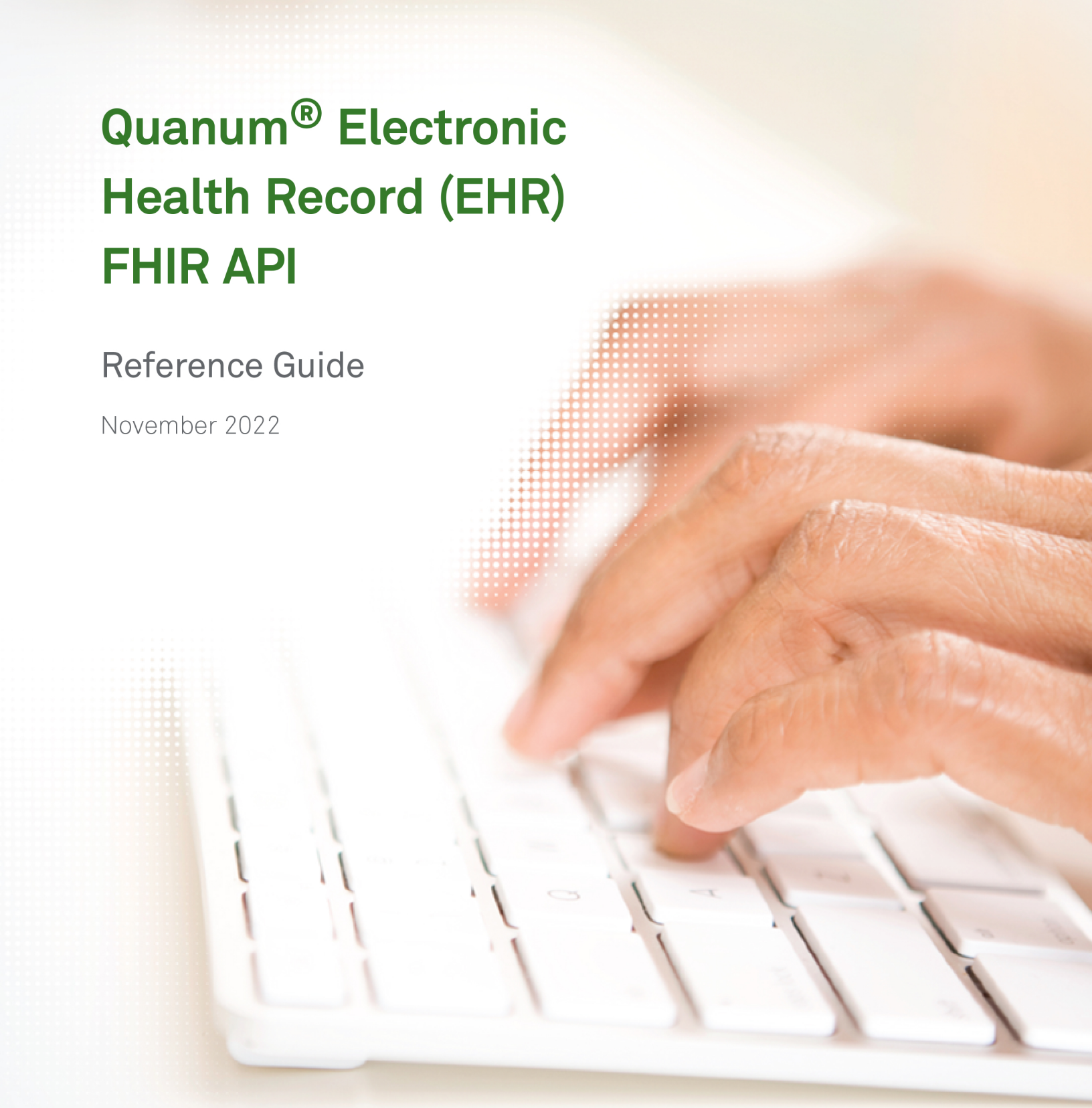
Quanum® Electronic Health Record (EHR) FHIR API

Reference Guide

November 2022



Quest Diagnostics®

Quanum® EHR - FHIR API Reference Guide

In This Document:

About This Guide

The *Quanum® EHR FHIR API Reference Guide* describes Quanum EHR's implementation of the HL7® Fast Healthcare Interoperability Resources (FHIR®) specification, which is a standard for exchanging healthcare information electronically. The guide outlines the steps necessary for clients to connect to the Application Programming Interface (API), as well as how to retrieve patient health information within Quanum EHR (including example requests and responses).

Intended Audience

This guide is intended for third-party developers who are designing software applications to access patient health information within Quanum EHR.

Terms of Use

This is a legal agreement between "you" (a "Developer" or “User”) and Quest Diagnostics. You must accept the Terms of Use (“Agreement”) in order to use the Quanum EHR public Application Programming Interface (“API”). This Agreement describes your rights and your obligations if you use the Quanum EHR FHIR API. By accepting this Agreement or by accessing or using the Quanum EHR FHIR API, you agree to be bound by this Agreement.

If you are entering into this Agreement on behalf of a company or other legal entity (“Entity”), you represent that you have the authority to bind such Entity to this Agreement. In that case, the terms “you” or “your” shall also refer to such Entity. If you do not have such authority, or if the Entity does not agree to be bound by this Agreement, the Entity and you may not use the Quanum EHR FHIR API. You acknowledge that this Agreement is a contract between you and Quest Diagnostics, even though it is electronic and is not physically signed by you and Quest Diagnostics.

API Definitions

As used herein: "Application” means any software application or product You offer, using the Quanum EHR FHIR API. “API Documentation” means the documentation that Quest Diagnostics provides regarding use of the Quanum EHR FHIR API. “API” means the publicly available Quanum EHR FHIR Programming Interface (“API”). “Client” means the software used to make requests to the API. "HIPAA" means the Health Insurance Portability and Accountability Act. "HITECH" means the Health Information Technology for Economic and Clinical Health Act under Title XIII of the American Recovery and Reinvestment Act.

API License and Restrictions

a Quest Diagnostics hereby grants you a revocable, limited, personal, non-sublicensable, non-exclusive, and non-transferable license to use the API to develop, test, and support your Application, and to integrate the Quanum EHR FHIR API with your Application. Your license is subject to the limitations set forth in this agreement.

b You may not use the Quanum EHR FHIR API in a manner that accesses or uses any information beyond what Quest Diagnostics allows under this Agreement or the API Documentation; that changes, breaks or circumvents any of the technical, administrative, process or security measures; that disrupts or degrades the performance of the Quanum EHR FHIR API; or that tests the vulnerability of Quest Diagnostics’ systems or networks.

c You may not transmit any viruses or other computer programming that may damage, detrimentally interfere with, surreptitiously intercept, or expropriate any system or data.

d You may not attempt to reverse engineer or otherwise derive source code, trade secrets, or know-how in the Quanum EHR FHIR API or any portion thereof.

e You acknowledge and agree that (i) Quest Diagnostics may modify the Quanum EHR FHIR API at any time in Quest Diagnostics’ sole discretion and (ii) future versions of the Quanum EHR FHIR API may not permit the operation of, or otherwise be compatible with any Developer App created hereunder.

f You may charge for your Application. However, you may not sell, rent, lease, sublicense, redistribute, or syndicate access to the Quanum EHR FHIR API.

g You will not attempt to exceed or circumvent limitations on access, calls and use of the Quanum EHR FHIR API, or otherwise use the Quanum EHR FHIR API in a manner that exceeds reasonable request volume, constitutes excessive or abusive usage, or otherwise fails to comply or is inconsistent with any part of this Agreement or the Documentation.

h You may not use any portion of the Quanum EHR FHIR API for any unlawful or illegal activity.

i You may not distribute or allow access to the Quanum EHR FHIR API to anyone other than, if applicable, the Entity on whose behalf you entered into this Agreement.

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a YOU ATTEST THAT YOU ARE AUTHORIZED TO ACCESS THE PHI YOU ARE REQUESTING THROUGH THE SYSTEM, AND YOU AGREE TO HANDLE AND PROCESS SUCH INFORMATION ACCORDING TO ANY AND ALL APPLICABLE LAWS. If you are a Developer, you agree to maintain suitable facilities, management, operational, and physical controls to protect PHI and any Codes consistent with the security and privacy controls imposed by HIPAA, HITECH, and any other federal, state, and local laws, where applicable, and to treat all Codes with no less care and protection than that afforded to Protected Health Information. You acknowledge and agree that you shall use the System only as and to the extent permitted by applicable law, including any applicable import or export laws, and only for applications related to the secure access to health information over the Internet, in a manner compliant with the security and privacy rules of HIPAA, HITECH, and any other applicable law or regulation. You acknowledge and agree that Company is not a Covered Entity. You agree that you will not intentionally submit to Company or otherwise share with Company any Protected Health Information and will not provide Company with access to any Protected Health Information except as required for you to Use the System. You acknowledge and agree that Company only acts as a conduit to transfer Protected Health Information or any other data between you and a Data Holder.

b You acknowledge that the System is a data transport tool and is not intended to serve as a medical record, and that it is your sole responsibility to establish policies and procedures that ensure that the content of any data accessed through the System is incorporated into a patient's medical record, when applicable. You agree that it is your sole responsibility to provide or obtain any and all necessary consents and to fulfill any and all obligations that are required by HIPAA, HITECH, or other governmental statute or regulation prior to use, disclosure, or transmission of any Protected Health Information or other data accessed through the System. You agree that Company has no obligation to archive or otherwise store any PHI or other data transferred through the System. You acknowledge that the data you request may not be accessible through the System when (i) you are denied access by Data Holder to any or all of the data requested or the Data Holder does not respond to your request for any reason, (ii) your request or the data provided by a Data Holder is not in a format recognized by the System, (iii) your request would cause transfer size or frequency to exceed the allowable maximum permitted by Company, (iv) the Codes you use to access the System are invalid, (v) this Agreement terminates, or (vi) for any other reason. You acknowledge that Company does not control the content of data accessed through the System, that data accessed through the System may contain software viruses or other malicious content, that it is your sole responsibility to protect your computer system from viruses, and that the Company has no responsibility to protect your computer system from viruses or other malware. You agree that Company, in its sole discretion, reserves the right not to enable Software or System for any particular Developer or User, should we determine, in our sole discretion, that Use by the Developer or User is a threat to Company’s systems or negatively impacts the Use of the System by other Users.

c The network, operating system and software of your web servers, databases, and computer systems (collectively, "Your Systems") must be properly configured to securely operate your Application. Your Application must use reasonable security measures to protect your users' information. You must not architect or select Your Systems in a manner to avoid the foregoing obligation. Your Systems shall use supported versions of operating systems and databases for which patches are actively deployed and shall be updated with security patches based on industry accepted standards and criticality. All critical patches shall be applied within 30 days of release.

d You must promptly report any security deficiencies in, or intrusions to, your Systems to Quest Diagnostics in writing via email to ITSecurityIncidentReporting@questdiagnostics.com. You will work with Quest Diagnostics to immediately correct any security deficiency, and will immediately disconnect any intrusions or intruder. In the event of any security deficiency or intrusion involving the Application, or the Quanum EHR FHIR API, you will make no public statements regarding such deficiencies or intrusions without prior written and express permission from Quest Diagnostics in each instance.

Term and Termination

This Agreement will go into effect on the date upon which you agree to them, by accessing or using the Quanum EHR FHIR API, and will continue until terminated as set forth herein. You may terminate this Agreement by discontinuing use of the Quanum EHR FHIR API. Upon termination of this Agreement:

a All rights and licenses granted to you will terminate immediately.

b You agree to promptly destroy Documentation and any other Quanum EHR FHIR API information in your possession or control that was received under this Agreement.

Disclaimers

a Warranties. THE QUANUM EHR FHIR API AND ALL RELATED COMPONENTS ARE PROVIDED ON AN "AS IS" AND "AS AVAILABLE" BASIS WITHOUT ANY WARRANTIES OF ANY KIND, AND QUEST DIAGNOSTICS EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES, WHETHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, TITLE, FITNESS FOR A PARTICULAR PURPOSE, AND NONINFRINGEMENT. YOU ACKNOWLEDGE THAT QUEST DIAGNOSTICS DOES NOT WARRANT THAT THE QUANUM EHIR FHIR API WILL BE UNINTERRUPTED, TIMELY, SECURE, ERROR-FREE OR VIRUS-FREE, NOR DOES IT MAKE ANY WARRANTY AS TO THE RESULTS THAT MAY BE OBTAINED FROM USE OF THE QUANUM EHR FHIR API, AND NO INFORMATION, ADVICE OR SERVICES OBTAINED BY YOU FROM QUEST DIAGNOSTICS SHALL CREATE ANY WARRANTY NOT EXPRESSLY STATED IN THIS AGREEMENT.

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c Indemnity. You agree to defend, hold harmless and indemnify Quest Diagnostics, and its subsidiaries, affiliates, officers, agents, employees, and suppliers, from and against any third party claim arising from or in any way related to your or your users' use of the Application or the Quanum EHR FHIR API, or any violation of this Agreement, including any liability or expense arising from all claims, losses, damages (actual and consequential), suits, judgments, litigation costs and attorneys' fees, of every kind and nature. In such a case, we will provide you with written notice of such claim, suit, or action.

Getting Started

The Quanum EHR FHIR API is based on Release 4 (STU) of the FHIR standard. It is a RESTful API, where all resource requests are performed using HTTPS, the server responds with standard HTTP response codes, and data is returned in JSON format. Additionally, the API is secured using SMART® authorization ("SMART on FHIR"), which is built on the OAuth 2.0 standard. For more information, see "Authentication and Authorization" on the next page.

By integrating third-party applications with Electronic Health Record data, the SMART App Launch Framework enables apps to be launched from either inside or outside an EHR system's user interface. The framework supports apps launched by users of PHRs, patient portals, or other FHIR systems in order to be used by physicians, patients, and others. For a range of app architectures, including applications that run on an end-user device and apps that operate on a secure server, it offers a dependable, secure authorization mechanism. The Launch Framework supports four key use cases:

- Patients apps that launch standalone.
- Patient apps that launch from a portal.
- Provider apps that launch standalone.
- Provider apps that launch from a portal.

These use cases include apps that carry out a variety of tasks, including data gathering, data sharing, case reporting, clinical decision assistance, and data visualization.

Supported launch frameworks include:

- **Standalone Launch.** A user starts an app outside of the EHR. For example, by tapping an app icon on a mobile phone home screen.
- **EHR Launch Application.** After starting an EHR session, a user starts to open an app. This might be a user-level app or a single-patient app that operates within a patient record (like an appointment manager or a population dashboard).

Before you can access our API, you must complete our registration process, which will provide you with the necessary credentials for authentication. If you're interested in registering for API access, please download and complete the Quanum EHR FHIR API Access Request Form and submit via email. Quanum support team will share the Client ID, which can be further used to get the access token using API. For any queries on the registration process, please contact Quanum EHR FHIR API support team at QuanumEHRFHIRAPI@questdiagnostics.com.

API Endpoints

In URL examples throughout this guide, *base_url* is used to represent the environment. To access the Stage or Production environment, use one of the following base URLs:

Stage

https://smartonfhir.elabs.stage.quanumsolutions.com/quanum-ehr-fhir-server/fhir

Production

https://smartonfhir.elabs.quanumsolutions.com/quanum-ehr-fhir-server/fhir

Authentication and Authorization

The Quanum EHR FHIR API uses SMART® authorization ("SMART on FHIR"), which is built on the OAuth 2.0 standard, for authentication and authorization. This framework provides secure access to patient data by requiring that every resource request includes an access token (as the *Bearer* token) in the *Authorization* header. At a high level, retrieving an access token involves:

1. Initiating an authorization grant request (to the authorization server's authorize endpoint URL). This request contains parameters, such as scope, client ID, and redirect_uri.
2. Receiving an authorization code (from the authorization server) at the specified redirect_uri.
3. Submitting the authorization code for an access token (via HTTP POST to the authorization server's token endpoint URL).
4. Receiving an access token (from the authorization server) at the specified redirect_uri.
5. Receiving a new access token using a refresh token (via HTTP POST to the authorization server's token endpoint URL).

For more details about requesting an access token via the authorization code grant request or by using a refresh token, see "Access Tokens" on the next page and "Refresh Tokens" on page 13.

Access Tokens

Access tokens are used to make API requests on behalf of a user. To request an access token, you must submit an authorization request to the authorize endpoint (see "Submit Authorization Request" below), and then once successfully authorized, exchange the authorization code for an access token via a POST request to the token endpoint (see "Exchange Authorization Code " on the next page).

Note: An access token and refresh token pair is issued (if *offline_access* is included in the *scope*) of the authorization request. For more information about refresh tokens, see "Refresh Tokens" on page 13.

Submit Authorization Request

Create a request for authorization by adding the parameters outlined below to the query component of the authorize endpoint URL, using the “application/x-www-form-urlencoded” format. If successful, the authorization server returns a JSON response with the authorization code.

