnit": "d"
              }
            },
            "asNeededBoolean": false,
            "route": {
              "coding": [
                {
                  "system":
"http://terminology.hl7.org/CodeSystem/v3-RouteOfAdministration",
                  "code": "PO"
                }
              ],
              "text": "Swallow, oral"
            },
            "doseAndRate": [
              {
                "doseQuantity": {
                  "value": 2,
                  "unit": "Tablet",
                  "system":
"http://snomed.info/sct",
                  "code": "428673006"
                }
              }
            ]
          }
        ]
      }
    ]
  }
}

```

5.1.3 Medication Example

This is an example of the Medication resource, which is contained in the MedicationDispense response.

```

{
  "resourceType": "Medication",
  "id": "Medication8C66632E5A2E111BE05400144FF84F18",
  "extension": [
    {

```

```

        "url":
        "http://ehealthontario.ca/fhir/StructureDefinition/ca-on-medications-ext-
        medication-strength",

        "valueString": "5mg"

    },

    {

        "url":
        "http://ehealthontario.ca/fhir/StructureDefinition/ca-on-medications-ext-
        compound-indicator",

        "valueBoolean": false

    }

],

"code": {

    "coding": [

        {

            "system": "http://hl7.org/fhir/NamingSystem/ca-hc-din",

            "code": "02267470",

            "display": "Novo-Bisoprolol"

        },

        {

            "system": "http://ehealthontario.ca/fhir/NamingSystem/ca-
            drug-gen-name",

            "display": "BISOPROLOL FUMARATE"

        },

        {

            "system": "http://ehealthontario.ca/fhir/NamingSystem/ca-
            on-drug-class-ahfs",

            "code": "240000000",

            "display": "CARDIOVASCULAR DRUGS"

```

```

    },
    {
      "system": "http://ehealthontario.ca/fhir/NamingSystem/ca-on-drug-subclass-ahfs",
      "code": "240400000",
      "display": "CARDIAC DRUGS"
    }
  ]
},
"form": {
  "coding": [
    {
      "system": "http://terminology.hl7.org/CodeSystem/v3-orderableDrugForm",
      "code": "TAB",
      "display": "Tablet"
    }
  ],
  "text": "Oral/Tab"
}
}

```

5.1.4 Patient Example

These is an example of a Patient resource, which would be contained in the MedicationDispense response.

```

{
  "resourceType": "Patient",
  "id": "PatDisp8C66632E5A2E111BE05400144FF84F18",
  "identifier": [
    {
      "system": "https://fhir.infoway-inforoute.ca/NamingSystem/ca-on-patient-hcn",
      "value": "5259156783"
    }
  ],
  "name": [
    {

```

```

    "family": "Chen",
    "given": [
      "Patrick"
    ]
  },
  "gender": "male",
  "birthDate": "1961-01-01"
}

```

5.1.5 MedicationRequest (Prescription) Example

This is an example of a MedicationRequest resource (i.e. a prescription), which would be contained in the MedicationDispense response.

```

{
  "resourceType": "MedicationRequest",
  "id": "MedRequest3A45B7BAB373537EE05400144FF8F552",
  "identifier": [
    {
      "system": "http://ehealthontario.ca/fhir/NamingSystem/ca-on-pharmacy-ON01987654-rx-number",
      "value": "9086374290"
    }
  ],
  "status": "unknown",
  "intent": "original-order",
  "medicationReference": {
    "reference": "#Medication3A45B7BAB373537EE05400144FF8F552"
  },
  "subject": {
    "reference": "#PatDisp3A45B7BAB373537EE05400144FF8F552"
  },
  "requester": {
    "reference": "#PractPrescr3A45B7BAB373537EE05400144FF8F552"
  },
  "reasonCode": [
    {
      "coding": [
        {
          "system": "http://ehealthontario.ca/fhir/NamingSystem/ca-on-drug-odb-prescription-reason",
          "code": "270",
          "display": "Limited to 2 weeks supply for acute pain."
        }
      ]
    }
  ]
}

```

5.1.6 Practitioner Examples

These are examples of a Practitioner resource (a prescriber and a dispenser), which would be contained in the MedicationDispense response.

5.1.6.1 Practitioner (Prescriber) Example

```

{
  "resourceType": "Practitioner",
  "id": "PractPrescr8C66632E5A2E111BE05400144FF84F18",

```

