

Quanum®

Quanum® Electronic Health Record (EHR) FHIR API

Reference Guide

November 2021

Quanum EHR - FHIR API Reference Guide

In This Document:

About This Guide	3
Intended Audience	3
Terms of Use	4
Getting Started	8
API Endpoints	8
Authentication and Authorization	8
Response Codes	12
Resources	13
Patient	14
Condition (Problems)	21
Smoking Status	25
Medication Statement	29
Allergy Intolerance	34
Vital Signs	40
Procedure	48
Lab Results	52
Immunization	57
Device	62
Goal	67
Care Team	70
Health Concerns	73
Assessments	77
Document Reference (All Patient Data)	81
Legal Notices	87

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.

Security Measures and Protected Health Information (PHI)

- 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 EHR 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.
- b **Limitation of Liability.** UNDER NO CIRCUMSTANCES AND UNDER NO LEGAL THEORY (WHETHER IN CONTRACT, TORT, OR OTHERWISE) SHALL QUEST DIAGNOSTICS BE LIABLE TO YOU OR ANY THIRD PARTY FOR (A) ANY INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, CONSEQUENTIAL OR PUNITIVE DAMAGES, INCLUDING LOST PROFITS, LOST SALES OR BUSINESS, OR LOST DATA, OR (B) ANY MATTER BEYOND QUEST DIAGNOSTICS' REASONABLE CONTROL. THE PROVISIONS OF THIS SECTION ALLOCATE THE RISKS UNDER THIS AGREEMENT BETWEEN THE PARTIES, AND THE PARTIES HAVE RELIED ON THESE LIMITATIONS IN DETERMINING WHETHER TO ENTER INTO THIS AGREEMENT. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES OR LIMITATION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHICH MEANS THAT SOME OF THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU. IN THESE JURISDICTIONS, QUEST DIAGNOSTICS' LIABILITY WILL BE LIMITED TO THE GREATEST EXTENT PERMITTED BY LAW.

- 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 request 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](#)" below.

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. 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 11.

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 11.

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
<code>response_type</code>	<code>code</code> (authorization code)
<code>client_id</code>	The client's identifier.
<code>redirect_uri</code>	One of the client's pre-registered redirect URIs.
<code>launch</code>	The launch value received when using the EHR launch flow.
<code>scope</code>	A string that describes the access rights that the client application needs to operate properly. The supported scope values are: <ul style="list-style-type: none">• <code>launch</code>• <code>offline_access</code>• <code>openid</code>• <code>profile</code>• <code>patient/*.read</code>• <code>user/*.read</code>
<code>state</code>	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.
<code>aud</code>	The url of the resource server. This is the same value as the <code>iss</code> parameter (which is short for issuer, and identifies an EHR's base FHIR endpoint).
Response Field	Description/Value
<code>code</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.
<code>state</code>	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
<code>grant_type</code>	<i>authorization_code</i>
<code>code</code>	The authorization code received from the authorization server.
<code>redirect_uri</code>	One of the client's pre-registered redirect URIs.
<code>client_id</code>	The client's identifier.
Response Field	Description/Value
<code>access_token</code>	The access token issued by the authorization server.
<code>token_type</code>	<i>Bearer</i>
<code>expires_in</code>	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.
<code>scope</code>	Scope of access authorized.
<code>id_token</code>	Authenticated user identity and profile.
<code>refresh_token</code>	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
<code>grant_type</code>	<code>refresh_token</code>
<code>refresh_token</code>	The refresh token from a prior authorization response.
<code>client_id</code>	The client's identifier.
<code>scope</code>	<p>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:</p> <ul style="list-style-type: none">• <code>offline_access</code>• <code>openid</code>• <code>patient/*.read</code>
Response Field	Description/Value
<code>access_token</code>	The new access token issued by the authorization server.
<code>token_type</code>	Bearer
<code>expires_in</code>	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.
<code>scope</code>	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: <ul style="list-style-type: none">• <code>offline_access</code>• <code>openid</code>• <code>patient/*.read</code>
<code>refresh_token</code>	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.
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 81. 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
Patient Name	Patient
Sex	Patient
Date of Birth	Patient
Race	Patient
Ethnicity	Patient
Preferred Language	Patient
Smoking Status	SmokingStatus (Observation)
Problems	Condition
Medications	MedicationStatement
Medication Allergies	AllergyIntolerance
Laboratory Tests	LabResults
Laboratory Values(s)/Result(s)	LabResults (Observation)
Vital Signs	VitalSigns (Observation)
Procedures	Procedure
Care Team Member(s)	CareTeam
Immunizations	Immunization
Unique Device Identifier(s) for a Patient's Implantable Device(s)	Device
Assessment and Plan of Treatment	Assessments (ClinicalImpression)
Goals	Goal
Health Concerns	HealthConcerns (Condition)

Patient

Description	Retrieves a patient's demographic information.
Method	GET
Supported Interactions	<ul style="list-style-type: none">SearchRead
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 12.

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.	string	N
birthdate	The patient's birth date, in the following format: <i>yyyy-mm-dd</i>	date	N
gender	The patient's gender. Supported values include: <i>male</i> , <i>female</i> , <i>other</i> , and <i>unknown</i> .	string	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	1..1
id	The unique identifier for the patient.	Identifier	1..1
active	Identifies whether the patient's record is active.	boolean	0..1
name	The patient's name.	HumanName	0..*

Field	Description	Type	Cardinality
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 8](#).

Read - Request

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

```
GET https://base_url/quanum-ehr-fhir-server/fhir/Patient/
2c92a61179378ae2017938b606d04c0f
```

Read - Response (JSON)

```
{
  "resourceType": "Patient",
  "id": "2c92a61179378ae2017938b606d04c0f",
  "extension": [
    {
      "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-race",
      "extension": [
        {
          "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-race",
          "valueCodeableConcept": {
            "coding": [
              {
                "system": "http://hl7.org/fhir/v3/Race",
                "code": "2108-9",
                "display": "European "
              }
            ],
            "text": "European "
          }
        }
      ]
    }
  ]
}
```

```

},
{
  "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-ethnicity",
  "extension": [
    {
      "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-ethnicity",
      "valueCodeableConcept": {
        "coding": [
          {
            "system": "http://hl7.org/fhir/v3/Ethnicity",
            "code": "2186-5",
            "display": "Not Hispanic or Latino "
          }
        ],
        "text": "Not Hispanic or Latino "
      }
    }
  ]
},
"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": "A89-B23"
  }
],
"active": true,
"name": [
  {
    "text": "Robert Smith",
    "family": "Smith",
    "given": [
      "Robert"
    ]
  }
],
"telecom": [
  {
    "system": "phone",

```

```

        "value": "(513) 111-2222",
        "use": "home"
    },
    {
        "system": "phone",
        "value": "(513) 222-3333",
        "use": "mobile"
    },
    {
        "system": "email",
        "value": "rsmith@email.com"
    }
],
"gender": "male",
"birthDate": "1965-09-23",
"address": [
    {
        "line": [
            "1175 Central Street"
        ],
        "city": "Cincinnati",
        "state": "OH",
        "postalCode": "45211"
    }
],
"maritalStatus": {
    "coding": [
        {
            "system": "http://hl7.org/fhir/ValueSet/marital-status",
            "code": "M",
            "display": "Married"
        }
    ]
},
"communication": [
    {
        "language": {
            "coding": [
                {
                    "system": "http://hl7.org/fhir/valueset-languages.html",
                    "code": "en"
                }
            ],
            "text": "English"
        }
    }
],
"managingOrganization": {
    "display": "2c92a6bc70c50de60170f96e538a028e"
}

```

```
    }
}
```

Search - Request

Returns one or more patients (as a bundle) using the specified given and family name:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/Patient?family=Smith&given=Robert
```

Search - Response (JSON)

```
{
  "resourceType": "Bundle",
  "id": "141a0a2e-7ea8-476e-8f57-db78368d2d51",
  "meta": {
    "lastUpdated": "2021-05-06T15:31:07.729+00:00"
  },
  "type": "searchset",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://base_url/quanum-ehr-fhir-server/fhir/Patient?family=Smith&given=Robert"
    }
  ],
  "entry": [
    {
      "fullUrl": "https://base_url/quanum-ehr-fhir-server-fhir/Patient/2c92a61179378ae2017938b606d04c0f",
      "resource": {
        "resourceType": "Patient",
        "id": "2c92a61179378ae2017938b606d04c0f",
        "extension": [
          {
            "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-race",
            "extension": [
              {
                "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-race",
                "valueCodeableConcept": {
                  "coding": [
                    {
                      "system": "http://hl7.org/fhir/v3/Race",
                      "code": "2108-9",
                      "display": "European "
                    },
                    {
                      "text": "European "
                    }
                  ]
                }
              }
            ]
          },
          {
            "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-ethnicity",
            "extension": [
              {
                "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-ethnicity",
                "valueCodeableConcept": {
                  "coding": [
                    {
                      "system": "http://hl7.org/fhir/v3/Ethnicity",
                      "code": "2186-5",
                      "display": "Not Hispanic or Latino "
                    }
                  ]
                }
              }
            ]
          }
        ]
      }
    }
  ]
}
```

```

        "text": "Not Hispanic or Latino "
    } } ],
}

"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": "A89-B23"
    }],
"active": true,
"name": [
    {
        "text": "Robert Smith",
        "family": "Smith",
        "given": [
            "Robert"
        ]}],
"telecom": [
    {
        "system": "phone",
        "value": "(513) 111-2222",
        "use": "home"
    },
    {
        "system": "phone",
        "value": "(513) 222-3333",
        "use": "mobile"
    },
    {
        "system": "email",
        "value": "rsmith@email.com"
    }],
"gender": "male",
"birthDate": "1965-09-23",
"address": [
    {
        "line": [
            "1175 Central Street"
        ],
        "city": "Cincinnati",
        "state": "OH",
        "postalCode": "45211"
    }],
"maritalStatus": {
    "coding": [
        {
            "system": "http://hl7.org/fhir/ValueSet/marital-status",
            "code": "M",

```

```
        "display": "Married"
    } ],
    "communication": [
        {
            "language": {
                "coding": [
                    {
                        "system": "http://hl7.org/fhir/valueset-languages.html",
                        "code": "en"
                    },
                    {
                        "text": "English"
                    }
                ],
                "display": "2c92a6bc70c50de60170f96e538a028e"
            }
        }
    ]
}
```

Condition (Problems)

Description	Retrieves a patient's conditions (problems).
Method	GET
Supported Interactions	<ul style="list-style-type: none">• 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 12.

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 14.	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
startDate	A date used to filter entries by clinically relevant date, in the following format: <i>yyyy-mm-dd</i> 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: <i>yyyy-mm-dd</i> 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 Condition resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Condition	1..1
id	The unique identifier for the clinical entry.	Identifier	1..1
clinicalStatus	The status of the condition. Supported values include active or inactive.	code	0..1
category	A category assigned to the condition. Problem is the only supported value.	CodeableConcept	1..1
code	The identified problem.	CodeableConcept	0..1
subject	The patient associated with the condition, described by the patient's unique identifier preceded by <i>Patient/</i> .	Reference(Patient)	1..1
onsetDateTime	The actual or estimated date and time the condition began.	dateTime	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 8.

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": "ver-status",  
        "code": "confirmed",  
        "display": "Confirmed"  
      }  
    ],  
    "text": "Confirmed"  
  }  
}
```

```

        "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=2c92a61179378ae2017938b606d04c0f&startDate=2021-01-01&endDate=2021-05-31
```

Search - Response (JSON)

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

```
{
    "resourceType": "Bundle",
    "id": "5e6b4e77-c782-44fb-aa12-e6b70f0ac9c1",
    "meta": {
        "lastUpdated": "2021-05-11T15:29:36.526+00:00"
    },
    "type": "searchset",
    "total": 2,
```

```

"link": [
  {
    "relation": "self",
    "url": "https://base_url/quanum-ehr-fhir-server/fhir/Condition?endDate=2021-05-31&patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-01-01"
  }
],
"entry": [
  {
    "fullUrl": "https://base_url/quanum-ehr-fhir-server/fhir/Condition/2c92a6117946c196017947cb8ab20e76",
    "resource": {
      "resourceType": "Condition",
      "id": "2c92a6117946c196017947cb8ab20e76",
      "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"
            }
          ]
        }
      ]
    }
  }
]

```

Smoking Status

Description	Retrieves a patient's smoking status. Note: The SmokingStatus resource is an implementation of the FHIR Observation resource.
Method	GET
Supported Interactions	<ul style="list-style-type: none">SearchRead
Response Format	application/JSON

Parameters

The following search parameters are supported for the Smoking Status 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 12](#).

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 14 ".	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 smoking status.	string	N
startDate	A date used to filter entries by clinically relevant date, in the following format: <i>yyyy-mm-dd</i> 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: <i>yyyy-mm-dd</i> 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 Smoking Status resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	SmokingStatus	1..1
id	The unique identifier for the clinical entry.	Identifier	1..1
status	The status of the observation. Final is the only supported value.	code	1..1
category	Classifies the general type of observation being made.	CodeableConcept	1..1
code	Observation's type or code.	CodeableConcept	1..1
subject	The patient associated with the smoking status, described by the patient's unique identifier preceded by <i>Patient/</i> .	Reference(Patient Group Device Location)	1..1
issued	The date and time this observation was recorded.	instant	0..1
valueCodeableConcept	The smoking status.	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 8.