Authorize endpoint URL - `https://base_url/quanum-ehr-oidc/authorize`

Request Parameter	Description/Value
response_type	*code* (authorization code)
client_id	The client's identifier.
redirect_uri	One of the client's pre-registered redirect URIs.
launch	The launch value received when using the EHR launch flow.
scope	A string that describes the access rights that the client application needs to operate properly. The supported scope values are: • *launch* • *offline_access* • *openid* • *profile* • *patient/*.read* • *user/*.read*
state	An opaque value used by the client to maintain state between the request and callback. The authorization server includes this value when redirecting the user-agent back to the client.
aud	The url of the resource server. This is the same value as the *iss* parameter (which is short for issuer, and identifies an EHR's base FHIR endpoint).
Response Field	**Description/Value**
code	The authorization code generated by the authorization server. The authorization code expires shortly after it is issued (usually 1 minute) to mitigate the risk of leaks.
state	An opaque value used by the client to maintain state between the request and callback.

Exchange Authorization Code

After obtaining an authorization code, exchange the code for an access token via HTTP POST to the authorization server's token endpoint URL, using content-type application/x-www-form-urlencoded. An *Authorization* header using HTTP Basic authentication is also required, where the user name is the *client_id* and the password is the *client_secret*. If successful, the authorization server returns a JSON response with the access token.

Token endpoint URL - `https://base_url/quanum-ehr-oidc/token`

Request Parameter	Description/Value
grant_type	*authorization_code*
code	The authorization code received from the authorization server.
redirect_uri	One of the client's pre-registered redirect URIs.
client_id	The client's identifier.
Response Field	**Description/Value**
access_token	The access token issued by the authorization server.
token_type	*Bearer*
expires_in	Lifetime in seconds of the access token, after which the token will no longer be accepted by the resource server. For example, the value 3600 means that the access token will expire in one hour from the time the response was generated.
scope	Scope of access authorized.
id_token	Authenticated user identity and profile.
refresh_token	Token that can be used to obtain a new access token, using the same or a subset of the original authorization grants.

Refresh Tokens

A refresh token can be used to replace an expired access token without user intervention. The refresh token is only available if *offline_access* was included in the *scope* of the authorization request. To request a new access token, issue an HTTP POST including the parameters outlined below to the authorization server's token endpoint URL, using content-type application/x-www-form-urlencoded. An *Authorization* header using HTTP Basic authentication is also required, where the user name is the *client_id* and the password is the *client_secret*. If successful, the authorization server returns a JSON response with the new access token and refresh token pair.

Token endpoint URL - `https://base_url/quanum-ehr-oidc/token`

Request Parameter	Description/Value
grant_type	*refresh_token*
refresh_token	The refresh token from a prior authorization response.
client_id	The client's identifier.
scope	The scopes of access requested. This value must be a strict sub-set of the scopes granted in the original launch; no new permissions can be obtained at refresh time. A missing value indicates a request for the same scopes granted in the original launch. The supported scope values are: • *offline_access* • *openid* • *patient/*.read*
Response Field	**Description/Value**
access_token	The new access token issued by the authorization server.
token_type	*Bearer*
expires_in	Lifetime in seconds of the access token, after which the token will no longer be accepted by the resource server. For example, the value 3600 means that the access token will expire in one hour from the time the response was generated.
scope	Scope of access authorized. This will be the same as the scope of the original access token, and it can be different from the scopes requested by the application. The supported scope values are: • *offline_access* • *openid* • *patient/*.read*
refresh_token	The new refresh token issued by the authorization server.

Response Codes

The Quanum EHR API uses standard HTTP response codes to indicate the status of a request. This section lists some of the possible response codes and provides an example 404 response.

Response Code	Description
200	The request was completed successfully.
400	The request was not properly constructed.
401	The user credentials were not authorized.
403	The requested resource actually MAY exists but you cannot access it.
404	The requested resource was not found, or no entries were found for the given search parameters.
500	An internal server error occurred.

Not Found Response

When no data is found for the given search parameters, a 404 code with the following response (JSON) body is returned:

Note: The response body will include the specific resource being queried, where *resource* is used in this example.

```
{
  "resourceType": "OperationOutcome",
  "issue": [
    {
      "severity": "error",
      "code": "processing",
      "diagnostics": "No resource entries found for the given search criteria."
    }
  ]
}
```

Resources

A FHIR resource represents exchangeable pieces of health care data, such as patient problems or medications. The table below describes the FHIR resources and the corresponding Common Clinical Data Set (CCDS) elements supported by the Quanum EHR FHIR API. You can request patient data from a particular resource, or request that all patient data (for the supported resources) be returned as a Base64 encoded, compressed CCDA. For more information about retrieving all patient data, see "Document Reference (All Patient Data)" on page 61. Additionally, all resources are read-only; methods other than GET are **not** supported by this API.

Note: For general information on FHIR resources, see the HL7 FHIR documentation.

CCDS Element	Resource
Sex	Patient
Date of Birth	Patient
Race	Patient
Ethnicity	Patient
Preferred Language	Patient
Encounters	"Encounter" on page 67
Smoking Status	"Observation" on page 95
Problems	"Condition (Problems) " on page 42
Medications	"Medication" on page 88
Medication Requests	"Medication Request" on page 90
Medication Allergies	"Allergy Intolerance" on page 26
Laboratory Tests	"Observation" on page 95
Laboratory Values(s)/Result(s)	"Observation" on page 95
Laboratory Results Reporting	"Diagnostic Report" on page 53
Report and Note exchange	"Diagnostic Report" on page 53
Vital Signs	"Observation" on page 95
Procedures	Procedure
Care Team Member(s)	"Care Team" on page 38
Care Plans	"Care Plan" on page 33
Practitioners	"Practitioner" on page 105
Immunizations	Immunization
Unique Device Identifier(s) for a Patient's Implantable Device(s)	Device

CCDS Element	Resource
Locations	"Location" on page 85
Organizations	"Organization" on page 101
Assessment and Plan of Treatment	"Care Plan" on page 33
Goals	Goal
Provenance	"Provenance" on page 114
Health Concerns	"Condition (Problems) " on page 42

Patient

Description	Retrieves a patient's demographic information.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

The following search parameters are supported for the Patient resource.

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Req'd
given	The patient's first name.	string	N
family	The patient's last name.	string	Y
name	The patient's given (first) or family (last) name.	string	N
telecom	The patient's phone number.	string	N
identifier	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search.	token	N
birthdate	The patient's birth date, in the following format: *yyyy-mm-dd*	date	N
gender	The patient's gender. Supported values include: *male*, *female*, *other*, and *unknown*.	token	N
birthdate+name	Combination search parameters supported for the Patient resource.	date+string	N
gender+name		token+string	N
birthdate+family		date+string	N
family+gender		string+token	N

Response Fields

The following fields may appear in a JSON response for the Patient resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Patient	0..*
id	The unique identifier for the patient.	Identifier	0..*

Field	Description	Type	Cardinality
active	Identifies whether the patient's record is active.	boolean	0..1
name	The patient's name.	HumanName	0..*
gender	The patient's gender. Supported values include male, female, other, and unknown.	code	0..1
birthDate	The patient's date of birth.	date	0..1
address	The patient's postal address.	Address	0..*
maritalStatus	The patient's marital status.	CodeableConcept	0..1
communication	The language(s) that can be used to communicate with the patient.	BackboneElement	0..*
managingOrganization	The organization responsible for updating the patient's record.	Reference (Organization)	0..1

Example Requests and Responses

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns demographics for a specific patient using the patient's identifier:

```
GET https://base_url/quanum-ehr-fhir-server-
/fhir/Patient/2c92a6128240106501826cbdec202a1a
```

Read - Response (JSON)

```
{
    "resourceType": "Patient",
    "id": "2c92a6128240106501826cbdec202a1a",
    "extension": [
        {
            "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-race",
            "extension": [
                {
                    "url": "ombCategory",
                    "valueCoding": {
                        "system": "urn:oid:2.16.840.1.113883.6.238",
                        "code": "2078-4",
                        "display": "Polynesian "
                    }
                },
                {
                    "url": "text",
```

```
                "valueString": "Polynesian "
            }
        ]
    },
    {
        "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-ethnicity",
        "extension": [
            {
                "url": "ombCategory",
                "valueCoding": {
                    "system": "urn:oid:2.16.840.1.113883.6.238",
                    "code": "2155-0",
                    "display": "Central American "
                }
            },
            {
                "url": "text",
                "valueString": "Central American "
            }
        ]
    },
    {
        "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-birthsex",
        "valueCode": "M"
    }
],
"identifier": [
    {
        "type": {
            "coding": [
                {
                    "system": "http://hl7.org/fhir/v2/0203",
                    "code": "MR",
                    "display": "Medical record number"
                }
            ],
            "text": "Medical record number"
        },
        "system": "urn:oid:2.16.840.1.113883.3.345.3",
        "value": "2c92a6128240106501826cbdec202a1a"
    }
],
"active": true,
"name": [
    {
        "use": "official",
        "text": "Amit Kumar",
        "family": "Kumar",
        "given": [
```

```
                "Amit",
                "M"
            ],
            "suffix": [
                "Mr"
            ]
        },
        {
            "use": "maiden",
            "text": "Amit Kumar",
            "family": "Kumar",
            "given": [
                "Amit",
                "BM"
            ],
            "suffix": [
                "Mr"
            ]
        },
        {
            "use": "anonymous",
            "text": "Kumar Amit",
            "family": "Amit",
            "given": [
                "Kumar",
                "OM"
            ],
            "suffix": [
                "Mr"
            ]
        }
    ],
    "telecom": [
        {
            "system": "phone",
            "value": "(123) 456-7890",
            "use": "home"
        },
        {
            "system": "phone",
            "value": "(123) 456-7890",
            "use": "mobile"
        },
        {
            "system": "phone",
            "value": "(123) 456-7890",
            "use": "work"
        },
        {
```

```
            "system": "email",
            "value": "ranjana.x.rai@questdiagnostics.com"
        }
    ],
    "gender": "male",
    "birthDate": "2020-04-13",
    "address": [
        {
            "line": [
                "30 Memorial Drive"
            ],
            "city": "Avon",
            "state": "MA",
            "postalCode": "12345",
            "period": {
                "start": "2022-08-17T00:00:00+00:00"
            }
        },
        {
            "line": [
                "89 Healthy Ave"
            ],
            "city": "Mason",
            "state": "OH",
            "postalCode": "45040",
            "period": {
                "start": "2022-08-06T00:00:00+00:00",
                "end": "2022-08-16T00:00:00+00:00"
            }
        }
    ],
    "maritalStatus": {
        "extension": [
            {
                "url": "http://hl7.org/fhir/StructureDefinition/data-absent-reason",
                "valueCode": "unknown"
            }
        ],
        "coding": [
            {
                "system": "http://terminology.hl7.org/CodeSystem/v3-MaritalStatus",
                "code": "UNK",
                "display": "Unknown"
            }
        ]
    },
    "managingOrganization": {
        "reference": "Organization/DEMO_ORG"
    }
```

```
}
```

Search - Request

Returns one or more patients (as a bundle) using the patient's unique identifier:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/Patient?_
id=2c92e13d836abb53018380827cd917f1
```

Search - Response (JSON)

```
{
  "resourceType": "Bundle",
  "id": "efa2ece6-88fb-472f-97fc-925d7b31758f",
  "meta": {
    "lastUpdated": "2022-10-19T07:54:54.054+00:00"
  },
  "type": "searchset",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://base_url/quanum-ehr-fhir-server/fhir/Patient?_id=2c92e13d836a-
bb53018380827cd917f1"
    }
  ],
  "entry": [
    {
      "fullUrl": "https://base_url/quanum-ehr-fhir-server-
/fhir/Patient/2c92e13d836abb53018380827cd917f1",
      "resource": {
        "resourceType": "Patient",
        "id": "2c92e13d836abb53018380827cd917f1",
        "extension": [
          {
            "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-race",
            "extension": [
              {
                "url": "ombCategory",
                "valueCoding": {
                  "system": "urn:oid:2.16.840.1.113883.6.238",
                  "code": "1004-1",
                  "display": "American Indian "
                }
              },
              {
                "url": "text",
                "valueString": "American Indian "
              }
            ]
          },
          {
```

```
    "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-ethnicity",
    "extension": [
      {
        "url": "ombCategory",
        "valueCoding": {
          "system": "urn:oid:2.16.840.1.113883.6.238",
          "code": "2155-0",
          "display": "Central American "
        }
      },
      {
        "url": "text",
        "valueString": "Central American "
      }
    ]
  },
  {
    "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-birthsex",
    "valueCode": "M"
  }
],
"identifier": [
  {
    "type": {
      "coding": [
        {
          "system": "http://hl7.org/fhir/v2/0203",
          "code": "MR",
          "display": "Medical record number"
        }
      ],
      "text": "Medical record number"
    },
    "system": "urn:oid:2.16.840.1.113883.3.345.3",
    "value": "2c92e13d836abb53018380827cd917f1"
  }
],
"active": true,
"name": [
  {
    "use": "official",
    "text": "John Smith",
    "family": "Smith",
    "given": [
      "John"
    ]
  }
],
"telecom": [
```

```
    {
      "system": "phone",
      "value": "(555) 723-1544",
      "use": "home"
    },
    {
      "system": "phone",
      "value": "(555) 723-1510",
      "use": "mobile"
    },
    {
      "system": "phone",
      "value": "(555) 152-2233",
      "use": "work"
    }
  ],
  "gender": "male",
  "birthDate": "1990-01-01",
  "address": [
    {
      "line": [
        "123 Any Way"
      ],
      "city": "Mason",
      "state": "OH",
      "postalCode": "45040",
      "period": {
        "start": "2022-09-27T19:52:58+00:00"
      }
    }
  ],
  "maritalStatus": {
    "extension": [
      {
        "url": "http://hl7.org/fhir/StructureDefinition/data-absent-reason",
        "valueCode": "unknown"
      }
    ],
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-MaritalStatus",
        "code": "UNK",
        "display": "Unknown"
      }
    ]
  },
  "communication": [
    {
      "language": {
```

```
              "coding": [
                {
                  "system": "urn:ietf:bcp:47",
                  "code": "en"
                }
              ],
              "text": "English"
            }
          }
        ],
        "managingOrganization": {
          "reference": "Organization/2c92e13d836abb530183806a80e117ef"
        }
      }
    }
  ]
}
```

Allergy Intolerance

Description	Retrieves a patient's allergies/adverse reactions to foods, medications, substances, or devices.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

The following search parameters are supported for the Allergy Intolerance resource.

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Req'd
patient	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.	string	Y
identifier	The unique identifier for a specific clinical entry. The clinical entry identifier can be retrieved by performing a search for a patient's allergies.	string	N
startDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd* If a start date is specified, only entries with a clinically relevant date that occurs on or after the specified start date are returned. **Note:** A start date may be used with or without an end date.	date	N
endDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd* If an end date is specified, only entries with a clinically relevant date that occurs on or before the specified end date are returned. **Note:** An end date may be used with or without a start date.	date	N
clinical-status	The clinical status of an allergy.	token	N
patient + clinical-status	Combination search parameter supported for the allergy intolerance resource.	reference+token	N

Response Fields

The following fields may appear in a JSON response for the Allergy Intolerance resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	AllergyIntolerance	0..*
id	The unique identifier for the clinical entry.	Identifier	0..*
clinicalStatus	The clinical status of the allergy. Supported values include active or inactive.	code	0..1
type	The underlying physiological mechanism for the reaction risk. The only supported value is allergy.	code	0..1
category	The category of the identified substance. Supported values include food, medication, or environment.	code	0..*
patient	The patient associated with the allergy, described by the patient's unique identifier preceded by *Patient/*.	Reference(Patient)	1..1
onsetPeriod	The period of time when the allergy was identified, defined by a start and end date/time.	dateTime	0..1
assertedDate	The date and time on which the existence of the allergy was first declared or acknowledged.	dateTime	0..1
reaction	Details about the adverse reaction to an identified substance.	BackboneElement	0..*
substance	The specific substance that is considered responsible for the adverse reaction.	CodeableConcept	0..1
manifestation	The clinical symptoms and/or signs that are observed or associated with the adverse reaction.	CodeableConcept	1..*
onset	The date and/or time of the onset of the reaction.	dateTime	0..1
severity	The clinical assessment of the severity of the adverse reaction as a whole. Supported values include mild, moderate, or severe.	code	0..1
note	Additional text about the adverse reaction not captured in other fields.	Annotation	0..*

Example Requests and Responses

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns a single allergy entry for the patient using the specified clinical entry identifier:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/AllergyIntolerance/
2c92a613778221180177a6c97db94428-AL
```

