Open@Epic CONFERENCE

FHIRstarting

Without Burning Anything Down

Presenters



Emma Miller

Epic EDI

Learning Objectives

1. Explore FHIR's general capabilities
2. Learn about Epic’s FHIR resource support
3. Understand use cases and tips for using FHIR

Agenda

01 **FHIR's Origin Story**

The Why

02 **Basic Concepts in FHIR**

The What

03 **Use Cases for FHIR**

The When

04 **Tips & Tricks**

The How

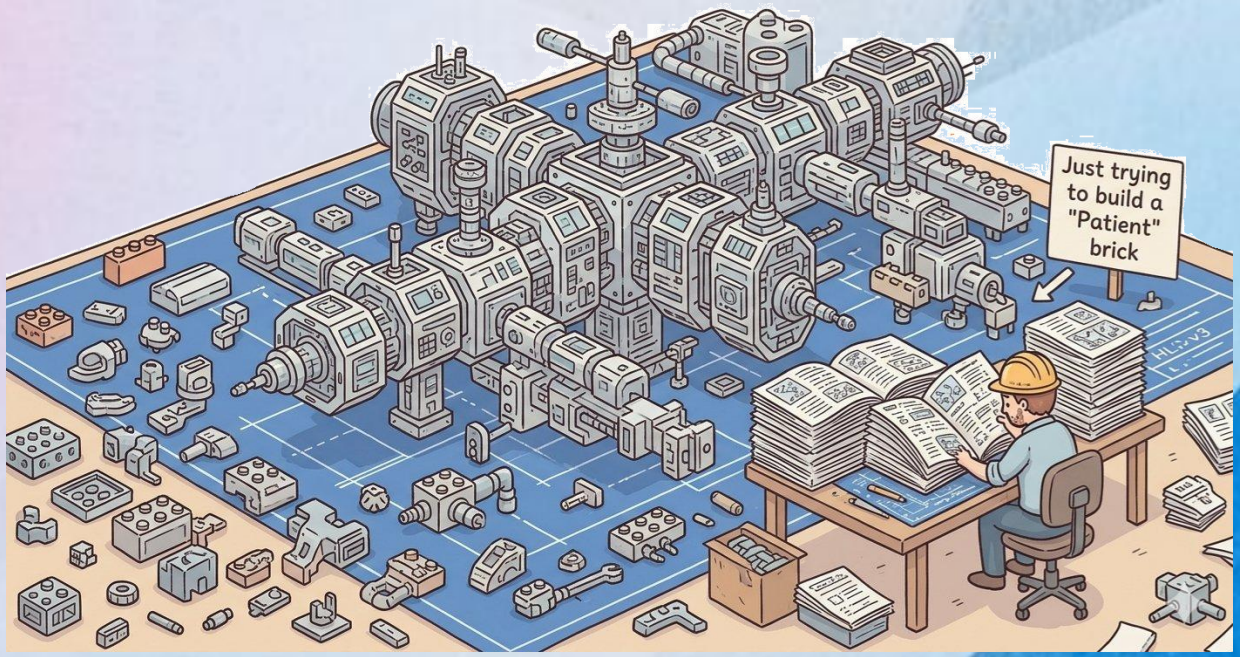
FHIR's Origin Story

The Why

Integration Tools Before FHIR



HL7v2



HL7v3

FHIR'S ORIGIN STORY · THE WHY

In Comes FHIR



FHIR'S ORIGIN STORY · THE WHY

RESTful ^ Basic Concepts in FHIR

The What

Building Blocks of FHIR



Resource

Exchangeable piece of information in healthcare ecosystem



Interaction

Action or API operation



Versions

Establish maturity, different API rules



Sub-Resources

More specific, narrow categorization of a resource

Building Blocks of FHIR

Resource . Interaction (Sub-Resource) (Version)

Patient	Read	Vitals	DSTU2
Observation	Search	Labs	STU3
ServiceRequest	Create	Social History	R4
DocumentReference			

FHIR with Epic

- Epic offers more than 600 FHIR APIs spanning DSTU2, STU3 and R4, with read, search, and create access depending on the resource
- Epic doesn't store FHIR resources in database
- Minimal customer-side configuration required
- Support US Core, and then some more!
- Sub-resourcing