```

      "identifier": [
        {
          "system": "https://fhir.infoway-inforoute.ca/NamingSystem/ca-on-
license-physician",
          "value": "9898789"
        }
      ],
      "name": [
        {
          "family": "Smith",
          "given": [
            "John"
          ]
        }
      ],
      "telecom": [
        {
          "system": "phone",
          "value": "905-543-2314",
          "use": "work"
        },
        {
          "system": "fax",
          "value": "416-452-3963",
          "use": "work"
        }
      ]
    }
  ]
}

```

5.1.6.2 Practitioner (Dispenser) Example

```

{
  "resourceType": "Practitioner",
  "id": "PractDisp8C66632E5A2E111BE05400144FF84F18",
  "identifier": [
    {
      "system": "https://fhir.infoway-inforoute.ca/NamingSystem/ca-on-
license-pharmacist",
      "value": "200087"
    }
  ],
  "name": [
    {
      "family": "Sway",
      "given": [
        "Ken"
      ]
    }
  ]
}

```

5.1.7 Organization (Dispensing Pharmacy) Example

This is an example of an Organization resource (e.g. a dispensing pharmacy), which would be contained in the MedicationDispense response.

```

{
  "resourceType": "Organization",
  "id": "OrgPharm8C66632E5A2E111BE05400144FF84F18",

```

```
    "identifier": [
      {
        "system": "https://fhir.infoway-inforoute.ca/NamingSystem/ca-on-
pharmacy-id-ocp",
        "value": "ON50533355"
      }
    ],
    "name": "Good Life Pharmacy",
    "telecom": [
      {
        "system": "phone",
        "value": "416-539-5532",
        "use": "work"
      },
      {
        "system": "fax",
        "value": "647-619-4550",
        "use": "work"
      }
    ]
  }
}
```

5.2 OperationOutcome Examples

These are examples of OperationOutcome resources, which will be returned as part of responses from the DHDR server.

5.2.1 OperationOutcome Example - Search

```
{
  resourceType: "OperationOutcome",
  id: "OperationOutcome1234",
  issue: [
    {
      severity: "fatal",
      code: "code-invalid",
      details: {
        coding: [{
          system: "http://ehealthontario.ca/fhir/NamingSystem/ca-on-medications-
error",
          code: "FHIR_MD_1086"
        }],
        text: "The \"name\" parameter has the modifier \"exact\" which is not
supported by this server"
      },
      expression: [
        "http.name:exact"
      ]
    }
  ]
}
```

5.2.2 OperationOutcome Example - Consent Block

A note that some information is blocked and additional information might be available if Temporary Consent Unblock is used

```
{
  resourceType: "OperationOutcome",
  id: "OperationOutcome1235",
  issue: [
    {
      severity: "warning",
      code: "suppressed",
      details: {
        text: "Some information is blocked. Additional information may be
available using the Temporary Consent Unblock Protocol"
      }
    }
  ]
}
```

5.2.3 OperationOutcome Example - Return Records due to Temporary Consent Unblock

A note that some information is presented due to a temporary consent unblock

```
{
  "resourceType": "OperationOutcome",
  "id": "OperationOutcome1235",
  "issue": [
    {
      "severity": "information",
      "code": "informational",
      "details": {
        "text": "Patient has temporarily unblocked access to view and use drug
information."
      }
    }
  ]
}
```

5.3 Bundle Example – Search

This is an example of the Bundle resource, which will be returned as part of responses from the DHDR server.