Read - Response (JSON)


```
{
    "resourceType": "AllergyIntolerance",
    "id": "2c92a613778221180177a6c97db94428-AL",
    "clinicalStatus": {
        "coding": [
            {
                "system": "http://terminology.hl7.org/CodeSystem/allergyintolerance-clin-
ical",
                "code": "active",
                "display": "Active"
            }
        ]
    },
    "verificationStatus": {
        "coding": [
            {
                "system": "http://terminology.hl7.org/CodeSystem/allergyintolerance-veri-
fication",
                "code": "confirmed",
                "display": "Confirmed"
            }
        ]
    },
    "type": "allergy",
    "category": [
        "medication"
    ],
    "patient": {
        "reference": "Patient/2c92a6c0268ece4b01268ff0b97a001b"
    },
    "onsetPeriod": {
        "start": "2021-02-15T00:00:00+00:00"
    },
    "recordedDate": "2021-02-15T17:42:38+00:00",
    "reaction": [
        {
            "substance": {
                "coding": [
```

```
                    {
                        "display": "Testopel Pellets"
                    }
                ]
            },
            "manifestation": [
                {
                    "coding": [
                        {
                            "system": "http://snomed.info/sct",
                            "code": "111551000",
                            "display": "Testicular hypofunction"
                        }
                    ],
                    "text": "Testicular hypofunction"
                },
                {
                    "coding": [
                        {
                            "system": "http://hl7.org/fhir/sid/icd-10",
                            "code": "E29.1",
                            "display": "Testicular hypofunction"
                        }
                    ],
                    "text": "Testicular hypofunction"
                }
            ],
            "onset": "2021-02-15T00:00:00+00:00",
            "severity": "severe"
        }
    ]
}
```


Search - Request

Returns one or more allergy entries (as a bundle) for the patient in the specified date range:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/AllergyIntolerance?patient=
2c92a6d96688a19a01668d6d6d3801a7&startDate=2018-10-19&endDate=2022-08-08
```

Search - Response (JSON)


```
{
    "resourceType": "Bundle",
    "id": "b8fc7943-3191-4883-a05d-ef68907e6ea4",
    "meta": {
        "lastUpdated": "2022-08-08T19:21:36.770+05:30"
    },
    "type": "searchset",
    "total": 2,
    "link": [
        {
```

```
            "relation": "self",
            "url": "http://base_url/quanum-ehr-fhir-server-
/fhir/AllergyIntolerance?patient=2c92a6d96688a19a01668d6d6d3801a7"
        }
    ],
    "entry": [
        {
            "fullUrl": "http://base_url/quanum-ehr-fhir-server-
/fhir/AllergyIntolerance/01c18db7bf4201666688a19a2c92a6d9",
            "resource": {
                "resourceType": "AllergyIntolerance",
                "id": "01c18db7bf4201666688a19a2c92a6d9",
                "clinicalStatus": {
                    "coding": [
                        {
                            "system": "http://ter-
minology.hl7.org/CodeSystem/allergyintolerance-clinical",
                            "code": "active",
                            "display": "Active"
                        }
                    ]
                },
                "verificationStatus": {
                    "coding": [
                        {
                            "system": "http://ter-
minology.hl7.org/CodeSystem/allergyintolerance-verification",
                            "code": "confirmed",
                            "display": "Confirmed"
                        }
                    ]
                },
                "type": "allergy",
                "patient": {
                    "reference": "Patient/2c92a6d96688a19a01668d6d6d3801a7"
                },
                "onsetPeriod": {
                    "start": "2018-10-19T00:00:00+05:30"
                },
                "recordedDate": "2018-10-19T19:05:21+05:30",
                "reaction": [
                    {
                        "substance": {
                            "coding": [
                                {
                                    "display": "Rice"
                                }
                            ]
                        },
```

```
                        "manifestation": [
                            {
                                "coding": [
                                    {
                                        "display": "No known"
                                    }
                                ],
                                "text": "No known"
                            }
                        ],
                        "onset": "2018-10-19T00:00:00+05:30"
                    }
                ]
            }
        },
        {
            "fullUrl": "http://base_url/quanum-ehr-fhir-server-
/fhir/AllergyIntolerance/01bf8db7831801666688a19a2c92a6d9",
            "resource": {
                "resourceType": "AllergyIntolerance",
                "id": "01bf8db7831801666688a19a2c92a6d9",
                "clinicalStatus": {
                    "coding": [
                        {
                            "system": "http://ter-
minology.hl7.org/CodeSystem/allergyintolerance-clinical",
                            "code": "active",
                            "display": "Active"
                        }
                    ]
                },
                "verificationStatus": {
                    "coding": [
                        {
                            "system": "http://ter-
minology.hl7.org/CodeSystem/allergyintolerance-verification",
                            "code": "confirmed",
                            "display": "Confirmed"
                        }
                    ]
                },
                "type": "allergy",
                "category": [
                    "medication"
                ],
                "code": {
                    "coding": [
                        {
                            "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
```

```
                            "code": "209098",
                            "display": "Testomar"
                        }
                    ]
                },
                "patient": {
                    "reference": "Patient/2c92a6d96688a19a01668d6d6d3801a7"
                },
                "onsetPeriod": {
                    "start": "2018-10-19T00:00:00+05:30"
                },
                "recordedDate": "2018-10-19T19:05:06+05:30",
                "reaction": [
                    {
                        "substance": {
                            "coding": [
                                {
                                    "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
                                    "code": "209098",
                                    "display": "Testomar"
                                }
                            ],
                            "text": "Testomar"
                        },
                        "manifestation": [
                            {
                                "coding": [
                                    {
                                        "display": "No known"
                                    }
                                ],
                                "text": "No known"
                            }
                        ],
                        "onset": "2018-10-19T00:00:00+05:30"
                    }
                ]
            }
        }
    ]
}
```

Care Plan

Description	Retrieves a patient's care plan.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

The following search parameter is supported for the Care Plan resource.

Parameter	Description	Type	Req'd
patient	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.	reference	Y
category	The type of plan.	token	Y
date	The date and time the care plan was recorded.	date	N
status	The status of the care plan. Supported values include draft, active, on-hold, revoked, completed, entered-in-error, unknown.	code	N
patient+category	Combination search parameters supported for the care plan resource.	reference+token	N
patient+category+status+date		reference+token+token+date	N
patient+category+status		reference+token+token	N
patient+category+date		reference+token+date	N

Response Fields

The following fields may appear in a JSON response for the Care Plan resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	CarePlan	0..*
id	The unique identifier for the clinical entry.	Identifier	0..*
category	Identifies the type of team.	CodeableConcept	0..*
description	The recorded assessment text.	string	0..1
subject	Identifies the patient or group whose care is handled by the team.	Reference(Patient | Group)	1..1
intent	Identifies the level of authority associated with the care plan. Supported values include proposal, plan, order, option, directive.	code	1..1
assessor	The clinician or provider who performed the assessment.	Reference(Practitioner)	0..1
status	The status of the care plan. Supported values include draft, active, on-hold, revoked, completed, entered-in-error, unknown.	code	1..1

Example Request and Response

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns one or more care plan entries for the patient using the specified clinical entry identifier:

```
GET https://base_url/quanum-ehr-fhir-server-
/fhir/CarePlan/2c92a60f81219a930181297e16c20738
```

Read - Response (JSON)

```
{
    "resourceType": "CarePlan",
    "id": "2c92a60f81219a930181297e16c20738",
    "text": {
        "status": "generated",
        "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\"><p>demo carePlan</p></div>"
    },
    "status": "active",
    "intent": "plan",
    "category": [
        {
            "coding": [
                {
                    "system": "http://hl7.org/fhir/us/core/CodeSystem/careplan-category",
                    "code": "assess-plan",
```

```
                    "display": "Assessment and Plan of Treatment"
                }
            ],
            "text": "Assessment and Plan of Treatment"
        }
    ],
    "subject": {
        "reference": "Patient/2c92a60f81219a930181297e16c20738"
    }
}
```


Search - Request

Returns one or more care plan entries (as a bundle) for the patient:

```
GET https://base_url/quanum-ehr-fhir-
server/fhir/CarePlan?patient=2c92a60f808e9cea0180938b49470e6e&category=assess-plan
```

Search - Response (JSON)


```
{
    "resourceType": "Bundle",
    "id": "ee073eec-2656-4b08-b674-c7c1108dc4cd",
    "meta": {
        "lastUpdated": "2022-06-07T12:50:19.345+00:00"
    },
    "type": "searchset",
    "total": 3,
    "link": [
        {
            "relation": "self",
            "url": "https://base_url/quanum-ehr-fhir-server-
/fhir/CarePlan?category=http%3A%2F%2Fhl7.org%2Ffhir%2Fus%2Fcore%2FCodeSystem%2Fcareplan-cat-
egory%7Cassess-plan&patient=2c92a60f808e9cea0180938b49470e6e"
        }
    ],
    "entry": [
        {
            "fullUrl": "https://base_url/quanum-ehr-fhir-server-
/fhir/CarePlan/2c92a60f808e9cea0180938b49470e6e",
            "resource": {
                "resourceType": "CarePlan",
                "id": "2c92a60f808e9cea0180938b49470e6e",
                "text": {
                    "status": "generated",
                    "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\"><p>Demo CarePlan -
2</p></div>"
                },
                "status": "active",
                "intent": "plan",
                "category": [
                    {
```

```
                        "coding": [
                            {
                                "system": "http://hl7.org/fhir/us/core/CodeSystem/careplan-
category",
                                "code": "assess-plan",
                                "display": "Assessment and Plan of Treatment"
                            }
                        ],
                        "text": "Assessment and Plan of Treatment"
                    }
                ],
                "subject": {
                    "reference": "Patient/2c92a60f808e9cea0180938b49470e6e"
                }
            }
        },
        {
            "fullUrl": "https://base_url/quanum-ehr-fhir-server-
/fhir/CarePlan/2c92a60f808e9cea0180938b49470e6e",
            "resource": {
                "resourceType": "CarePlan",
                "id": "2c92a60f808e9cea0180938b49470e6e",
                "text": {
                    "status": "generated",
                    "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\"><p>demo Erroneous
CarePlan</p></div>"
                },
                "status": "entered-in-error",
                "intent": "plan",
                "category": [
                    {
                        "coding": [
                            {
                                "system": "http://hl7.org/fhir/us/core/CodeSystem/careplan-
category",
                                "code": "assess-plan",
                                "display": "Assessment and Plan of Treatment"
                            }
                        ],
                        "text": "Assessment and Plan of Treatment"
                    }
                ],
                "subject": {
                    "reference": "Patient/2c92a60f808e9cea0180938b49470e6e"
                }
            }
        },
        {
            "fullUrl": "https://base_url/quanum-ehr-fhir-
```

```
server/fhir/CarePlan/2c92a60f808e9cea0180938b49470e6e",
            "resource": {
                "resourceType": "CarePlan",
                "id": "2c92a60f808e9cea0180938b49470e6e",
                "text": {
                    "status": "generated",
                    "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\"><p>demo
carePlan</p></div>"
                },
                "status": "active",
                "intent": "plan",
                "category": [
                    {
                        "coding": [
                            {
                                "system": "http://hl7.org/fhir/us/core/CodeSystem/careplan-
category",
                                "code": "assess-plan",
                                "display": "Assessment and Plan of Treatment"
                            }
                        ],
                        "text": "Assessment and Plan of Treatment"
                    }
                ],
                "subject": {
                    "reference": "Patient/2c92a60f808e9cea0180938b49470e6e"
                }
            }
        }
    ]
}
```

Care Team

Description	Retrieves a patient's care team.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

The following search parameter is supported for the Care Team resource.

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Req'd
patient	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.	string	Y
status	The status of the care team.	token	Y
patient+status	Combination search parameter supported for the care team resource.	string+token	N

Response Fields

The following fields may appear in a JSON response for the Care Team resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	CareTeam	0..*
id	The unique identifier for the clinical entry.	Identifier	0..*
status	Identifies the status of the care team. Supported values include proposed, active, suspended, inactive, or entered-in-error.	code	0..1
category	Identifies the type of team.	CodeableConcept	0..*
subject	Identifies the patient or group whose care is handled by the team.	Reference(Patient | Group)	0..1
participant	Identifies all people and organizations who are part of the care team.	BackboneElement	0..*

Example Request and Response

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns one or more care team entires for the patient using the specified clinical entry identifier:

```
GET https://base_url/quanum-ehr-fhir-server-
/fhir/CareTeam/2c92a6c2488fc21401489e1d968f1b2f
```

Read - Response (JSON)


```
{
    "resourceType": "CareTeam",
    "id": "2c92a6c2488fc21401489e1d968f1b2f",
    "status": "active",
    "category": [
        {
            "coding": [
                {
                    "system": "http://hl7.org/fhir/care-team-category",
                    "code": "care-team",
                    "display": "Care Team"
                }
            ],
            "text": "Care Team"
        }
    ],
    "subject": {
        "reference": "Patient/CareTeam/2c92a6c2488fc21401489e1d968f1b2f"
    },
    "participant": [
        {
            "role": [
                {
                    "coding": [
                        {
                            "system": "http://snomed.info/sct",
                            "code": "453231000124104",
                            "display": "Primary care provider (occupation)"
                        }
                    ],
                    "text": "Primary care provider (occupation)"
                }
            ],
            "member": {
                "reference": "Practitioner/1000000863",
                "display": "Brian Clinician"
            },
            "onBehalfOf": {
```

```
                "reference": "Organization/Demo Health Assoc"
            }
        }
    ]
}
```


Search - Request

Returns one or more care team entries (as a bundle) for the patient:

```
GET https://base_url/quanum-ehr-fhir-server-
/fhir/CareTeam?patient=2c92a6c2488fc21401489e1d968f1b2f&status=active
```

Search - Response (JSON)


```
{
    "resourceType": "Bundle",
    "id": "c52b1464-6347-43aa-9a76-fe8b57f2d25d",
    "meta": {
        "lastUpdated": "2022-09-29T20:27:36.238+00:00"
    },
    "type": "searchset",
    "total": 1,
    "link": [
        {
            "relation": "self",
            "url": "http://base_url/quanum-ehr-fhir-server-
/fhir/CareTeam?patient=2c92a6c2488fc21401489e1d968f1b2f&status=active%0A"
        }
    ],
    "entry": [
        {
            "fullUrl": "http://base_url/quanum-ehr-fhir-server-
/fhir/CareTeam/2c92a6c2488fc21401489e1d968f1b2f",
            "resource": {
                "resourceType": "CareTeam",
                "id": "2c92a6c2488fc21401489e1d968f1b2f",
                "status": "active",
                "category": [
                    {
                        "coding": [
                            {
                                "system": "http://hl7.org/fhir/care-team-category",
                                "code": "care-team",
                                "display": "Care Team"
                            }
                        ],
                        "text": "Care Team"
                    }
                ],
                "subject": {
                    "reference": "Patient/2c92a6c2488fc21401489e1d968f1b2f"
```

```
                },
                "participant": [
                    {
                        "role": [
                            {
                                "coding": [
                                    {
                                        "system": "http://snomed.info/sct",
                                        "code": "453231000124104",
                                        "display": "Primary care provider (occupation)"
                                    }
                                ],
                                "text": "Primary care provider (occupation)"
                            }
                        ],
                        "member": {
                            "reference": "Practitioner/1000000863",
                            "display": "Brian Clinician"
                        },
                        "onBehalfOf": {
                            "reference": "Organization/Demo Health Assoc"
                        }
                    }
                ]
            }
        }
    ]
}
```

Condition (Problems)

Description	Retrieves a patient's conditions (problems).
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

The following search parameters are supported for the Condition resource.

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Req'd
patient	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.	string	Y
identifier	The unique identifier for a specific clinical entry. The clinical entry identifier can be retrieved by performing a search for a patient's conditions.	string	N
category	The category of the condition.	token	N
code	Classification of the condition.	token	N
onsetDateTime	The date and time the condition started.	date	N
clinicalStatus	The clinical status of the condition.	token	N
patient+code	Combination search parameter supported for the condition resource.	string+token	N
patient+onsetDateTime		string+date	N
patient+clicnialStatus		string+token	N
patient+category		string+token	N

Response Fields

The following fields may appear in a JSON response for the Condition resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Condition	0..*
id	The unique identifier for the clinical entry.	Identifier	0..*
clinicalStatus	The status of the condition. Supported values include active or inactive.	code	1..1
category	A category assigned to the condition. Problem is the only supported value.	CodeableConcept	0..*
code	The identified problem.	CodeableConcept	0..1
subject	The patient associated with the condition, described by the patient's unique identifier preceded by *Patient/*.	Reference(Patient)	1..1
onsetDateTime	The actual or estimated date and time the condition began.	dateTime	0..1
note	Additional information about the condition.	Annotation	0..*

Example Requests and Responses

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns a single condition entry for the patient using the specified clinical entry identifier:

```
GET https://base_url/quanum-ehr-fhir-
server/fhir/Condition/2c92a6117946c196017947ccadda0e77
```

Read - Response (JSON)

```
{
    "resourceType": "Condition",
    "id": "2c92a6117946c196017947ccadda0e77",
    "clinicalStatus": {
        "coding": [
            {
                "system": "active",
                "code": "http://terminology.hl7.org/CodeSystem/condition-clinical",
                "display": "Active"
            }
        ],
        "text": "Active"
    },
    "verificationStatus": {
```

```
        "coding": [
            {
                "system": "unconfirmed",
                "code": "http://terminology.hl7.org/CodeSystem/condition-ver-status",
                "display": "Unconfirmed"
            }
        ],
        "text": "Unconfirmed"
    },
    "category": [
        {
            "coding": [
                {
                    "system": "http://hl7.org/fhir/condition-category",
                    "code": "problem",
                    "display": "Problem"
                }
            ]
        }
    ],
    "code": {
        "coding": [
            {
                "system": "icd10cm",
                "code": "I50.2",
                "display": "Systolic (congestive) heart failure"
            }
        ]
    },
    "subject": {
        "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
    },
    "onsetDateTime": "2021-04-02T00:00:00+00:00"
}
```

Search - Request

Returns one or more condition entries (as a bundle) for the patient in the specified date range:

```
GET https://base_url/quanum-ehr-fhir-
server/fhir/Condition?patient=ff8081812dd49942012dd4a455780002
```

Search - Response (JSON)

Note: Only a portion of the response is included for this example.