OEC02 – FHIR Roadmap

Wednesday, 11:30 AM

Use Cases for FHIR

The When

Use Cases for FHIR

Patient





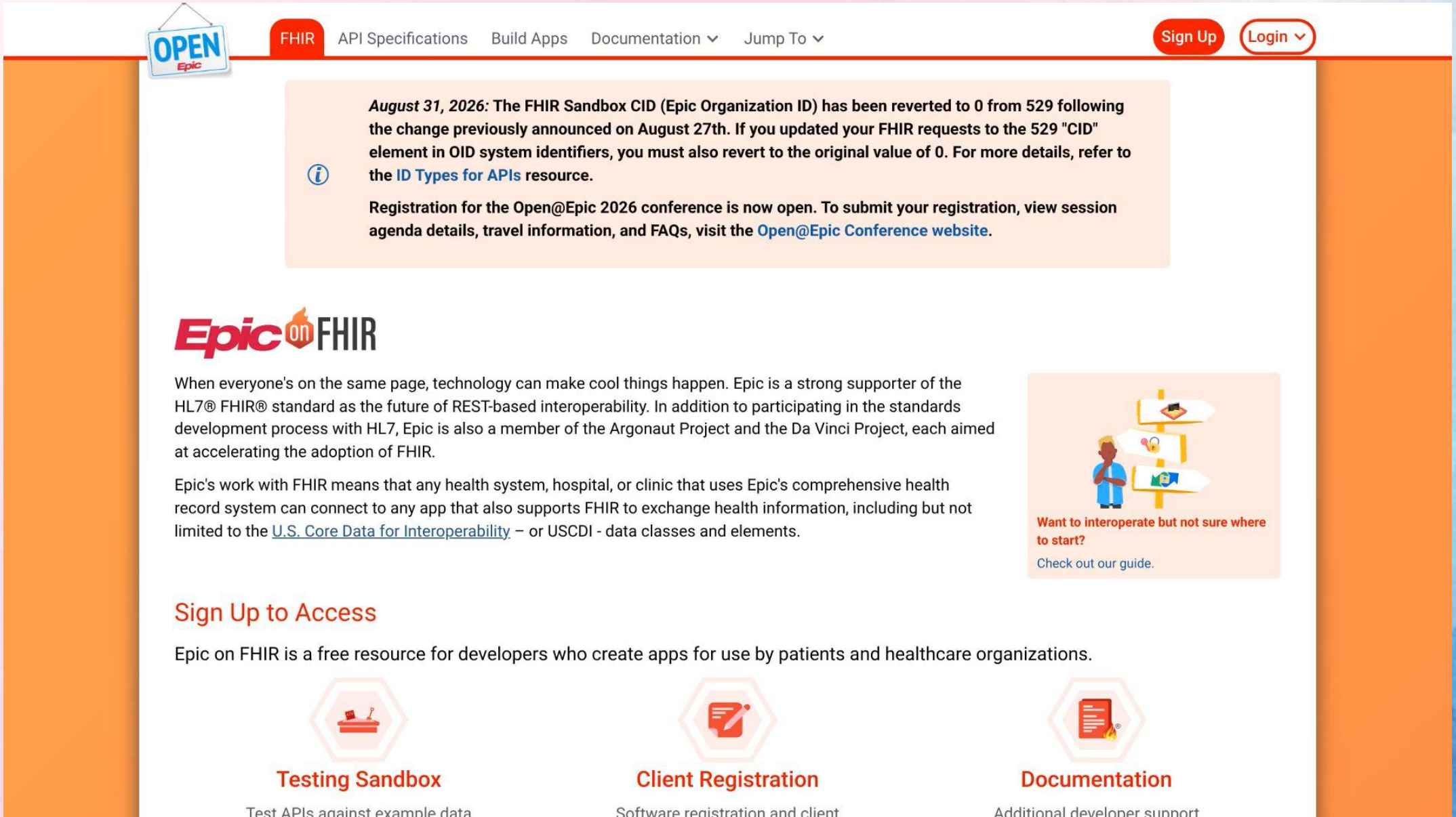
Backend



EMR User

Design Strategies to Increase Patient Data Sharing

Epic's FHIR Resource Library



RESTful FHIR is Not Always the Answer



Real-Time

Bulk Data



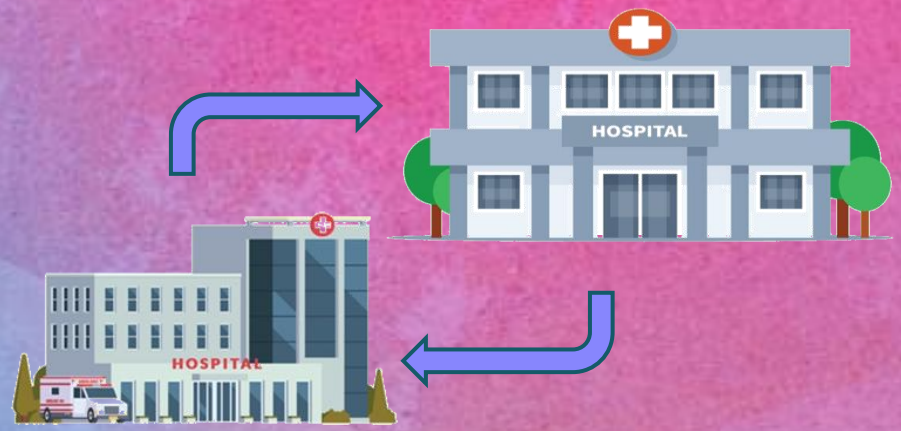


Clinical Decision Support

OEC14 – Speed, Safety, and Standards: Engineering Your Connection

Wednesday, 1:30 PM

Cross Org



USE CASES FOR FHIR · THE WHEN

Tips & Tricks

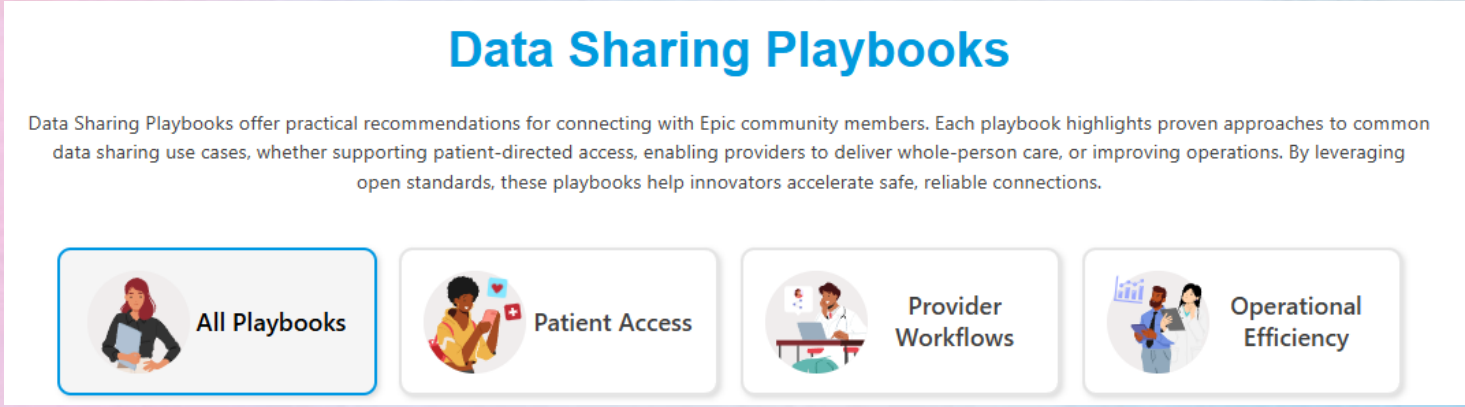
The How