Read - Request

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

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

Read - Response (JSON)

```
{  
    "resourceType": "SmokingStatus",  
    "id": "2c92a611794242da017942e22daf11bd",  
    "meta": {  
        "profile": [  
            "http://hl7.org/fhir/Observation"  
        ]  
    },  
    "text": {  
        "status": "generated",  
        "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\"><p>Start Date/Age: 4/2021; Notes:  
As of 5/6/2021</p></div>"  
    },  
    "status": "final",  
}
```

```

"category": [
    {
        "coding": [
            {
                "system": "http://hl7.org/fhir/observation-category",
                "code": "social-history",
                "display": "Social History"
            }
        ],
        "text": "Social History"
    }
],
"code": {
    "coding": [
        {
            "system": "http://loinc.org",
            "code": "72166-2",
            "display": "Tobacco smoking status NHIS"
        }
    ]
},
"subject": {
    "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
},
"effectiveDateTime": "2021-05-06T18:13:09+00:00",
"issued": "2021-05-06T18:13:09.679+00:00",
"valueCodeableConcept": {
    "coding": [
        {
            "system": "http://snomed.info",
            "code": "428041000124106",
            "display": "Current some day smoker"
        }
    ],
    "text": "Current some day smoker"
}
}

```

Search - Request

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

```
GET https://base_url/quanum-ehr-fhir-server/fhir/SmokingStatus?patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-05-01&endDate=2021-05-31
```

Search - Response (JSON)

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

```
{
    "resourceType": "Bundle",
    "id": "784b803c-29bb-4a9e-8359-1e1e9db87d61",
```

```

"meta": {
    "lastUpdated": "2021-05-11T15:33:36.279+00:00"
},
"type": "searchset",
"total": 2,
"link": [
    {
        "relation": "self",
        "url": "https://base_url/quanum-ehr-fhir-server/fhir/SmokingStatus?endDate=2021-05-31&patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-05-01"
    }
],
"entry": [
    {
        "fullUrl": "https://base_url/quanum-ehr-fhir-server-/fhir/SmokingStatus/2c92a611794242da017942e22daf11bd",
        "resource": {
            "resourceType": "SmokingStatus",
            "id": "2c92a611794242da017942e22daf11bd",
            "meta": {
                "profile": [
                    "http://hl7.org/fhir/Observation"
                ],
                "text": {
                    "status": "generated",
                    "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\"><p>Start Date/Age: 4/2021; Notes: As of 5/6/2021</p></div>"
                },
                "status": "final",
                "category": [
                    {
                        "coding": [
                            {
                                "system": "http://hl7.org/fhir/observation-category",
                                "code": "social-history",
                                "display": "Social History"
                            }
                        ],
                        "text": "Social History"
                    }
                ],
                "code": {
                    "coding": [
                        {
                            "system": "http://loinc.org",
                            "code": "72166-2",
                            "display": "Tobacco smoking status NHIS"
                        }
                    ]
                }
            }
        }
    }
]

```

Medication Statement

Description	Retrieves a patient's medication history, not including vaccines. For information about retrieving vaccines, see " Immunization " on page 57.
Method	GET
Supported Interactions	<ul style="list-style-type: none">• Search• Read
Response Format	application/JSON

Parameters

The following search parameters are supported for the Medication Statement 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 12.

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 14.	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
startDate	A date used to filter entries by clinically relevant date, in the following format: <i>yyyy-mm-dd</i> 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: <i>yyyy-mm-dd</i> 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 Medication Statement resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	MedicationStatement	1..1
id	The unique identifier for the clinical entry.	Identifier	1..1
status	Indicates the status of the medication. Supported values included active, completed, entered-in-error, or intended.	code	1..1
medicationCodeableConcept	The medication that was taken or is being taken.	CodeableConcept	1..1
effectivePeriod	The period of time that the medication was taken.	Period	0..1
dateAsserted	The date/time that the medication was issued.	dateTime	1..1
subject	The patient associated with the medication, described by the patient's unique identifier preceded by <i>Patient/</i> .	Reference(Patient Group)	1..1
dosage	Indicates how the medication is/was being taken.	Dosage	1..1
reasonCode	An associated diagnosis.	CodeableConcept	0..*

Example Requests and Responses

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 8.

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/MedicationStatement/  
2c92a6117946c1960179481fcc721d8d
```

Read - Response (JSON)

```
{  
  "resourceType": "MedicationStatement",  
  "id": "2c92a6117946c1960179481fcc721d8d",  
  "status": "active",  
  "medicationCodeableConcept": {  
    "coding": [
```

```

{
    "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
    "display": "lidocaine-phenylephrine ophthalmic"
}
],
"text": "lidocaine-phenylephrine ophthalmic 10 mg-15 mg/mL solution"
},
"subject": {
    "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
},
"effectivePeriod": {
    "start": "2021-04-28T00:00:00+00:00"
},
"dateAsserted": "2021-04-28T00:00:00+00:00",
"dosage": [
{
    "text": "1 drop solution",
    "route": {
        "coding": [
{
            "system": "http://hl7.org/fhir/ValueSet/route-codes",
            "code": "INTO"
}
]
    }
}
]
}
}

```

Search - Request

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

```
GET https://base_url/quanum-ehr-fhir-server/fhir/MedicationStatement?patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-05-01&endDate=2021-06-01
```

Search - Response (JSON)

```
{
    "resourceType": "Bundle",
    "id": "f0fad769-8620-43d5-b0d5-18be5cd10a41",
    "meta": {
        "lastUpdated": "2021-05-07T14:52:40.974+00:00"
    },
    "type": "searchset",
    "total": 1,
    "link": [
{
        "relation": "self",
        "url": "https://base_url/quanum-ehr-fhir-server-fhir/MedicationStatement?endDate=2021-06-01&patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-05-01"
    }
]
}
```

```

        }
    ],
    "entry": [
        {
            "fullUrl": "https://base_url/quanum-ehr-fhir-server-
/fhir/MedicationStatement/2c92a6117946c1960179481db8b91d8b",
            "resource": {
                "resourceType": "MedicationStatement",
                "id": "2c92a6117946c1960179481db8b91d8b",
                "status": "active",
                "medicationCodeableConcept": {
                    "coding": [
                        {
                            "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
                            "code": "855318",
                            "display": "warfarin"
                        }
                    ],
                    "text": "warfarin 3 mg tablet"
                },
                "subject": {
                    "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
                },
                "effectivePeriod": {
                    "start": "2021-05-07T00:00:00+00:00",
                    "end": "2021-08-05T00:00:00+00:00"
                },
                "dateAsserted": "2021-05-07T00:00:00+00:00",
                "dosage": [
                    {
                        "text": "1 tablet take as directed",
                        "timing": {
                            "code": {
                                "coding": [
                                    {
                                        "code": "As Directed",
                                        "display": "take as directed"
                                    }
                                ],
                                "text": "take as directed"
                            }
                        }
                    },
                    "route": {
                        "coding": [
                            {
                                "system": "http://hl7.org/fhir/ValueSet/route-codes",
                                "code": "PO",
                                "display": "PO (Oral)"
                            }
                        ]
                    }
                ]
            }
        }
    ]
}

```

```
        ]
    },
    "doseAndRate": [
        {
            "doseQuantity": {
                "value": 1
            }
        }
    ]
}
]
```

Allergy Intolerance

Description	Retrieves a patient's allergies/adverse reactions to foods, medications, substances, or devices.
Method	GET
Supported Interactions	<ul style="list-style-type: none">SearchRead
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 12](#).

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 14 .	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: <i>yyyy-mm-dd</i> 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: <i>yyyy-mm-dd</i> 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 Allergy Intolerance resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	AllergyIntolerance	1..1
id	The unique identifier for the clinical entry.	Identifier	1..1
clinicalStatus	The clinical status of the allergy. Supported values include active or inactive.	code	1..1
type	The underlying physiological mechanism for the reaction risk. The only supported value is allergy.	code	1..1
category	The category of the identified substance. Supported values include food, medication, or environment.	code	0..1
patient	The patient associated with the allergy, described by the patient's unique identifier preceded by <i>Patient/</i> .	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..1
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 8.

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/  
2c92a61179378ae2017938d08a43551a
```

Read - Response (JSON)

```
{  
  "resourceType": "AllergyIntolerance",  
  "id": "2c92a61179378ae2017938d08a43551a",  
  "clinicalStatus": {  
    "coding": [  
      {  
        "system": "active",  
        "code": "http://terminology.hl7.org/CodeSystem/allergyintolerance-clinical",  
        "display": "Active"  
      }  
    ],  
    "text": "Active"  
  },  
  "verificationStatus": {  
    "coding": [  
      {  
        "system": "confirmed",  
        "code": "http://terminology.hl7.org/CodeSystem/allergyintolerance-verification",  
        "display": "Confirmed"  
      }  
    ],  
    "text": "Confirmed"  
  },  
  "type": "allergy",  
  "category": [  
    "medication"  
  ],  
  "code": {  
    "coding": [  
      {  
        "display": "amoxicillin"  
      }  
    ]  
  },  
  "patient": {  
    "reference": "Patient/2c92a61179378ae2017938b606d04c0f"  
  },  
  "onsetPeriod": {
```

```

    "start": "2019-11-09T00:00:00-05:00"
},
"recordedDate": "2021-05-04T19:17:41+00:00",
"reaction": [
{
    "substance": {
        "coding": [
            {
                "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
                "code": "723",
                "display": "amoxicillin"
            }
        ],
        "text": "amoxicillin"
    },
    "manifestation": [
        {
            "coding": [
                {
                    "display": "No known"
                }
            ],
            "text": "No known"
        }
    ],
    "onset": "2019-11-09T00:00:00-05:00",
    "severity": "moderate"
}
]
}

```

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=2c92a61179378ae2017938b606d04c0f&startDate=2021-05-01&endDate=2021-05-15

Search - Response (JSON)

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

```
{
    "resourceType": "Bundle",
    "id": "d547deec-2c65-4015-8b9a-61b2a53c4d08",
    "meta": {
        "lastUpdated": "2021-05-11T15:19:45.390+00:00"
    },
    "type": "searchset",
    "total": 3,
    "link": [
        {

```

```

    "relation": "self",
    "url": "https://base_url/quanum-ehr-fhir-server/fhir/AllergyIntolerance/?endDate=2021-05-15&patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-05-01"
  }
],
"entry": [
{
  "fullUrl": "https://base_url/quanum-ehr-fhir-server-fhir/AllergyIntolerance/2c92a61179378ae2017938d08a43551a",
  "resource": {
    "resourceType": "AllergyIntolerance",
    "id": "2c92a61179378ae2017938d08a43551a",
    "clinicalStatus": {
      "coding": [
        {
          "system": "active",
          "code": "http://terminology.hl7.org/CodeSystem/allergyintolerance-clinical",
          "display": "Active"
        }
      ],
      "text": "Active"
    },
    "verificationStatus": {
      "coding": [
        {
          "system": "confirmed",
          "code": "http://terminology.hl7.org/CodeSystem/allergyintolerance-verification",
          "display": "Confirmed"
        }
      ],
      "text": "Confirmed"
    },
    "type": "allergy",
    "category": [
      "medication"
    ],
    "code": {
      "coding": [
        {
          "display": "amoxicillin"
        }
      ]
    },
    "patient": {
      "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
    },
    "onsetPeriod": {
      "start": "2019-11-09T00:00:00-05:00"
    }
  }
}
]

```

```
},
"recordedDate": "2021-05-04T19:17:41+00:00",
"reaction": [
  {
    "substance": {
      "coding": [
        {
          "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
          "code": "723",
          "display": "amoxicillin"
        }
      ],
      "text": "amoxicillin"
    },
    "manifestation": [
      {
        "coding": [
          {
            "display": "No known"
          }
        ],
        "text": "No known"
      }
    ],
    "onset": "2019-11-09T00:00:00-05:00",
    "severity": "moderate"
  }
],
}
},
```

Vital Signs

Description	Retrieves a patient's vital signs, including weight, height, temperature, pulse/heart rate, respiration, oxygen saturation, body mass index (BMI), blood pressure, and head circumference. Note: The VitalSigns resource is an implementation of the FHIR Observation resource.
Method	GET
Supported Interactions	<ul style="list-style-type: none">SearchRead
Response Format	application/JSON

Parameters

The following search parameters are supported for the Vital Signs 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 12](#).

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 14 .	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 vital signs.	string	N
category	One of the following vital sign categories: <ul style="list-style-type: none">WeightHeightTemperatureHeartRateRespiratoryRateOxygenSaturationBodyMassIndexBloodPressureHeadCircumference	string	N
startDate	A date used to filter entries by clinically relevant date, in the following format: <i>yyyy-mm-dd</i>	date	N

Parameter	Description	Type	Req'd
	<p>If a start date is specified, only entries with a clinically relevant date that occurs on or after the specified start date are returned.</p> <p>Note: A start date may be used with or without an end date.</p>		
endDate	<p>A date used to filter entries by clinically relevant date, in the following format:</p> <p><i>yyyy-mm-dd</i></p> <p>If an end date is specified, only entries with a clinically relevant date that occurs on or before the specified end date are returned.</p> <p>Note: An end date may be used with or without a start date.</p>	date	N

Response Fields

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

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Condition	1..1
id	The unique identifier for the vital sign, made up of the clinical entry identifier followed by a - (hyphen) and the category.	Identifier	1..1
status	The status of the vital result. Final is the only supported value.	code	1..1
category	Classifies the general type of observation being made.	CodeableConcept	0..*
code	The vital sign's code and/or description.	CodeableConcept	1..1
subject	The patient associated with the vital sign, described by the patient's unique identifier preceded by <i>Patient/</i> .	Reference(Patient Group Device Location)	1..1
context	The clinical entry identifier for the encounter during which the vital sign was recorded.	Reference(Encounter EpisodeOfCare)	0..1
issued	The date and time the vitals were recorded.	instant	0..1
valueQuantity	The vital result value and unit of measure.	Quantity	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 8.