```
{
    "resourceType": "Bundle",
    "id": "deff9bdb-3d00-4f23-8691-03e691088426",
    "meta": {
        "lastUpdated": "2022-09-29T13:40:38.852+00:00"
    },
```

```
    "type": "searchset",
    "total": 2,
    "link": [
        {
            "relation": "self",
            "url": "https://base_url/quanum-ehr-fhir-
server/fhir/Condition?patient=ff8081812dd49942012dd4a455780002"
        }
    ],
    "entry": [
        {
            "fullUrl": "https://base_url/quanum-ehr-fhir-
server/fhir/Condition/2c92a6be350c380501350c5e0a111150-PP",
            "resource": {
                "resourceType": "Condition",
                "id": "2c92a6be350c380501350c5e0a111150-PP",
                "clinicalStatus": {
                    "coding": [
                        {
                            "system": "http://terminology.hl7.org/CodeSystem/condition-
clinical",
                            "code": "inactive",
                            "display": "Inactive"
                        }
                    ],
                    "text": "Inactive"
                },
                "verificationStatus": {
                    "coding": [
                        {
                            "system": "http://terminology.hl7.org/CodeSystem/condition-ver-
status",
                            "code": "confirmed",
                            "display": "Confirmed"
                        }
                    ],
                    "text": "Confirmed"
                },
                "category": [
                    {
                        "coding": [
                            {
                                "system": "http://hl7.org/fhir/condition-category",
                                "code": "problem-list-item",
                                "display": "Problem List Item"
                            }
                        ],
                        "text": "Problem"
                    }
```

```
                ],
                "code": {
                    "coding": [
                        {
                            "system": "http://snomed.info/sct",
                            "code": "301327002",
                            "display": "Undifferentiated illness: GOK - God only knows"
                        }
                    ]
                },
                "subject": {
                    "reference": "Patient/ff8081812dd49942012dd4a455780002"
                }
            }
        },
        {
            "fullUrl": "https://base_url/quanum-ehr-fhir-
server/fhir/Condition/2c92a6bc4529426601452d00e53779a7-PP",
            "resource": {
                "resourceType": "Condition",
                "id": "2c92a6bc4529426601452d00e53779a7-PP",
                "clinicalStatus": {
                    "coding": [
                        {
                            "system": "http://terminology.hl7.org/CodeSystem/condition-
clinical",
                            "code": "inactive",
                            "display": "Inactive"
                        }
                    ],
                    "text": "Inactive"
                },
                "verificationStatus": {
                    "coding": [
                        {
                            "system": "http://terminology.hl7.org/CodeSystem/condition-ver-
status",
                            "code": "confirmed",
                            "display": "Confirmed"
                        }
                    ],
                    "text": "Confirmed"
                },
                "category": [
                    {
                        "coding": [
                            {
                                "system": "http://hl7.org/fhir/condition-category",
                                "code": "problem-list-item",
```

```
                                "display": "Problem List Item"
                            }
                        ],
                        "text": "Problem"
                    }
                ],
                "code": {
                    "coding": [
                        {
                            "system": "http://hl7.org/fhir/sid/icd-9-cm/",
                            "code": "250.00",
                            "display": "Diabetes mellitus without mention of complication,
type II or unspecified type, not stated as uncontrolled"
                        },
                        {
                            "system": "http://snomed.info/sct",
                            "code": "73211009",
                            "display": "Diabetes mellitus"
                        }
                    ]
                },
                "subject": {
                    "reference": "Patient/ff8081812dd49942012dd4a455780002"
                },
                "onsetDateTime": "2018-05-10T12:00:00+00:00"
            }
        }
    ]
}
```

Device

Description	Retrieves a patient's devices.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

The following search parameters are supported for the Device resource.

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Req'd
patient	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.	string	Y
identifier	The unique identifier for a specific clinical entry. The clinical entry identifier can be retrieved by performing a search for a patient's devices.	string	N
type	The type of device.	token	N
patient+type	Combination search parameter supported for the device resource.	reference+token	N

Response Fields

The following fields may appear in a JSON response for the Device resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Device	0..*
id	The unique identifier for the clinical entry.	Identifier	0..*
status	The status of the device's availability. Supported values include active, inactive, entered-in-error, and unknown.	code	0..1
patient	The patient to whom the device is affixed, described by the patient's unique identifier preceded by *Patient/*.	Reference (Patient)	1..1

Field	Description	Type	Cardinality
udi	The Unique Device Identifier (UDI) assigned to the device label or package.	BackboneElement	0..*
type	The code or identifier that indicates the kind of device.	CodeableConcept	0..*
lotNumber	The lot number assigned by the manufacturer.	string	0..1
manufacturer	The name of the device's manufacturer.	string	0..1
expirationDate	The date and time after which this device is no longer valid or should not be used (if applicable).	dateTime	0..1
version	The version of the device, if the device has multiple releases under the same model, or if the device is software or carries firmware.	string	0..*
note	Device notes and comments, such as descriptive information, usage information, or implantation information.	Annotation	0..*

Example Requests and Responses

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns a single device entry for the patient using the specified clinical entry identifier:

```
GET https://base_url/quanum-ehr-fhir-server-
/fhir/Device/2c92e13d836abb44018384b255bb0fe5-ME
```

Read - Response (JSON)

```
{
  "resourceType": "Device",
  "id": "2c92e13d836abb44018384b255bb0fe5-ME",
  "udiCarrier": [
    {
      "deviceIdentifier": "M424400POD6S0",
      "carrierHRF":
"+M424400POD6S0/$$420020216LOT123456789012345/SXYZ456789012345678/16D20130202C"
    }
  ],
  "status": "active",
  "distinctIdentifier": "M424400POD6S0",
  "manufacturer": "PENUMBRA, INC.",
  "manufactureDate": "2013-02-02T00:00:00+00:00",
  "expirationDate": "2020-02-02T00:00:00+00:00",
  "lotNumber": "LOT123456789012345",
```

```
  "serialNumber": "XYZ456789012345678",
  "deviceName": [
    {
      "name": "Embolization implant kit",
      "type": "manufacturer-name"
    }
  ],
  "type": {
    "coding": [
      {
        "system": "http://snomed.info/sct",
        "code": "468391005",
        "display": "Embolization implant kit (physical object)"
      }
    ]
  },
  "version": [
    {
      "value": "400POD6S"
    }
  ],
  "patient": {
    "reference": "Patient/2c92e13d836abb53018380827cd917f1"
  },
  "note": [
    {
      "text": "test"
    }
  ]
}
```


Search - Request

Returns one or more device entries (as a bundle) by the patient's unique identifier:

```
GET https://base_url/quanum-ehr-fhir-server-
/fhir/Device?patient=2c92e13d836abb53018380827cd917f1
```

Search - Response (JSON)


```
{
  "resourceType": "Bundle",
  "id": "5911337b-46c3-4835-a937-8f03bacb40e9",
  "meta": {
    "lastUpdated": "2022-10-19T07:54:57.226+00:00"
  },
  "type": "searchset",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://base_url/quanum-ehr-fhir-
```

```
server/fhir/Device?patient=2c92e13d836abb53018380827cd917f1"
    }
  ],
  "entry": [
    {
      "fullUrl": "https://base_url/quanum-ehr-fhir-server-
/fhir/Device/2c92e13d836abb44018384b255bb0fe5-ME",
      "resource": {
        "resourceType": "Device",
        "id": "2c92e13d836abb44018384b255bb0fe5-ME",
        "udiCarrier": [
          {
            "deviceIdentifier": "M424400POD6S0",
            "carrierHRF":
"+M424400POD6S0/$$420020216LOT123456789012345/SXYZ456789012345678/16D20130202C"
          }
        ],
        "status": "active",
        "distinctIdentifier": "M424400POD6S0",
        "manufacturer": "PENUMBRA, INC.",
        "manufactureDate": "2013-02-02T00:00:00+00:00",
        "expirationDate": "2020-02-02T00:00:00+00:00",
        "lotNumber": "LOT123456789012345",
        "serialNumber": "XYZ456789012345678",
        "deviceName": [
          {
            "name": "Embolization implant kit",
            "type": "manufacturer-name"
          }
        ],
        "type": {
          "coding": [
            {
              "system": "http://snomed.info/sct",
              "code": "468391005",
              "display": "Embolization implant kit (physical object)"
            }
          ]
        },
        "version": [
          {
            "value": "400POD6S"
          }
        ],
        "patient": {
          "reference": "Patient/2c92e13d836abb53018380827cd917f1"
        },
        "note": [
          {
```

```
            "text": "test"
          }
        ]
      }
    }
  ]
}
```

Diagnostic Report

Description	Retrieves a patient's diagnostic reports.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

The following search parameter is supported for the Diagnostic Report resource.

Parameter	Description	Type	Req'd
patient	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.	reference	Y
category	Identifies the type of diagnostic report.	token	Y
code	The report's code, as opposed to atomic results' codes, which are names on the resource that the result has referenced.	token	N
identifier	The unique identifier for a specific clinical entry. The clinical entry identifier can be retrieved by performing a search for a patient's diagnostic report.	token	N
startDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd* If a start date is specified, only entries with a clinically relevant date that occurs on or after the specified start date are returned. **Note:** A start date may be used with or without an end date.	date	N
endDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd*	date	N

Parameter	Description	Type	Req'd
	If an end date is specified, only entries with a clinically relevant date that occurs on or before the specified end date are returned. **Note:** An end date may be used with or without a start date.		
status	The status of the diagnostic report. Supported values include registered, partial, preliminary, or final.	code	N
patient+category	Combination search parameters supported for the care plan resource.	reference+token	N
patient+code		reference+token	N
patient+status		reference+token	N
patient+category+date		reference+token+date	N
patient+code+date		reference+token+date	N

Response Fields

The following fields may appear in a JSON response for the Diagnostic Report resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	DiagnosticReport	0..*
id	The unique identifier for the report.	Identifier	0..*
category	Identifies the department, clinical specialty, or diagnostic service that provided the report.	CodeableConcept	0..*
subject	The subject of the report.	Reference(Patient | Group | Device | Location | Organization | Procedure | Practitioner | Medication | Substance)	0..1
issued	The time and date when the report was provided to provider.	instant	0..1
effectiveDateTime	The date and time the diagnostic report was issued.	dateTime | Period	0..1
status	The status of the diagnostic report.	code	1..1

Field	Description	Type	Cardinality
code	The diagnostic report code.	CodeableConcept	1..1
performer	The facility that is responsible for issuing the diagnostic report.	reference	0..*
specimen	The information about the specimen in reference to the diagnostic report.	reference	0..*
result	Observations that are part of the diagnostic report.	reference	0..*

Example Request and Response

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns one or more diagnostic report entries for the patient using the specified clinical entry identifier:

```
GET https://base_url/quanum-ehr-fhir-server-
/fhir/DiagnosticReport/2c92a62e7b828c3a017b8761ec8d0011-LAB-1
```

Read - Response (JSON)

```
{
    "resourceType": "DiagnosticReport",
    "id": "2c92a62e7b828c3a017b8761ec8d0011-LAB-1",
    "meta": {
        "tag": [
            {
                "system": "urn:quest:quanum:source",
                "display": "Quanum-EHR"
            }
        ]
    },
    "status": "final",
    "category": [
        {
            "coding": [
                {
                    "system": "http://terminology.hl7.org/CodeSystem/v2-0074",
                    "code": "LAB",
                    "display": "Laboratory"
                }
            ],
            "text": "LAB"
        }
    ],
    "code": {
```

```
    "coding": [
        {
            "system": "http://loinc.org",
            "code": "10165",
            "display": "BASIC METABOLIC PANEL"
        }
    ],
    "text": "BASIC METABOLIC PANEL"
},
"subject": {
    "reference": "Patient/2c92a62e7b828c3a017b8761eb2d0010"
},
"effectiveDateTime": "2021-02-07T11:57:00+00:00",
"issued": "2021-02-07T11:57:00.000+00:00",
"performer": [
    {
        "reference": "Organization/KYL",
        "display": "Lexington Kentucky"
    }
],
"result": [
    {
        "reference": "Observation/2c92a62e7b828c3a017b8761ec8d0011-1-8",
        "display": "CARBON DIOXIDE"
    },
    {
        "reference": "Observation/2c92a62e7b828c3a017b8761ec8d0011-1-2",
        "display": "UREA NITROGEN (BUN)"
    },
    {
        "reference": "Observation/2c92a62e7b828c3a017b8761ec8d0011-1-4",
        "display": "BUN/CREATININE RATIO"
    },
    {
        "reference": "Observation/2c92a62e7b828c3a017b8761ec8d0011-1-5",
        "display": "SODIUM"
    },
    {
        "reference": "Observation/2c92a62e7b828c3a017b8761ec8d0011-1-7",
        "display": "CHLORIDE"
    },
    {
        "reference": "Observation/2c92a62e7b828c3a017b8761ec8d0011-1-6",
        "display": "POTASSIUM"
    },
    {
        "reference": "Observation/2c92a62e7b828c3a017b8761ec8d0011-1-1",
        "display": "GLUCOSE"
    },
```

```
        {
            "reference": "Observation/2c92a62e7b828c3a017b8761ec8d0011-1-9",
            "display": "CALCIUM"
        },
        {
            "reference": "Observation/2c92a62e7b828c3a017b8761ec8d0011-1-3",
            "display": "CREATININE"
        }
    ]
}
```

Search - Request

Returns one or more diagnostic report entries (as a bundle) for the patient:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/DiagnosticReport?
patient=2c92a6bb6be64029016bf7399307008e&date=ge2019-06-01&date=le2020-06-01
```