General Tips & Tricks

Playbooks

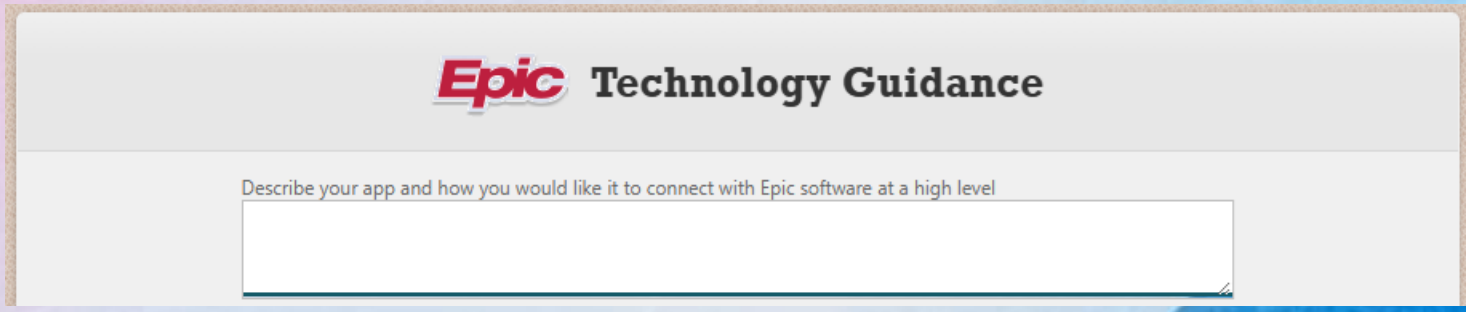
Offer a template for integration design.

Some playbooks include FHIR APIs.



Technology Guidance Form

When in doubt, just ask!

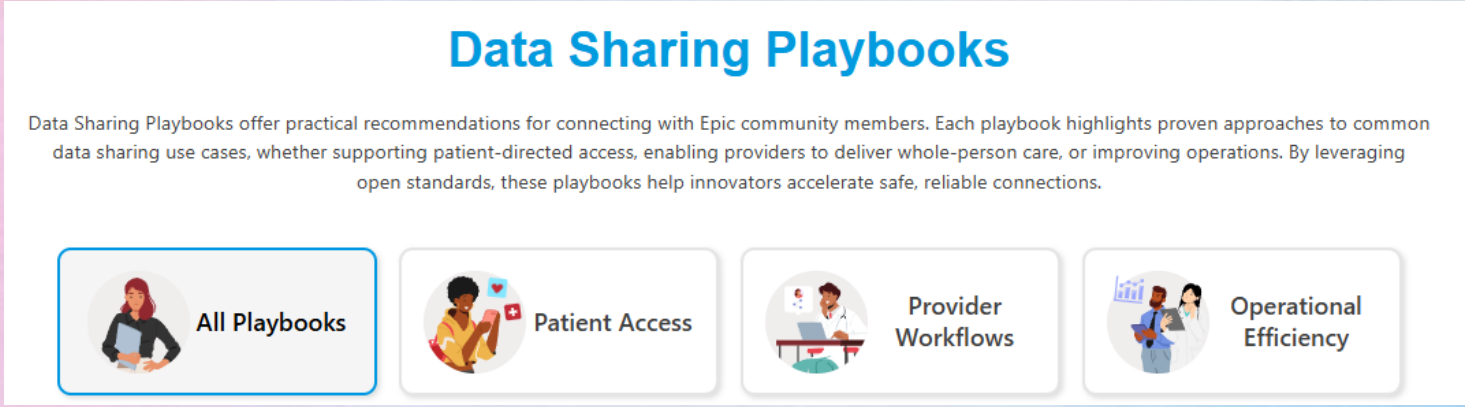


General Tips & Tricks

Playbooks

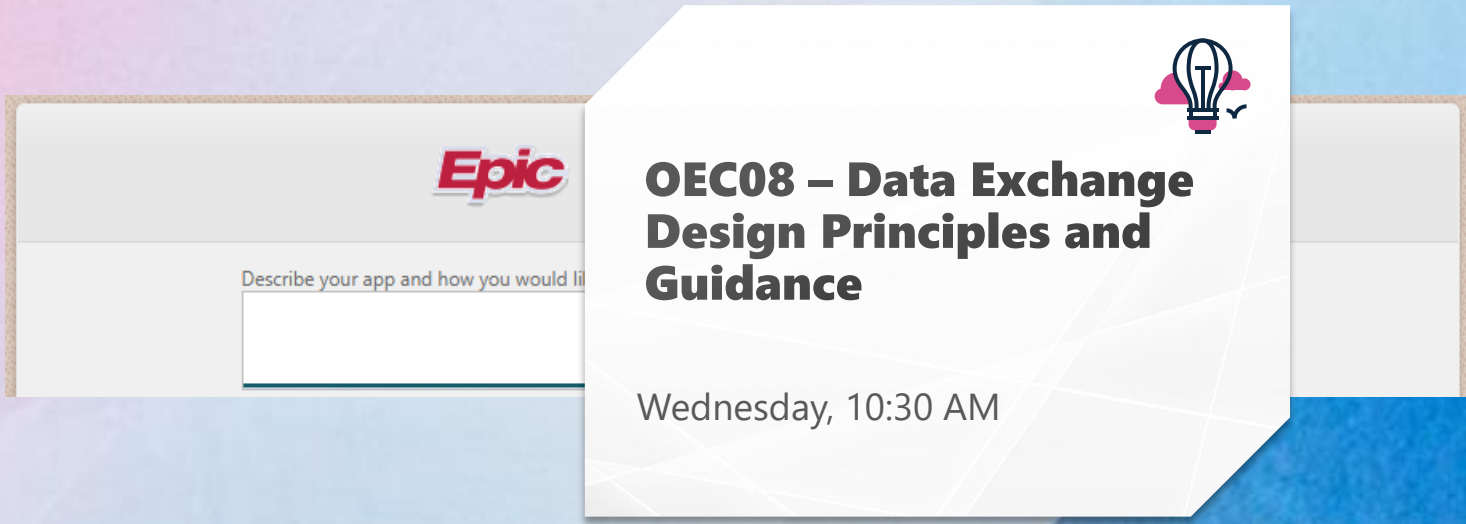
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Technology Guidance Form

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General Tips & Tricks

Client IDs

Through open.epic, you will need to create a new client ID when you make changes to an already-released app.