```
{
  "resourceType": "Bundle",
  "id": "76395924-28c2-4cb1-93c1-608fb6eea979",
  "language": "en",
  "type": "searchset",
  "timestamp": "2019-02-25T15:43:54.271-05:00",
  "total": 63,
  "link": [
    {
      "relation": "self",
      "url": "[base]/MedicationDispense?patient.identifier= https://fhir.infoway-inforoute.ca/NamingSystem/ca-on-patient-hcn|12345678&whenprepared=ge2018-02-24&whenprepared=le2019-02-25&\_sort=-whenprepared&\_count=10&search-id=76395924-28c2-4cb1-93c1-608fb6eea979&page=3"
    },
    {
      "relation": "next",
      "url": "[base]/MedicationDispense?patient.identifier=https://fhir.infoway-inforoute.ca/NamingSystem/ca-on-patient-hcn|12345678&whenprepared=ge2018-02-24&whenprepared=le2019-02-25&\_sort=-whenprepared&\_count=10&search-id=76395924-28c2-4cb1-93c1-608fb6eea979&page=4"
    }
  ],
  "entry": [
    {
      "fullUrl": "[base]/MedicationDispense/355461",
      "resource": {
        "resourceType": "MedicationDispense",
        "id": "9",
        ...
      }
    },
    {
      "fullUrl": "[base]/MedicationDispense/1787802",
      "resource": {
        "resourceType": "MedicationDispense",
        "id": "10",
        ...
      }
    }
  ]
}
```

Appendix A: HTTP Response Codes

HTTP Response Codes

This specification makes rules about the use of specific HTTP status codes in particular circumstances where the status codes SHALL map to particular states correctly, and only where the correct status code is not obvious. Other HTTP status codes may be used for other states as appropriate, and this particularly includes various authentication related status codes and redirects. Authentication redirects should not be interpreted to change the location of the resource itself.

FHIR defines an OperationOutcome resource that can be used to convey specific detailed processable error information. For a few combinations of interactions and specific return codes, an OperationOutcome is required to be returned as the content of the response. The OperationOutcome may be returned with any HTTP 4xx or 5xx response, but is not required - many of these errors may be generated by generic server frameworks underlying a FHIR server.

Gateway HTTP Response Codes

Table 24 Gateway HTTP Response Codes

HTTP end point	HTTP verb	Scenario	HTTP response code	Notes
DHDR end point	GET & POST	Authorization success	application dependent	Successfully authorized. Copy the code returned from the application.
		Successful Return	200	OK
			201	Created
		Invalid token format	400	Bad Request
		Token information incorrect	401	Unauthorized
		Unauthorized	403	Forbidden
		Invalid Health Number	404	Not Found
		Unhandled exception	500	Server internal error
	Any other		405	Method not allowed

In all the cases above except for the successful authorization, Gateway will respond with appropriate FHIR response to the client using an OperationOutcome Resource (Ref. <http://hl7.org/fhir/R4/operationoutcome.html>).

IANA Defined HTTP Status Codes

<http://www.iana.org/assignments/http-status-codes/http-status-codes.xhtml>

The IANA HTTP Status Codes listed below describes HTTP responses that may be processed by the Gateway without accessing the DHDR solution. As a result, OperationOutcome resources would not be returned in these cases.

Table 25 IANA-Defined HTTP Status Codes

Response Code	Description	FHIR Usage Notes
200	OK	
201	Created	
400	Bad Request	Resource could not be parsed or failed basic FHIR validation rules (or multiple matches were found for
401	Unauthorized	
403	Forbidden	Authorization is required for the interaction that was attempted
404	Not Found	Resource type not supported, or not a FHIR end-point
405	Method Not Allowed	The resource did not exist prior to the update, and the server does not allow client defined ids
422	Unprocessable Entity	The proposed resource violated applicable FHIR profiles or server business rules. Accompanied by an OperationOutcome resource providing additional detail.
500	Internal Server Error	

Appendix B: DHDR R3 Change Log

- Updated to FHIR R4.
- Added search by POST in addition to GET.
- Added “whenprepared” search parameter (and removed “whenhandedover” search parameter).
- Removed Patient Demographics profile: only patient information from the dispense record would be returned. DHDR consumers would get patient demographics information from PCR or from their own database.
- Changed the way 3-point validation is performed: gender & date of birth parameters are matched against PCR rather than against historical dispense records.
- Replaced references to the Terminology Worksheet with links to Infoway’s Terminology Gateway Value Sets for codes and to the Canadian URI Registry for URIs.
- Added “meta.source” data element.
- MedicationDispense profile changes:
 - added mandatory “whenPrepared” (a dispense date), changed cardinality of “whenHandedOver” to optional and changed definition of whenHandedOver to indicate that this is a pickup date rather than a dispense date;
 - pre-adopted standard FHIR MedicationDispense “refillsRemaining” & “quantityRemaining” extensions; updated “identifier” to contain the Current Rx number;
 - MedicationDispense.identifier may now identify the source pharmacy for the prescription number, system uri in the form [local-base]/ca-on-pharmacy-[Pharmacy ID]-rx-number;
 - added optional “unit”, “system” & “code” sub-elements to “quantity” for records that have this information;
 - added “dosageInstruction” element with sub-elements for: Dosage Specification, Patient Dosage Instruction, Frequency, PRN (asNeeded) Indicator, Administrable Route, Administrable Dose.
- Medication profile changes:
 - added an option of using CCDD terminology in addition to DIN/PIN codes, Ontario Provincial PIN and Local Insurance PIN also newly supported;
 - added an optional coded drug dosage form in addition to the textual one for records that have coded information;
 - added compound-indicator extension.
 - removed Medication.isBrand to align with FHIR R4
- MedicationRequest profile changes:
 - added original Rx “identifier” to replace the “identifier” definition from the previous version;