Search - Response (JSON)

```
{
    "resourceType": "Bundle",
    "id": "f2b6fea6-7792-4c5c-8e25-d7479f7cadd0",
    "meta": {
        "lastUpdated": "2022-07-18T02:34:19.963+00:00"
    },
    "type": "searchset",
    "total": 2,
    "link": [
        {
            "relation": "self",
            "url": "https://base_url/quanum-ehr-fhir-server-
/fhir/DiagnosticReport?date=ge2019-06-01&date=le2020-06-01&pa-
tient=2c92a6bb6be64029016bf7399307008e"
        }
    ],
    "entry": [
        {
            "fullUrl": "https://base_url/quanum-ehr-fhir-server-
/fhir/DiagnosticReport/00fddf29bd8e017474db02172c92a6bb-LAB-1",
            "resource": {
                "resourceType": "DiagnosticReport",
                "id": "00fddf29bd8e017474db02172c92a6bb-LAB-1",
                "meta": {
                    "tag": [
                        {
                            "system": "urn:quest:quanum:source",
                            "display": "Quanum-EHR"
                        }
                    ]
                },
                "status": "final",
```

```
"category": [
    {
        "coding": [
            {
                "system": "http://terminology.hl7.org/CodeSystem/v2-0074",
                "code": "LAB",
                "display": "Laboratory"
            }
        ],
        "text": "LAB"
    }
],
"code": {
    "coding": [
        {
            "system": "http://loinc.org",
            "code": "7600XOW=",
            "display": "LIPID PANEL, STANDARD"
        }
    ],
    "text": "LIPID PANEL, STANDARD"
},
"subject": {
    "reference": "Patient/2c92a6bb6be64029016bf7399307008e"
},
"effectiveDateTime": "2019-06-20T02:00:00+00:00",
"issued": "2019-06-20T02:00:00.000+00:00",
"performer": [
    {
        "reference": "Organization/KYL",
        "display": "Lexington Kentucky"
    }
],
"result": [
    {
        "reference": "Observation/00fddf29bd8e017474db02172c92a6bb-1-1",
        "display": "CHOLESTEROL, TOTAL"
    },
    {
        "reference": "Observation/00fddf29bd8e017474db02172c92a6bb-1-5",
        "display": "CHOL/HDLC RATIO"
    },
    {
        "reference": "Observation/00fddf29bd8e017474db02172c92a6bb-1-6",
        "display": "NON HDL CHOLESTEROL"
    },
    {
        "reference": "Observation/00fddf29bd8e017474db02172c92a6bb-1-2",
        "display": "HDL CHOLESTEROL"
```

```
                    },
                    {
                        "reference": "Observation/00fddf29bd8e017474db02172c92a6bb-1-3",
                        "display": "TRIGLYCERIDES"
                    },
                    {
                        "reference": "Observation/00fddf29bd8e017474db02172c92a6bb-1-4",
                        "display": "LDL-CHOLESTEROL"
                    }
                ]
            }
        },
        {
            "fullUrl": "https://base_url/quanum-ehr-fhir-server-
/fhir/DiagnosticReport/00fddf29bd8e017474db02172c92a6bb-LAB-2",
            "resource": {
                "resourceType": "DiagnosticReport",
                "id": "00fddf29bd8e017474db02172c92a6bb-LAB-2",
                "meta": {
                    "tag": [
                        {
                            "system": "urn:quest:quanum:source",
                            "display": "Quanum-EHR"
                        }
                    ]
                },
                "status": "final",
                "category": [
                    {
                        "coding": [
                            {
                                "system": "http://terminology.hl7.org/CodeSystem/v2-0074",
                                "code": "LAB",
                                "display": "Laboratory"
                            }
                        ],
                        "text": "LAB"
                    }
                ],
                "code": {
                    "coding": [
                        {
                            "system": "http://loinc.org",
                            "code": "571SB=",
                            "display": "IRON, TOTAL"
                        }
                    ],
                    "text": "IRON, TOTAL"
                },
```

```
                "subject": {
                    "reference": "Patient/2c92a6bb6be64029016bf7399307008e"
                },
                "effectiveDateTime": "2019-06-20T02:00:00+00:00",
                "issued": "2019-06-20T02:00:00.000+00:00",
                "performer": [
                    {
                        "reference": "Organization/KYL",
                        "display": "Lexington Kentucky"
                    }
                ],
                "result": [
                    {
                        "reference": "Observation/00fddf29bd8e017474db02172c92a6bb-2-1",
                        "display": "IRON, TOTAL"
                    }
                ]
            }
        }
    ]
}
```

Document Reference (All Patient Data)

Description	Retrieves a CCDA document containing all of the patient's data for the supported resources.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

The following search parameter is supported for the Document Reference resource.

Parameter	Description	Type	Req'd
patient	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.	reference	Y
category	Identifies the type of document.	token	Y
type	The type of document.	token	N
status	The status of the document. Supported value include preliminary, final, amended, entered-in-error.	token	N
subject	The subject of the document.	reference	N
identifier	The unique identifier for a specific clinical entry. The clinical entry identifier can be retrieved by performing a search for a patient's diagnostic report.	token	N
startDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd* If a start date is specified, only entries with a clinically relevant date that occurs on or after the specified start date are returned. **Note:** A start date may be used with or without an end date.	date	N

Parameter	Description	Type	Req'd
endDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd* If an end date is specified, only entries with a clinically relevant date that occurs on or before the specified end date are returned. **Note:** An end date may be used with or without a start date.	date	N
patient+category	Combination search parameters supported for the document reference resource.	reference+token	N
patient+type		reference+token	N
patient+status		reference+token	N
patient+category+date		reference+token+date	N
patient+type+period		reference+token+date	N

Response Fields

The following fields may appear in a JSON response for the Document Reference resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	DocumentReference	0..*
id	The patient's unique identifier.	Identifier	0..*
status	The status of the document reference. Current is the only supported value.	code	1..1
type	Identifies the kind of document being referenced.	CodeableConcept	0..1
category	Categorization of document.	CodeableConcept	0..*
subject	The patient associated with the document, described by the patient's unique identifier preceded by *Patient/*.	Reference(Patient | Practitioner | Group | Device)	0..1
indexed	The date and time the document reference was created.	instant	0..1
content	The MIME type of the content and the referenced document (Base64 encoded, compressed CCDA).	BackboneElement	1..*

Example Request and Response

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns a CCDA using the specified patient's unique identifier:

Note: The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.

```
GET https://base_url/quanum-ehr-fhir-server/fhir/DocumentReference/
2c92e13d83eb6ba70183edebe3dc6edd-DOC
```

Read - Response (JSON)

```
{
  "resourceType": "DocumentReference",
  "id": "2c92e13d83eb6ba70183edebe3dc6edd-DOC",
  "identifier": [
    {
      "system": "https://base_url/quanum-ehr-fhir-
server/fhir/DocumentReference/2c92e13d83eb6ba70183edebe3dc6edd-DOC",
      "value": "2c92e13d83eb6ba70183edebe3dc6edd-DOC"
    }
  ],
  "status": "current",
  "type": {
    "coding": [
      {
        "system": "http://loinc.org",
        "code": "11488-4",
        "display": "Consultation Note"
      }
    ],
    "text": "Consultation Note"
  },
  "category": [
    {
      "coding": [
        {
          "system": "http://hl7.org/fhir/us/core/CodeSystem/us-core-documentreference-
category",
          "code": "clinical-notes",
          "display": "Clinical Note"
        }
      ]
    }
  ],
  "subject": {
```

```
    "reference": "Patient/2c92e13d836abb53018380827cd917f1"
  },
  "date": "2022-10-18T04:00:00.000+00:00",
  "author": [
    {
      "reference": "Practitioner/1283493496",
      "display": "1283493496"
    }
  ],
  "custodian": {
    "reference": "Organization/2c92e13d836abb530183806a80e117ef",
    "display": "G10 Org 1"
  },
  "content": [
    {
      "attachment": {
        "contentType": "application/pdf",
        "url": "https://base_url/quanum-ehr-fhir-
server/fhir/ClinicalDocument/2c92e13d83eb6ba70183edebe3a76edc"
      },
      "format": {
        "system": "http://ihe.net/fhir/ValueSet/IHE.FormatCode.codesystem",
        "code": "urn:ihe:iti:xds:2017:mimeTypeSufficient",
        "display": "mimeType Sufficient"
      }
    }
  ],
  "context": {
    "encounter": [
      {
        "reference": "Encounter/2c92e13d836abb53018387d5727a3512-E"
      }
    ],
    "period": {
      "start": "2022-10-19T01:46:43+00:00",
      "end": "2022-10-19T01:46:43+00:00"
    }
  }
}
```


Search - Request

Returns one or more diagnostic report entries (as a bundle) for the patient:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/DocumentReference?_
id=2c92e13d83eb6ba70183edebe3dc6edd-DOC
```

Search - Response (JSON)


```
{
  "resourceType": "Bundle",
  "id": "47e9d698-5a3c-407f-b536-4626199570f1",
```

```
  "meta": {
    "lastUpdated": "2022-10-19T07:55:01.076+00:00"
  },
  "type": "searchset",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://base_url/quanum-ehr-fhir-server/fhir/DocumentReference?_id=2c92e13d83-
3eb6ba70183edebe3dc6edd-DOC"
    }
  ],
  "entry": [
    {
      "fullUrl": "https://base_url/quanum-ehr-fhir-server-
/fhir/DocumentReference/2c92e13d83eb6ba70183edebe3dc6edd-DOC",
      "resource": {
        "resourceType": "DocumentReference",
        "id": "2c92e13d83eb6ba70183edebe3dc6edd-DOC",
        "identifier": [
          {
            "system": "https://base_url/quanum-ehr-fhir-server-
/fhir/DocumentReference/2c92e13d83eb6ba70183edebe3dc6edd-DOC",
            "value": "2c92e13d83eb6ba70183edebe3dc6edd-DOC"
          }
        ],
        "status": "current",
        "type": {
          "coding": [
            {
              "system": "http://loinc.org",
              "code": "11488-4",
              "display": "Consultation Note"
            }
          ],
          "text": "Consultation Note"
        },
        "category": [
          {
            "coding": [
              {
                "system": "http://hl7.org/fhir/us/core/CodeSystem/us-core-documentreference-
category",
                "code": "clinical-notes",
                "display": "Clinical Note"
              }
            ]
          }
        ],
```

```
        "subject": {
          "reference": "Patient/2c92e13d836abb53018380827cd917f1"
        },
        "date": "2022-10-18T04:00:00.000+00:00",
        "author": [
          {
            "reference": "Practitioner/1283493496",
            "display": "1283493496"
          }
        ],
        "custodian": {
          "reference": "Organization/2c92e13d836abb530183806a80e117ef",
          "display": "G10 Org 1"
        },
        "content": [
          {
            "attachment": {
              "contentType": "application/pdf",
              "url": "https://base_url/quanum-ehr-fhir-server-
/fhir/ClinicalDocument/2c92e13d83eb6ba70183edebe3a76edc"
            },
            "format": {
              "system": "http://ihe.net/fhir/ValueSet/IHE.FormatCode.codesystem",
              "code": "urn:ihe:iti:xds:2017:mimeTypeSufficient",
              "display": "mimeType Sufficient"
            }
          }
        ],
        "context": {
          "encounter": [
            {
              "reference": "Encounter/2c92e13d836abb53018387d5727a3512-E"
            }
          ],
          "period": {
            "start": "2022-10-19T01:46:43+00:00",
            "end": "2022-10-19T01:46:43+00:00"
          }
        }
      }
    }
  ]
}
```

Encounter

Description	Retrieves a patient's encounter. Encounter contains a patients interaction with a healthcare provider to receive healthcare services or to assess the patient's health status. The Encounter records information about actual activities, while the Appointment record records planned activities.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

The following search parameters are supported for the encounter resource.

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Req'd
patient	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.	string	Y
identifier	The unique identifier for a specific clinical entry. The clinical entry identifier can be retrieved by performing a search for a patient's assessments.	string	N
startDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd* If a start date is specified, only entries with a clinically relevant date that occurs on or after the specified start date are returned. **Note:** A start date may be used with or without an end date.	date	N
endDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd* If an end date is specified, only entries with a clinically relevant date that occurs on or before the specified end date are returned.	date	N

Parameter	Description	Type	Req'd
	Note: An end date may be used with or without a start date.		
status	The status of the encounter. Supported values include in-progress, onhold, complete, cancelled, entered-in-error, or unknown.	token	N
class	Classifies the patient encounter.	token	N
type	Identifies the type of encounter.	token	N
date+patient	Combination search parameters supported for the encounter resource.	date+reference	N
patient+status		reference+token	N
class+patient+		token+reference	N
patient+type		reference+token	N

Response Fields

The following fields may appear in a JSON response for the Encounter resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Encounter	0..*
id	The unique identifier for the encounter.	Identifier	0..*
status	The status of the encounter.	code	1..1
location	List of locations where the patient has been during this encounter.	Reference (Location)	0..*
subject	The patient associated with the encounter.	Reference(Patient | Group)	0..1
reasonCode	This code or reference identifies the reason for the encounter.	CodeableConcept (Condition | Observation | Procedure | Immunization)	0..*
participant	List of people associated with the encounter.	CodeableConcept	0..*
period	The date and time the assessment was recorded.	dateTime	0..1
type	Specifies the type of encounter. For example, e-mail consultation, surgical day-care.	CodeableConcept	0..*
length	The length of time the encounter lasted.	Duration	0..1
diagnosis	The diagnosis associated with the encounter.	Reference (Condition | Procedure)	0..*

Field	Description	Type	Cardinality
class	Classifies the patient encounter. For example, Inpatient, outpatient.	CodeableConcept	0..*
account	The accounts associated to bill the encounter.	reference	0..*

Example Requests and Responses

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns a single encounter entry for the patient using the specified encounter identifier:

```
GET https://base_url/quanum-ehr-fhir-
server/fhir/Encounter/2c92a6137ac0399b017b74b43be74e95
```

Read - Response (JSON)

```
{
    "resourceType": "Encounter",
    "id": "2c92a6137ac0399b017b74b43be74e95",
    "identifier": [
        {
            "system": "Encounter/2c92a6137ac0399b017b74b43be74e95",
            "value": "2c92a6137ac0399b017b74b43be74e95"
        }
    ],
    "status": "in-progress",
    "class": {
        "system": http://terminology.hl7.org/CodeSystem/v3-ActCode,
       "code": "AMB",
        "display": "ambulatory"
    },
    "type": [
        {
            "coding": [
                {
                    "system": http://www.ama-assn.org/go/cpt,
                    "code": "99345",
                    "display": "HOME VISIT NEW PT UNSTABL/SIGNIF NEW PROB 75 MIN"
                }
            ],
            "text": "HOME VISIT NEW PT UNSTABL/SIGNIF NEW PROB 75 MIN"
        }
    ],
    "subject": {
        "reference": "Patient/2c92a6137ac0399b017b74b212994776"
    },
    "participant": [
```

```
        {
            "type": [
                {
                    "coding": [
                        {
                            "system": http://terminology.hl7.org/CodeSystem/v3-Par-
ticipationType,
                            "code": "PPRF",
                            "display": "primary performer"
                        }
                    ],
                    "text": "primary performer"
                }
            ],
            "period": {
                "start": "2021-08-23T05:00:00+00:00"
            },
            "individual": {
                "reference": "Practitioner/2c92a6bb672dab630167320877720397",
                "display": "Brian PoynterCMS"
            }
        }
    ],
    "period": {
        "start": "2021-08-23T05:00:00+00:00"
    },
    "reasonCode": [
        {
            "coding": [
                {
                    "system": http://snomed.info/sct,
                    "code": "420270002",
                    "display": "Ketoacidosis due to type 1 diabetes mellitus"
                }
            ],
            "text": "Ketoacidosis due to type 1 diabetes mellitus"
        }
    ],
    "reasonReference": [
        {
            "id": "2c92a6137ac0399b017b74b47b5255af"
        }
    ],
    "location": [
        {
            "location": {
                "reference": "Location/DEMO_ORG",
                "display": "Demo Health Assoc"
            }
```

```
        }
    ],
    "serviceProvider": {
        "reference": "Organization/DEMO_ORG",
        "display": "Demo Health Assoc"
    }
}
```

Search - Request

Request

Returns one or more encounters entries (as a bundle) for the patient in the specified date range:

```
GET https://base_url/quanum-ehr-fhir-
server/fhir/Encounter?patient=2c92a6137ac0399b017b74b212994776
```

Search - Response (JSON)

Note: Only a portion of the response is included for this example.