General Tips & Tricks

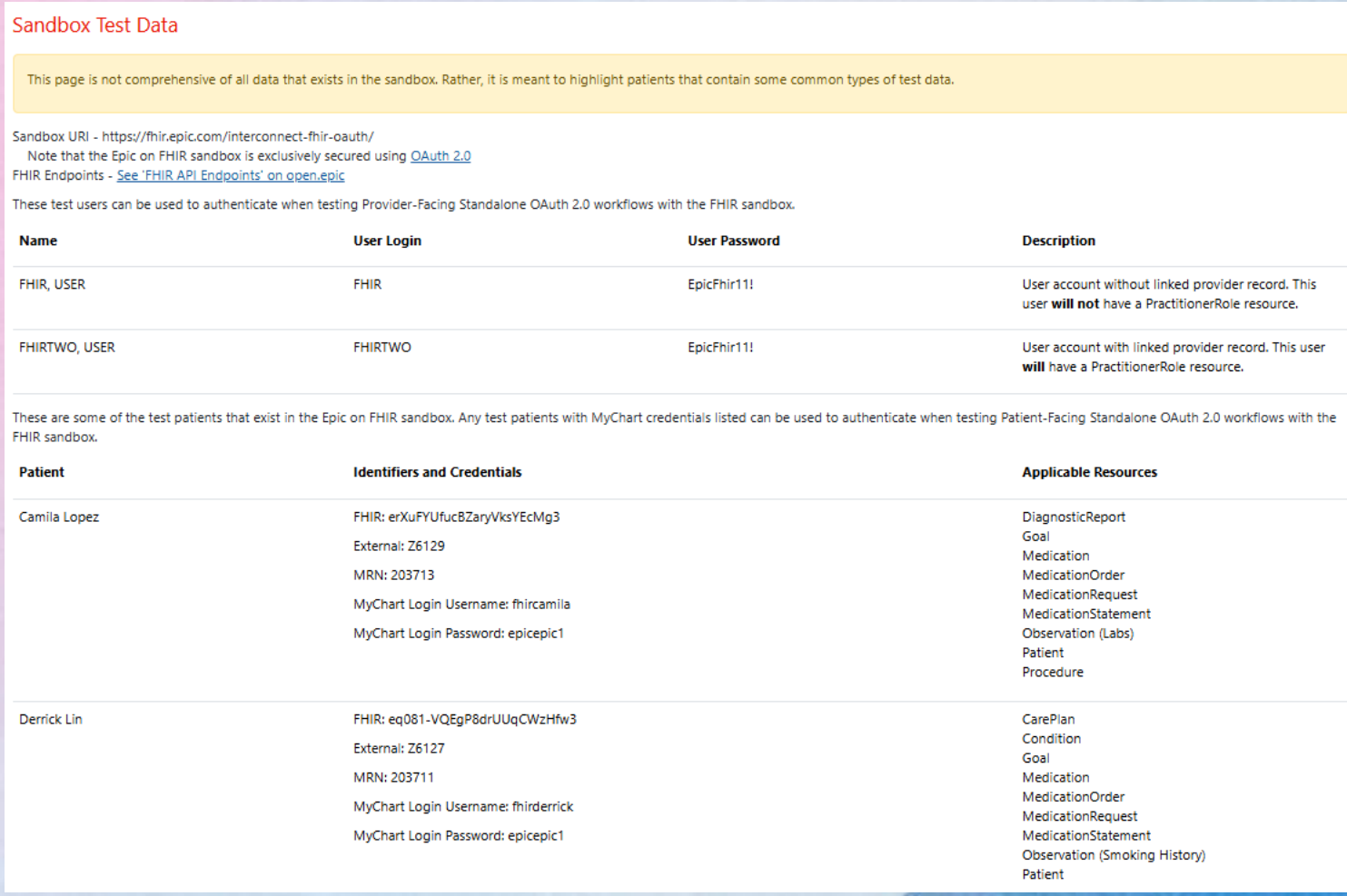
Sandbox Test Data

Client IDs

Through open.epic, you will need to create a new client ID when you make changes to an already-released app.

Sandbox Testing

Try-It cases within specs and test data to use for external Bruno calls



Sandbox Test Data

This page is not comprehensive of all data that exists in the sandbox. Rather, it is meant to highlight patients that contain some common types of test data.

Sandbox URI - https://fhir.epic.com/interconnect-fhir-oauth/
Note that the Epic on FHIR sandbox is exclusively secured using OAuth 2.0
FHIR Endpoints - See 'FHIR API Endpoints' on open.epic

These test users can be used to authenticate when testing Provider-Facing Standalone OAuth 2.0 workflows with the FHIR sandbox.

Name	User Login	User Password	Description
FHIR, USER	FHIR	EpicFhir11!	User account without linked provider record. This user **will not** have a PractitionerRole resource.
FHIRTWO, USER	FHIRTWO	EpicFhir11!	User account with linked provider record. This user **will** have a PractitionerRole resource.

