

Vulcan FHIR to OMOP Implementation Guide

*** Ballot Participation ***



Davera Gabriel

Vulcan FHIR to OMOP IG Project Co-Lead

Jean Duteau

HL7 Technical Steering Committee Chair

Biomedical Research & Regulation Work Group Co-Chair

Vulcan FHIR to OMOP IG Project Technical Lead





Vulcan FHIR to OMOP Implementation Guide Ballot

What is it?

How can I help?



What is an HL7 Ballot?

- HL7 is an ANSI-accredited Standards Development Organization (SDO)
- Formal process to validate an “Authoritative” Standard
- Balloting ensures stakeholder feedback = Quality Control

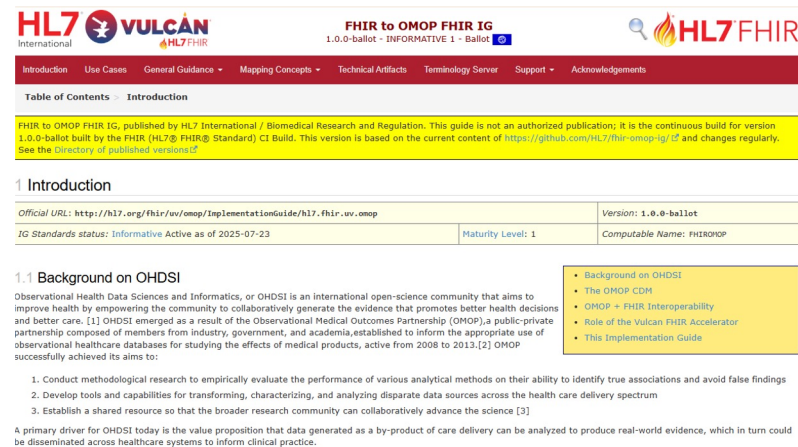


FHIR to OMOP IG has completed a major milestone
by “going to ballot” in September 2025 cycle



What is the FHIR to OMOP Implementation Guide?

- Culmination of 2+ years of conference calls
 - Detailed review of prior FHIR to OMOP transformations
- Scope: Common Core EHR data
- A “primer” for FHIR to OMOP implementers
- Foundation for **FHIR** → **OMOP** transforms



The screenshot shows the HL7 FHIR to OMOP Implementation Guide website. The header includes the HL7 FHIR logo and the title "FHIR to OMOP FHIR IG 1.0.0-ballot - INFORMATIVE 1 - Ballot". The navigation menu includes Introduction, Use Cases, General Guidance, Mapping Concepts, Technical Artifacts, Terminology Server, Support, and Acknowledgements. The main content area displays the "Table of Contents" and "Introduction" sections. The introduction section provides a brief overview of the guide's purpose and its relationship to the FHIR standard.

HL7 FHIR to OMOP FHIR IG
1.0.0-ballot - INFORMATIVE 1 - Ballot

Introduction Use Cases General Guidance Mapping Concepts Technical Artifacts Terminology Server Support Acknowledgements

Table of Contents Introduction

FHIR to OMOP FHIR IG, published by HL7 International / Biomedical Research and Regulation. This guide is not an authorized publication; it is the continuous build for version 1.0.0-ballot built by the FHIR (HL7® FHIR® Standard) CI Build. This version is based on the current content of <https://github.com/HL7/fhir-omop-ig> and changes regularly. See the [Directory of published versions](#).

1 Introduction

Official URL: <http://hl7.org/fhir/uv/omop/ImplementationGuide/hl7.fhir.uv.omop> Version: 1.0.0-ballot

IG Standards status: Informative Active as of 2025-07-23 Maturity Level: 1 Computable Name: FHIR-OMOP

1.1 Background on OHSI

Observational Health Data Sciences and Informatics, or OHSI is an international open-science community that aims to improve health by empowering the community to collaboratively generate the evidence that promotes better health decisions and better care. [1] OHSI emerged as a result of the Observational Medical Outcomes Partnership (OMOP), a public-private partnership composed of members from industry, government, and academia, established to inform the appropriate use of observational healthcare databases for studying the effects of medical products, active from 2008 to 2013. [2] OMOP successfully achieved its aims to:

1. Conduct methodological research to empirically evaluate the performance of various analytical methods on their ability to identify true associations and avoid false findings
2. Develop tools and capabilities for transforming, characterizing, and analyzing disparate data sources across the health care delivery spectrum
3. Establish a shared resource so that the broader research community can collaboratively advance the science [3]

A primary driver for OHSI today is the value proposition that data generated as a by-product of care delivery can be analyzed to produce real-world evidence, which in turn could be disseminated across healthcare systems to inform clinical practice.

- Background on OHSI
- The OMOP CDM
- OMOP + FHIR Interoperability
- Role of the Vulcan FHIR Accelerator
- This Implementation Guide

<https://build.fhir.org/ig/HL7/fhir-omop-ig/>





A Primer for FHIR to OMOP (F2O) Implementers

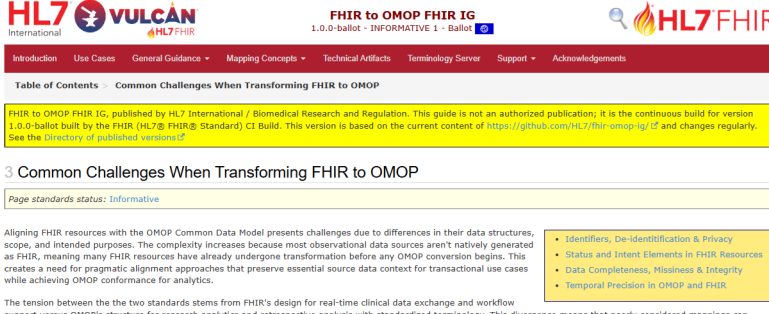
- General Guidance
- Best Practices
- Considerations
 - *customizable to individual implementations*

- Concept Mapping Principles & Patterns

5 Coded Field Mapping Principles

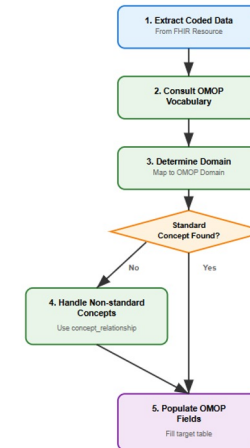
Page standards status: Informative

Unlike purely schema-to-schema transformations, transforming FHIR to OMOP requires evaluation of the concepts coded in the source data to determine and assign appropriate representation in a target OMOP database. This means that FHIR resources contained in profiles such as "IPA-Condition" or "IPA-Observation" may or may not generate records on a target OMOP domain table bearing the same or similar names, such as "condition_occurrence" and "observation." Rather, the concepts represented in the FHIR resource determine the appropriate transformation targets, and each must be evaluated on a case-by-case basis. FHIR coded source data transformation to OMOP often do follow patterns where similar data sources are processed through a common series of steps to populate an OMOP target database. This standardized approach lowers the decision burden for ETL developers and ensures consistent handling of coded clinical information across diverse healthcare datasets.



The screenshot shows the HL7 FHIR to OMOP FHIR IG website. The header includes the HL7 and VULCAN logos, and the title "FHIR to OMOP FHIR IG 1.0.0-ballot - INFORMATIVE 1 - Ballot". The navigation bar contains links for Introduction, Use Cases, General Guidance, Mapping Concepts, Technical Artifacts, Terminology Server, Support, and Acknowledgements. The main content area is titled "3 Common Challenges When Transforming FHIR to OMOP" and includes a "Page standards status: Informative" label. A disclaimer states that the guide is not an authorized publication and is the continuous build for version 1.0.0-ballot. A sidebar on the right lists key topics: Identifiers, De-identification & Privacy; Status and Intent Elements in FHIR Resources; Data Completeness, Missingness & Integrity; and Temporal Precision in OMOP and FHIR.