```
{
    "resourceType": "Bundle",
    "id": "03166bcd-dbd8-4150-9003-edbc7b501c5b",
    "meta": {
        "lastUpdated": "2022-06-29T11:25:21.803+00:00"
    },
    "type": "searchset",
    "total": 1,
    "link": [
        {
            "relation": "self",
            "url": http://base_url/quanum-ehr-fhir-server/fhir/Encounter?date=lt2021-08-
24T00%3A00%3A00Z&date=gt2021-08-22T00%3A00%3A00Z&patient=2c92a6137ac0399b017b74b212994776
        }
    ],
    "entry": [
        {
            "fullUrl": http://base_url/quanum-ehr-fhir-server-
/fhir/Encounter/2c92a6137ac0399b017b74b43be74e95,
            "resource": {
                "resourceType": "Encounter",
                "id": "2c92a6137ac0399b017b74b43be74e95",
                "identifier": [
                    {
                        "system": "Encounter/2c92a6137ac0399b017b74b43be74e95",
                        "value": "2c92a6137ac0399b017b74b43be74e95"
                    }
                ],
                "status": "in-progress",
                "class": {
                    "system": http://terminology.hl7.org/CodeSystem/v3-ActCode,
                    "code": "AMB",
```

```
                    "display": "ambulatory"
                },
                "type": [
                    {
                        "coding": [
                            {
                                "system": http://www.ama-assn.org/go/cpt,
                                "code": "99345",
                                "display": "HOME VISIT NEW PT UNSTABL/SIGNIF NEW PROB 75 MIN"
                            }
                        ],
                        "text": "HOME VISIT NEW PT UNSTABL/SIGNIF NEW PROB 75 MIN"
                    }
                ],
                "subject": {
                    "reference": "Patient/2c92a6137ac0399b017b74b212994776"
                },
                "participant": [
                    {
                        "type": [
                            {
                                "coding": [
                                    {
                                        "system": http://terminology.hl7.org/CodeSystem/v3-
ParticipationType,
                                        "code": "PPRF",
                                        "display": "primary performer"
                                    }
                                ],
                                "text": "primary performer"
                            }
                        ],
                       "period": {
                            "start": "2021-08-23T05:00:00+00:00"
                        },
                        "individual": {
                            "reference": "Practitioner/2c92a6bb672dab630167320877720397",
                            "display": "Brian PoynterCMS"
                        }
                    }
                ],
                "period": {
                    "start": "2021-08-23T05:00:00+00:00"
                },
                "reasonCode": [
                    {
                        "coding": [
                            {
                                "system": http://snomed.info/sct,
```

```
                            "code": "420270002",
                            "display": "Ketoacidosis due to type 1 diabetes mellitus"
                        }
                    ],
                    "text": "Ketoacidosis due to type 1 diabetes mellitus"
                }
            ],
            "reasonReference": [
                {
                    "id": "2c92a6137ac0399b017b74b47b5255af"
                }
            ],
            "location": [
                {
                    "location": {
                        "reference": "Location/DEMO_ORG",
                        "display": "Demo Health Assoc"
                    }
                }
            ],
            "serviceProvider": {
                "reference": "Organization/DEMO_ORG",
                "display": "Demo Health Assoc"
            }
        }
    }
]
}
```

Goal

Description	Retrieves a patient's goals.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

The following search parameters are supported for the Goal resource.

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Req'd
patient	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.	string	Y
identifier	The unique identifier for a specific clinical entry. The clinical entry identifier can be retrieved by performing a search for a patient's goals.	string	N
startDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd* If a start date is specified, only entries with a clinically relevant date that occurs on or after the specified start date are returned. **Note:** A start date may be used with or without an end date.	date	N
endDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd* If an end date is specified, only entries with a clinically relevant date that occurs on or before the specified end date are returned. **Note:** An end date may be used with or without a start date.	date	N
lifecycle-status	The status of the goal thru its lifecycle.	token	N

Parameter	Description	Type	Req'd
target-date	A target value that represents the goal's accomplishment.	date	N
patient+lifecycle-status	Combination search parameters supported for the goal resource.	reference+token	N
patient+target-date		reference+date	N

Response Fields

The following fields may appear in a JSON response for the Goal resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Goal	0..*
id	The unique identifier for the clinical entry.	Identifier	0..*
status	Indicates whether the goal has been reached and is still relevant. Accepted is the only supported value.	code	1..1
category	The category of the goal. For example, Treatment, dietary, behavioral, etc.	CodeableConcept	0..*
priority	Identify the importance associated with achieving/sustaining the goal.	CodeableConcept	0..1
description	A coded or textual description of the goal.	CodeableConcept	1..1
subject	The patient associated with the goal, described by the patient's unique identifier preceded by *Patient/*.	Reference(Patient | Group | Organization)	1..1
note	Additional comments about the goal.	Annotation	0..*

Example Requests and Responses

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns a single goal entry for the patient using the specified clinical entry identifier:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/Goal/
67f6119b45a70158580c8bfb2c92a6bb-2761
```

Read - Response (JSON)

```
{
  "resourceType": "Goal",
  "id": "67f6119b45a70158580c8bfb2c92a6bb-2761",
```

```
  "lifecycleStatus": "completed",
  "description": {
    "coding": [ {
      "system": "http://snomed.info/sct",
      "code": "22495007",
      "display": "Abnormal weight"
    } ]
  },
  "subject": {
    "reference": "Patient/2c92a6ba2de2b12c012ded437fca1f6e"
  },
  "startDate": "2016-10-29",
  "target": [ {
    "dueDate": "2016-10-29"
  } ],
  "note": [ {
    "text": "test"
  } ]
}
```

Search - Request

Returns one or more goal entries (as a bundle) for the patient in the specified date range:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/Goal?patient=
2c92a6ba2de2b12c012ded437fca1f6e&startDate=2016-09-01&endDate=2022-09-30
```

Search- Response (JSON)

Note: Only a portion of the response is included for this example.

```
{
  "resourceType": "Bundle",
  "id": "5c396841-6bcc-4988-97e6-719be6d66afe",
  "meta": {
    "lastUpdated": "2022-08-16T08:16:23.561-05:00"
  },
  "type": "searchset",
  "total": 2,
  "link": [ {
    "relation": "self",
    "url": "http://base_url/quanum-ehr-fhir-server-
/fhir/Goal?patient=2c92a6ba2de2b12c012ded437fca1f6e"
  } ],
  "entry": [ {
    "fullUrl": "http://base_url/quanum-ehr-fhir-server-
/fhir/Goal/67f6119b45a70158580c8bfb2c92a6bb-2761",
    "resource": {
      "resourceType": "Goal",
      "id": "67f6119b45a70158580c8bfb2c92a6bb-2761",
      "lifecycleStatus": "completed",
      "description": {
```

```
        "coding": [ {
          "system": "http://snomed.info/sct",
          "code": "22495007",
          "display": "Abnormal weight"
        } ]
      },
      "subject": {
        "reference": "Patient/2c92a6ba2de2b12c012ded437fca1f6e"
      },
      "startDate": "2016-10-29",
      "target": [ {
        "dueDate": "2016-10-29"
      } ],
      "note": [ {
        "text": "test"
      } ]
    }
  }, {
    "fullUrl": "http://base_url/quanum-ehr-fhir-server-
/fhir/Goal/1c61119fdaaa0158580c8bfb2c92a6bb-2762",
    "resource": {
      "resourceType": "Goal",
      "id": "1c61119fdaaa0158580c8bfb2c92a6bb-2762",
      "lifecycleStatus": "completed",
      "description": {
        "coding": [ {
          "system": "http://snomed.info/sct",
          "code": "22495007",
          "display": "Abnormal weight"
        } ]
      },
      "subject": {
        "reference": "Patient/2c92a6ba2de2b12c012ded437fca1f6e"
      },
      "startDate": "2016-10-29",
      "target": [ {
        "dueDate": "2016-10-29"
      } ],
      "note": [ {
        "text": "test"
      } ]
    }
  } ]
}
```

Immunization

Description	Retrieves a patient's immunizations. **Note:** Only administered immunizations are supported for this resource.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

The following search parameters are supported for the Immunization resource:

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Req'd
patient	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.	string	Y
status	The status of the immunization.	token	N
identifier	The unique identifier for a specific clinical entry. The clinical entry identifier can be retrieved by performing a search for a patient's immunizations.	string	N
startDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd* If a start date is specified, only entries with a clinically relevant date that occurs on or after the specified start date are returned. **Note:** A start date may be used with or without an end date.	date	N
endDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd* If an end date is specified, only entries with a clinically relevant date that occurs on or before the specified end date are returned. **Note:** An end date may be used with or without a start date.	date	N

Parameter	Description	Type	Req'd
patient+status	Combination search parameters supported for the immunization resource.	reference+token	N
patient+date		reference+date	N

Response Fields

The following fields may appear in a JSON response for the Immunization resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Immunization	0..*
id	The unique identifier for the clinical entry.	Identifier	0..*
status	Indicates the status of the vaccination event. Supported values included completed or entered-in-error.	code	1..1
notGiven	Indicates whether the vaccine was refused/not given. False is the only supported value.	boolean	1..1
vaccineCode	The vaccine that was administered.	CodeableConcept	1..1
patient	The patient associated with the vaccine, described by the patient's unique identifier preceded by *Patient/*.	Reference(Patient)	1..1
date	The date and time the vaccine was administered.	dateTime	0..1
location	The location (of the facility) where the vaccine was administered.	Reference (Location)	0..1
manufacturer	The vaccine's manufacturer.	Reference (Organization)	0..1
lotNumber	The vaccine's lot number.	string	0..1
expirationDate	The vaccine's expiration date.	date	0..1
site	The area of the body in which the vaccine was administered.	CodeableConcept	0..1
route	The path by which the vaccine was taken into the body.	CodeableConcept	0..1
doseQuantity	The quantity of the vaccine that was administered.	SimpleQuantity	0..1
performer	The individual who administered the vaccine.	Reference (Practitioner)	0..*

Example Requests and Responses

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns a single immunization entry for the patient using the specified clinical entry identifier:

```
GET https://base_url/quanum-ehr-fhir-server-
/fhir/Immunization/2fcbe262a124016161d4173c2c92a6d9
```

Read - Response (JSON)


```
{
    "resourceType": "Immunization",
    "id": "2fcbe262a124016161d4173c2c92a6d9-V",
    "extension": [
        {
            "url": "http://terminology.hl7.org/CodeSystem/data-absent-reason",
            "valueCode": "unknown"
        }
    ],
    "status": "completed",
    "statusReason": {
        "coding": [
            {
                "system": "http://terminology.hl7.org/CodeSystem/v3-ActReason",
                "code": "IMMUNE",
                "display": "IMMUNE"
            }
        ],
        "text": "Testing has shown that the patient already has immunity to the agent tar-
geted by the immunization"
    },
    "vaccineCode": {
        "coding": [
            {
                "system": "http://hl7.org/fhir/sid/cvx",
                "code": "03",
                "display": "measles/mumps/rubella virus vaccine"
            }
        ],
        "text": "M-M-R II - powder for injection"
    },
    "patient": {
        "reference": "Patient/2c92ba0d30aebc590130aeccad76001a"
    },
    "occurrenceDateTime": "2018-03-01T16:24:39+00:00",
    "primarySource": true,
    "location": {
        "display": "Mason"
```

```
    },
    "manufacturer": {
        "display": "Abbott Laboratories"
    },
    "lotNumber": "344",
    "expirationDate": "2010-12-02",
    "site": {
        "text": "Left Upper Arm - Lateral Aspect"
    },
    "route": {
        "coding": [
            {
                "system": "http://terminology.hl7.org/CodeSystem/v3-RouteOfAdministration",
                "code": "IND",
                "display": "IND (Intradermal)"
            }
        ]
    },
    "doseQuantity": {
        "value": 2
    },
    "performer": [
        {
            "actor": {
                "display": "Nishi A"
            }
        }
    ]
}
```


Search - Request

Returns one or more immunization entries (as a bundle) for the patient in the specified date range:

```
GET https://base_url/quanum-ehr-fhir-server-
/fhir/Immunization?patient=2c92a6ba2de2b12c012ded437fca1f6e
```

Search - Response (JSON)


```
{
    "resourceType": "Bundle",
    "id": "2bde4aff-8b61-492f-aa36-0ff9ccc5eef5",
    "meta": {
        "lastUpdated": "2022-09-29T20:47:13.197+00:00"
    },
    "type": "searchset",
    "total": 2,
    "link": [
        {
            "relation": "self",
            "url": "http://base_url/quanum-ehr-fhir-
```

```
server/fhir/Immunization?patient=2c92a6ba2de2b12c012ded437fca1f6e"
        }
    ],
    "entry": [
        {
            "fullUrl": "http://base_url/quanum-ehr-fhir-server-
/fhir/Immunization/26a0a664ccea0153539b43182c92a6d9-V",
            "resource": {
                "resourceType": "Immunization",
                "id": "26a0a664ccea0153539b43182c92a6d9-V",
                "extension": [
                    {
                        "url": "http://terminology.hl7.org/CodeSystem/data-absent-reason",
                        "valueCode": "unknown"
                    }
                ],
                "status": "completed",
                "statusReason": {
                    "coding": [
                        {
                            "system": "http://terminology.hl7.org/CodeSystem/v3-ActReason",
                            "code": "IMMUNE",
                            "display": "IMMUNE"
                        }
                    ],
                    "text": "Testing has shown that the patient already has immunity to the
agent targeted by the immunization"
                },
                "vaccineCode": {
                    "coding": [
                        {
                            "system": "http://hl7.org/fhir/sid/cvx",
                            "code": "33",
                            "display": "pneumococcal 23-polyvalent vaccine"
                        }
                    ],
                    "text": "Pneumovax 23 - solution"
                },
                "patient": {
                    "reference": "Patient/2c92a6ba2de2b12c012ded437fca1f6e"
                },
                "occurrenceDateTime": "2015-01-31T05:00:00+00:00",
                "primarySource": false,
                "route": {
                    "coding": [
                        {
                            "system": "http://terminology.hl7.org/CodeSystem/v3-RouteOfAd-
ministration",
                            "code": "INJECT"
```

```
                        }
                    ]
                }
            }
        },
        {
            "fullUrl": "http://base_url/quanum-ehr-fhir-server-
/fhir/Immunization/2c92a61283764fea01837b289f0018e1-V",
            "resource": {
                "resourceType": "Immunization",
                "id": "2c92a61283764fea01837b289f0018e1-V",
                "extension": [
                    {
                        "url": "http://terminology.hl7.org/CodeSystem/data-absent-reason",
                        "valueCode": "unknown"
                    }
                ],
                "status": "completed",
                "statusReason": {
                    "coding": [
                        {
                            "system": "http://terminology.hl7.org/CodeSystem/v3-ActReason",
                            "code": "IMMUNE",
                            "display": "IMMUNE"
                        }
                    ],
                    "text": "Testing has shown that the patient already has immunity to the
agent targeted by the immunization"
                },
                "vaccineCode": {
                    "coding": [
                        {
                            "system": "http://hl7.org/fhir/sid/cvx",
                            "code": "208",
                            "display": "SARS-CoV-2 mRNA (tozinameran) vaccine"
                        }
                    ],
                    "text": "Pfizer-BioNTech COVID-19 Vaccine PF 30 mcg/0.3 mL suspension"
                },
                "patient": {
                    "reference": "Patient/2c92a6ba2de2b12c012ded437fca1f6e"
                },
                "occurrenceDateTime": "2022-09-26T18:53:02+00:00",
                "primarySource": true,
                "location": {
                    "display": "Demo Health Assoc"
                },
                "manufacturer": {
                    "display": "Pfizer, Inc"
```

```
                },
                "lotNumber": "534535",
                "expirationDate": "2022-11-01",
                "site": {
                    "text": "Left Deltoid"
                },
                "route": {
                    "coding": [
                        {
                            "system": "http://terminology.hl7.org/CodeSystem/v3-RouteOfAd-
ministration",
                            "code": "IM",
                            "display": "IM (Iintramuscular)"
                        }
                    ]
                },
                "performer": [
                    {
                        "actor": {
                            "display": "Dr. Chaitanya Nayak"
                        }
                    }
                ]
            }
        }
    ]
}
```

Location

Description	Retrieves the location information.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

The following search parameters are supported for the Location resource.

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Req'd
name	Portion of the location's name.	string	N
address	The physical location information.	string	Y
address-city	The city specified in an address.	string	N
address-postalcode	The postal code specified in an address.	string	N
address-state	The state specified in an address.	string	N
identifier	A unique identifier for the location.	token	N

Response Fields

The following fields may appear in a JSON response for the Location resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Location	0..*
id	The unique code or number to identify the location of a patient.	Identifier	0..*
status	The status of the location.	code	0..1
name	The name of the location used by the patient.	string	0..1
address	The physical location information.	Address	0..1

Example Requests and Responses

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns location information for a specific patient using the identifier:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/Location/160549
```

Read - Response (JSON)

```
{
  "resourceType": "Location",
  "id": "160549",
  "status": "active",
  "name": "AKLocation",
  "telecom": [
    {
      "system": "phone",
      "value": "5134247575"
    }
  ],
  "address": {
    "line": [
      "2209 KINGSTON DR"
    ],
    "city": "LAWRENCE",
    "state": "AL",
    "postalCode": "66049"
  },
  "managingOrganization": {
    "display": "2c92a6c021686cae01217cede5480058"
  }
}
```

Search - Request

Returns one or more location entries (as a bundle) for the patient patients:

```
GET https://base_url/quanum-ehr-fhir-
server/fhir/Location?address=1122%20Elm&name=DH%20East
```

Search - Response (JSON)

```
{
    "resourceType": "Bundle",
    "id": "e4969d04-8d4a-45dd-8510-21b2f2e9e52a",
    "meta": {
        "lastUpdated": "2022-10-26T15:41:01.668+05:30"
    },
    "type": "searchset",
    "total": 1,
    "link": [
        {
            "relation": "self",
            "url": "http://base_url/quanum-ehr-fhir-server-
/fhir/Location?address=1122%20Elm&name=DH%20East"
```

```
        }
    ],
    "entry": [
        {
            "fullUrl": "http://base_url/quanum-ehr-fhir-server/fhir/Location/DEMO_ORG",
            "resource": {
                "resourceType": "Location",
                "id": "DEMO_ORG",
                "status": "active",
                "name": "DH East",
                "telecom": [
                    {
                        "system": "phone",
                        "value": "9374432340"
                    }
                ],
                "address": {
                    "line": [
                        "1122 Elm"
                    ],
                    "city": "Mason",
                    "state": "OH",
                    "postalCode": "45020"
                },
                "managingOrganization": {
                    "display": "DEMO_ORG"
                }
            }
        }
    ]
}
```

Medication

Description	Retrieves the patient's medication history. Using an external reference to a *Medication* resource, the *MedicationRequest* resource can represent a medication. The READ shall be supported if an external medication resource is utilized in a medication request.
Method	GET
Supported Interactions	Read
Response Format	application/JSON

Parameters

The following search parameters are supported for the Medication resource.