 - new mandatory element MedicationRequest.status;
 - added an option of having SNOMED CT “reasonCode” codes from the Canadian “indication for use” value set in addition to ODB reason codes for limited use drugs.
- Patient profile changes:
 - added slice for otherID for Patient.identifier, but not yet supported in the current release;
 - Patient.name.given supports 0..2 cardinality, with second repetition supporting middle name, if known;
 - removed Patient.link
 - removed Patient.active
- Removed DUR information (DetectedIssue resource).
- Consent profile changes:

- updated data element names to align with FHIR R4
 - updated Consent purpose code;
 - changed Consent.except.action.coding.code+display value from “access” to “use”;
 - changed Consent.except.class.system+code+display values
- Practitioner (Consent) profile changes:
 - Practitioner.identifier cardinality relaxed from 1..1 to 0..1
- Organization (Consent) profile changes:
 - Organization.name cardinality relaxed from 1..1 to 0..1
- Bundle profile changes:
 - Added Bundle.timestamp
- OperationOutcome profile changes:
 - added “expression” element, deprecated “location” element to align with FHIR R4

Appendix C: FHIR Maturity Model

From <http://www.hl7.org/fhir/R4/versions.html#maturity>

All resources in the FHIR specification are assigned a "Maturity Level", known as FMM (following the well-established CMM grades- Capability Maturity Model).

The FMM level can be used by implementers to judge how advanced - and therefore stable - a resource is. The following FMM levels are defined as follows:

Table 26 FHIR Maturity Model Definition

FMM Level	FMM Definition
FMM0	The resource or profile (artifact) has been published on the current build. This level is synonymous with Draft
FMM1	FMM0 + the artifact produces no warnings during the build process and the responsible WG has indicated that they consider the artifact substantially complete and ready for implementation
FMM2	FMM1 + the artifact has been tested and successfully exchanged between at least three independently developed systems leveraging at least 80% of the core data elements using semi-realistic data and scenarios based on at least one of the declared scopes of the resource (e.g. at a connectathon). These interoperability results must have been reported to and accepted by the FMG
FMM3	FMM2 + the artifact has been verified by the work group as meeting the <u>Conformance Resource Quality Guidelines</u> ; has been subject to a round of formal balloting; has at least 10 distinct implementer comments recorded in the tracker drawn from at least 3 organizations resulting in at least one substantive change
FMM4	FMM3 + the artifact has been tested across its scope (see below), published in a formal publication (e.g. Trial-Use), and implemented in multiple prototype projects. As well, the responsible work group agrees the resource is sufficiently stable to require implementer consultation for subsequent non-backward compatible changes.
FMM5	FMM4 + the artifact has been published in two formal publication release cycles at FMM1+ (i.e. Trial-Use level) and has been implemented in at least 5 independent production systems in more than one country
Normative	the artifact is now considered stable

Appendix D: Extensions

Extension ca-on-medications-ext-medication-strength

Table 27 Medication Extension: Medication Strength

Name	Card	Type	Value/Vocab	Description	Comments
extension	0..1	Extension		Dispensed Drug Strength	
url	1..1	uri	[base-structure]/ca-on-medications-ext-medication-strength	Identifies the meaning of the extension.	
valueString	1..1	string		Textual description of the strength of a medication product when discrete amount for each ingredient is not required, e.g. "330mg & 50mg & 40mg & 15mg".	

Extension ca-on-medications-ext-quantity-remaining

Table 28 MedicationDispense Extension: Dispense Remaining Quantity

Name	Card	Type	Value/Vocab	Description	Comments
extension	0..1	Extension		Quantity Remaining. Total quantity remaining on a prescription after this dispense.	
url	1..1	uri	[base-structure]/ca-on-medications-ext-quantity-remaining	Identifies the meaning of the extension.	
valueQuantity	1..1	Quantity		Value of extension.	
value	1..1	decimal		The value of the measured amount. The value includes an implicit precision in the presentation of the value.	
unit	0..1	string		A human-readable form of the unit.	
system	0..1	uri		The identification of the system that provides the coded form of the unit.	
code	0..1	code	ValueSet: https://gateway.inforoute.ca/vs/prescribedquantityunit	A computer processable form of the unit in some unit representation system.	ValueSet: TBC

Extension ca-on-medications-ext-refills-remaining

Table 29 MedicationDispense Extension: Dispense Remaining Refills

Name	Card	Type	Value/Vocab	Description	Comments
extension	0..1	Extension		Remaining Refills	
url	1..1	uri	"[base-structure]/ca-on-medications-ext-refills-remaining"	Identifies the meaning of the extension.	
valueInteger	1..1	integer		Number of refills allowed or remaining after a dispensing event.	

Extension ca-on-medications-ext-compound-indicator**Table 30 Medication Extension: Drug Compound Indicator**

Name		Card	Type	Value/Vocab	Description	Comments
extension		0..1	Extension		Dispensed Drug Compound Indicator	
	url	1..1	uri	[base-structure]/ca-on-medications-ext-compound-indicator	Identifies the meaning of the extension.	
	valueBoolean	1..1	boolean		Indicates whether a dispensed drug is a compound	

Appendix E: Integration Traceability

HTTP Header Attributes

The ONE Access Gateway - Provider Integration Specification defines the requirements for connectivity and integration between provider and point-of-service systems with Ontario Health Digital Services EHR assets.

The ONE Access Gateway specification identifies HTTP Header attributes that support integration traceability, in addition to other attributes to support integration requirements such as authentication and authorization. Please contact architecture@ehealthontario.on.ca for additional information on this specification.

Appendix F : MedicationDispense with Contained Resource Example