FHIR to OMOP Concept Transformation Base Pattern



FHIR to OMOP Technical Artifacts

- FHIR Logical Models
 - for OMOP CDM Tables
- FHIR Structure Maps
 - in FHIR Mapping Language
- Connectathon Validation Package
- Echidna FHIR Terminology Server Guidance

Key Elements Table	Differential Table	Snapshot Table	Statistics/References	All
Name	Flags	Card.	Type	Description & Constraints
ConditionOccurrence		0..*	Base	Condition Occurrence OMOP Table
condition_occurrence_id		1..1	integer	Condition Occurrence Identifier
person_id		1..1	Reference(Person OMOP Table)	Person
condition_concept_id		1..1	code	Condition
condition_start_date		1..1	date	Condition Start Date
condition_start_datetime		0..1	dateTime	Condition Start Datetime
condition_end_date		0..1	date	Condition End Date
condition_end_datetime		0..1	dateTime	Condition End Datetime
condition_type_concept_id		1..1	code	Condition Type
condition_status_concept_id		0..1	code	Condition Status
stop_reason		0..1	string	Stop Reason
provider_id		0..1	Reference(Provider OMOP Table)	Provider

```
/// url = 'http://hl7.org/fhir/uv/omop/StructureMap/AllergyMap'
/// name = 'AllergyMap'
/// title = 'Mapping Allergy resource to Observation OMOP Domain'
/// status = 'draft'

uses "http://hl7.org/fhir/StructureDefinition/AllergyIntolerance" alias Allergy as source
uses "http://hl7.org/fhir/uv/omop/StructureDefinition/Observation" alias ObservationTable as target

group Observation(source src : Allergy, target tgt : ObservationTable) {
  src.code as s -> tgt then {
    s.coding as sc -> tgt then {
      sc.code -> tgt.observation_concept_id, tgt.observation_source_value, tgt.observation_source_concept_id;
    };
  }; // src.id as id -> tgt.observation_id = cast(id, "integer");
  src.onset : dateTime as osd -> tgt.observation_date = cast(osd, 'date'), tgt.observation_datetime = osd; // src.patient as s -> tgt then {
  src.reaction as s -> tgt then {
    s.manifestation as sman -> tgt then {
      sman.concept as smanc -> tgt then {
        smanc.coding as sc -> tgt then {
          sc.code -> tgt.value_as_concept_id, tgt.value_source_value;
```

ECHIDNA SYSTEMS

^ K

CodeSystem

Get available CodeSystems GET

Lookup code in any CodeSystem by URL (GET) GET

Lookup code in any CodeSystem by URL (POST) POST

Lookup code in specific CodeSystem instance by ID (GET) GET

v0.10.1 OAS 3.1.0

OMOP FHIR Terminology Server

Download OpenAPI Document



How can you help?

- **We need your feedback !!**

- Did we achieve our target to develop a foundation: a F2O primer?
- Can the IG be improved?

- What do you need to do?

- **Join the ballot pool**
- **Vote & provide comments**





HL7 September Cycle Ballot Key Dates

Ballot Pool Registration (Required): July 7 - August 7, 2025

Official Ballot Period: August 8 - September 8, 2025

Important: *Registration during the July 7 - August 7 window is mandatory.*
Only registered participants can submit ballot comments and vote on comments.

HL7 Working Group Meeting: September 13-19, 2025 (Pittsburgh)

WGM Ballot Reconciliation Kick-off: Wednesday September 17, 2025
@ Biomedical Research & Regulation (BR&R) Working Group



How do I learn about HL7 Membership & Members?

- HL7 Organizational Members have voting “seats”
 - Designated members at your organization can join / participate as your proxy
- Membership not required, individual participation available for a fee
 - See: <https://www.hl7.org/BallotDesktop/index.cfm?view=home>

➤ **How to Check if Your Company is an HL7 Member**

➤ **How to Find Your Organization's HL7 Representative**

Instructions here: <http://bit.ly/4obJRqm>





Questions? Reach out to us!

davera.gabriel@evidentli.com

jean.duteau@dogwoodhealthconsulting.com