Read - Request

Returns a single blood pressure vital sign entry for the patient using the specified vital sign identifier:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/VitalSigns/  
2c92a61179378ae2017938d3dd145a10-BloodPressure
```

Read - Response (JSON)

```
{  
  "resourceType": "VitalSigns",  
  "id": "2c92a61179378ae2017938d3dd145a10-BloodPressure",  
  "meta": {  
    "profile": [  
      "http://hl7.org/fhir/Observation"  
    ]  
  },  
  "status": "final",  
  "category": [  
    {  
      "coding": [  
        {  
          "system": "http://hl7.org/fhir/observation-category",  
          "code": "vital-signs",  
          "display": "Vital Signs"  
        }  
      ],  
      "text": "Vital Signs"  
    }  
  ],  
  "code": {  
    "coding": [  
      {  
        "system": "http://loinc.org",  
        "code": "85354-9",  
        "display": "Blood pressure panel with all children optional"  
      }  
    ],  
    "text": "Blood pressure panel with all children optional"  
  },  
  "subject": {  
    "reference": "Patient/2c92a61179378ae2017938b606d04c0f"  
  },  
  "encounter": {  
    "display": "2c92a61179378ae2017938d3dd2f5a11"  
  },  
  "effectiveDateTime": "2021-02-02T05:00:00-05:00",  
  "value": {  
    "unit": "mmHg",  
    "display": "120/80 mmHg",  
    "value": 120  
  },  
  "component": [  
    {  
      "value": 120, "unit": "mmHg", "display": "120 mmHg", "code": "85354-9", "category": "vital-signs", "profile": "http://hl7.org/fhir/Observation", "effectiveDateTime": "2021-02-02T05:00:00-05:00", "subject": "Patient/2c92a61179378ae2017938b606d04c0f", "encounter": "2c92a61179378ae2017938d3dd2f5a11", "resourceType": "VitalSigns", "id": "2c92a61179378ae2017938d3dd145a10-BloodPressure", "meta": {  
        "profile": [  
          "http://hl7.org/fhir/Observation"  
        ]  
      },  
      "status": "final",  
      "category": [  
        {  
          "coding": [  
            {  
              "system": "http://hl7.org/fhir/observation-category",  
              "code": "vital-signs",  
              "display": "Vital Signs"  
            }  
          ],  
          "text": "Vital Signs"  
        }  
      ],  
      "code": {  
        "coding": [  
          {  
            "system": "http://loinc.org",  
            "code": "85354-9",  
            "display": "Blood pressure panel with all children optional"  
          }  
        ],  
        "text": "Blood pressure panel with all children optional"  
      },  
      "effectiveDateTime": "2021-02-02T05:00:00-05:00",  
      "value": {  
        "unit": "mmHg",  
        "display": "120 mmHg",  
        "value": 120  
      },  
      "component": [  
        {  
          "value": 80, "unit": "mmHg", "display": "80 mmHg", "code": "85354-9", "category": "vital-signs", "profile": "http://hl7.org/fhir/Observation", "effectiveDateTime": "2021-02-02T05:00:00-05:00", "subject": "Patient/2c92a61179378ae2017938b606d04c0f", "encounter": "2c92a61179378ae2017938d3dd2f5a11", "resourceType": "VitalSigns", "id": "2c92a61179378ae2017938d3dd145a10-BloodPressure", "meta": {  
            "profile": [  
              "http://hl7.org/fhir/Observation"  
            ]  
          },  
          "status": "final",  
          "category": [  
            {  
              "coding": [  
                {  
                  "system": "http://hl7.org/fhir/observation-category",  
                  "code": "vital-signs",  
                  "display": "Vital Signs"  
                }  
              ],  
              "text": "Vital Signs"  
            }  
          ],  
          "code": {  
            "coding": [  
              {  
                "system": "http://loinc.org",  
                "code": "85354-9",  
                "display": "Blood pressure panel with all children optional"  
              }  
            ],  
            "text": "Blood pressure panel with all children optional"  
          },  
          "effectiveDateTime": "2021-02-02T05:00:00-05:00",  
          "value": {  
            "unit": "mmHg",  
            "display": "80 mmHg",  
            "value": 80  
          }  
        }  
      ]  
    }  
  ]  
}
```

```

"issued": "2021-02-02T05:00:00.000-05:00",
"component": [
  {
    "code": {
      "coding": [
        {
          "system": "http://loinc.org",
          "code": "8480-6",
          "display": "Systolic blood pressure"
        }
      ],
      "text": "Systolic blood pressure"
    },
    "valueQuantity": {
      "value": 127,
      "unit": "mmHg",
      "system": "http://unitsofmeasure.org",
      "code": "mm[Hg]"
    }
  },
  {
    "code": {
      "coding": [
        {
          "system": "http://loinc.org",
          "code": "8462-4",
          "display": "Diastolic blood pressure"
        }
      ],
      "text": "Diastolic blood pressure"
    },
    "valueQuantity": {
      "value": 87,
      "unit": "mmHg",
      "system": "http://unitsofmeasure.org",
      "code": "mm[Hg]"
    }
  }
]
}

```

Search - Request

Returns one or more BMI vital sign entries (as a bundle) for the patient:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/VitalSigns?patient=2c92a61179378ae2017938b606d04c0f&category=BodyMassIndex
```

Search - Response (JSON)

```
{
  "resourceType": "Bundle",
  "id": "89ef2f97-a64d-40df-b96e-c2523bf67ce3",
  "meta": {
    "lastUpdated": "2021-05-07T15:07:29.989+00:00"
  },
  "type": "searchset",
  "total": 3,
  "link": [
    {
      "relation": "self",
      "url": "https://base_url/quanum-ehr-fhir-server-fhir/VitalSigns?category=BodyMassIndex&patient=2c92a61179378ae2017938b606d04c0f"
    }
  ],
  "entry": [
    {
      "fullUrl": "https://base_url/quanum-ehr-fhir-server-fhir/VitalSigns/2c92a61179378ae2017938dabeca6dfa-BodyMassIndex",
      "resource": {
        "resourceType": "VitalSigns",
        "id": "2c92a61179378ae2017938dabeca6dfa-BodyMassIndex",
        "meta": {
          "profile": [
            "http://hl7.org/fhir/Observation"
          ]
        },
        "status": "final",
        "category": [
          {
            "coding": [
              {
                "system": "http://hl7.org/fhir/observation-category",
                "code": "vital-signs",
                "display": "Vital Signs"
              }
            ],
            "text": "Vital Signs"
          }
        ],
        "code": {
          "coding": [
            {

```

```

        "system": "http://loinc.org",
        "code": "39156-5",
        "display": "Body mass index (BMI) [Ratio]"
    }
],
"text": "Body mass index (BMI) [Ratio]"
},
"subject": {
    "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
},
"encounter": {
    "display": "2c92a61179378ae2017938dabee16dfb"
},
"effectiveDateTime": "2021-04-04T04:00:00+00:00",
"issued": "2021-04-04T04:00:00.000+00:00",
"valueQuantity": {
    "value": 34.933998107910159,
    "unit": "kg/m2",
    "system": "http://unitsofmeasure.org",
    "code": "kg/m2"
}
}
},
{
"fullUrl": "https://base_url/quanum-ehr-fhir-server-
/fhir/VitalSigns/2c92a61179378ae2017938d861956405-BodyMassIndex",
"resource": {
    "resourceType": "VitalSigns",
    "id": "2c92a61179378ae2017938d861956405-BodyMassIndex",
    "meta": {
        "profile": [
            "http://hl7.org/fhir/Observation"
        ]
    },
    "status": "final",
    "category": [
        {
            "coding": [
                {
                    "system": "http://hl7.org/fhir/observation-category",
                    "code": "vital-signs",
                    "display": "Vital Signs"
                }
            ],
            "text": "Vital Signs"
        }
    ],
    "code": {
        "coding": [

```

```

    {
      "system": "http://loinc.org",
      "code": "39156-5",
      "display": "Body mass index (BMI) [Ratio]"
    }
  ],
  "text": "Body mass index (BMI) [Ratio]"
},
"subject": {
  "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
},
"encounter": {
  "display": "2c92a61179378ae2017938d861aa6406"
},
"effectiveDateTime": "2021-03-03T05:00:00-05:00",
"issued": "2021-03-03T05:00:00.000-05:00",
"valueQuantity": {
  "value": 31.64179039001465,
  "unit": "kg/m2",
  "system": "http://unitsofmeasure.org",
  "code": "kg/m2"
}
}
},
{
  "fullUrl": "https://base_url/quanum-ehr-fhir-server-
/fhir/VitalSigns/2c92a61179378ae2017938d3dd145a10-BodyMassIndex",
  "resource": {
    "resourceType": "VitalSigns",
    "id": "2c92a61179378ae2017938d3dd145a10-BodyMassIndex",
    "meta": {
      "profile": [
        "http://hl7.org/fhir/Observation"
      ]
    },
    "status": "final",
    "category": [
      {
        "coding": [
          {
            "system": "http://hl7.org/fhir/observation-category",
            "code": "vital-signs",
            "display": "Vital Signs"
          }
        ],
        "text": "Vital Signs"
      }
    ],
    "code": {

```

```
"coding": [
  {
    "system": "http://loinc.org",
    "code": "39156-5",
    "display": "Body mass index (BMI) [Ratio]"
  }
],
"text": "Body mass index (BMI) [Ratio]"
},
"subject": {
  "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
},
"encounter": {
  "display": "2c92a61179378ae2017938d3dd2f5a11"
},
"effectiveDateTime": "2021-02-02T05:00:00-05:00",
"issued": "2021-02-02T05:00:00.000-05:00",
"valueQuantity": {
  "value": 34.202396392822269,
  "unit": "kg/m2",
  "system": "http://unitsofmeasure.org",
  "code": "kg/m2"
}
}
]
}
```

Procedure

Description	Retrieves a patient's procedures.
Method	GET
Supported Interactions	<ul style="list-style-type: none">• 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 12.

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 14.	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: <i>yyyy-mm-dd</i> 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: <i>yyyy-mm-dd</i> 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 Procedure resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Procedure	1..1
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	1..1
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 <i>Patient/</i> .	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..1

Example Requests and Responses

Note: For information about the environments represented by *base_url* in the examples below, see "API Endpoints" on page 8.

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/  
2c92a61179378ae2017938d3dd2f5a11-149787
```

Read - Response (JSON)

```
{  
  "resourceType": "Procedure",  
  "id": "2c92a61179378ae2017938d3dd2f5a11-149787",  
  "meta": {  
    "tag": [  
      {  
        "system": "urn:quest:quanum:source",  
        "display": "Quanum-EHR"  
      }  
    ]  
  },  
  "status": "completed",  
  "code": {
```

```

"coding": [
    {
        "system": "http://www.ama-assn.org/go/cpt",
        "code": "V5008",
        "display": "Hearing screening"
    }
],
},
"subject": {
    "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
},
"performedDateTime": "2021-02-02T05:00:00-05:00",
"performer": [
    {
        "actor": {
            "id": "2c92a6bb71ab7d2d0171ac0db3a01a2b",
            "display": "Pam Johnson"
        }
    }
]
}

```

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=2c92a61179378ae2017938b606d04c0f&startDate=2021-02-01&endDate=2021-04-01
```

Search - Response (JSON)

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

```
{
    "resourceType": "Bundle",
    "id": "16957f18-46ed-4917-94c2-86dca12a9edf",
    "meta": {
        "lastUpdated": "2021-05-07T15:28:43.538+00:00"
    },
    "type": "searchset",
    "total": 2,
    "link": [
        {
            "relation": "self",
            "url": "https://base_url/quanum-ehr-fhir-server/fhir/Procedure/?endDate=2021-04-01&patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-02-01"
        }
    ],
    "entry": [
        {
            "fullUrl": "https://base_url/quanum-ehr-fhir-server-fhir/Procedure/2c92a61179378ae2017938d3dd2f5a11-149787",

```

```
"resource": {
  "resourceType": "Procedure",
  "id": "2c92a61179378ae2017938d3dd2f5a11-149787",
  "meta": {
    "tag": [
      {
        "system": "urn:quest:quignum:source",
        "display": "Quanum-EHR"
      }
    ]
  },
  "status": "completed",
  "code": {
    "coding": [
      {
        "system": "http://www.ama-assn.org/go/cpt",
        "code": "V5008",
        "display": "Hearing screening"
      }
    ]
  },
  "subject": {
    "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
  },
  "performedDateTime": "2021-02-02T05:00:00-05:00",
  "performer": [
    {
      "actor": {
        "id": "2c92a6bb71ab7d2d0171ac0db3a01a2b",
        "display": "Pam Johnson"
      }
    }
  ]
},
```

Lab Results

Description	Retrieves a patient's lab results. Note: The LabResults resource is an implementation of the FHIR Observation resource.
Method	GET
Supported Interactions	<ul style="list-style-type: none">SearchRead
Response Format	application/JSON

Parameters

The following search parameters are supported for the Lab Results 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 12](#).

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 14 .	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 lab results.	string	N
startDate	A date used to filter entries by clinically relevant date, in the following format: <i>yyyy-mm-dd</i> 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: <i>yyyy-mm-dd</i> 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 Lab Results resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	LabResults	1..1
id	The unique identifier for the lab result, made up of the clinical entry identifier followed by a - (hyphen) , then the test identifier, another - (hyphen), and the result identifier.	Identifier	1..1
status	The status of the lab result. Supported values include final, preliminary, registered, corrected, entered-in-error, unknown, or amended.	code	1..1
category	Classifies the general type of observation being made.	CodeableConcept	0..*
code	The test's code and/or description.	CodeableConcept	1..1
subject	The patient associated with the lab result, described by the patient's unique identifier preceded by <i>Patient/</i> .	Reference(Patient Group Device Location)	1..1
issued	The date and time that the lab result was received.	instant	0..1
valueQuantity	The result value and unit of measure.	Quantity	0..1
valueCodeableConcept	The result value.	CodeableConcept	0..1
interpretation	The assessment made based on the result value.	CodeableConcept	0..1
comment	Notes about the result value.	string	0..1
referenceRange	Reference range for the result value.	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 8.