```
{
  "resourceType": "Bundle",
  "id": "1d5fded6-c7ee-41ce-a5c8-a219557df6f6",
  "language": "en",
  "type": "searchset",
  "timestamp": "2020-02-14T11:17:51.067-05:00",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url":
        "https://wsgateway.prod.ehealthontario.ca/API/FHIR/Medications/v3/MedicationDispense
        ?patient.identifier=https://fhir.infoway-inforoute.ca/NamingSystem/ca-on-patient-
        hcn%7C5259156783&whenprepared=eq2016-01-02&search-id=1d5fded6-c7ee-41ce-a5c8-
        a219557df6f6"
    }
  ],
  "entry": [
    {
      "fullUrl":
        "https://wsgateway.prod.ehealthontario.ca/API/FHIR/Medications/v3/MedicationDispense
        /8C66632E5A2E111BE05400144FF84F18",
      "resource": {
        "resourceType": "MedicationDispense",
        "id": "8C66632E5A2E111BE05400144FF84F18",
        "meta": {
          "lastUpdated": "2019-06-28T13:13:16.000-04:00",
```

```

        "source": "http://ehealthontario.ca/hns"

    },

    "text": {

        "status": "generated",

        "div": "<div
xmlns=\"http://www.w3.org/1999/xhtml\">Narrative is not implemented in this
release</div>"

    },

    "contained": [

        {

            "resourceType": "Medication",

            "id": "Medication8C66632E5A2E111BE05400144FF84F18",

            "extension": [

                {

                    "url": "http://ehealthontario.ca/fhir/StructureDefinition/ca-on-
medications-ext-medication-strength",

                    "valueString": "5mg"

                },

                {

                    "url": "http://ehealthontario.ca/fhir/StructureDefinition/ca-on-
medications-ext-compound-indicator",

                    "valueBoolean": false

                }

            ],

            "code": {

                "coding": [

                    {

                        "system": "http://hl7.org/fhir/NamingSystem/ca-hc-din",

```

```

        "code": "02267470",

        "display": "Novo-Bisoprolol"

    },

    {

        "system": "http://ehealthontario.ca/fhir/NamingSystem/ca-drug-gen-
name",

        "display": "BISOPROLOL FUMARATE"

    },

    {

        "system": "http://ehealthontario.ca/fhir/NamingSystem/ca-on-drug-
class-ahfs",

        "code": "240000000",

        "display": "CARDIOVASCULAR DRUGS"

    },

    {

        "system": "http://ehealthontario.ca/fhir/NamingSystem/ca-on-drug-
subclass-ahfs",

        "code": "240400000",

        "display": "CARDIAC DRUGS"

    }

]

},

"form": {

    "coding": [

        {

            "system": "http://terminology.hl7.org/CodeSystem/v3-
orderableDrugForm",

            "code": "TAB",

```

```

        "display": "Tablet"

    },

    {
        "text": "Oral/Tab"
    }
},

{
    "resourceType": "Patient",
    "id": "PatDisp8C66632E5A2E111BE05400144FF84F18",
    "identifier": [
        {
            "system": "https://fhir.infoway-inforoute.ca/NamingSystem/ca-on-
patient-hcn",
            "value": "5259156783"
        }
    ],
    "name": [
        {
            "family": "Chen",
            "given": [
                "Patrick"
            ]
        }
    ],
    "gender": "male",
    "birthDate": "1961-01-01"
},

```