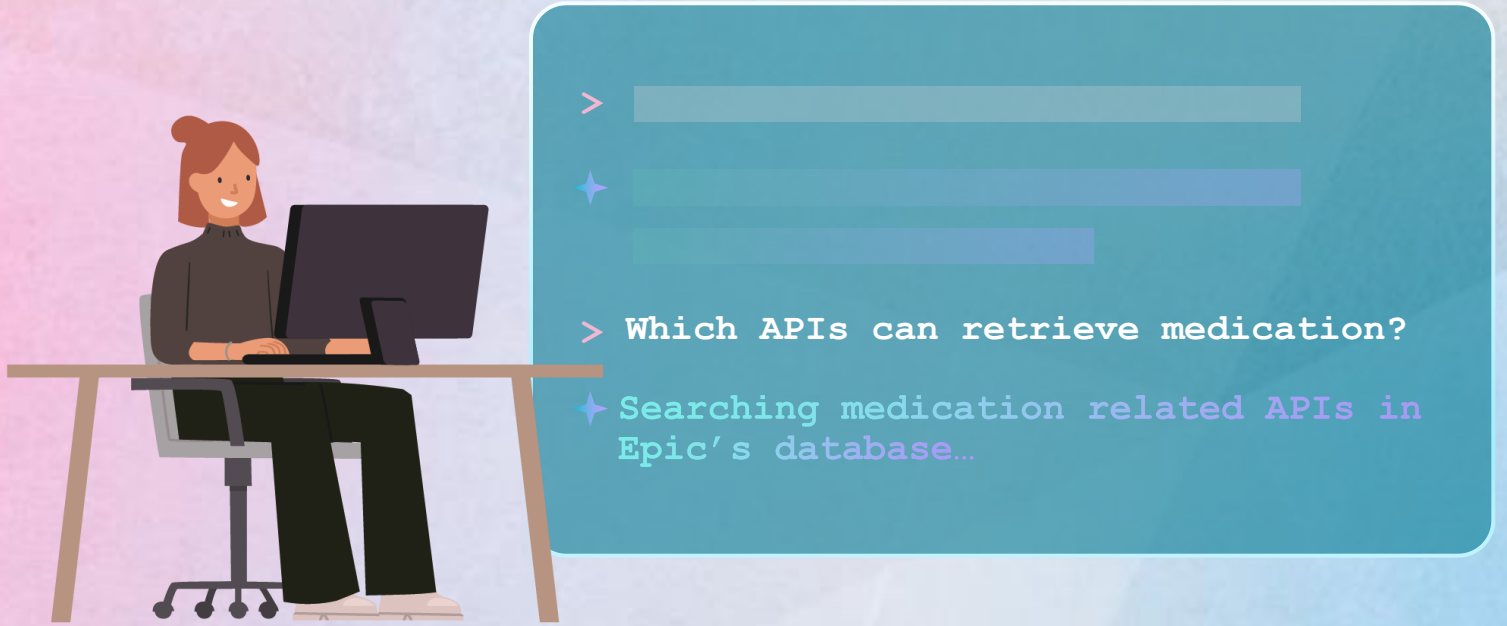
These are some of the test patients that exist in the Epic on FHIR sandbox. Any test patients with MyChart credentials listed can be used to authenticate when testing Patient-Facing Standalone OAuth 2.0 workflows with the FHIR sandbox.

Patient	Identifiers and Credentials	Applicable Resources
Camila Lopez	FHIR: erXuFYUfucBZaryVksYEcMg3 External: Z6129 MRN: 203713 MyChart Login Username: fhircamila MyChart Login Password: epicepic1	DiagnosticReport Goal Medication MedicationOrder MedicationRequest MedicationStatement Observation (Labs) Patient Procedure
Derrick Lin	FHIR: eq081-VQEgP8drUUqCWzHfw3 External: Z6127 MRN: 203711 MyChart Login Username: fhirderrick MyChart Login Password: epicepic1	CarePlan Condition Goal Medication MedicationOrder MedicationRequest MedicationStatement Observation (Smoking History) Patient

General Tips & Tricks

Open.Epic MCP

Leverage the breadth of Epic's public documentation to answer your interoperability questions



Environment Strategy

Support (at least) a test app, and be ready to connect that to a health system's test environment & test FHIR endpoint



FHIR Tips & Tricks

Use native query parameters

These will help refine your results and help your query run more efficiently

Observation.Search (Vital Signs) (R4) USCDI

Native Request Elements

Name	Description	Requirement
_count (String)	Number of results per page.	Optional
_id (String)	FHIR resource IDs for the desired resources. Can be used in combination with _count, _include, and _revInclude. All others will be ignored.	Optional
_include (String)	Used to indicate which referenced resources to include in the search bundle.	Optional
_revinclude (String)	Used to include Provenance or AuditEvent resources that refer to search results, when available.	Optional
category (token)	Use `"vital-signs"` to search for vitals Observations. Either category or code must be provided.	Conditional
code (token)	Formatted as `<system>|<code>`. If a system is not provided, the code is assumed to be a LOINC code. Valid codes and their systems include: • LOINC Code System Value: http://loinc.org *or* no system value. • Epic Encoded Flowsheet Identifier System Value: `http://open.epic.com/FHIR/StructureDefinition/observation-flowsheet-id` **Note:** The encoded flowsheet identifier must be generated by IT admins at an Epic organization. • Epic Internal Flowsheet Identifier - This only works if the flowsheet is considered a vital sign. System Value: Epic generated OID, varies in each Epic environment. • Cancer Data Standards Registry and Repository (CADSR) Terminology System Value: `http://wiki.nci.nih.gov/display/cadsr` The following LOINC codes can be used for searching growth chart data: • 59576-9: BMI percentile • 77606-2: Weight-for-length percentile • 8289-1: Head circumference percentile	Conditional
date (date)	The date range for when the Observation was taken. For growth chart data, only the most recent Observation within the timeframe is returned.	Optional

FHIR Tips & Tricks

Use native query parameters

These will help refine your results and help your query run more efficiently

Handle Operation Outcomes

Develop your product to handle these in code

FHIR Error Codes

Error Code	Severity	Description	Example
4100	Fatal	The resource request contained an invalid parameter	Invalid parameter such as a nonexistent patient ID: `AllergyIntolerance?patient=foo`
4101	Warning	Resource request returns no results	A request for data that was otherwise valid but no information was documented or found (i.e. a patient with no pertinent implanted devices, or a demographic search where no patients met the search criteria).
4102	Fatal	The read resource request contained an invalid ID	Invalid Resource ID: `AllergyIntolerance/foo`
4103	Fatal	The resource requested has been deleted	A read request for a resource that was deleted in the system
4104	Fatal	A required FHIR element was not available to send in the response	Failed to determine a SNOMED code for the smoking status.
4107	Fatal	The read resource request has been merged	Requesting a Patient which has been merged - in this event, in addition to the error response, we will respond with an HTTP Redirect status. To browsers and many HTTP clients, the redirect will be transparent.
4110	Fatal	No parameters are provided in the search request	An invalid search request such as : `AllergyIntolerance?`