Read - Request

Returns a single lab result entry for the patient using the specified lab result identifier:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/LabResults/  
2c92a62e795bf9d201795cc1437d0017-1-1
```

Read - Response (JSON)

```
{  
  "resourceType": "LabResults",  
  "id": "2c92a62e795bf9d201795cc1437d0017-1-1",  
  "meta": {  
    "profile": [  
      "http://hl7.org/fhir/Observation"  
    ],  
    "tag": [  
      {  
        "system": "urn:quest:quignum:source",  
        "display": "Quignum-EHR"  
      }  
    ]  
  },  
  "status": "final",  
  "category": [  
    {  
      "coding": [  
        {  
          "system": "http://hl7.org/fhir/observation-category",  
          "code": "laboratory",  
          "display": "Laboratory"  
        }  
      ],  
      "text": "Laboratory"  
    }  
  ],  
  "code": {  
    "coding": [  
      {  
        "system": "http://loinc.org",  
        "code": "17856-6",  
        "display": "HEMOGLOBIN A1C"  
      }  
    ],  
    "text": "HEMOGLOBIN A1C"  
  },  
  "subject": {  
    "reference": "Patient/2c92a61179378ae2017938b606d04c0f"  
  },  
  "effectiveDateTime": "2021-02-26T00:00:00-05:00",  
  "issued": "2021-02-26T00:00:00.000-05:00",  
  "valueQuantity": {  
    "value": 8,  
    "unit": "%",  
    "system": "http://unitsofmeasure.org",  
    "code": "%"  
  },  
}
```

```

"interpretation": [
  {
    "coding": [
      {
        "system": "http://hl7.org/fhir/v2/0078",
        "code": "*"
      }
    ]
  }
],
"referenceRange": [
  {
    "text": ">9.0"
  }
]
}

```

Search - Request

Returns one or more lab result entries (as a bundle) for the patient, for the specified lab results identifier and date range:

```
GET https://base_url/quanum-ehr-fhir-server/fhir/LabResults?patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-02-01&endDate=2021-02-28
```

Search - Response (JSON)

```
{
  "resourceType": "Bundle",
  "id": "555a48f3-21fc-4680-a380-6fad00958b33",
  "meta": {"lastUpdated": "2021-05-11T14:56:24.833+00:00"},
  "type": "searchset",
  "total": 1,
  "link": [   {
    "relation": "self",
    "url": "https://base_url/quanum-ehr-fhir-server/fhir/LabResults?endDate=2021-02-28&patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-02-01"
  }],
  "entry": [   {
    "fullUrl": "https://base_url/quanum-ehr-fhir-server-fhir/LabResults/2c92a62e795bf9d201795cc1437d0017-1-1",
    "resource": {
      "resourceType": "LabResults",
      "id": "2c92a62e795bf9d201795cc1437d0017-1-1",
      "meta": {
        "profile": ["http://hl7.org/fhir/Observation"],
        "tag": [          {
          "system": "urn:quest:quanum:source",
          "display": "Quanum-EHR"
        }]
      },
      "status": "final",
    }
  }
]
```

```

"category": [
    {
        "coding": [
            {
                "system": "http://hl7.org/fhir/observation-category",
                "code": "laboratory",
                "display": "Laboratory"
            }
        ],
        "text": "Laboratory"
    }
],
"code": [
    {
        "coding": [
            {
                "system": "http://loinc.org",
                "code": "17856-6",
                "display": "HEMOGLOBIN A1C"
            }
        ],
        "text": "HEMOGLOBIN A1C"
    }
],
"subject": {"reference": "Patient/2c92a61179378ae2017938b606d04c0f"},
"effectiveDateTime": "2021-02-26T00:00:00-05:00",
"issued": "2021-02-26T00:00:00.000-05:00",
"valueQuantity": {
    "value": 8,
    "unit": "%",
    "system": "http://unitsofmeasure.org",
    "code": "%"
},
"interpretation": [{"coding": [
        {
            "system": "http://hl7.org/fhir/v2/0078",
            "code": "*"
        }
    }]],
"referenceRange": [{"text": ">9.0"}]
}
}
}

```

Immunization

Description	Retrieves a patient's immunizations. Note: Only administered immunizations are supported for this resource.
Method	GET
Supported Interactions	<ul style="list-style-type: none">SearchRead
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 12](#)".

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 14 ".	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 immunizations.	string	N
startDate	A date used to filter entries by clinically relevant date, in the following format: <i>yyyy-mm-dd</i> 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: <i>yyyy-mm-dd</i> 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 Immunization resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Immunization	1..1
id	The unique identifier for the clinical entry.	Identifier	1..1
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 <i>Patient/</i> .	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
practitioner	The individual who administered the vaccine.	Reference(Practitioner)	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 8.

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/  
2c92a6117946c196017948236ba51d91
```

Read - Response (JSON)

```
{  
  "resourceType": "Immunization",  
  "id": "2c92a6117946c196017948236ba51d91",  
  "status": "completed",  
  "vaccineCode": {  
    "coding": [  
      {  
        "system": "http://hl7.org/fhir/sid/cvx",  
        "code": "212",  
        "display": "SARS-CoV-2 (COVID-19) Ad26 vaccine, recombinant"  
      }  
    ],  
    "text": "Janssen COVID-19 Vaccine PF - suspension"  
  },  
  "patient": {  
    "reference": "Patient/2c92a61179378ae2017938b606d04c0f"  
  },  
  "occurrenceDateTime": "2021-05-06T18:41:00+00:00",  
  "location": {  
    "display": "QA CQM Org"  
  },  
  "manufacturer": {  
    "display": "Johnson and Johnson"  
  },  
  "lotNumber": "876",  
  "expirationDate": "2022-02-01",  
  "site": {  
    "text": "Left Deltoid"  
  },  
  "route": {  
    "coding": [  
      {  
        "system": "http://hl7.org/fhir/ValueSet/route-codes",  
        "code": "IM",  
        "display": "IM (Intramuscular)"  
      }  
    ]  
  },  
},
```

```

  "doseQuantity": {
    "value": 1
  },
  "performer": [
    {
      "actor": {
        "display": "Clinician Johnson"
      }
    }
  ]
}

```

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=2c92a61179378ae2017938b606d04c0f&startDate=2021-04-01&endDate=2021-04-30
```

Search - Response (JSON)

```
{
  "resourceType": "Bundle",
  "id": "63199ac2-5798-44fa-b441-c42d6e621011",
  "meta": {
    "lastUpdated": "2021-05-07T16:02:07.509+00:00"
  },
  "type": "searchset",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://base_url/quanum-ehr-fhir-server/fhir/Immunization?endDate=2021-04-30&patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-04-01"
    }
  ],
  "entry": [
    {
      "fullUrl": "https://base_url/quanum-ehr-fhir-server-fhir/Immunization/2c92a6117946c19601794821509d1d8f",
      "resource": {
        "resourceType": "Immunization",
        "id": "2c92a6117946c19601794821509d1d8f",
        "status": "completed",
        "vaccineCode": {
          "coding": [
            {
              "system": "http://hl7.org/fhir/sid/cvx",
              "code": "187",
              "display": "zoster vaccine, inactivated"
            }
          ],
        }
      }
    }
  ]
}
```

```

        "text": "Shingrix adjuvanted powder for injection"
    },
    "patient": {
        "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
    },
    "occurrenceDateTime": "2021-04-02T18:38:00+00:00",
    "location": {
        "display": "QA CQM Org"
    },
    "manufacturer": {
        "display": "Baxter Healthcare Corporation"
    },
    "lotNumber": "12345",
    "expirationDate": "2021-12-01",
    "site": {
        "text": "Left Deltoid"
    },
    "route": {
        "coding": [
            {
                "system": "http://hl7.org/fhir/ValueSet/route-codes",
                "code": "IM",
                "display": "IM (Intramuscular)"
            }
        ]
    },
    "doseQuantity": {
        "value": 1
    },
    "performer": [
        {
            "actor": {
                "display": "Clinician Johnson"
            }
        }
    ]
}
]
}

```

Device

Description	Retrieves a patient's devices.
Method	GET
Supported Interactions	<ul style="list-style-type: none">• 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 12.

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 14.	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
startDate	A date used to filter entries by clinically relevant date, in the following format: <i>yyyy-mm-dd</i> 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: <i>yyyy-mm-dd</i> 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 Device resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Device	1..1
id	The unique identifier for the clinical entry.	Identifier	1..1
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 <i>Patient/</i> .	Reference(Patient)	1..1
udi	The Unique Device Identifier (UDI) assigned to the device label or package.	BackboneElement	0..1
type	The code or identifier that indicates the kind of device.	CodeableConcept	0..1
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..1
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 8](#).

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/
2c92a6117946c1960179575f56ff6511
```

Read - Response (JSON)

```
{  
    "resourceType": "Device",  
    "id": "2c92a6117946c1960179575f56ff6511",  
    "udiCarrier": [  
        {  
            "deviceIdentifier": "00613994222114",  
            "carrierHRF": "(01)00613994222114(11)161212(17)191212(10)AB23XY(21)1234"  
        }  
    ],  
    "status": "active",  
    "manufacturer": "MEDTRONIC, INC.",  
    "manufactureDate": "2016-12-12T00:00:00-05:00",  
    "expirationDate": "2019-12-12T00:00:00-05:00",  
    "lotNumber": "AB23XY",  
    "deviceName": [  
        {  
            "name": "Dual-chamber implantable pacemaker, rate-responsive"  
        }  
    ],  
    "type": {  
        "coding": [  
            {  
                "system": "http://snomed.info",  
                "code": "14106009",  
                "display": "Cardiac pacemaker, device (physical object)"  
            }  
        ]  
    },  
    "version": [  
        {  
            "value": "VEDR01"  
        }  
    ],  
    "patient": {  
        "reference": "Patient/2c92a61179378ae2017938b606d04c0f"  
    }  
}
```

Search - Request

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

```
GET https://base_url/quanum-ehr-fhir-server/fhir/Device?patient=  
2c92a61179378ae2017938b606d04c0f&startDate=2021-03-01&endDate=2021-05-31
```

Search - Response (JSON)

```
{  
    "resourceType": "Bundle",  
    "id": "19b6ebe3-cb49-418c-9c02-7bb4649fecdc",  
    "meta": {
```

```
"lastUpdated": "2021-05-11T15:41:58.556+00:00"
},
"type": "searchset",
"total": 2,
"link": [
{
  "relation": "self",
  "url": "https://base_url/quanum-ehr-fhir-server/fhir/Device?endDate=2021-05-31&patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-03-01"
}
],
"entry": [
{
  "fullUrl": "https://base_url/quanum-ehr-fhir-server-fhir/Device/2c92a6117946c1960179575e91796510",
  "resource": {
    "resourceType": "Device",
    "id": "2c92a6117946c1960179575e91796510",
    "udiCarrier": [
      {
        "deviceIdentifier": "08717648200274",
        "carrierHRF": "(01)08717648200274(11)141231(17)150707(10)A213B1(21)1234"
      }
    ],
    "status": "active",
    "manufacturer": "ABBOTT VASCULAR INC.",
    "manufactureDate": "2014-12-31T00:00:00-05:00",
    "expirationDate": "2015-07-07T00:00:00+00:00",
    "lotNumber": "A213B1",
    "deviceName": [
      {
        "name": "Drug-eluting coronary artery stent, non-bioabsorbable-polymer-coated"
      }
    ],
    "type": {
      "coding": [
        {
          "system": "http://snomed.info",
          "code": "700516001",
          "display": "Drug-eluting coronary artery stent, non-bioabsorbable-polymer-coated (physical object)"
        }
      ]
    },
    "version": [
      {
        "value": "1145350-28"
      }
    ],
    "tag": [
      {
        "code": "1145350-28"
      }
    ]
  }
}
```

```

"patient": {
    "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
}
},
{
    "fullUrl": "https://base_url/quanum-ehr-fhir-server-
/fhir/Device/2c92a6117946c1960179575f56ff6511",
    "resource": {
        "resourceType": "Device",
        "id": "2c92a6117946c1960179575f56ff6511",
        "udiCarrier": [
            {
                "deviceIdentifier": "00613994222114",
                "carrierHRF": "(01)00613994222114(11)161212(17)191212(10)AB23XY(21)1234"
            }
        ],
        "status": "active",
        "manufacturer": "MEDTRONIC, INC.",
        "manufactureDate": "2016-12-12T00:00:00-05:00",
        "expirationDate": "2019-12-12T00:00:00-05:00",
        "lotNumber": "AB23XY",
        "deviceName": [
            {
                "name": "Dual-chamber implantable pacemaker, rate-responsive"
            }
        ],
        "type": {
            "coding": [
                {
                    "system": "http://snomed.info",
                    "code": "14106009",
                    "display": "Cardiac pacemaker, device (physical object)"
                }
            ]
        },
        "version": [
            {
                "value": "VEDR01"
            }
        ],
        "patient": {
            "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
        }
    }
}
]
}

```

Goal

Description	Retrieves a patient's goals.
Method	GET
Supported Interactions	<ul style="list-style-type: none">• 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 12.

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 14.	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: <i>yyyy-mm-dd</i> 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: <i>yyyy-mm-dd</i> 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 Goal resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Goal	1..1
id	The unique identifier for the clinical entry.	Identifier	1..1
status	Indicates whether the goal has been reached and is still relevant. Accepted is the only supported value.	code	1..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 <i>Patient/</i> .	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 8.