```

    {
      "resourceType": "Practitioner",
      "id": "PractPrescr8C66632E5A2E111BE05400144FF84F18",
      "identifier": [
        {
          "system": "https://fhir.infoway-inforoute.ca/NamingSystem/ca-on-
license-physician",
          "value": "9898789"
        }
      ],
      "name": [
        {
          "family": "Smith",
          "given": [
            "John"
          ]
        }
      ],
      "telecom": [
        {
          "system": "phone",
          "value": "905-543-2314",
          "use": "work"
        },
        {
          "system": "fax",
          "value": "416-452-3963",

```

```

        "use": "work"

    }

]

},

{

    "resourceType": "Organization",

    "id": "OrgPharm8C66632E5A2E111BE05400144FF84F18",

    "identifier": [

        {

            "system": "https://fhir.infoway-inforoute.ca/NamingSystem/ca-on-pharmacy-id-ocp",

            "value": "ON50533355"

        }

    ],

    "name": "Good Life Pharmacy",

    "telecom": [

        {

            "system": "phone",

            "value": "416-539-5532",

            "use": "work"

        },

        {

            "system": "fax",

            "value": "647-619-4550",

            "use": "work"

        }

    ]

}

```

```

    },

    {

      "resourceType": "Practitioner",

      "id": "PractDisp8C66632E5A2E111BE05400144FF84F18",

      "identifier": [

        {

          "system": "https://fhir.infoway-inforoute.ca/NamingSystem/ca-on-
license-pharmacist",

          "value": "200087"

        }

      ],

      "name": [

        {

          "family": "Sway",

          "given": [

            "Ken"

          ]

        }

      ]

    },

    {

      "resourceType": "MedicationRequest",

      "id": "MedRequest3A45B7BAB373537EE05400144FF8F552",

      "identifier": [

        {

          "system": "http://ehealthontario.ca/fhir/NamingSystem/ca-on-pharmacy-
ON01987654-rx-number",

```

```

        "value": "9086374290"

    },

    ],

    "status": "unknown",

    "intent": "original-order",

    "medicationReference": {

        "reference": "#Medication3A45B7BAB373537EE05400144FF8F552"

    },

    "subject": {

        "reference": "#PatDisp3A45B7BAB373537EE05400144FF8F552"

    },

    "requester": {

        "reference": "#PractPrescr3A45B7BAB373537EE05400144FF8F552"

    },

    "reasonCode": [

        {

            "coding": [

                {

                    "system": "http://ehealthontario.ca/fhir/NamingSystem/ca-on-drug-odb-prescription-reason",

                    "code": "270",

                    "display": "Limited to 2 weeks supply for acute pain."

                }

            ]

        }

    ]

}

```

```

],

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            "valueInteger": 1

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        {

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            "valueQuantity": {

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                "system": "http://snomed.info/sct",

                "code": "428673006"

            }

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    ],

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            "value": "509799785"

        }

    ],

    "status": "completed",

    "category": {

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                "code": "product",
                "display": "Drug or Device"
            }
        ],
        "medicationReference": {
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        },
        "subject": {
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"#PatDisp8C66632E5A2E111BE05400144FF84F18"
        },
        "performer": [
            {
                "actor": {
                    "reference":
"#OrgPharm8C66632E5A2E111BE05400144FF84F18"
                }
            },
            {
                "actor": {
                    "reference":
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                }
            }
        ]
    }

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    }

    ],

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        }

    ],

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        "unit": "Tablet",

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        "code": "428673006"

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    "daysSupply": {

        "value": 20

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    "whenPrepared": "2016-01-02",

    "whenHandedOver": "2016-01-03",

    "dosageInstruction": [

        {

            "text": "Take 2 tablet Daily",

            "patientInstruction": "Take 2 tablet Daily",

            "timing": {

                "repeat": {

                    "frequency": 2,

                    "period": 1,

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        "periodMax": 12,

        "periodUnit": "d"

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    },

    "asNeededBoolean": false,

    "route": {

        "coding": [

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                "system":
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                "code": "PO"

            }

        ],

        "text": "Swallow, oral"

    },

    "doseAndRate": [

        {

            "doseQuantity": {

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                "unit": "Tablet",

                "system":
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                "code": "428673006"

            }

        }

    ]

}

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```
    ]
  }
}
]
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Appendix G: DHDR Data Element to FHIR Element Mapping