FHIR Tips & Tricks

_include parameter
Epic on FHIR

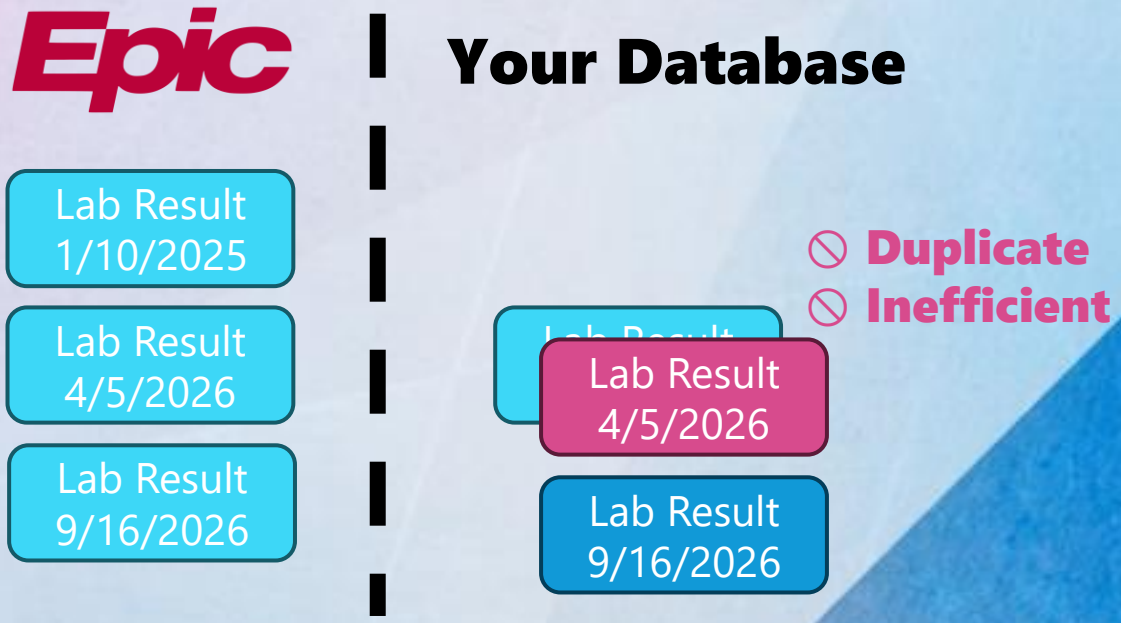
Consider _include

Avoid subsequent queries for referenced data

Patient.Search? … &_include=Patient:generalPractitioner:Practitioner

Consider _lastUpdated

Where available, avoid extensive lookbacks for new data or polling



Observation.Search? … date=gt2026-01-01

TIPS & TRICKS · THE HOW

FHIR Tips & Tricks

_include parameter
Epic on FHIR

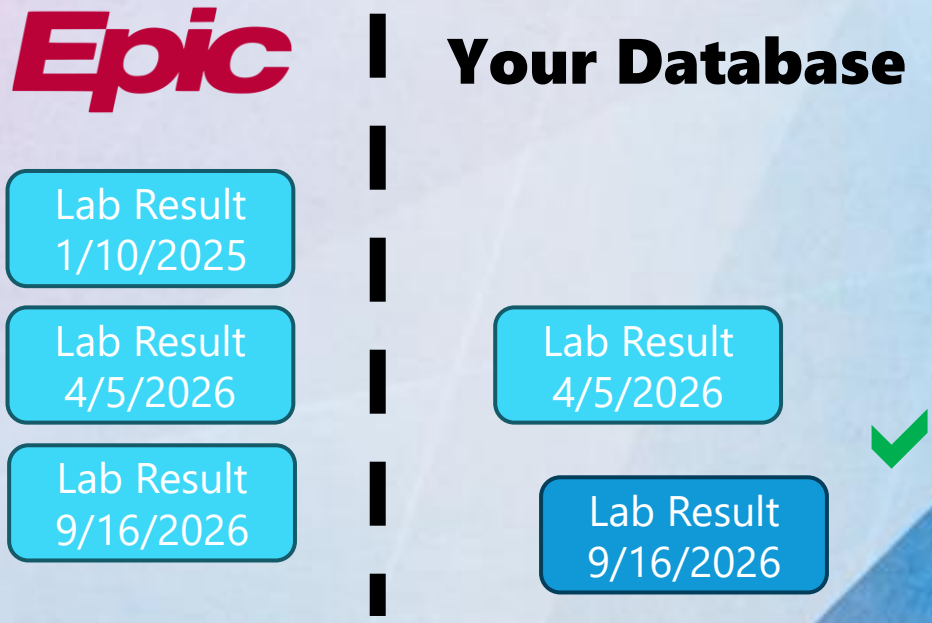
Consider _include

Avoid subsequent queries for referenced data

Patient.Search? … &_include=Patient:generalPractitioner:Practitioner

Consider _lastUpdated

Where available, avoid extensive lookbacks for new data or polling



Observation.Search? … _lastUpdated=gt2026-04-05

FHIR Tips & Tricks

ID Types for APIs

Interpret Identifiers

Many resources contain an identifier element that relate back to a more common construct, like an MRN or a CSN. Work with health systems to interpret them.

FHIR API IDs and HL7 OIDs

Epic's FHIR APIs often use object identifiers (OIDs) to uniquely identify and exchange information about particular entities. An OID is a global, unambiguous identifier for an object. It is formatted as a series of numbers and periods that represent a hierarchy of information. Organizations such as HL7, Epic, and individual healthcare organizations have registered their own unique node in the OID namespace with the International Standards Organization (ISO). Some examples include:

- Epic: 1.2.840.114350
- NPI: 2.16.840.1.113883.4.6
- HL7: 2.16.840.1.113883

OIDs are widely used by a variety of applications. FHIR APIs are only one place where you might see them. For example, HL7v2 messages, HL7v3 messages, and CDA exchanges all involve the use of OID identifiers. HL7 provides a useful site for reviewing existing registered OIDs: https://www.hl7.org/oid/.