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/  
2c92a61179378ae2017938dabee16dfb-13265
```

Read - Response (JSON)

```
{
  "resourceType": "Goal",
  "id": "2c92a61179378ae2017938dabee16dfb-13265",
  "description": {
    "coding": [
      {
        "system": "http://snomed.info",
        "code": "361182006",
        "display": "Group exercise"
      }
    ]
  },
  "subject": {
    "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
  },
  "startDate": "2021-04-04",
  "note": [
    {
      "text": "Join Silver Sneakers"
    }
  ]
}
```

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=2c92a61179378ae2017938b606d04c0f&startDate=2021-02-01&endDate=2021-04-30
```

Search- Response (JSON)

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

```
{
  "resourceType": "Bundle",
  "id": "de25a0fe-a4f7-4f19-ba3b-97be9e502a22",
  "meta": {
    "lastUpdated": "2021-05-11T15:44:49.148+00:00"
  },
  "type": "searchset",
  "total": 2,
  "link": [
    {
      "relation": "self",
      "url": "https://base_url/quanum-ehr-fhir-server/fhir/Goal?endDate=2021-04-30&patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-02-01"
    }
  ],
  "entry": [
    {
      "fullUrl": "https://base_url/quanum-ehr-fhir-server-fhir/Goal/2c92a61179378ae2017938d3dd2f5a11-13264",
      "resource": {
        "resourceType": "Goal",
        "id": "2c92a61179378ae2017938d3dd2f5a11-13264",
        "description": {
          "coding": [
            {
              "system": "http://snomed.info",
              "code": "225925001",
              "display": "Regular exercise"
            }
          ]
        },
        "subject": {
          "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
        }
      }
    }
  ]
}
```

Care Team

Description	Retrieves a patient's care team.
Method	GET
Supported Interactions	Search
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 12](#).

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 14 .	string	Y

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	1..1
id	The unique identifier for the clinical entry.	Identifier	1..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)	1..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 8](#).

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=2c92a61179378ae2017938b606d04c0f
```

Search - Response (JSON)

```
{  
  "resourceType": "Bundle",  
  "id": "fda08911-40bf-465e-b449-6770d2ce6a0e",  
  "meta": {  
    "lastUpdated": "2021-05-07T15:30:15.278+00:00"  
  },  
  "type": "searchset",  
  "total": 1,  
  "link": [  
    {  
      "relation": "self",  
      "url": "https://base_url/quanum-ehr-fhir-server-  
/fhir/CareTeam?patient=2c92a61179378ae2017938b606d04c0f"  
    }  
  ],  
  "entry": [  
    {  
      "fullUrl": "https://base_url/quanum-ehr-fhir-server-  
/fhir/CareTeam/2c92a61179378ae2017938b606d04c0f",  
      "resource": {  
        "resourceType": "CareTeam",  
        "id": "2c92a61179378ae2017938b606d04c0f",  
        "category": [  
          {  
            "coding": [  
              {  
                "system": "http://hl7.org/fhir/care-team-category",  
                "code": "care-team",  
                "display": "Care Team"  
              }  
            ],  
            "text": "Care Team"  
          }  
        ],  
        "subject": {  
          "reference": "Patient/2c92a61179378ae2017938b606d04c0f"  
        },  
        "participant": [  
          {  
            "role": [  
              {  
                "text": "Caregiver"  
              }  
            ],  
            "member": {  
              "display": "Janet Smith"  
            }  
          },  
        ]  
      }  
    }  
  ]  
}
```

```
{  
    "role": [  
        {  
            "text": "Family physician"  
        }  
    ],  
    "member": {  
        "display": "Donald Adams"  
    }  
}  
}  
]  
}  
}
```

Health Concerns

Description	Retrieves a patient's health concerns. Note: The HealthConcerns resource is an implementation of the FHIR Condition resource.
Method	GET
Supported Interactions	<ul style="list-style-type: none">• Search• Read
Response Format	application/JSON

Parameters

The following search parameters are supported for the Health Concerns 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 12](#)".

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 14 ".	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 health concerns.	string	N
startDate	A date used to filter entries by clinically relevant date, in the following format: <i>yyyy-mm-dd</i> 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: <i>yyyy-mm-dd</i> 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 Health Concerns resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	HealthConcerns	1..1
id	The unique identifier for the clinical entry.	Identifier	1..1
category	Classifies the data as being a health concern.	CodeableConcept	1..1
code	A textual description of the health concern.	CodeableConcept	0..1
subject	The patient associated with the health concern, described by the patient's unique identifier preceded by <i>Patient/</i> .	Reference(Patient Group)	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 8.

Read - Request

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

```
GET https://base_url/quanum-ehr-fhir-server/fhir/HealthConcerns/  
2c92a61179378ae2017938dabee16dfb
```

Read - Response (JSON)

```
{  
  "resourceType": "HealthConcerns",  
  "id": "2c92a61179378ae2017938dabee16dfb",  
  "meta": {  
    "profile": [  
      "http://hl7.org/fhir/Condition"  
    ]  
  },  
  "category": [  
    {  
      "coding": [  
        {  
          "system": "https://www.hl7.org/fhir/condition.html",  
          "code": "Concern",  
          "display": "Health Concern"  
        }  
      ],  
      "text": "Health Concern"  
    }  
  ],  
  "code": {  
    "text": "Lacks motivation to exercise"  
  }  
}
```

```

},
"subject": {
  "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
}
}

```

Search - Request

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

```
GET https://base_url/quanum-ehr-fhir-server/fhir/HealthConcerns?patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-02-01&endDate=2021-03-01
```

Search - Response (JSON)

```
{
  "resourceType": "Bundle",
  "id": "9df68aea-e2fd-4b11-bb64-f263ee4c1130",
  "meta": {
    "lastUpdated": "2021-05-10T14:51:24.172+00:00"
  },
  "type": "searchset",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://base_url/quanum-ehr-fhir-server/fhir/HealthConcerns?endDate=2021-03-01&patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-02-01"
    }
  ],
  "entry": [
    {
      "fullUrl": "https://base_url/quanum-ehr-fhir-server-fhir/HealthConcerns/2c92a61179378ae2017938d3dd2f5a11",
      "resource": {
        "resourceType": "HealthConcerns",
        "id": "2c92a61179378ae2017938d3dd2f5a11",
        "meta": {
          "profile": [
            "http://hl7.org/fhir/Condition"
          ]
        },
        "category": [
          {
            "coding": [
              {
                "system": "https://www.hl7.org/fhir/condition.html",
                "code": "Concern",
                "display": "Health Concern"
              }
            ]
          },
          "text": "Health Concern"
        ]
      }
    }
  ]
}
```

```
        }
    ],
    "code": {
        "text": "Lack of energy"
    },
    "subject": {
        "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
    }
}
]
}
```

Assessments

Description	Retrieves a patient's assessments. Note: The Assessments resource is an implementation of the FHIR ClinicalImpression resource.
Method	GET
Supported Interactions	<ul style="list-style-type: none">• Search• Read
Response Format	application/JSON

Parameters

The following search parameters are supported for the Assessments 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 12.

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 14.	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: <i>yyyy-mm-dd</i> 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: <i>yyyy-mm-dd</i> 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 Assessments resource.

Field	Description	Type	Cardinality
resourceType	Identifies the resource.	Assessments	1..1
id	The unique identifier for the assessment, made up of the clinical entry identifier followed by a - (hyphen) and the assessment identifier.	Identifier	1..1
status	The status of the assessment. Completed is the only supported value.	code	1..1
description	The recorded assessment text.	string	0..1
subject	The patient associated with the assessment, described by the patient's unique identifier preceded by <i>Patient/</i> .	Reference (Patient Group)	1..1
date	The date and time the assessment was recorded.	dateTime	0..1
assessor	The clinician or provider who performed the assessment.	Reference (Practitioner)	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 8.

Read - Request

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

```
GET https://base_url/quanum-ehr-fhir-server/fhir/Assessments/  
2c92a61179378ae2017938d3dd2f5a11-471
```

Read - Response (JSON)

```
{  
  "resourceType": "Assessments",  
  "id": "2c92a61179378ae2017938d3dd2f5a11-4711",  
  "meta": {  
    "profile": [  
      "http://hl7.org/fhir/ClinicalImpression"  
    ]  
  },  
  "text": {  
    "status": "additional",  
    "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\"><p>Intervention Order: Follow Up for  
Above Normal BMI, Prescribed diet education</p></div>"  
  },  
  "status": "completed",  
  "description": "Poor diet and lack of exercise",  
}
```

```

"subject": {
    "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
},
"date": "2021-05-10T00:00:00+00:00",
"assessor": {
    "display": "Pam Johnson"
}
}

```

Search - Request

Request

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

```
GET https://base_url/quanum-ehr-fhir-server/fhir/Assessments?patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-01-01&endDate=2021-05-15
```

Search - Response (JSON)

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

```
{
    "resourceType": "Bundle",
    "id": "e9008413-629c-4ae8-9539-f7a506c7031d",
    "meta": {
        "lastUpdated": "2021-05-11T15:48:37.447+00:00"
    },
    "type": "searchset",
    "total": 2,
    "link": [
        {
            "relation": "self",
            "url": "https://base_url/quanum-ehr-fhir-server/fhir/Assessments/?endDate=2021-05-15&patient=2c92a61179378ae2017938b606d04c0f&startDate=2021-01-01"
        }
    ],
    "entry": [
        {
            "fullUrl": "https://base_url/quanum-ehr-fhir-server/fhir/Assessments/2c92a61179378ae2017938d3dd2f5a11-4711",
            "resource": {
                "resourceType": "Assessments",
                "id": "2c92a61179378ae2017938d3dd2f5a11-4711",
                "meta": {
                    "profile": [
                        "http://hl7.org/fhir/ClinicalImpression"
                    ]
                },
                "text": {
                    "status": "additional",
                    "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\"><p>Intervention Order: Follow Up for Above Normal BMI, Prescribed diet education</p></div>"
                }
            }
        }
    ]
}
```

```
},
"status": "completed",
"description": "Poor diet and lack of exercise",
"subject": {
    "reference": "Patient/2c92a61179378ae2017938b606d04c0f"
},
"date": "2021-05-10T00:00:00+00:00",
"assessor": {
    "display": "Pam Johnson"
}
},
},
```

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	Read
Response Format	application/JSON

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	1..1
id	The patient's unique identifier.	Identifier	1..1
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	1..1
subject	The patient associated with the document, described by the patient's unique identifier preceded by <i>Patient/</i> .	Reference(Patient Practitioner Group Device)	1..1
indexed	The date and time the document reference was created.	instant	1..1
content	The MIME type of the content and the referenced document (Base64 encoded, compressed CCDA).	BackboneElement	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 8.

Read - Request

Returns a CCDA using the specified patient identifier:

Note: The patient identifier can be retrieved by performing a patient search. For more information, see "Patient" on page 14.

```
GET https://base_url/quanum-ehr-fhir-server/fhir/DocumentReference/  
2c92a61179378ae2017938b606d04c0f
```

Read - Response (JSON)

