

# OMOP-on-FHIR: A FHIR Server Development to Facilitate Data Interaction with the OMOP-CDM and FHIR for PGHD

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**Abstract.** This paper introduces the concept of the implementation of a FHIR server for bidirectional data exchange with the OMOP-CDM. Leveraging FHIR as a metamodel, the implementation aims to promote a more interconnected and patient-centric healthcare ecosystem. The methodology involves utilizing the Java HAPI FHIR API for server architecture and validating the solution through patient data exchange with a FHIR reference implementation server. This initiative signifies a significant advancement in healthcare data interoperability, promising improved patient care quality and clinical research vigor.

**Keywords.** OMOP-CDM, FHIR, OMOP-on-FHIR.HAPI-FHIR Server, FHIR-API

## 1. Introduction

Seamless data integration is crucial in healthcare informatics for interoperability and comprehensive patient care. This paper focuses on implementing a robust FHIR server to facilitate bidirectional data exchange between OMOP-CDM and FHIR, promoting a patient-centric healthcare ecosystem [1].

## 2. Methodology

The methodology for implementing OMOP-on-FHIR involves leveraging the FHIR standard as a meta-model to integrate common data models, utilizing the Java HAPI FHIR-API for server architecture, and validating the solution through patient data exchange with a FHIR reference implementation server. Collaboration between HL7 and the OHDSI community also aims to create a single common data model that integrates HL7 FHIR and OMOP [2,3]. Moreover, using FHIR as an intermediate representation

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does not lead to further information loss, and the server implementation features an FHIR API with new operations designed to support various data analysis tasks [4,5].

### 3. Results

Converting data from OMOP-CDM to FHIR involves several critical steps (Fig. 1). OMOP data is first converted to JSON and then to FHIR-compatible JSON. Validation against FHIR standards ensures data integrity, with errors corrected iteratively. Validated FHIR JSON bundles are imported into the FHIR server. Concept Maps align OMOP and FHIR data. Thorough testing identifies missing information. The specifics depend on use cases, versions, and customizations. Always refer to official documentation.

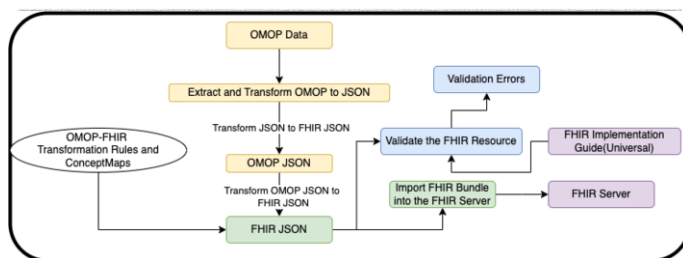


Figure 1. OMOP to FHIR: Concept Diagram

### 4. Discussion and Conclusion

Mapping data from OMOP to FHIR requires clear resource mappings, handling complex medication events, and creating terminology tables. Scalable algorithms, standardized rules, and collaboration ensure interoperability. Bulk conversion involves understanding both models, efficient extraction processes, and FHIR-aligned transformation logic. Integrating PGHD via FHIR enhances healthcare research and practice but poses data integrity and privacy challenges. The OMOP-on-FHIR initiative transforms OMOP data into FHIR resources, expanding standardized data access and supporting compliance.

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