Each organization is responsible for managing additional sub-nodes within their registered space. For example, Epic has registered OID 1.2.840.114350, and has assigned the following child OIDs (among many others):

- 1.2.840.114350.**1.13.0.1.7.2.657380** – Represents the Interface Specification (AIP) master file in the open.epic sandbox environment
- 1.2.840.114350.**1.13.0.1.7.5.737384.0** – Represents the Epic MRN ID type in the open.epic sandbox environment
- 1.2.840.114350.**1.72.3.10** – Represents an observation about a patient FYI in Care Everywhere

Epic also issues child OIDs to each unique organization that uses Epic software, so that identifiers can be uniquely distinguished across organizations. When Epic issues a child OID to an organization, we have a specific structure we use. A common pattern is:

1.2.840.114350.1.13.<CID>.<EnvType>.7.<Value>

The pieces of this example OID represent the concepts outlined in the following table:

OID Segment	Meaning
1.2.840.114350	Epic's root OID
.1	Indicates that this is an application-type ID
.13	The application ID. Some common application IDs include: • 13: EDI • 72: Care Everywhere
.<CID>	The unique Epic organization ID (FHIR Sandbox Value = 529)
.<EnvType>	The environment type. 1-Epic refers to Epic environments, such as the open.epic sandboxes. 2-Production and 3-Non-production refer to instances of Epic deployed at healthcare organizations. • 1: Epic • 2: Production • 3: Non-production
.7	Indicates that this OID is intend for use in an HL7-type message
.<Value>	The value. This varies greatly depending on the concept we are generating an OID for. It might include multiple additional sub-nodes.

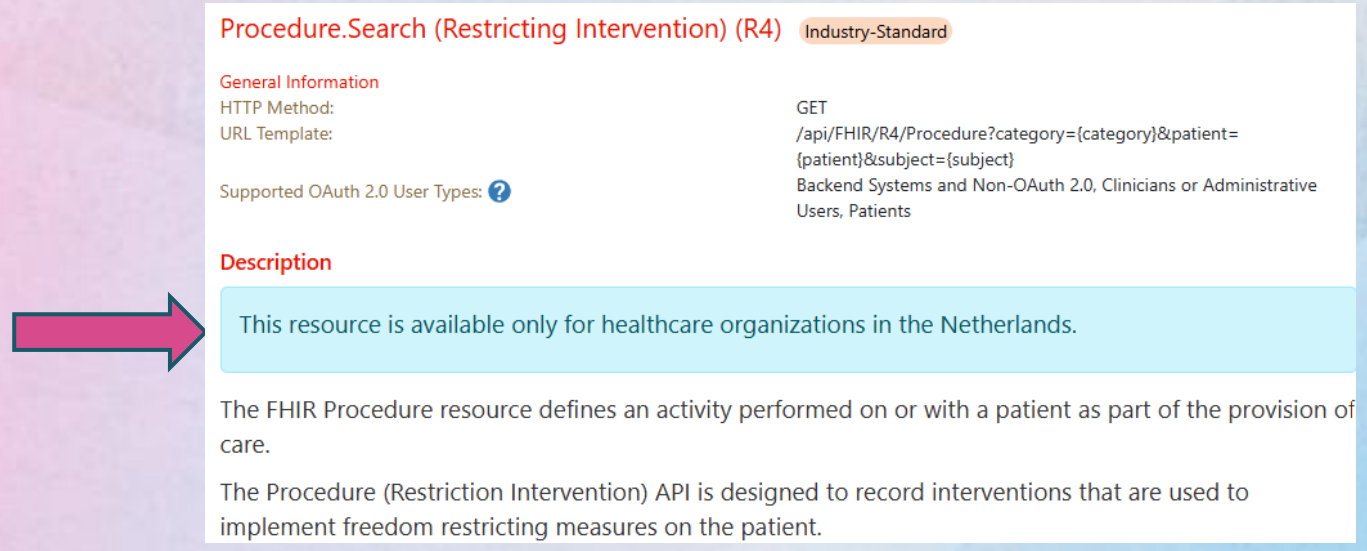
FHIR Tips & Tricks

Interpret Identifiers

Many resources contain an identifier element that relate back to a more common construct, like an MRN or a CSN. Work with health systems to interpret them.

Locale or Org Restrictions

Resources may only be applicable to certain locales or types of organizations. Review specs for more details.



Procedure.Search (Restricting Intervention) (R4) Industry-Standard

General Information

HTTP Method: GET

URL Template: /api/FHIR/R4/Procedure?category={category}&patient={patient}&subject={subject}