```
{  
  "resourceType": "DocumentReference",  
  "id": "2c92a61179378ae2017938b606d04c0f",  
  "status": "current",  
  "type": {  
    "coding": [  
      {  
        "system": "http://loinc.org",  
        "code": "48764-5",  
        "display": "Summary purpose CCD Document"  
      }  
    ],  
    "text": "CCD Document"  
  },  
  "subject": {  
    "reference": "Patient/2c92a61179378ae2017938b606d04c0f"  
  },  
  "content": [  
    {  
      "attachment": {  
        "contentType": "application/zip",  
        "data": "  
"ZUp6dGZXbVQyem1TNk9meXI4RFR4bXpZRzZNU0wxR1VXNjBOV1ZWdVY3KzZ1bFR0bm80WEx5WWdFcEs0VFpFYWtySmQ4  
K3Mzd1VzOFFCS1NLrmZaWmsxUHQwamlTQUNaaVR5UW1kri9mMWxiNkJOeFBkT3hmKzZJNTBJSEVwdDNETk51L3R6NS9mR  
j1WK3Y4OS9qVmFHcVp0cWxqNjhMUUnQydGkrd21xMmQ3Ykw1NzVjMmZsKzV1M3ZkN256NS9QUdh2bmpydnNTWUlnOXY1eG  
N6M1RWm1NODtZidCtkaldTU2VzOVhObjY5cHZWOWFnQzJYZmZwS2oxMjg5dz1lejMrZ2IrT3FaYjcyZ3BXdEh4MzRBYUx  
ZRpOb0xGM3UrdT1Y0XJVdDZ1b0Y3MDR2S1Ay1hqOBV6TDU3UkdiOUNhT1FTYksybmpRrVFqSS9BNkdhZFh2REJmOXFr  
S3dPNWp1UC8zSkhPUmZWY1U0Uno4VndVW1UyVDRRUFTTDc0eEE0bjZmNXV1dkhQRHhjQy9DbEMzQVJaYn16c1Z6WWpuR  
XZ3RDN3NGx6THRTWUxZN3dwYVZ4QVBhdXpRV2cyQ01FVzF6UExTOEQrbGZ5NFh1aF1FTEEyd0laT2hERUFNaG9PaHJHQ2  
RMQ1I5S00wVmZkaEIyUFBNcFEzNE9ObjZLOGmxL2FkYnZJYmwrmjFMUEI5ZG1IaHPNTV2Nm0RWhMNWJZVmtSWmJrTGJ  
kREgyWk1IbzJMQnBsS11ka1hDNxEvdnJtNm5IV1NZSGt4RTFPVnN1MTVqMS94M2dJVE1XYURMamVuUjdtnGRuOFF6Wi9v  
V0dVOGQyemZ0TFFCTGkwMnhTMUJNT3FOZVdJUVdKb3NGMFgzekUzazAxd1I5d3RhVzBNV1FSS0V2RBMeDJBdlRnSW9td  
HFDOUBSS8xQTJzzNk3MW15T2JGaHVndXJLd3Zkem1KVW4xUWV4dVfpY3UwUjNYZU1UdWt2ajBCYnphd0ZSQVN3OU9PS0  
RnSFJjV1pFbGdvZzI3N31RNTdDZ1hDQ0FDVmtXeEM1Z3g2R3FZU0YyS0oxMVptNnVDYWdpS0xpd31iZDA4M0ZzMVZ3cFR  
qaWlqYm1tdnRGUGFaNmJMWGR2WU1GeTA5V0N5UHR4M3hpUGdkVDRaMzMwWT1jSmZJeDBtZVR3MWjkMjBiWml1VVM5NE1k  
b0ExbUtMVHZWWTZVdW1PT3FsM2tBckxpSCTCSm9tbm5kcdJtUU1zuUFRSRkNiYnhSYWFCWj1wRi9saW94NkZkd0hPSnhhc  
zJqckdMWGg4aTE3M1Jma05FbUZPSmZqckpMRDNPR3BCaGE0TWYxR3RtMm1xVm9RTThUTzhzUUhod29MWE1ETkxRSFI3L0  
9ETW1RdWdoMC9SeTERVDV3VmVtOWJUZUxZMi9kv29GejJOZJXTbFZNUF1XTU9HQktQSGxIccTJYlpCM0JUVzN0U1RocG1  
qN1J0c2tkMv1vSXU1NmZxck5GMktrN1V2RE5ob0JhvW9QNEJGbThGU2I3Mz1JSkNLcFBuaGVvQnU4aTBXQuhWZGt4Z1pL  
RnhnbWFuT2dYK29YYm11N1VteVzvVGhBZHDLzRuWG01L1FwYitDWFo4eXNTNmFYdVm1NFI4cjA4OU9HZDJ2M3haaDByA  
Fk4SEd3WEc1ZFowT3dqvEx3a0tET0w2NnozV1FnMHRsdS85UVF3WmFBUHNTERHV1E0Nkpyd0ZUYn1ZQzNZN2ZyOVphS1  
YzUmIyWDB2WThqcE5palZ1V1JCWEJEYX1KVnRKQ1RyYnJOTDA2dnNESGhQbW5hVHg1aXZqM3A1M2ovQ3dXNGNsZmNaMnh  
mOFN4VzFHSWhSdUkwVFk1S3FWODJzbFhPVn1XWC9LT2V5Tj1oemJDYURCVkd0anNFcTZsQkE50Wo5NnpOK09vcXpTb0xT  
RmJXQjBrbmdUUTBqbW9aNOVMb1RpODFrbGZkNG51ZUx2em9yT3hnamt6TUNptXoyWWVzR05QRmdSWWx4Nxk0QkovK2RRe  
mFlSFZKaDdKQnpmU0RvZmNFZ0t1eVF3bUtvA3I2c11VSFNzdWdYQVBUykJFMS91MEVBUU1Hzkh6U1pMeEVyZXBVenZWdW  
ZIUm5BdTkxdmZ1djVvSHoTzBjMTArejc3SW9tSC9kZldrcGo2VVVWS1ZocVJaWmk2Zk5IWH12S2FkMnRZM1poQU1qTW9  
4R0ovRUhOdTBWVTF5UHVKMU1ubDurb0hxMWIwTkkwNE96MzAvdUhuUZ0pKUmpWSWJ4ck9aM1J2TGV1OWhUODVMBw14dC84
```

M002VXJjN2txTHpEcU1kc2RiWWk3Y053MWNSR1ZoaU40SHQ1M1VnMHZ0clpPeDVIYWkrN3Y2M1pSVVRwWEZMbTRqZDY3e
mlmUVFWeEVkNWhVTD1BUHFIaEwwOGJXSTZebCtONDFRY0o2Q2pXb3VOS29seW1UMnVUU01LY1JMRnFzUz1CNUFJb1N2ZT
FCRzdmM1YxMDJmV1MxVGtuUUUF1T0E4QThPeFZOZ3FKNjN2MC96MGdSSXJVesvZmNnWF1HdVmzSz12e1E2T29zCFZHeVN
DUzg2ZXFQTUVuR3huL290c3c1N2p0ODBrOUZXY043akp2cWxZazcxSnBwZHV5eE5BekF4Snp1WXQrV1paemwzb2x5S110
M1g1RWdNd3M4RFhFS1ZMRRFFCTE9rT2g4T3VCbitOVWVPdjJDYitmZ3A5dz1RWVVWbVhrbG1YMGhtMUDRbmRES1dseVZLV
0ZZbEp1bFZiTFd0U00vUEpwRFhPeGzw1NPQj1zSjVvczNyeVFCZkc5ck5S3M2Q083dUpBcmthcg1NNVM5UhpEOWxBNj
J4NGdsUnJ3ME1mQ0haOU5QbEVqdGhFWX1RYndGOWpSSHZod0pvWmVhcWRHSGp0N2FpVzJock1MK01MWUhqUno1ZEh5SET
qaEJ6TThVR2I1bk5nUzROY0EzcE02U21oZHNQUVo0RHu xaHZIM3Bt0VpK2M4YzR4ZHMzbmlvVkpVjZ3ZU8zamVKSknN
MjZGSc2UVpvK3NmUXFRenZQMVV4cUhLS1rMwvYTgZT0JvalczeUJwZEZ4bGw2THVLQ25ncFgxWnFYTUQzUi8rbjIwV
3YvdXZBdjFjeEFMZ11EUzM4aHpmVjdRy1FuWjJOZkF4dG9ybmpnZ29KYzlaQm4wM0RYOEV2UWznYjdIQm50TW1lWUNQNE
Nil2RNvHhUVDU1aFvqU0ZzYTZDTjV1eEJvMHVZUG1TMTZ1Q1BubWtMc0hvcVFktkjMznkdTJQL0hsQUhtZkozeWdxR1Q
wWTZPcmk10DRtbkFpeE0wY1RsZXRRV3pMMLhSTTB3WVU1ZDAzTHdoRm9ScnFwc01HeElQZkVrWS9hWTBzS1RJSmhAHC9t
ZXFIRENERHZMqn1BbtJtbUntWUpZS2FJNWxnQT1HdmRzWmZFBzkyOVFhdUFxeTJ3YVFHYktJTmQ2UwxtTQtDCTFpiRERjN
3dDOEpPaVJvQW44RHNgdDFCTGpPMjdUL2tkUU0rWWJpY1R4dzVhTzQ0U1BsNST2TzFrSyt4SjcwcnV5RUVaRXptbzRXSU
xQQjVib2NROXFxaTZPS1I2N0ZBWjZITU56eVdCREZSR0p5bCtOYjJqtETmtT1A2WXkvV093N2xNNjhYb1p6ckYxNHRxTWZ
yMjhhdzRIBu1Nb1dXSnlTNzVUMDF2YX1TSG5yVUJsdWNBRVYxdXd4Q1MzZzRhaTNRTUpLZhhibVp1VTDENzcvZDJ2Q1F5
am92bWNidHJoOF1RVWV0NjltOVdoWjFCOVaweFN1Rkgwb01iWnJYd05WQTA2U3FGcnY2OEtBMEZRNi9mWE1RTm5aN2QzT
jVjWDdCM1d1UXgwmcmx4c2UrSEsx211TVRMcEdiVXFNkzwUDA2Y2hERmkva2V5dGZUR1JhYVgxQzVRRHhYa0xPSm5IZE
NwQ2pWRUZKVGhKS1NnTEI4eGhYT1EyL2NvYUNnNFVVYUpDZGpHU1NjYWx5s3BBM1VvQ0J4U0ZQY3FWMnpaUENzZkFuYwX
hTm1qQW1WQUNVV2dyCv1Yb2pDOTJRT3FrB2tOcG8yOTNCVmM2dUh5L1VNSG1YWjB2UERLTm1MSGRNb1lqK051NGZUdHhX
UkthRD1vS1gyTVRLYWFZFNBpZFNcGxnN21FUG9QbDzTtUJ3UmY5N1hrb0ZJNXzm0JLNExrehkIS2hKdGNRcEh1Q1BOU
2lyNzBzd3JyU3JoS0hzVvpHMj1WsZdVdGdFNnVaMFhPWGt1bWJL1EvctFkeDrhQ11Xdg5DvjNmbnhTcUNBWFRkvKn1c0
hFeUm3W1M2TE5Lb1JXb0duVDBvMGlOMGd1UVFrc01LU2pMUjB6aEhCd21oVmE1WE5MeldKUVArMet60G1HSDBhYVZfNU9
XV2prUnRYSW11aUZ5SW5YYVpId3FkSzF6anBjVHVXSV1JVVZLVjFDN3d2QW920GR4WGhot2tos3VGRUZVaGE3UUdBMS9N
SUDadWtFVTBKb1kwYkZyNmp0aytsVnVraUluYzYya3Vtakt2VkxyV2RuNVZXS3Z5ZzLeEdGeVpZXXRem8vYWFjSzdeC
WxmcGJRcHIvenF5UmVGVBkR1E5RjdCc11MWUxZR1gvRzdnSz1czUvVw16bG1Vc29LS1AxRWdXaj1IOUNJcnEvUTYvd1
hHeTlnWGQvRV1ROVdITVhLSwdZUDZFTFdIMUFUE1XRF1XZjRQL013RTh1OHJhYmpmV1U3bWNzOuh0Q3pqdERYewZjZH
jMjVibE12QmFKejZMTV1aSGFYeTh1cmo3bXVPWEkyODdEb014SkTwSw11NS9PM2swdWJocFdLRVdWaX1JUGEvbGtLcVVt
R250dFB0UU51YzzFa3luYVpuQulxaDjjut5cGVLOWRPaGRtdU51bHJ6NWUvL054eGxMaDhySnhYK0IwZFd0Qy93QWzd
1MreXdoQTVhd0k0Q2Zkd1Njc2FFbHdsTHI2OEU5K2x2ZUgwblcyUG1FZWo4cHBWWGVNdGczSEk30XRjWERtSwdrb1k5b2
5iRys3VHR5UjJZOXJiRzhYT0R4ZEFicWjyzNhj10bxQ3ODNvVkpMqmJOUEtaRWUxanE3bwZUb2JxQTVhcdB1RNNaU0c
3Ylc3OHvPvn15ZmE2eGdyasSzanJ2T0xWKzhLw1FyRDVrVGJsV0VIEwKxN1B0d21RYkwxZV11NzZTa1o40HRQMXFWRkE5
T2JUM1NUeGpkcjdn3hqloralRBmzbPL3p5YXNVOF1Nz0dyNn1RSWY0V3VSNk1veHzsNBmRWJqazNpdWNCaHR2cXBIM
ktqQnBxFRFYUjZtMGJFME45Wk9jFcjtZENDdWhGS1pSdWE1di80empTZFh0NctINDrsSThXUjRMafpPQWtkdE5DaWRxTm
dBNmFTTVFSOW5QdU1SR01KYUJXR2dSR3JnTTVLNVpFT3dmN3RkejRrYnR5cVVOUGV2M000NkxDdTRZWE9oNk91aCsydFE
rYVI3N0dFOWxEZkZ2OWNheFo5MXZ3MGdhSHJQRFJxdE5vUng3NzM1R2VYWWY0TFCKzdCQmVCND1udWV2VGdzv0VFa1h
RHZ3c2NnQ0p6VDJsWVNEbDRveHNFaxe5Q2Nxem9qUG1zK0VQRjhZRWdHTUZnUjY0SXhsN0VnWW9taC9oVkd4RHB4bnluW
VdBQmJwdFdLVS91c1V1WhpubzViem44Sk44enZaSHRPm10R3AxUjRTczhyTmRSTUsWYTBza1FyUnJSaVJddEd0SExBRH
1vSE5I1dpREtrRThvQlpYYUFochBKa0R6T3FkaWxTUlhEYkhrMHJXSTNrMWZ4ZTkzaTA1emo5cXjkNk51TnZ0M29uMjJ
qTDJRaX1IMHZEZLzdQRk50Znc2bE5LMXV4ZjdPeU5IemIyejNpREx6ZmQ5S1pNaE4zYnB2Qzd0VGt1Y21VajhQMT16amR0
ZGNVbE1Ys1o4dfU0UGZCUWhLdH1EeWJrUzcyas1K3FhY0p3czhuK05pMz1pbEFxZ3JDVjdtQjJ10X1uTVRsZFBWTkxJd
TRTNU40ZjBmWW9FZGpDWE1KRGhhTHZvs1B2c2M4UkpaVTdFMm11Zz14d1ZNZEtrdTzit3BJV1gyMGZ2Rk0yU3dtbStTb1
dEenUydE15QXZNRVJNNGR50Dg0Y1phY05vd1BrT0ZnVHA3RXp2aH11Y3pFcVVPS1h2b2hPQXFtrk1MzDQ0YThDRHBvNmN
hMGR1ZkNHR0h3dWI1VHdmdVo4SGNhBuzKb1RKSFN0RWx2dWNYbWd0akVNkzN1eG1OYnd5R2JGVEZBNUNKtkRBTjZ1b0d1
QUVzSThoMFV2Q1o3RGtyaUc1VGNHZU8x0DhYVVRjC3k3U2FBbDhNMW9JQ3ZvMEhzQ2JxY0E1My9SRj11bXpoOThKZhdz
Wd2aHJwMWxCazduYU5kbnc4WEM2bmzaK25KaDRSL2ZjMV1ycjdBaKRpCVN1cVpGRHMybG9zdkJ1UHJ4bmVkMURWVDYxST
V3cFNTUXJYSmJIYjU4SGgxZDF1UGIyVVJaMThsQXFvRS9maXNNRhhCVFNWR0Z1eUNiBXR1c08ybkl1STZ1eWt6SDZVcTB
QeXgvRF1YS2wyWj1qSVU2VFBWYmlac1QyS1VVV2NkKzZ3MFFLVBZckZPVVEzRm9Td2NuRzdBczUwMuXIMHVDzjv5V2Fs

ajFaZ3ZNcE5UcGhYbHByNUVMZG9WWXVOBu00d29hT3VyQjROSkpmY1hvS2syR2d5eFdNRnB6dzZHzJnaVB1dGJ4ODM5L
0JjSGRjQ0YrN1BManp4Y1hWbGt2Vk80OUNUVzBGQnFTaXNIeFk0MjNxbFNWZUhHUVJNTmgwRktOSHhIRVFZVNOM1NPRW
hFWmZ6c1pUQ2dqTFNCa0M4b11jYTNxVE1ab3FwcEM5Q1c5R1pueWtIVDZreXR6cFF1MCtwTWUrbE1rVzFjV1JXTjR4SXd
iaWN3aDYyeWFuOXJWWjFXMVNsOGJWV2Rid2szVzFvbkhsUzFxhE9kv1Nsb29tR1ZSeDZJUXdsVUhrNst2NWVxVTNBXRZ
cFBxL2djcs9nSudsWmtVShh3cS9qa29Ha1ZuMWJ4U1pkcEZaOERGSitCeENIL2NXczlxY01NclhIRGFLTFZibHJ0SmluM
1R1Tm1xOTNFZZyV2J1VG4wVzdrSxhOYXNoMDU2Vk5sc1c3em9zNDREMDZUM1RKL2kvQyt0ZmZOYnFrTSttS1RXMwtxdS
txOTYrakUyTHFFZ1NoNTkvbUVkNGFGUFRSM2E5akJsNFpsVGhkbmh0NGZUUFLBU2IxTW11QnE2OTVzNnk2S1kvZmVZNR
6MGt1U0c3dFBMSVJGN015R1FmZG04bWVYQ3ZOSUDKd0x3TwkxYzFVZW9QdWJranUzNkhXRU1GZ21UM2NKc2VGWFnIay9T