Data Field	Description	FHIR Resource Mapping
Patient		
Patient First Name	First name of the patient	MedicationDispense.subject.Patient.name.given
Patient Last Name	Last name of the patient	MedicationDispense.subject.Patient.name.family
Patient Gender	Gender of the patient	MedicationDispense.subject.Patient.gender
Patient Date of Birth	Date of birth of the patient	MedicationDispense.subject.Patient.birthDate
Health Number	Number on an Ontario Health Card that uniquely identifies a patient	MedicationDispense.subject.Patient.identifier[1].value
Medication		
Drug Identification Number/Product Identification Number (DIN/PIN)	Drug Identification Number (DIN) assigned by Health Canada to every drug (e.g. Voltaren – DIN 00514012). Product Identification Number (PIN) assigned by the Ministry of Health and Long-Term Care (MOHLTC) to some drugs.	MedicationDispense.medicationReference.Medication.code.coding[1].code
Brand Name	Brand name or trade name of the prescription drug dispensed (e.g. Voltaren)	MedicationDispense.medicationReference.Medication.code.coding[1].display
Generic Name	Non-proprietary name or generic name of the drug dispensed (e.g. diclofenac sodium).	MedicationDispense.medicationReference.Medication.code.coding[2].display

Therapeutic Classification	Pharmacologic therapeutic classification of the prescription drug dispensed (e.g., analgesics nonsteroidal)	MedicationDispense.medicationReference.Medication.code.coding[3].display
Therapeutic Sub-Classification	Pharmacologic therapeutic sub-classification of the prescription drug dispensed. (e.g. anti-inflammatory agent)	MedicationDispense.medicationReference.Medication.code.coding[4].display
Strength	The amount of active ingredient in the prescription drug dispensed (e.g. 100mg)	MedicationDispense.medicationReference.Medication.extension[1].valueString
Compound Indicator	Indicates that the drug product identified in the dispensed event was used to prepare a compounded medication	MedicationDispense.medicationReference.Medication.extension[2].valueBoolean
Dosage Form	The physical form of a dose of a drug product (e.g., suppository)	MedicationDispense.medicationReference.Medication.form.text
Practitioner Prescriber		
Prescriber ID	License/registration number of the prescriber, issued by their licencing college.	MedicationDispense.authorizingPrescription.MedicationRequest.requester .Practitioner.identifier.value
Prescriber Issuing College	Identifies the registration authority (i.e. regulatory college – CPSO, RCDSO, etc.) which issued the license/registration number to the prescriber of the medication/pharmacy service.	MedicationDispense.authorizingPrescription.MedicationRequest.requester .Practitioner.identifier.system The DHDR identifier system should be mapped to the college description in the "PrescriberID Reference Mapping" tab.

Prescriber Name	First and last name of the prescriber that provided the prescription or ordered the pharmacy service	MedicationDispense.authorizingPrescription.MedicationRequest.requester .Practitioner.name.family MedicationDispense.authorizingPrescription.MedicationRequest.requester .Practitioner.name.given
Prescriber Phone Number	Phone number of the prescriber that provided the prescription or ordered the pharmacy service	MedicationDispense.authorizingPrescription.MedicationRequest.requester .Practitioner.telecom[1].value
Prescriber Fax Number	Fax number of the prescriber that provided the prescription or ordered the pharmacy service	MedicationDispense.authorizingPrescription.MedicationRequest.requester .Practitioner.telecom[2].value
Practitioner Dispenser		
Pharmacist ID	License/registration number of the dispenser, issued by their licencing college	MedicationDispense.performer[2].actor.Practitioner.identifier.value
Pharmacist Issuing College	Identifies the registration authority (i.e. regulatory college) which issued the license/registration number to the dispenser of the medication/pharmacy service. This is OCP in most cases, but may be CPSO in the case of a dispensing physician.	MedicationDispense.performer[2].actor.Practitioner.identifier.system The DHDR identifier system should be mapped to the college description in the "PrescriberID Reference Mapping" tab.
Pharmacist Name	First and last name of the pharmacist or dispensing physician that dispensed the prescription or rendered the pharmacy service	MedicationDispense.performer[2].actor.Practitioner.name.family MedicationDispense.performer[2].actor.Practitioner.name.given