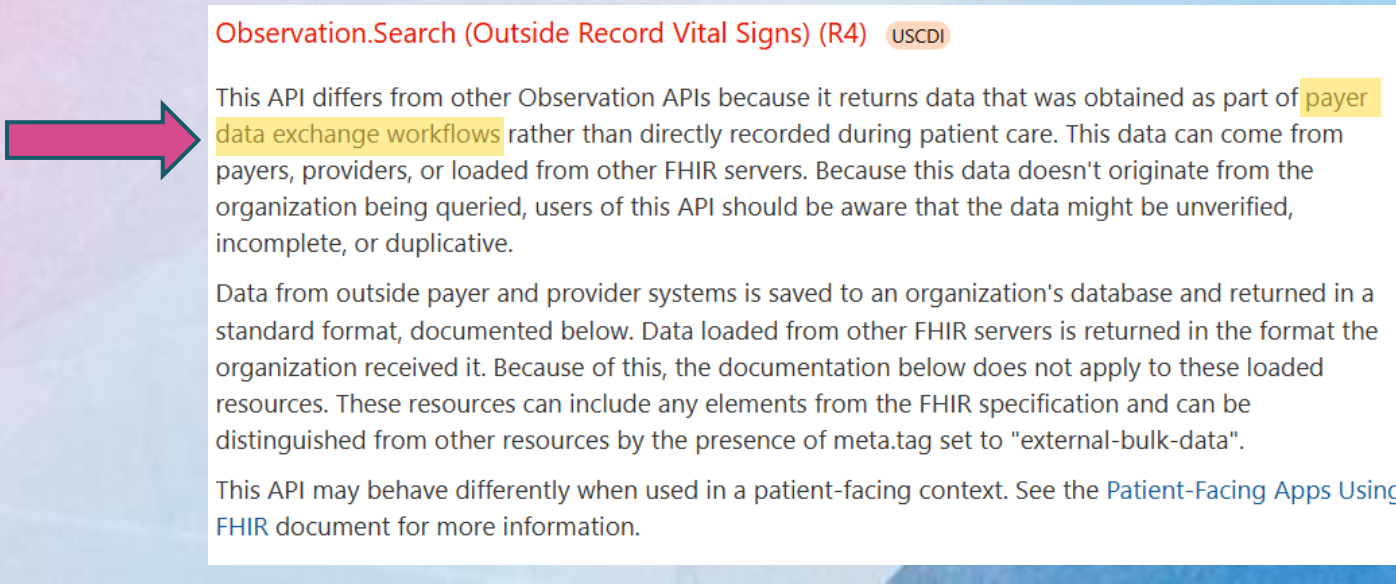
Supported OAuth 2.0 User Types: Backend Systems and Non-OAuth 2.0, Clinicians or Administrative Users, Patients

Description

This resource is available only for healthcare organizations in the Netherlands.

The FHIR Procedure resource defines an activity performed on or with a patient as part of the provision of care.

The Procedure (Restriction Intervention) API is designed to record interventions that are used to implement freedom restricting measures on the patient.



Observation.Search (Outside Record Vital Signs) (R4) USCDI

This API differs from other Observation APIs because it returns data that was obtained as part of payer data exchange workflows rather than directly recorded during patient care. This data can come from payers, providers, or loaded from other FHIR servers. Because this data doesn't originate from the organization being queried, users of this API should be aware that the data might be unverified, incomplete, or duplicative.

Data from outside payer and provider systems is saved to an organization's database and returned in a standard format, documented below. Data loaded from other FHIR servers is returned in the format the organization received it. Because of this, the documentation below does not apply to these loaded resources. These resources can include any elements from the FHIR specification and can be distinguished from other resources by the presence of meta.tag set to "external-bulk-data".

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

FHIR Tips & Tricks

Leverage USCDI

Licensing and build impacts for health systems with non-USCDI APIs

API types

USCDI FHIR APIs

- **Advance Directive Document Group**
  - → Binary.Read (Advance Directive)
  - → Binary.Search (Advance Directive)
  - → DocumentReference.Read (Advance Directive)
  - → DocumentReference.Search (Advance Directive)
  - → Observation.Read (Advance Directive)
  - → Observation.Search (Advance Directive)
- AllergyIntolerance.Read
- AllergyIntolerance.Read (Outside Record)
- AllergyIntolerance.Search
- AllergyIntolerance.Search (Outside Record)
- **Bulk Data Group**
  - → Bulk Data Delete Request ^
  - → Bulk Data File Request ^
  - → Bulk Data Kick-off ^
  - → Bulk Data Status Request ^
- CarePlan.Read (Encounter-Level)
- CarePlan.Read (Longitudinal)
- CarePlan.Read (Outside Record)
- CarePlan.Search (Encounter-Level)
- CarePlan.Search (Longitudinal)
- CarePlan.Search (Outside Record)
- CareTeam.Read (Longitudinal)
- CareTeam.Read (Outside Record)
- **Generated CCDA Document Group**
  - → Binary.Read (Generated CCDA)
  - → Binary.Search (Generated CCDA)
  - → DocumentReference.Read (Generated CCDA)
  - → DocumentReference.Search (Generated CCDA)
- Goal.Read (Care Plan)
- Goal.Read (Outside Record)
- Goal.Read (Patient)
- Goal.Search (Care Plan)
- Goal.Search (Outside Record)
- Goal.Search (Patient)
- Immunization.Read
- Immunization.Read (Outside Record)
- Immunization.Search
- Immunization.Search (Outside Record)
- **Labs Document Group**
  - → Binary.Read (Labs)
  - → Binary.Search (Labs)
  - → DocumentReference.Read (Labs)
  - → DocumentReference.Search (Labs)
- Location.Read (Organizational Directory)
- Location.Read (Outside Record)
- Location.Search (Organizational Directory)
- Location.Search (Outside Record)
- Observation.Search (Assessments)
- Observation.Search (Care Experience Preference)
- Observation.Search (Labs)
- Observation.Search (Outside Record Activities of Daily Living)
- Observation.Search (Outside Record Occupation)
- Observation.Search (Outside Record Pregnancy Status)
- Observation.Search (Outside Record Results)
- Observation.Search (Outside Record Screening Assessment)
- Observation.Search (Outside Record SDOH Assessment)
- Observation.Search (Outside Record Sexual Orientation)
- Observation.Search (Outside Record Smoking Status)
- Observation.Search (Outside Record Vital Signs)
- Observation.Search (SDOH Assessments)
- Observation.Search (SmartData Elements)
- Observation.Search (Social History)
- Observation.Search (Study Finding)
- Observation.Search (Vitals)
- Organization.Read (Organizational Directory)
- Organization.Read (Outside Record)
- Organization.Search (Organizational Directory)
- Organization.Search (Outside Record)
- **Outside Record - Clinical Notes Group**

Wrap Up

Key Takeaways

01 **FHIR is a modern interoperability tool**

02 **Structure**

Resources, interactions, versions, and sub-resources

03 **Use Cases**

FHIR is especially great for patient-facing and provider-facing exchanges

04 **With great power comes great responsibility**

Leverage best practices as you design your product's integration

Q&A

Q&A

OEC32

Wrap-Up: Putting It All Together

Form closes today at 5:00 PM

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