OTVmMmQyN3hjTFV5Ni90Q29FNzdOS3hzSzDFR2xoL2VDNFBoUEtCWGRrTDRJMzJ2ekV5Mst0dEhCbUNjQ1IvQvp1UGdSd
1hiVnp5eVhTMm52V0VYS01Ud0REamhET1Flb1zae1F6SUwzMXA1UU1IcG53M1M2dVV6UUQ3VnJxWGNpSmNsRTZXdlpWMU
5jWcTsajVSR1E2MG1tcy9Qd11GZ1NNZVZkTDZ4VDF3ZW1IbGQ4QTgzVEJ0WU5YQnFQK1I0c3AxMGFoc0x1K01kTEJjaHN
hSzVLL0hHUnBmcmtINzI4RDFtaGlIWHpSRjR6aH4b25yaDdQU280aENhb21pS11vZlpBT1FXMXh2Y2IzZEFSMSkVvY1JF
OF1KTv1mSnB3djNsSTJ0emdaVDI2Z2pEdnRKZ3VQNERzY2duNnBRMFRMeTB1YzgzzGVRVHovY1F0ZzFBWG1UaHVSTmNZd
kNFRE96ai9IQRt0WdEOGJhV1gyMG1POX1vRmJY2W5IME1vY1BrWDVrZmV6eEVGcmEwV1EzcHhMSTIyREJnTjZYSkdvTm
5iNFAxK0hsbmpvdXV1a2xhemx3QWsVdm1NbDV1bjR3eHZYakJwN2RJZVA2VEZYbUozamswdU9LQi9hdHJ1bWJBNmNJY1U
yK0RwUFcwOUJoZDQzazRyVGV4QV1Mv1JUaFFBmkhMWEFKKzZqUppZHvWnkpRYUVouGRVStdURmFTdXBDS1J1U3NJOEOr
NU1BajhYUUx6WFBSV1BZwmV5WFNmN3ltMzdjME16Ui4Y1Z5L29yUE1qTUdHb1dyZwdiVG95bEthc1FMdWpxNDNsYkppT
zJrYXpodnMvb1YrcGZ1bDJBm094MFRYaWVjZHMz1ZrM0xFeTuYRktQYzJOQmFkMGYrVk5zRdd3Q0tmQnNrMDFx0p1YV
pLbE0xaHFraVF5cUdxRFAXTExiNUZGaFZyZitWRE1kM3JqRD1jM3R60WNuMzM3dW9XVGNucGJ2MXJzSxpSNFFIVVJ5VU1
qbzRxa0N6N1hESERPnhodzE5YzhuaEpHYXVkdzRaVEwzbWFjL0N0YTJjTWRKdWU0ajNXTWVsTTduQ3ZhY2dpVURpc1BB
Q2t1cTfEV1B1YnUrQ31waGziYVRTT2xLShpTwkJkeKNHN3nNzX1SdzY2L1FheUE0cGpZbGZqQ2V6VFQ1SERrUWVkvNpGc
WzxVHF6RjdwRnVmb0FkdExndmFvOWJ0dCt0NGU1U2R6MjNIWDJPS29Vcy85YXvhL25odFZUMy90Z09wTEJLVWFLMVNQTW
tsemU5Smswa005UXpnTUDGNEF3cFpUc0N1Y0cwQzhzZmQ0ZC9DZ0ovN2hmdWVGK0ZjektoNDZQbS92SGk5bi93eTA2QVR
YOW1nbmJJdXhvb21ZdGw5Y1FYdjdWOWx0NEFkMHQxOUGzs2daR1c4QVBjL3EyUlRmNmgyQ1ZFcUdrSHF4THhObWx6LzJa
Zmt1VWZhaGVzNFNDcmw3dUxoOEFBb3BLQnoxRW1HVVFcb1B6c1I5UFZ5K3B6Mgh0SFFKVZHTS9CVzIwZkjjNED4a2pQN
0dXN0pXdjBMN311S1YyL3d4aXZZWkc5UFNoekz5d1JYbH1Md0pMTDZB0tYQWmzckRDWFBTd3BLazNCcnZKbytQbHcrMX
V1NzNkVUNjS2xhTDFjTE9zUkZFWUVta094ajI10TNGMe1oaVpQcTZMaXJ5d0JDRtNEMdhLVE5MTi9XN3pPT1JmU3RybHJ
aNEFyV2FkQlpJRW1NMkRERVM0VE1MMXNWcU1Rej15YmV2R245VmNkbVZJdFpCamRmRVgZRHXRvg4R1Y4QVV0bVI5Sm1M
VngxSVAwWitCVDRJODRmWFo0Kzh3V1VtdFV0d1hPSUgrREpsVWxWZE5JQW1GeDBtzHpzA3ZncDBVUUpITXJ1QnNsaa2zsR
kZSTEZxeF12SSt4aEtHbTJodFJFRitmdWxkRi91L2NjNH5aDZUTDRXYzVpdXZub1NhNC9hbFRLRmxGODJ3aTVDQXhZSF
dWN3RxYzBmcXMvdFVDUW8xZWRDdk5VT2owMW1RuZavRTNqaDJUQWI1VWRlTGftcm5RZ2R0Y1JOVzkyOC9ISXNyNDJomeJ
RdmkvdmZNNHVoWmtVaVdmCw1IIS0hobDhIMmJQYkwydm9jb3RJR29kamtpNFRoNTMwY1RWRU0wTTVjMk80Z285jFVVVS
Qkz3MGVrZGp6SG9Nb29Hz1hRQ1MvK0VDb3V5bno2by9zcXpqY11EVitoR1hQbEh6WHU40DgzMjh0TD1zOERVZ313MnRhD
k15SHU1RzNuWstsNEZLU01acmhMQWhYOWdwYnhFQ1pVbkVKanJzU1hrV3hFNExVZzM4eXlmZGpnOFVudWlCMH1jTvpFRH
Rqc1Q4NDd5Tj1YVjcwajdpb3BweHI2Szk4TEV1aFBKMhdHb1VabmNCbnR2bnVub110RFhyYUFLSDerc095d1B02ZVrc2J
TazExYVprN0NXYTY5R3MwnjnjU08wWXFNN0Z5RC83aG1WaUpmMktocUthZExdE5yRncrc2FXZmdva3MvWnFheU5JeXdVU1dmazBta2hIC
YVkyTkt2eWNTeVE2O1FnNvCm9zb21WaVpmMktocUthZExdE5yRncrc2FXZmdva3MvWnFheU5JeXdVU1dmazBta2hIC
WRmQ0ZGMHdEMmZUNjK5bmo1VVBEQmpLSjcvCwd3MW8rU1JNNXJVWVvHzXFaUvpkbU9ncTFHbGt6Wk1NUwxUNFdXUW1WMG
tIQ3Fxb0pndEJ2TnNBOXziY3pCTDIwUWhPbFRsRUdRdf1kOEfnWERJT1p3K2VCCzZxSndEckEvWEswNnBObVFaS2F1NGI
4c0V2Nk12S25UQS9TTktkn2svQk16L1BwM0FwcdU1Vfd4RnfjRHvVXF0dkJ2aFlyM1BxYWF1SCs5bzFVUhc0NVNvTkzs
ZmxZTGHj0WhWSU51aUhBz11SXZnakMrdU5iSUN3dH1BQVUwdFZmekV0ZFdycjZodWhLvxpTaFFSuh1M3RfaXppV3F1O
ElrcUtxOF1zbUo1SG1Xa2hONi9YLys3RDgveTfGSGRUN1M2SW9WV293anhGUTFJV0pXNUxLMWFuYw9VNUdVYnpXKzlaS2
NCb3JnYWFLdzc2cUNQM1dTbkbNvbFVBV1pPWU10cHRGYX1YSTFEamFTbENkNHIVSnJZS0owMEDkMwtyd3c1RFRqMk1sZU9
HRVJaMXdyWlhneU5aZkRsMTk5MFDRjA1T29peTJWb01HV245skzQVz1Xd2x1t0VtMVzvTHYxVXFBNtbushFyR291VGW
dFJLRutGaEtWZ3JyRnAxMnMyaXRCUGThujFzSnFxL0thSEtyWU9KMFVLZTFFdnd3NVBUaldbBgvpr0hSRTZBnNCSjhyU
21MeKRMZVhtVVdmdDhBaC80cExuR1JjcDZTTkJxb3c0RXNkSVhHcU9ESz1ueDNHOhdMTzBRaVh1QkVNUkxvMVQxZ0NnM3
NuMXFtYmVvZ21xVjdQYVpoR2pPUnBbmmdKNHJOOUhqSGNiOH13Q0h1uVRyZTBBUFF4cXV6VFArT1n6L21UOWkwZ3RpThp
NZ1BRTXZJSXhiZ0Zna3VYsm9UWk5xNnRUVm9PNmFOL0pYcEljUFJ0MnZvN1R5Vj1pT1A0cWVOSGhMUEE2eWdnVUxuSwTq

Zj1IZkFwMW41VnpteHVMck5VaHhXSkrWmRzWEdjUGpoY2pLN3UwWHY3eDdRdytYN3k0ZUh5VFVubF1rQTFRUDVMMkE5S HlnUGRvT1VVS2ZCYUVaZnV4aWdSakhHZR5Z0raktqWG9xU1d6RUFPdEE3MWRuTy94bUZhENjeFJoK2F1ejuwZnpTc1 1xb1NaSVRqcXk5cjVCY3RDR09qektzTXRrOUTrTTNLZETHSnpwbzztWXVBTWo0ajVpWFrmGJOVGFCZkdCQ0xJQmE1Tjb NbklhUnR1allsU21TSmhzTxhzUkYrV1Z6UvhGTGJZZUVGTwHQty8rRUZKZXJudDzWm1JBbEFIN1YzNUU4VzJJOVNGemRF a3pRVWhKMEUwNkZidllHzjhLOHE5SGJEUzkrM2gxMFJXSEtKbzRkUDkrRjFURXF1dVpTNmplUmQ3VzI0VG8vUk1TMGRWT nB0W1k2UGNFdFJmZXY2UytWY1RNefV1MFFDTGRabDczeW4rZE1SNExyNWh4V014aFNKM3hiR1hhUzlmOFVqdGVLSXVOLz luU3ROMkFMQnzuTTJCQXdFZE4rMz1DN3NXY0FpVU9WcVJUSud0Zmz3cjRRNmhtZDU1ZVBGeD16R2x0TkdvVDFCUFFiv0t xY1F1SzhpemQ1T01tcndvam15eWpVSGZqNTg0Q1cxN3h3c285bGrjK2Z6S0kvVnV1c251dWY0RzhvdXJpVutWcXNhSkpz anJ1ZmRFWxN1RmtLcEJyWw9EVUhPRWdWR1BTSE91V2d5TnqaW5Wa01ieVA4NDZHYzJ5TDZpQ3FnQuG3aUFuQ0N5a310Y UUwYXJyY1AwQW9Xc1NMVjJ4MGpUaHpjWjFzTDZhBvZ4dFhKT0ZqeTZJNVRzbWE0Q0c0NuHmdGppOG5qdTJJakdOcWJhM1 hJZDNxZVUrcnJHOvhRQTNwdU1XYkFMR05udXRRT2tONGZ2aV1DRzJ2a25EVDCvTUxKQWUzUTNOLzJcaXE4UndramJkaUx WbVVCRUVvYUZvbEZ1bUgvk1JXOFNLL2FqOHN1U2FxMEYyQk5tchv4bGtONklsaHFHN3h3K2N0Ni9QSmcrejd0VDUyS1hR NjNnMGI5REVrR1NBS3hqVDMrbD1KODU2RHNEWVBudEpxZ3hPaU9ZTjg4TjA4OEZZdElFnjztVmZNUzFZdk11Y3hnZjNMc 1R1bEY3NUM4VnRHUGY0VjJkbFUvMEMyd2FLzm85NndaYzZXR3E2eU1JZEVSL0wvR1JHdmlQz1ZMQmJyN01HcU9nYmtMQz V0SWx4R2ZDSFE4MmljaE5XMFJpVWV4RCtLdWnhY1QzS1lqcmowUkw0dGowTzdTc21oZ2tQWDR3V2VHMFUK05rSGFmBnF nV3A3eDBJYk9NU2oxNUTZWEJneGQ3VEZ1NmNjMzBnNkgzQk1IVG5GQ1pEbGZSbERRdVNWbjRWZkRDbzN5Wm8rdHNOQXNE S1J4bHdUSXZTSHEvUmwzdk11d2xrWT1Lb1Y0cUzsVmZRUDF5K2YyRGVpd1NWL0JIaXvjS1IzVXFxaDhNbUw0d09Wyst2W WJ3djNPQithZC9nM3UvM1ZaSDdBdmNNK0pOQW9EckFobDU3OTntSkpNNTF0cUVWOGs4dDVJd1Zv21JaHJZNfHNam5WVF MvcnR5dkNKS2d5bG9yOTdkeVAweW1WdXV1NvpnN115UE1zd241MFppR21xckpIQTQ0VGVOVkErS0J1Uy9maXhJd291Zvg 4Ti9oThpRMTRBZUNMWctsWTV1Z3FlTnVuSENiyUdYOVZ0WnZaJm0Zx12cnQ3TCtzOGo2eittR1BaVWY5a2hIN1A2ZvdF V1ZGS0hMy2ZjM0o0WmYycnF6cGNsKzJXZHhcDlQbGEwMDzhRXA1K3paV2ExNz1pemxvQTE5Y2RTMXVZTWs4WmJtWG9mW DRwTFe3NW80czNhdXpyTmNmdeN6bkn1TT1oTjY4VUJLRE80d11XUU5MYnJQTA1RGPvWWwybkF4YStieERjdta0V0xXU0 02R2QzZVJuTzJiTjVFa2E1RGFZeTrwTwpjYTU2Q1UN1hiSzz3cjF6a2trMEDkYwk4UGFDZ0RGZXJdcElqU29vOUZ0Z2F ac0k2UGZVSGdzUndzM2VnK0g30Efrblp3bTYybnU0VFk4S3N1aW9Iak9uRm1rTUx1MTVRd014dFdYMVdlb0J1WHJhckZ6 VDF3VTFORmpGVkZzQVhwcehEekYwM1J1Q1YdUhEenlsNEFQdGoveGloOvdBTGg5TEVheDBVz1VYohluYTFuUFZhzkZ3S GNZQjNKZmhZa1ppZmVhSk0bVpBWxp3a1JWV014cjBiaTRSQXFOSvhFZCsvZ1gwMHwZDN2ai91Vhg2dkwyMGQwzS9rSE VnVjBjM1g3KytQbDdLV2dLanY2cXdsVwzVwj1RU3dFdVRTaEx1VhZzC25hbWd6VuptTzNabzV1Wwd1dGdOODU3aE5Udg8 rS2ZBaUxsTXIzcjQ0VThNTnVvbDZhdTVVQTFkNUxRRXNrZct1TzR0dVk4MWNuuKc4SUNETG1KbjnjTWZ4QUU0bURDbHdv bmo2MWhTHIrOUR1dGw1YUxEb1J1Q1pleWh1ZitVTW9Qb1dZazzQREQ3jBRQ1h5MXM1ZjhKL1g0ZE9NUGhsdmNpWC9ER FNSK00oxWjhqNFV2S1BeBHNsLzzjY05kdkhTeFp0Vk10TFRQa0j5QzQwY110Vtk0s25wzVp1NjhurG1JV2VCK2owWUI0d2 1hVh1Xl0tPZUU5RFNzTvP6VmpvM0tdHVwbHZYRFFCMDfNUVorQ21hcGxQT2kxUno1NzBiWG8vZw15eEplbxJdcGYwSmx kZT1kWhppc1dZekhubXo4L21TY0UxK05sd0xmb2FFaVhiWF1DTHVdeTRQdG5idUtjNE1ORzZuMi80dEh4UXVY1KBCQW10 OWhXUnRwB0gvUngxb0xNQ1MyOXRBWxXMXd1M3QwWmxqWFhkUWhGWW9kQytqMnc5WEp4T01Hb3FXN3pQbHBZTDU5eUkyL zBxcU9oU0hqZWNmcUteEOFBIaxWx0bUx1VEJVL0VOVW9VbGVSREJ4U2pTSVJDUjRxb2pnM1dxbzVqbXBZQm9SeXFsrWtUYU Jud1FWUmd2OXdCQzd0UXpzbFVraExOKzF1RTA3U1M2S2I3M2UzzVU3N2dGeXV5U3VxSkE4YmpKZWza315UUZPNi9OZ0V ya01Qc2FmaVpUK2FudWt60vh1ZwlxZnk2dkgwM1pqRHI5N2ZGeGtDMEt1elduZGZdc3BQMF5RkgzSkRldT15eWJnQ1Ux NOF0Qk13MW9oeXJyU3c1eG9YUWUQ2Y0x0RzNScGJwK1VYL21nbDRGSFNNqjg3RkR3QU8xbGN3T1BxQjz1Y2I5WUTXVU5c m1aSD1zR1dEWHUxa1BBWjBhUGtKmXY4NkZ2U2R1ekhXOD1DcmdwNzNuR2NTNUzoazhwQ3FPWk9xTkhomjRDWTQzbWloeT M5dHprM53bWV5b1VLcEUwvjZGL3A1SWJaRzhzb1Vdu28xTUVizmY3Zk5m0Ed1zkdVQTRPYkMzSVZ4aDZxdutBNEVKnj1 UdHN1RDdJNFG3bmJaSmRiV3A0S003cmlPamQwbmhGMmdhUkJrcWFubDc4aDI3TzdjZFBey2M5dzVIWGgzNDFOUGerSjk UWVuZzRMREpsOew0aHRCRzRnRFZkrWtRwfHeW10UmZDTXFJSzJKcjhyQkC3RXZESVRCYTFGNE01RkUrWjM0V29Ldk1Nb mxtaEg2UFZISWNKTktvOWJGRmx0ZGZZWHBxVk5raHZNVExOSUc2M1NOUWRMNE80TGxKMTazTk9FQ0hyRGdGbFJSSG9MYU prbWlHTUtoAXBj0JYQVB3MThBOXp0Si9zZwz0OE15cE1GcDR6bzZNY111U1NzQt13OTNUVHZtUkphWXVIY1QzRW9FVTN OV3V6UmNjYnJBZnRBb1EvaWg5c3V2ZXF3WHJmY1NvamRBQZadWJnQ04wdEVvbC9sZ2xIemhCOGNpcHpoM0x4K1dDbTbn Wm4yc2h4Sm5CNFVIU11GT1RMYit5cuu1SGtLmi8vnkNFVjBSemdwC0RWQstaR21zRWprMURmUU1VU1Y0ZktibHlrYTNvR 3 cwd2VIUTY4M3F5UXYyRTJkTzQxc0tla28wbky3dG1FZwu3bXlnUlBuSmJxNDFMZw0rchZiqvvwN0cxS0w2bvnuxUTE4UV M3bk9JOWVJSFpsMkx2cnBZQU9zcVbaRFZzaTV1MW5YQS92d1ZXSmrJc11vQ01FaWpuR3VLWGNQRWVscUNNVUx4c0dWSDN Pem9Hv1U2clZ6MzzvdWFvaDFsR1dMcFzoUFBJNTV1bFoyVG5jOU9k2kV5RktvZFFJZ0dteDJqQzkwn2pnc1VTRUw3bE1Y