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Req'd
patient	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.	string	N
identifier	The unique identifier for a specific clinical entry. The clinical entry identifier can be retrieved by performing a search for a patient's medications.	string	Y

Response Fields

The following fields may appear in a JSON response for the Medication resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Medication	0..*
id	The unique identifier for the clinical entry.	Identifier	0..*
code	Identifies the medication.	CodeableConcept	0..1
status	The status of the medication. Supported values include active, inactive, or entered-in-error.	code	0..1
dosage	Indicates how the medication is/was being taken.	Dosage	1..1

Example Requests and Responses

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns a single medication entry for the patient using the specified clinical entry identifier:

```
GET https://base_url/quanum-ehr-fhir-server-
/fhir/Medication/2c92a6127f0afe1d017f2712f95e271a
```

Read - Response (JSON)

```
{
    "resourceType": "Medication",
    "id": "2c92a6127f0afe1d017f2712f95e271a",
    "code": {
        "coding": [
            {
                "system": http://www.nlm.nih.gov/research/umls/rxnorm,
                "code": "866429",
                "display": "Metoprolol Succinate ER"
            }
        ],
        "text": "Metoprolol Succinate ER 25 mg tablet, extended release"
    }
}
```

Medication Request

Description	Retrieves a patient's medication request.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

The following search parameters are supported for the Medication Request resource.

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Req'd
patient	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.	string	Y
identifier	The unique identifier for a specific clinical entry. The clinical entry identifier can be retrieved by performing a search for a patient's medications.	string	N
authoredon	The date and/or time the medication was requested.	date	N
intent	Classifies the intent of the medication request.	token	N
status	The status of the prescription.	token	N
encounter	The clinical entry identifier for the encounter during which the medication was requested.	reference	N
patient+intent+authoredon	Combination search parameters supported for the medication request resource.	reference+token+date	N
patient+intent		reference+token	N
patient+intent+encounter		reference+token+reference	N
patient+intent+status		reference+token+token	N

Response Fields

The following fields may appear in a JSON response for the Medication Request resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	MedicationRequest	0..*
id	The unique identifier associated with the medication request.	Identifier	0..*
status	Indicates the status of the prescription. Supported values include active, on-hold, cancelled, completed, entered-in-error, stopped, draft or unknown.	code	1..1
medicationCodeableConcept	The medication that was requested.	CodeableConcept	1..1
subject	The patient associated with the medication, described by the patient's unique identifier preceded by *Patient/*.	Reference(Patient | Group)	1..1
dosageInstruction	Indicates how the medication is/was being taken.	Dosage	1..1
reasonCode	The reason for making the medication request.	CodeableConcept	0..*
intent	Identifies the intent of the request. Supported values include proposal, plan, order, original-order, reflex-order, filler-order, instance-order, or option.	code	1..1
requester	The individual, organization, or device that initiated the request and has responsibility for its activation.	Reference (Practitioner | Organization | patient)	0..1
priority	The priority of the Medication Request in comparison to other requests. Supported values include routine, urgent, asap, or stat.	code	0..1
encounter	The request associated with the encounter.	Reference (Encounter)	0..1

Example Requests and Responses

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns a single medication request entry for the patient using the specified clinical entry identifier:

```
GET https://base_url/quanum-ehr-fhir-server-
/fhir/MedicationRequest/2c92e13d836abb53018380827cd917f1
```

Read - Response (JSON)


```
{
  "resourceType": "MedicationRequest",
  "id": "2c92e13d836abb53018380827cd917f1",
  "meta": {
    "tag": [
      {
        "system": "urn:quest:quanum:source",
        "display": "Quanum-EHR"
      }
    ]
  },
  "status": "completed",
  "intent": "original-order",
  "category": [
    {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/medicationrequest-category",
          "code": "outpatient",
          "display": "Outpatient"
        }
      ],
      "text": "Outpatient"
    }
  ],
  "reportedBoolean": false,
  "medicationCodeableConcept": {
    "coding": [
      {
        "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
        "code": "239191",
        "display": "RXNORM"
      }
    ],
    "text": "RXNORM"
  },
  "subject": {
    "reference": "Patient/2c92e13d836abb53018380827cd917f1"
  },
  "encounter": {
    "reference": "Encounter/2c92e13d836abb53018387d5727a3512-E"
  },
  "authoredOn": "2022-09-28T14:54:22+00:00",
```

```
  "requester": {
    "reference": "Practitioner/2c92e13d836abb440183848fd7e60f5b",
    "display": "sunny fun user"
  },
  "dosageInstruction": [
    {
      "sequence": 1,
      "text": "take as directed",
      "asNeededBoolean": true
    }
  ]
}
```

Search - Request

Returns one or more medication request entries (as a bundle) for the patient in the specified date range:

```
GET https://base_url/quanum-ehr-fhir-server-
/fhir/MedicationRequest?patient=2c92a6bb2599a2a701259e30d9fc0345
```

Search - Response (JSON)

```
{
    "resourceType": "Bundle",
    "id": "e8295c75-35a8-4ce5-a122-1e9a8e026e74",
    "meta": {
        "lastUpdated": "2022-07-13T16:55:27.902+05:30"
    },
    "type": "searchset",
    "total": 21,
    "link": [
        {
            "relation": "self",
            "url": "http://base_url/quanum-ehr-fhir-server-
/fhir/MedicationRequest?patient=2c92a6bb2599a2a701259e30d9fc0345"
        }
    ],
    "entry": [
        {
            "fullUrl": "http://base_url/quanum-ehr-fhir-server-
/fhir/MedicationRequest/2c92a6bb2599a2a701259e30d9fc0345",
            "resource": {
                "resourceType": "MedicationRequest",
                "id": "2c92a6bb2599a2a701259e30d9fc0345",
                "meta": {
                    "tag": [
                        {
                            "system": "urn:quest:quanum:source",
                            "display": "Quanum-EHR"
                        }
                    ]
                },
```

```
                "status": "active",
                "intent": "order",
                "category": [
                    {
                        "coding": [
                            {
                                "system": "http://ter-
minology.hl7.org/CodeSystem/medicationrequest-category",
                                "code": "outpatient",
                                "display": "Outpatient"
                            }
                        ],
                        "text": "Outpatient"
                    }
                ],
                "reportedBoolean": true,
                "medicationCodeableConcept": {
                    "coding": [
                        {
                            "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
                            "code": "312301",
                            "display": "pentoxifylline"
                        }
                    ],
                    "text": "pentoxifylline"
                },
                "subject": {
                    "reference": "Patient/2c92a6bb2599a2a701259e30d9fc0345"
                },
                "authoredOn": "2016-02-16T12:00:00+05:30",
                "requester": {
                    "reference": "Patient/2c92a6bb2599a2a701259e30d9fc0345"
                },
                "dosageInstruction": [
                    {
                        "sequence": 1,
                        "asNeededBoolean": true
                    }
                ]
            }
        }
    ]
}
```

Observation

Description	Retrieves a observations about a patient. This resource include smoking status, vital signs (consists of weight, height, temperature, pulse/heart rate, respiration, oxygen saturation, body mass index (BMI), blood pressure, and head), and lab results.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

The following search parameters are supported for the Observation resource.

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Required
patient	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.	string	Y
identifier	The unique identifier for a specific clinical entry. The clinical entry identifier can be retrieved by performing a search for a patient's observation.	string	N
category	One of the following observation categories: • Vital signs such as Weight, Height, Temperature, HeartRate, RespiratoryRate, OxygenSaturation, BodyMassIndex, BloodPressure, and HeadCircumference. • Laboratory Data like blood glucose, or an estimated GFR. • Imaging results like bone density or fetal measurements. • Clinical Findings* such as abdominal tenderness. • Device measurements such as EKG data or Pulse Oximetry data. • Clinical assessment tools such as APGAR or a Glasgow Coma Score. • Personal characteristics: such as eye-color. • Social history like tobacco use, family support, or cognitive status.	string	N

Parameter	Description	Type	Required
	• Core characteristics like pregnancy status, or a death assertion. • Product quality tests such as pH, Assay, Microbial limits, etc. on product and substance.		
startDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd* If a start date is specified, only entries with a clinically relevant date that occurs on or after the specified start date are returned. **Note:** A start date may be used with or without an end date.	date	N
endDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd* If an end date is specified, only entries with a clinically relevant date that occurs on or before the specified end date are returned. **Note:** An end date may be used with or without a start date.	date	N

Response Fields

The following fields may appear in a JSON response for the Observation resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Observation	0..*
id	The unique identifier for the clinical entry.	Identifier	0..*
status	The status of the observation result.	code	1..1
category	Classifies the general type of observation being made.	CodeableConcept	0..*
code	The observation's type or code.	CodeableConcept	1..1
subject	The patient associated with the observation.	Reference(Patient | Group | Device | Location | Medication | Procedure | Practitioner | Organization)	1..1

Field	Description	Type	Cardinality
issued	The date and time this observation was recorded.	instant	0..1
valueCodeableConcept	The observation value.	CodeableConcept	0..1

Example Requests and Responses

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns a single observation entry for the patient using patient's body height:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/Observation/
2c92a611794242da017942e22daf11bd
```

Read - Response (JSON)


```
{
                "resourceType": "Observation",
                "id": "2c92a61282e891070182fd25514e4319-VG-Height",
                "status": "final",
                "category": [
                    {
                        "coding": [
                            {
                                "system": "http://terminology.hl7.org/CodeSystem/observation-
category",
                                "code": "vital-signs",
                                "display": "Vital Signs"
                            }
                        ],
                        "text": "Vital Signs"
                    }
                ],
                "code": {
                    "coding": [
                        {
                            "system": "http://loinc.org",
                            "code": "8302-2",
                            "display": "Body height"
                        }
                    ],
                    "text": "Body height"
                },
                "subject": {
                    "reference": "Patient/2c92a6128240106501826cbdec202a1a"
                },
                "encounter": {
```

```
                    "display": "2c92a61282e891070182fce7acf134e4"
                },
                "effectiveDateTime": "2022-09-02T04:00:00+00:00",
                "issued": "2022-09-02T04:00:00.000+00:00",
                "valueQuantity": {
                    "value": 25.0,
                    "unit": "in",
                    "system": "http://unitsofmeasure.org",
                    "code": "[in_i]"
                }
            }
```


Search - Request

Returns one or more observation entries (as a bundle) for the patient in the specified date range:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/SmokingStatus?patient=
2c92a6128240106501826cbdec202a1a&startDate=2022-08-01&endDate=2022-10-31
```

Search - Response (JSON)

Note: Only a portion of the response is included for this example.


```
{
    "resourceType": "Bundle",
    "id": "be704ed5-1e6e-43df-b389-4278cf58d423",
    "meta": {
        "lastUpdated": "2022-10-04T10:22:32.769+00:00"
    },
    "type": "searchset",
    "total": 2,
    "link": [
        {
            "relation": "self",
            "url": "http://base_url/quanum-ehr-fhir-server/fhir/Observation?category=vital-
signs&date=ge2022-01-01T00%3A00%3A00Z&patient=2c92a6128240106501826cbdec202a1a"
        }
    ],
    "entry": [
        {
            "fullUrl": "http://base_url/quanum-ehr-fhir-server-
/fhir/Observation/2c92a61282e891070182fd25514e4319-VG-Weight",
            "resource": {
                "resourceType": "Observation",
                "id": "2c92a61282e891070182fd25514e4319-VG-Weight",
                "status": "final",
                "category": [
                    {
                        "coding": [
                            {
                                "system": "http://terminology.hl7.org/CodeSystem/observation-
```

```
category",
                                "code": "vital-signs",
                                "display": "Vital Signs"
                            }
                        ],
                        "text": "Vital Signs"
                    }
                ],
                "code": {
                    "coding": [
                        {
                            "system": "http://loinc.org",
                            "code": "77606-2",
                            "display": "Weight-for-length Per age and sex"
                        }
                    ],
                    "text": "Weight-for-length Per age and sex"
                },
                "subject": {
                    "reference": "Patient/2c92a6128240106501826cbdec202a1a"
                },
                "encounter": {
                    "display": "2c92a61282e891070182fce7acf134e4"
                },
                "effectiveDateTime": "2022-09-02T04:00:00+00:00",
                "issued": "2022-09-02T04:00:00.000+00:00",
                "valueQuantity": {
                    "value": 100.0,
                    "unit": "%",
                    "system": "http://unitsofmeasure.org",
                    "code": "%"
                }
            }
        },
        {
            "fullUrl": "http://base_url/quanum-ehr-fhir-server-
/fhir/Observation/2c92a61282e891070182fd25514e4319-VG-Height",
            "resource": {
                "resourceType": "Observation",
                "id": "2c92a61282e891070182fd25514e4319-VG-Height",
                "status": "final",
                "category": [
                    {
                        "coding": [
                            {
                                "system": "http://terminology.hl7.org/CodeSystem/observation-
category",
                                "code": "vital-signs",
                                "display": "Vital Signs"
```

```
                        }
                    ],
                    "text": "Vital Signs"
                }
            ],
            "code": {
                "coding": [
                    {
                        "system": "http://loinc.org",
                        "code": "8302-2",
                        "display": "Body height"
                    }
                ],
                "text": "Body height"
            },
            "subject": {
                "reference": "Patient/2c92a6128240106501826cbdec202a1a"
            },
            "encounter": {
                "display": "2c92a61282e891070182fce7acf134e4"
            },
            "effectiveDateTime": "2022-09-02T04:00:00+00:00",
            "issued": "2022-09-02T04:00:00.000+00:00",
            "valueQuantity": {
                "value": 25.0,
                "unit": "in",
                "system": "http://unitsofmeasure.org",
                "code": "[in_i]"
            }
        }
    }
]
}
```

Organization

Description	Retrieves the organization's information.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

The following search parameter is supported for the Organization resource.

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Req'd
name	The name of the organization.	string	Y
address-city	The city specified in an address.	string	N
address-state	The state specified in an address.	string	N
address-postalcode	The postal code specified in an address.	string	N

Response Fields

The following fields may appear in a JSON response for the Organization resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Organization	0..*
id	The unique identifier for the organization that is used to identify the organization across multiple systems.	Identifier	0..*
active	Identifies whether the organization's record is active.	boolean	0..1
name	The name associated with the organization.	string	0..1

Example Request and Response

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns one or more organization entries for the patient using the specified clinical entry identifier:

```
GET https://base_url/quanum-ehr-fhir-server-
/fhir/Organization/2c92e13d836abb530183806a80e117ef
```

Read - Response (JSON)

```
{
  "resourceType": "Organization",
  "id": "2c92e13d836abb530183806a80e117ef",
  "identifier": [
    {
      "system": "http://hl7.org/fhir/sid/us-npi",
      "value": "9723645272"
    }
  ],
  "active": true,
  "name": "G10 Org 1",
  "telecom": [
    {
      "system": "phone",
      "value": "5132631111"
    },
    {
      "system": "fax",
      "value": "5132632222"
    }
  ],
  "address": [
    {
      "line": [
        "123 Any Way"
      ],
      "city": "Mason",
      "state": "OH",
      "postalCode": "45040",
      "country": "United States"
    }
  ]
}
```

Search - Request

Returns one or more organization entries (as a bundle) in the specified date range:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/Organization?name=test
```

Search - Response (JSON)


```
{
    "resourceType": "Bundle",
    "id": "f0d31af4-e36d-417d-8fb3-5dd469db60d7",
    "meta": {
        "lastUpdated": "2022-05-18T14:36:45.599-04:00"
    },
    "type": "searchset",
    "total": 1,
    "link": [
        {
            "relation": "self",
            "url": http://base_url/quanum-ehr-fhir-server/fhir/Organization?name=test
        }
    ],
    "entry": [
        {
            "fullUrl": http://base_url/quanum-ehr-fhir-server/fhir/Organization/0000000000,
            "resource": {
                "resourceType": "Organization",
                "id": "0000000000",
                "identifier": [
                    {
                        "system": http://hl7.org/fhir/sid/us-npi,
                        "value": "0000000000"
                    }
                ],
                "name": "Demo Health Assoc",
                "telecom": [
                    {
                        "system": "email",
                        "value": mtoth@medplus.com
                    },
                    {
                        "system": "phone",
                        "value": "9374432340"
                    },
                    {
                        "system": "fax",
                        "value": "5132295505"
                    }
                ],
                "address": [
                    {
                        "line": [
                            "1234 Any Street",
                            "Suite 101",
                            "Test Address3"
                        ],
```

