

Types of **Interoperability**

Between Health Systems



Shared Instance: Connect

Health system shares its instance with other providers in the community



EpicCare Link

Community providers access the patient chart via a web portal



Care Everywhere

Sends out requests (both manual and automatic) to other health systems, receives a standardized summary (C-CDA), and incorporates the new data into the patient record



Direct Messaging

The organization that is currently seeing the patient can send the standardized C-CDA summary to another organization

Patient-Directed Interoperability



Share Everywhere

Patients can direct a temporary web view of their record summary to anyone in the world who has an internet connection



Lucy

Freestanding personal health record



Extract

Patients can obtain an extract of their data from their health systems

Between Software & Applications



Interfaces & APIs

Tens of billions of interface messages & API calls monthly

Leader *in* **Interoperability**



eHealth Exchange[™]



IHE
INTERNATIONAL

Integrating
the Healthcare
Enterprise



And many more...

Interoperability *in* Action



more than

180 billion

interface messages
each year



over

30,000

active interfaces



more than

1,000

vendors

Interoperability in *Action*



Fast
Healthcare
Interoperability
Resources

67 billion

Total API transactions
over last year

12 billion

using FHIR
(up from 1.2B last yr)

Self-Service Interop Portal

- ▶ Interoperability Guide
- ▶ Explore Interfaces
- ▶ FHIR Toolbox
 - ▶ *Patient Apps*
 - ▶ *Provider Apps*



App Orchard

by *Epic*

Epic



Interoperability Guide

Want to interoperate?

Epic's comprehensive health record software supports a broad set of interoperability technologies.

First, tell us a bit about yourself. Who are you?



Developer



Consultant



Patient



Intergalactic
Villain



Payer/
Insurer



Provider



Community
Partner



Someone
Else












Explore Interfaces

We support over 30,000 live interfaces

Each month more than 13 billion messages are sent between Epic and non-Epic systems. Across the Epic community, we have over 30,000 active interfaces with more than 1,000 vendors. We offer interfaces that are compliant with HL7, X12, DICOM, NCPDP, and other standards and can support interfaces that are either real-time or batch, one-way or bidirectional, point-to-point or mediated by an interface engine.

Explore information for

 Ancillary	 Clinical	 Financial	 Registration	 International
 Operations	 Public Health	 Scheduling	 Prototypes	

Explore by standard

ASC X12	DICOM	HL7 FHIR	HL7 v2	HL7 v3
IHE	NCPDP	Web Services	Other	





FHIR Toolbox

Epic on FHIR

When everyone's on the same page, technology can make cool things happen. Epic is a strong supporter of the HL7® FHIR® standard as the future of REST-based interoperability. In addition to participating in the standards development process with HL7, Epic is also a member of the Argonaut Project and the Da Vinci Project, each aimed at accelerating the adoption of FHIR.

Epic's work with FHIR means that any health system, hospital, or clinic that uses Epic's comprehensive health record system can connect to any app that also supports FHIR to exchange health information, including but not limited to the U.S. Core Data for Interoperability – or USCDI – data classes and elements.



Sign Up to Access

Epic on FHIR is a free resource for developers who create apps for use by patients and healthcare organizations.



Testing Sandbox

Test APIs against example data



Client Registration

Software registration and client identifier management



Documentation

Additional developer support documentation

Summary of Resources

AdverseEvent
Read, Search — R4

AllergyIntolerance
Read, Search, Create — R4
Read, Search, Create — STU3
Read, Search — DSTU2

Device
Read, Search — R4
Read, Search — STU3
Read, Search — DSTU2

DiagnosticReport
Read, Search — R4
Read, Search — STU3

Medication
Read — R4
Read — STU3
Read, Search — DSTU2

MedicationRequest/Order
Read, Search — R4
Read, Search — STU3

Patient
Read, Search, Create — R4
Read, Search, Create — STU3
Read, Search — DSTU2

Practitioner
Read, Search — R4
Read, Search — STU3





FHIR Toolbox

← Back to API List
Observation.Read (Vitals) (R4) USCDI v1

General Information
 Http Method: GET
 Url Template: api/FHIR/R4/Observatory[ID]

Description
 The FHIR Observation resource defines measurements and assertions about a patient, including vital signs, laboratory data, imaging results, devices measurements, clinical assessment tools, personal characteristics, social history, and core characteristics.

This API may behave differently when used in a patient-facing context. See the Patient-Facing Apps Using FHIR document for more information.