```

MXY2aVBtWHdocm01NkJIR3BJYUNadWM0bmtCalc4TzhBS2p3M0xSc1h1WVEyOEp5bVRiNj1jUD1XeTgwU0EwVVN1aHdXW
jA2enhQdXRIVXdDTU12SVVJOFRsR0ZTVWFwQ2tsZXRpcFpnN1EvR2Y2aGI2QzVGvjbjMkhjWS9CSCs1Zk15THdxUWtHUn
J6eVVhTFJYbFNNZTRTamtZeEVTOEZvZnQ4bHmczMyCDV0a1JCSEFvTjVvMitnU2xKa0tYRXhwWXFWWXU5UjJCWXBxTU0
zaDdSYU1pMXFJaATA2N0Mzt29UTkZ0c2JXVjhRcnNwOGp0aj1XNjA0ZD1wGhsMk80TUs5Yk1KaHRzMTB1c3NLMDNDeGNQ
bFoxTE1JaHcvSHRySSswOGg4ZU91OEFXaWpkTWhZa2dweWxacVJKT3NtTTAwb1Q1NVFWcUpRZHF1UThsU2hWYmxDcTVPR
jhtVUxUVkpDTXQxbmRPRVRCMU1WWVzdXQwSVEexeUYyeHBZS1ZJM5tM1EzSzJJL1dXU3pjW1XTm1lejhsZ11XchQ2TV
p0bXJwVXdnYWdvb1BXeUsvYmgzNzMxTmZJY2Frc0s4NXNZcnJOQ1Y3ZVBkNFY4bXBLMnk2ZXB1cEZQa3dWV3NBREVDSGF
zVWhkYjRWVXVDSy9vRDN0V11IM290T2w0ampYVEZIYnlwbzZwaU5WM0NCM1h1a2RjN1BwQUVnMk5aYnJoVEwzRGlaSW55
N3dUSmQ1aGFQU0Z1QkNKY2VRSH1xM001WXJuTkV4bC9FbDlacUJDV3A2R2NnTEIvTmJrORGRuek1GQzIvWEFaV2ZOUjFjV
0x5QS9FNmNjK3ZQVm04Z01kbGpDemZrLzV1c21CS3JKSG5EYTV6bxh0K21zRW9vblhadEpwTSttMG1YVGk3MjBtb1RhVH
pvk1dTWNWeW0wSk1Qa3Fhb04ycjE4Y2JMSHRYY0VYVUNaamxmTVU1OG5DUHA3M3hoQ3FpNk83Q116VXBmNjh6RTBjRkw
3Q0M1UzdQS3ZtU282MF1oMXBzc3pUcVBUTEExbHVMZXdtN3BIa08vMDRzVUZucENLNXM2QVJFZkczb1FxYTc0YVpSWVor
K1FWRThnMjdrMThkMDBZejb3cE9q0XVFT2tpOVFrLzhGMHZrs0pHUC8vNX1kMzIwR211eHpnWHc1Q3JJNjV1aUxLbnN1M
WQzOWoycFA1VDZCNSt4Ofd3SDVOVDg3VmM1VFBoC1SQzRoQXQvbFNRfH5V1k1OFdoVjc4YXZXVGcrZ1JZM1lFU1Zrej
B5bkTBYncrNURzbUk4UTNFd1BRTHzvbEcvR2dWdm9sQ1h4YUZCbjBUWVhaWUtBclNsBZ2bkVec294V0dZVVplMETqZU5
LcDNvcE1XNkZXdW53WnY3MnR1K3NqQzJxeWtjUjBmeExDSnV6eEdscUF0ZWCZf1RN05rRnY0VGtHME9GNX13Rm5EMm9T
ZTYyclc4QzJmTE9rOGJicVozWUpsL080UE5CQkFaS0Z2bEIvalBpbXRSI2pKYzhEeVdZVUxuRFdBOFFvVkx1W1ZZTjVBR
mVXRnF1TzzZT0h2Qi9NT2tUenFNTzg1ajZJSkp6bUtWbUhCRUxYQ1FHM3dLTnFqUzdBZhBcWs0VWxNT2VNzVB0Qk5kbG
VVeDZ5QmpqcUZGbFMrdjU3Y29ydjM2UEhoY3ZKNFF4UE1IZDBreUJyQmZ4RXJZRFBhbFNzbGtWM0ZkTVJ1L0NhTTIyVkp
KZ1Q5K3kxMUo2Q1p2aUxHMW1JR21tdzJqbW430GVuWUtGUTMxVVV2MzBja3JaU0RIMEpSOHawaDFMQkxsc2c0NmJIMn1y
dlpENTZzYkZRT1Q3V290QWQ0c1NTVkJObEY0REs3UHhsT0pEYX1jdnRZRTBoUnVRe1JzWX15cjZxbXRVeUZNaHRibHRiS
zErV1UwRE1zZGdYVWMwMTNodzlnUH1RckFiODFEYmFtd2RZMDJKb0dNMj1mbG9EZw5Ha1FTZ1I3SHoxMThTNEpRa2tWR3
ZYQ2d3Z111b2hNWStQL0JXczRESUE9"
    }
}
]
}

```

Legal Notices

COPYRIGHT NOTICE

Quest Diagnostics Corporate Headquarters, 500 Plaza Drive, Secaucus, New Jersey 07094, U.S.A.

© 2000 – 2021 Quest Diagnostics. All Rights Reserved.

This document is protected by copyright and distributed under licenses restricting its use, copying and distribution. Parties to a user agreement with Quest Diagnostics for the software described in this document are granted permission to use and reproduce portions of this document solely for their internal training requirements, provided that this copyright notice and other proprietary notices appears in all copies. Except as provided in this paragraph, no part of this document may be reproduced or transmitted in any form or by any means without the express written permission of Quest Diagnostics.

CPT copyright 2017 American Medical Association. All rights reserved.

Fee schedules, relative value units, conversion factors and/or related components are not assigned by the AMA, are not part of CPT, and the AMA is not recommending their use. The AMA does not directly or indirectly practice medicine or dispense medical services. The AMA assumes no liability for data contained or not contained herein.

TRADEMARKS

Quest, Quest Diagnostics, the associated logo, Nichols Institute and all associated Quest Diagnostics marks are the registered trademarks of Quest Diagnostics.

CPT is a registered trademark of the American Medical Association.

All third party marks—® and ™—are the property of their respective owners.

DISCLAIMER OF WARRANTIES

THIS DOCUMENT IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. QUEST DIAGNOSTICS DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. IN NO EVENT SHALL QUEST DIAGNOSTICS AND/OR ITS SUPPLIERS BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOSS OF USE, DATA OR PROFITS, WHICH MAY ARISE OUT OF OR IN CONNECTION WITH THE USE OF THESE MATERIALS.

THIS DOCUMENT COULD INCLUDE TECHNICAL INACCURACIES OR TYPOGRAPHICAL ERRORS. THE INFORMATION CONTAINED IN THIS DOCUMENT IS PERIODICALLY CHANGED WITHOUT NOTICE. QUEST DIAGNOSTICS MAY MAKE IMPROVEMENTS AND/OR CHANGES IN THE PRODUCT(S) AND/OR THE SOFTWARE DESCRIBED IN THIS DOCUMENT AT ANY TIME.

RESTRICTED RIGHTS LEGEND

All Quest Diagnostics products and publications are commercial in nature. Use, duplication, or disclosure by the U.S. Government is subject to restrictions of FAR 52.227-14 and FAR 52.227-19, or DFAR 252.227-7015 and DFAR 227.7202-3.

Any rights not expressly granted herein are reserved.

Quanum®



QuestDiagnostics.com