```
                        "city": "Cincinnati",
                        "state": "OH",
                        "postalCode": "45243",
                        "country": "United States"
                    }
                ]
            }
        }
    ]
}
```

Practitioner

Description	Retrieves the practitioner information. A practitioner is a person who is involved in the delivery of healthcare or associated services either directly or indirectly.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

The following search parameter is supported for the Practitioner resource.

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Req'd
name	The name of the practitioner.	string	Y
identifier	An identifier that applies to the practitioner in this role.	token	N
given	The practitioner's first name.	string	N
family	The practitioner's last name.	string	N

Response Fields

The following fields may appear in a JSON response for the Practitioner resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Practitioner	0..*
identifier	An identifier that applies to the practitioner in this role.	Identifier	0..*
name	The names associated with the practitioner.	HumanName	0..*
active	Identifies whether the practitioner's record is active.	boolean	0..1
telecom	The practitioner's phone number.	ContactPoint	0..*
address	The practitioner's postal address (typically the home address).	Address	0..*

Field	Description	Type	Cardinality
gender	The practitioner's gender. Supported values include male, female, other, and unknown.	code	0..1
qualification	The official qualifications, certifications, accreditation, training, or licenses of the practitioner pertaining to the provision of care.	object	0..*

Example Request and Response

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns one or more practitioner entries for the patient using the specified clinical entry identifier:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/Practitioner/
```

Read - Response (JSON)


```
{
  "resourceType": "Practitioner",
  "id": "1283493496",
  "identifier": [
    {
      "system": "http://hl7.org/fhir/sid/us-npi",
      "value": "1283493496"
    },
    {
      "system": "https://base_url/quanum-ehr-fhir-server/fhirPractitioner/staff_id",
      "value": "2c92e13d836abb530183806b970917f0"
    }
  ],
  "name": [
    {
      "text": "nishi asem",
      "family": "asem",
      "given": [
        "nishi"
      ],
      "suffix": [
        "RN"
      ]
    }
  ],
  "address": [
    {
      "line": [
```

```
        "123 Any Way"
      ],
      "city": "Mason",
      "state": "OH",
      "postalCode": "45040"
    }
  ]
}
```

Search - Request

Returns one or more practitioner entries (as a bundle) for the patient:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/
```

Search - Response (JSON)

```
{
    "resourceType": "Bundle",
    "id": "5c15e6e4-5dfe-4a1e-81e0-b16f985cec57",
    "meta": {
        "lastUpdated": "2022-04-26T10:33:12.567-04:00"
    },
    "type": "searchset",
    "total": 1,
    "link": [
        {
            "relation": "self",
            "url": http://base_url/quanum-ehr-fhir-server/fhir/Practitioner?name=bor
        }
    ],
    "entry": [
        {
            "fullUrl": http://base_url/quanum-ehr-fhir-server/fhir/Practitioner/1887277394,
            "resource": {
                "resourceType": "Practitioner",
                "id": "1887277394",
                "identifier": [
                    {
                        "system": http://hl7.org/fhir/sid/us-npi,
                        "value": "1887277394"
                    },
                    {
                        "system": "Practitioner/staff_id",
                        "value": "2c92a6bc629b0bbe0162b0c7dabf597b"
                    }
                ],
                "name": [
                    {
                        "text": "asmi bora",
                        "family": "bora",
                        "given": [
```

```
                            "asmi"
                        ]
                    }
                ],
                "address": [
                    {
                        "line": [
                            "1234 Any Street",
                            "Suite 101",
                            "Test Address3"
                        ],
                        "city": "Cincinnati",
                        "state": "OH",
                        "postalCode": "45243"
                    }
                ]
            }
        }
    ]
}
```

Procedure

Description	Retrieves a patient's procedures.
Method	GET
Supported Interactions	• Search • Read
Response Format	application/JSON

Parameters

The following search parameters are supported for the Procedure resource.

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Req'd
patient	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.	string	Y
identifier	The unique identifier for the procedure, made up the clinical entry identifier, or the clinical entry identifier followed by the procedure key. The identifier can be retrieved by performing a search for a patient's procedures.	string	N
startDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd* If a start date is specified, only entries with a clinically relevant date that occurs on or after the specified start date are returned. **Note:** A start date may be used with or without an end date.	date	N
endDate	A date used to filter entries by clinically relevant date, in the following format: *yyyy-mm-dd* If an end date is specified, only entries with a clinically relevant date that occurs on or before the specified end date are returned. **Note:** An end date may be used with or without a start date.	date	N

Parameter	Description	Type	Req'd
code	Classification of the procedure.	token	N
status	The status of the procedure.	token	N
patient+code+date	Combination search parameters supported for the procedure resource.	reference+token+date	N
patient+date		reference+date	N
patient+status		reference+token	N

Response Fields

The following fields may appear in a JSON response for the Procedure resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Procedure	0..*
id	The unique identifier for the procedure, made up the clinical entry identifier, or the clinical entry identifier followed by a - (hyphen) and the procedure key.	Identifier	0..*
status	Identifies the state of the procedure. Completed is the only supported value.	code	1..1
subject	The patient associated with the procedure, described by the patient's unique identifier preceded by *Patient/*.	Reference(Patient | Group)	1..1
code	The performed procedure.	CodeableConcept	0..1
performedDateTime	The date and time the procedure was performed.	dateTime	0..1
performer	The clinician or provider who performed the procedure.	BackboneElement	0..*

Example Requests and Responses

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns a single procedure entry for the patient using the specified clinical entry identifier:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/Procedure/
043fd0848c1a016363d06cfa2c92a6bb-3303
```

Read - Response (JSON)

```
{
  "resourceType": "Procedure",
```

```
  "id": "043fd0848c1a016363d06cfa2c92a6bb-3303",
  "meta": {
    "tag": [ {
      "system": "urn:quest:quanum:source",
      "display": "Quanum-EHR"
    } ]
  },
  "status": "completed",
  "code": {
    "coding": [ {
      "system": "http://snomed.info/sct",
      "code": "373066001",
      "display": "Vaginal Intercourse Screening"
    }, {
      "code": "64728-9",
      "display": "Vaginal Intercourse"
    } ]
  },
  "subject": {
    "reference": "Patient/2c92a6ba2de2b12c012ded437fca1f6e"
  },
  "performedDateTime": "2018-06-05T05:00:00+00:00"
}
```


Search - Request

Returns one or more procedure entries (as a bundle) for the patient in the specified date range:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/Procedure?patient=
2c92a6ba2de2b12c012ded437fca1f6e&startDate=2018-05-01&endDate=2021-04-01
```

Search - Response (JSON)

Note: Only a portion of the response is included for this example.


```
{
  "resourceType": "Bundle",
  "id": "0664cf5d-bdde-47ca-a89c-661be31e2757",
  "meta": {
    "lastUpdated": "2022-08-19T14:40:28.469+00:00"
  },
  "type": "searchset",
  "total": 2,
  "link": [ {
    "relation": "self",
    "url": "http://base_url/quanum-ehr-fhir-server/fhir/Procedure?date=ge2017-12-22&d-
ate=le2018-06-05&patient=2c92a6ba2de2b12c012ded437fca1f6e"
  } ],
  "entry": [ {
    "fullUrl": "http://base_url/quanum-ehr-fhir-server-
/fhir/Procedure/043fd0848c1a016363d06cfa2c92a6bb-3303",
    "resource": {
```

```
      "resourceType": "Procedure",
      "id": "043fd0848c1a016363d06cfa2c92a6bb-3303",
      "meta": {
        "tag": [ {
          "system": "urn:quest:quanum:source",
          "display": "Quanum-EHR"
        } ]
      },
      "status": "completed",
      "code": {
        "coding": [ {
          "system": "http://snomed.info/sct",
          "code": "373066001",
          "display": "Vaginal Intercourse Screening"
        }, {
          "code": "64728-9",
          "display": "Vaginal Intercourse"
        } ]
      },
      "subject": {
        "reference": "Patient/2c92a6ba2de2b12c012ded437fca1f6e"
      },
      "performedDateTime": "2018-06-05T05:00:00+00:00"
    }
  }, {
    "fullUrl": "http://base_url/quanum-ehr-fhir-server-
/fhir/Procedure/2c92a6be353e419c0135531c98d85c3b",
    "resource": {
      "resourceType": "Procedure",
      "id": "2c92a6be353e419c0135531c98d85c3b",
      "meta": {
        "tag": [ {
          "system": "urn:quest:quanum:source",
          "display": "Quanum-EHR"
        } ]
      },
      "status": "completed",
      "code": {
        "coding": [ {
          "code": "84432",
          "display": "THYROGLOBULIN"
        } ]
      },
      "subject": {
        "reference": "Patient/2c92a6ba2de2b12c012ded437fca1f6e"
      },
      "performedDateTime": "2017-12-22T17:43:36+00:00"
    }
  }
```

```
    } ]
}
```

Provenance

Description	Retrieves patient's provenance information. The Provenance resource describes the entities and agents involved in creating, revising, deleting, or signing a version of the resource. Using this information, one can form assessments about the quality, reliability, and/or trustworthiness of the resource or find out where to look for more information about its origins.
Method	GET
Supported Interactions	Read
Response Format	application/JSON

Response Fields

The following fields may appear in a JSON response for the Provenance resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Provenance	0..*
target	The Reference(s) created or updated as a result of the activity described.	reference	1..*
occurred	The date and time the activity happened.	Period | dateTime	0..1
agent	A person, organization, software application, device, or other entity involved in an activity.	CodeableConcept	1..*
id	The patient's unique identifier.	Identifier	0..*
patient	The patient's unique identifier. The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.	reference	0..1

Example Request and Response

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 9.

Read - Request

Returns a single provenance entry using the unique identifier:

Note: The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 17.

```
GET https://base_url/quanum-ehr-fhir-server/fhir/Provenance/
2c92e13d836abb53018380827cd917f1
```

Read - Response (JSON)


```
{
  "resourceType": "Provenance",
  "id": "2c92e13d836abb53018380827cd917f1",
  "target": [
    {
      "reference": "CareTeam/2c92e13d836abb53018380827cd917f1"
    }
  ],
  "recorded": "2022-09-27T19:52:58.000+00:00",
  "agent": [
    {
      "type": {
        "coding": [
          {
            "system": "http://terminology.hl7.org/CodeSystem/provenance-participant-type",
            "code": "author",
            "display": "Author"
          }
        ],
        "text": "Author"
      },
      "who": {
        "reference": "Practitioner/2c92e13d836abb530183806b970917f0",
        "display": "Dr. nishi asem"
      },
      "onBehalfOf": {
        "reference": "Organization/2c92e13d836abb530183806a80e117ef",
        "display": "G10 Org 1"
      }
    },
    {
      "type": {
        "coding": [
          {
            "system": "http://hl7.org/fhir/us/core/CodeSystem/us-core-provenance-participant-
type",
            "code": "transmitter",
            "display": "Transmitter"
          }
        ],
        "text": "Transmitter"
      },
      "who": {
        "reference": "Practitioner/2c92e13d836abb530183806b970917f0",
        "display": "Dr. nishi asem"
      },
      "onBehalfOf": {
        "reference": "Organization/2c92e13d836abb530183806a80e117ef",
```

```
        "display": "G10 Org 1"
      }
    }
  ]
}
```

Bulk Export

Using the Bulk Export functionality, data may be exported from the FHIR server in accordance with the FHIR Bulk Data Export.

The FHIR service asynchronously creates data for which the client is authorized, whether that is for all patients, a defined group of patients, or all data contained in the FHIR server itself. Whenever data is exported, a separate file is created per resource type to limit the file size. Once a file reaches 10,000 lines, a new file is created, which can result in multiple files for each resource type (for example, *resourcename_file_1.ndjson, resourcename_file_2.ndjson*). Additionally, the API is secured using SMART® authorization ("SMART on FHIR"), which is built on the OAuth 2.0 standard. For more information, see "Authentication and Authorization" on page 10.

To initiate a bulk export, a user needs the access token for the bulk FHIR APIs. Complete the Quanum EHR FHIR API Access Request Form and submit it via email to receive the Client ID, which can also be used to retrieve the access token via API. For any queries on the registration process, please contact the Quanum EHR FHIR API support team at QuanumEHRFHIRAPI@questdiagnostics.com.

FHIR `$export` Operator

To retrieve a list of bulk data files for your client application, request the bulk-data endpoint with the FHIR $export operator.

Bulk `$export` - Access Token

Export large amounts of data for a specific Quanum EHR patient, group of patients, or server by using the FHIR `$export` operator. Make a separate request for each download file included in the response to the original request (which requires an access token; "Authentication and Authorization" on page 10). The following is an alternative client header auth $export option:

```
curl --location --request GET 'https://base_url/fhir/$export' \
--header 'Authorization: Bearer {{accessToken}}'
```

Bulk `$export` - Client Header

By using the FHIR $export operator, you can export bulk data for a given Quanum EHR patient, group of patients, or a server with the below endpoint.

Note: A list of download files is returned with this initial request, which can then be individually requested to retrieve the data. You must provide your client ID and client secret as part of your request header.

Make sure to replace the yellow highlighted placeholders with the exact value in the endpoint before submitting the request.

```
curl --location --request GET 'https://base_url/fhir/$export' \
--header 'client_id: <client_id>' \
--header 'client_secret: <client_secret>' \
```

```
--header '<bulkActionRequestId>: <client_name>'
```

Query Parameters

The following search parameters are supported for the bulk data kick-off request:

Note: If no entries are available for the specified parameters, a 404 response code is received. For an example of this response, see "Not Found Response" on page 14.

Parameter	Description	Type	Req'd
_outputFormat	The format for the requested bulk data files to be generated. Defaults to application/fhir%2Bndjson (application/fhir+ndjson).	string	N
_since	Allows you to only export resources that have been modified since the time provided.	FHIR instant	N
_type	Allows you to specify which types of resources will be included. For example,_type=Observation would return only observation resource.	string of comma-delimited FHIR resource types	N

Example Requests and Responses

Use the endpoint to export bulk data for a given Quanum EHR user using the FHIR® `$export` operator. This initial request returns a list of download files, which can then be individually requested to retrieve the data. The FHIR service supports `$export` at the following level:

- All data on all patients. Exports a detailed set of FHIR resources related to all patients.

  Patient endpoint URL - `GET https://base_url/quanum-ehr-fhir-server/fhir/patient/$export`
- All data on a group of patients. Exports a detailed set of FHIR resources covering all the patients within a specified group of patients.

  Group endpoint URL - `GET https://base_url/quanum-ehr-fhir-server/fhir/Group/[group_id]/$export`
- All data on the server. Performs FHIR bulk export at system level.

  Server endpoint URL - `GET https://base_url/quanum-ehr-fhir-server/fhir/$export`

Note: Whenever data is exported, a separate file is created per resource type to limit the file size. Once a file reaches 10,000 lines, a new file is created, resulting in multiple files for each resource type (for example, resourcename_file_1.ndjson, resourcename_file_2.ndjson).

Binary Resource Request

Resources like DocumentReference are frequently used to store large amounts of data, including scanned PDFs and photographs. These resources make use of the Attachments datatype, which eventually holds a content type and a representation of the binary content that is base 64 encoded. In the event of large files, base 64 encoding can use a significant amount of additional space, and clients may find it difficult to place these binary attachments inline within an FHIR resource. Binary Resources not associated with an individual patient MAY be included in a System Level export.

Binary resource endpoint URL - `GET https://base_url/fhir/binary/{{binary_uid}}`

Bulk Data Cancel Request

Description	Based on the FHIR Asynchronous Request Pattern, after a Bulk Data request has been initiated, a client MAY issue a DELETE request to the URL specified in the `Content-Location` header to terminate the request. A server MAY utilize a request to indicate that a client has finished obtaining files and that it is okay for the server to delete those files from storage if the request has been fulfilled.
Method	DELETE
Request URL	`https://base_url/fhir/bulkExport/{bulkActionRequestId}`
Response Format	application/JSON
Response Status Code	• `202 Accepted`, if the request is accepted. • `400`, if the request is unauthorized. • `500`, if an internal server error occurred.

Bulk Data Status Request

Description	Based on the FHIR Asynchronous Request Pattern, the client MAY check the status URL specified in the `Content-Location` header after a Bulk Data request has been initiated.
Method	GET
Request URL	`https://base_url/fhir/$export-poll-status?_jobId={{job_Id}}`
Response Format	application/JSON
Response Status Code	The server returns any of the following status: • `202 Accepted`, during the export process. • `500 Internal Server Error`, If the export operation fails. • `200 OK`, upon completion of the export operation.

Download Bulk Data Output File

To download the generated bulk data (ndjson files), use the URLs supplied by the server in the complete status response along with the access token. If the access token has already expired, repeat the process for generating the Bulk Export access token.

Method	GET
Request URL	GET [url from status request output field]
Response Format	application/fhir+ndjson
Response Status Code	The server returns any of the following status: • "202 Accepted", during the export process. • "500 Internal Server Error", If the export operation fails. • "200 OK", upon completion of the export operation.

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