Request:

```
https://hostname/instance-FHIR-Current-Stage1-Primary-Unsecured/api/FHIR/R4/Observation/eyJ...
```

Name	Description	Is Optional	Is Array
ID (String)	The observation FHIR ID.	false	false

Response:

```
<Observation xmlns="http://hl7.org/fhir">
  <id value="eyJyY290YVY0-abv10-Hfcdb8eah70-4Pva5-cav6laekRZfde6ncu0bs-gk2yYw6lnk10188N83">
  <status value="final" />
  <category>
    <coding>
      <system value="http://hl7.org/fhir/observation-category" />
      <code value="vital-signs" />
      <display value="Vital Signs" />
    </coding>
    <text value="Vital Signs" />
  </category>
  <code>
    <coding>
      <system value="urn:oid:1.2.840.1.113.0.1.7.2.707679-5" />
      <code value="BP" />
      <display value="BP" />
    </coding>
    <system value="http://open.epic.com/FHIR/StructureDefinition/obset-FlowSheet-Id" />
  </code>
  </Observation>
```

Http Method: GET

URL Template: https://fhir.epic.com/interconnect-fhir-auth/api/FHIR/R4/Observatory[ID]

Request Parameters:
 ID: emjcyWAhUFD00XNFg1Dr-2-8dlVcq3B0McZpbjYOC7JA/1pPzK0y'

Raw Request

Try It Out

Response

```
resourceType: Observation
id: emjcyWAhUFD00XNFg1Dr-2-8dlVcq3B0McZpbjYOC7JA/1pPzK0y1075T49MHL83
status: final
category:
  coding:
    system: http://terminology.hl7.org/CodeSystem/observation-category
    code: vital-signs
    display: Vital Signs
  text: Vital Signs
code:
  coding:
    system: urn:oid:1.2.840.1.113.0.1.7.2.707679-5
    code: BP
    display: BP
  system: http://open.epic.com/FHIR/StructureDefinition/obset-FlowSheet-Id
```



More FHIR

AdverseEvent	Consent	Location	Schedule
AllergyIntolerance	Coverage	Medication	ServiceRequest (Community Referral)
Appointment	Device	MedicationOrder	ServiceRequest (Dental Procedure)
Binary (CCDA Documents)	DiagnosticReport (Results)	MedicationRequest (Orders)	ServiceRequest (Orders)
Binary (Clinical Notes)	DocumentReference (CCDA Documents)	MedicationRequest (Unsigned Order)	ServiceRequest (Referral)
Binary (Handoff)	DocumentReference (Clinical Notes)	MedicationStatement	ServiceRequest (Unsigned Order)
Binary (HIS)	DocumentReference (External CCDA)	Observation (ADLs)	Slot
Binary (Labs)	DocumentReference (Handoff)	Observation (Core Characteristics)	Specimen
Binary (OASIS)	DocumentReference (HIS)	Observation (Labs)	Substance
Binary (Practitioner Photo)	DocumentReference (Labs)	Observation (LDA-W)	Task (Community Referral)
BodyStructure (Tooth)	DocumentReference (OASIS)	Observation (Obstetric Details)	ValueSet
CarePlan (Dental)	Encounter	Observation (Periodontal)	
CarePlan (Encounter-Level)	Endpoint	Observation (SmartData Elements)	
CarePlan (Inpatient Pathway)	EpisodeOfCare	Observation (Smoking History)	
CarePlan (Inpatient)	ExplanationOfBenefit	Observation (Vitals)	
CarePlan (Longitudinal)	FamilyMemberHistory	Organization	
CarePlan (Oncology)	Flag (Patient FYI)	Patient	
CarePlan (Outpatient)	Goal (Patient)	Practitioner	
CarePlan (Questionnaires Due)	Goal (Care Plan)	PractitionerRole	
CareTeam (Longitudinal)	Goal (Pathway Step)	Procedure (Orders)	
Communication (Community Resource)	Immunization	Procedure (Surgeries)	
Condition (Care Plan Problem)	List (Allergies)	Procedure (Surgical History)	
Condition (Dental Finding)	List (Family History)	ProcedureRequest (Orders)	
Condition (Encounter Diagnosis)	List (Hospital Problems)	ProcedureRequest (Unsigned Order)	
Condition (Genomics)	List (Immunization)	Questionnaire (Appointment and Series)	
Condition (Health Concern)	List (Medications)	QuestionnaireResponse (Appointment and Series)	
Condition (Infection)	List (Patient List)	RelatedPerson	
Condition (Problems)	List (Patients With Questionnaires Due)	ResearchStudy	
	List (Problems)	ResearchSubject	

More FHIR

AdverseEvent
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List (Problems)

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MedicationRequest (Orders)
MedicationRequest (Unsigned Order)
MedicationStatement
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App Developer Program

- ▶ Trusted Ecosystem
- ▶ Developer Program
- ▶ Reusable Focus
- ▶ App Gallery
- ▶ AppOrchard.epic.com

Epic

INNOVATE WITH



AppOrchard

by **Epic**