	* Always available in NMS. Available in ODB if the pharmacist rendered a pharmacy service"	
Organization		
Pharmacy ID	Registration number of the dispensary which provided the medication/pharmacy service. Typically, for an accredited pharmacy, this will be the National Pharmacy ID Code, in alignment with the Canadian Pharmacists Association v3 claim standard. Will be a ministry assigned number for other dispensary locations (e.g. dispensing physicians).	MedicationDispense.performer[1].actor.Organization.identifier.value
Pharmacy Issuing College	Identifies the registration authority (i.e. regulatory college) which issued the license/registration number to the dispensary which provided the medication/pharmacy service - this is OCP in most cases.	MedicationDispense.performer[1].actor.Organization.identifier.system (Fixed to URI of Ontario College of Pharmacists Pharmacy ID: https://fhir.infoway-inforoute.ca/NamingSystem/ca-on-pharmacy-id-ocp)
Pharmacy Name	Name of the pharmacy that dispensed the prescription or rendered the pharmacy service	MedicationDispense.performer[1].actor.Organization.name
Pharmacy Phone Number	Phone number of the pharmacy that dispensed the prescription or	MedicationDispense.performer[1].actor.Organization.telecom[1].value

	rendered the pharmacy service	
Pharmacy Fax Number	Fax number of the pharmacy that dispensed the prescription or rendered the pharmacy service	MedicationDispense.performer[1].actor.Organization.telecom[2].value
Medication Request		
Original Rx Number	Number assigned by EMR or ePrescribing system to a new prescription on the original date of prescription	MedicationDispense.authorizingPrescription.MedicationRequest.identifier.value
Original Rx Number System	Source system of the original Rx Number (e.g EMR, PMS or ePrescribing).	MedicationDispense.authorizingPrescription.MedicationRequest.identifier.system
Medical Condition / Reason for Use	Indicates prescriber's designation of the medical condition for which the patient is being treated. This data field is only available for Limited Use products (e.g. Acarbose, Aflibercept)	MedicationDispense.authorizingPrescription.MedicationRequest.reasonCode .coding.code MedicationDispense.authorizingPrescription.MedicationRequest.reasonCode .coding.display
Medication Dispense		
Refills Remaining	Total number of refills remaining on a prescription	MedicationDispense.extension[1].valueInteger
Quantity Remaining	Total quantity remaining on a prescription	MedicationDispense.extension[2].valueQuantity.value MedicationDispense.extension[2].valueQuantity.unit
Current Prescription Number	The number assigned by the pharmacy that appears on the label of the dispensed prescription	MedicationDispense.identifier.value
Quantity	Quantity of medication dispensed	MedicationDispense.quantity.value

		MedicationDispense.quantity.unit
Estimated Days Supply	Estimated number of days of treatment based on the directions for use on the prescription and/or the pharmacist's judgment on usage	MedicationDispense.daysSupply.value
Dispensed Date	Transaction date when the prescription drug was dispensed or the pharmacy service was rendered	MedicationDispense.whenPrepared
Last Pickup Date	Date when the last dispensed product was provided to the patient	MedicationDispense.whenHandedOver
Dosage Specification	Free text dosage instructions.	MedicationDispense.dosageInstruction.text
Patient Dosage Instruction	The instructions to the patient on how to take the medication (e.g. with food)	MedicationDispense.dosageInstruction.patientInstruction
Frequency	The frequency with which the medication is to be taken (e.g., once a day, twice a day, every six hours)	MedicationDispense.dosageInstruction.timing.repeat.frequency MedicationDispense.dosageInstruction.timing.repeat.period MedicationDispense.dosageInstruction.timing.repeat.periodMax MedicationDispense.dosageInstruction.timing.repeat.periodUnit
PRN Indicator	An indicator that the medication is to be taken "as needed"	MedicationDispense.dosageInstruction.asNeededBoolean
Route	The route by which a drug is administered to the patient (e.g., oral, inhalation, transdermal, injectable, rectal)	MedicationDispense.dosageInstruction.route.text
Dose	The dose of the medication to be administered or taken	MedicationDispense.dosageInstruction.doseAndRate.doseQuantity.value MedicationDispense.dosageInstruction.doseAndRate.doseQuantity.unit

	by the patient (e.g. two capsules)	
*This table should be used as a quick-reference only and does not include some fields required by DHDR.		

Prescriber ID Reference Mapping

HNS Code	FHIR Practitioner.Identifier.System	Description
01	ca-on-license-physician	The College of Physicians and Surgeons of Ontario
02	ca-on-license-dental-surgeon	Royal College of Dental Surgeons of Ontario
03	ca-on-license-chiropract	College of Chiropractors of Ontario
08	ca-on-license-midwife	College of Midwives of Ontario
09	ca-on-license-pharmacist	Ontario College of Pharmacists
43	ca-on-license-optometrist	College of Optometrists of Ontario
44	ca-on-license-nurse	College of Nurses of Ontario
NO	ca-on-license-naturopath	College of Naturopaths of Ontario