

Product Name and Version	2
INTRODUCTION	2
FHIR Endpoints	2
Production Endpoint	2
Test Server Endpoint	2
Types of Smart-On-FHIR applications	2
Types of Authentications supported	2
Steps for Smart App Launch	2
Client APP Registration	3
Obtain authorization code	4
Obtain access token	7
Symmetric Authentication Request	7
Access FHIR API	10
Request : Patient	10
Request : AllergyIntolerance	15
Request : CarePlan	17
Request : CareTeam	20
Request: Problems / Health Concern	22
Request: Implantable Device	25
Request: Diagnostic Report/ Clinical Notes/ DocumentReference	27
Request: Laboratory Result Observation	29
Request: GOAL	31
Request: Immunization	32
Request: Medication	34
Request: Smoking Status	34
Request: Procedure	38
Request: Provenance	40
Request: Vital Signs	44
Profile audience and scope	52
Security and Privacy Considerations	52
App Protection	52
Terms of Use	53

Product Name and Version : Novoclinical 1.0

INTRODUCTION

In this documentation we will list all the steps required to access protected health information based on the documentation of an open API. The API makes health information broadly available using FHIR®, a set of clinical interoperability resources under the umbrella of the HL7 standards organization. FHIR is based on common web standards can be reached through a RESTful protocol in which each FHIR resource has a known URL. This document describes OAuth 2.0 for client applications to authorize, authenticate, and integrate with FHIR-based data systems.

We follow Smart-On-FHIR authentication (OAuth2) and authorization (Ref. <http://hl7.org/fhir/smart-app-launch/toc.html>)

FHIR Endpoints

Note: Production and Test Server endpoints are subject to change.

Production Endpoint

- FHIR: <https://fhir.novoclinical.com/fhir>
- Authentication Server: <https://smartserver.novoclinical.com>

Test Server Endpoint

- FHIR: <https://fhir.novoclinical.com/fhir>
- Authentication Server: <https://smartserver.novoclinical.com>

Types of Smart-On-FHIR applications

- Standalone App: SMART on FHIR confidential client with a patient context, refresh token, and OpenID Connect (OIDC) identity token.
- EHR Embedded app: Demonstrate the ability to perform an EHR launch to a SMART on FHIR
- Smart Backend Services App (Multi-patient authorization and API): These are server-to-server backend applications e.g. Export clinical data for multiple patients in a group. This app is system level app without any UI.

Types of Authentications supported

- Symmetric ("client secret") authentication ([HL7.FHIR.UV.SMART-APP-LAUNCH\Example App Launch for Symmetric Client Auth - FHIR v4.0.1](#))
- Asymmetric ("private key JWT") authentication ([HL7.FHIR.UV.SMART-APP-LAUNCH\Example App Launch for Asymmetric Client Auth - FHIR v4.0.1](#))
- Public Clients ([HL7.FHIR.UV.SMART-APP-LAUNCH\Example App Launch for Public Client - FHIR v4.0.1](#))

Steps for Smart App Launch

1. Client App Registration
2. Retrieve .well-known/smart-configuration
3. Obtain authorization code
4. Obtain access token
5. Access FHIR API
6. Refresh Token to obtain new access token

Client APP Registration

Before a SMART app can run against an EHR, the app must be registered with that EHR's authorization service. We are using OAuth 2.0 Client Registration.

Client App Request process

- Third-party application must sign the *API Subscription Agreement* with following details
 - The app name
 - The necessary APIs / Scopes
 - Any redirect URIs
 - Launch URL (optional)
- The application is created by the EHR admin after confirming the app's registration parameters and communicates a Client Id to the app.
 - FHIR APIs (of any supported version) listed within the USCDI v3 core data set will be supported
 - Only reads data from FHIR server

Retrieve .well-known/smart-configuration

In order to obtain launch context and request authorization to access FHIR resources, the app discovers the EHR FHIR server's SMART configuration metadata, including OAuth authorization and token URLs.

FHIR server makes SMART configuration available from well-known endpoint. You can get Authorization end point and token endpoint.

Request

GET 200 [https://\[FHIR-Base-URL\]/r4/.well-known/smart-configuration](https://[FHIR-Base-URL]/r4/.well-known/smart-configuration)

Response

```
{
  "authorization_endpoint": "https://[SMART-BASE-URL]/oauth2/authorize",
  "token_endpoint": "https://[SMART-BASE-URL]/oauth2/token",
  "revocation_endpoint": "https://[SMART-BASE-URL]/oauth2/revoke-token",
  "token_endpoint_auth_methods_supported": [
    "client_secret_post",
    "client_secret_basic",
    "private_key_jwt"
  ],
  "scopes_supported": [
    "fhirUser",
    "launch",
    "openid",
    "profile"
  ],
  "response_types_supported": [
    "code"
  ],
  "capabilities": [
    "launch-ehr",
    "launch-standalone",
    "client-public",
    "client-confidential-symmetric",
    "sso-openid-connect",
    "context-banner",
    "context-style",
    "context-ehr-patient",
    "context-ehr-encounter",
    "context-standalone-patient",
    "context-standalone-encounter",
    "permission-offline",
    "permission-patient",
    "permission-user"
  ]
}
```

Error codes

JSON response is returned from the FHIR Server along with the code

200: OK

401: Unauthorized

400: Bad Request

500: Internal Server Error

Obtain authorization code

The app supplies the following parameters to the EHR's "authorize" endpoint.

Parameters

response_type	required	Fixed value: <code>code</code> .
client_id	required	The client's identifier.
redirect_uri	required	Must match one of the client's pre-registered redirect URIs.
launch	conditional	When using the <code>EHR Launch</code> flow, this must match the launch value received from the EHR. Omitted when using the <code>Standalone Launch</code> .
scope	required	Must describe the access that the app needs, including scopes like <code>patient/*.rs</code>, <code>openid</code> and <code>fhirUser</code> (if app needs authenticated patient identity) and either: a <code>launch</code> value indicating that the app wants to receive already-established launch context details from the EHR a set of launch context requirements in the form <code>launch/patient</code>, which asks the EHR to establish context on your behalf. Please refer to the scopes supported in the table below
state	required	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. The parameter SHALL be used for preventing cross-site request forgery or session fixation attacks. The app SHALL use an unpredictable value for the state parameter with at least 122 bits of entropy (e.g., a properly configured random uuid is suitable).

aud	required	URL of the EHR resource server from which the app wishes to retrieve FHIR data. This parameter prevents leaking a genuine bearer token to a counterfeit resource server. (Note that in the case of an <code>EHR launch</code> flow, this <code>aud</code> value is the same as the launch's <code>iss</code> value.) Note that the <code>aud</code> parameter is semantically equivalent to the <code>resource</code> parameter defined in RFC8707 . SMART's <code>aud</code> parameter predates RFC8707 and we have decided not to rename it for reasons of backwards compatibility. We might consider renaming SMART's <code>aud</code> parameter in the future if implementer feedback indicates that alignment would be valuable. For the current release, servers SHALL support the <code>aud</code> parameter and MAY support a <code>resource</code> parameter as a synonym for <code>aud</code> .
-----	----------	---

Scopes Supported

Scope	Grants
patient/*.read	Permission to read and search any resource for the current patient (see notes on wildcard scopes below).
user/*.read	Permission to read and write all resources that the current user can access (see notes on wildcard scopes below).
openid	Permission to retrieve information about the current logged-in user.

Scope	Grants
fhirUser	
launch	Permission to obtain launch context when app is launched from an EHR.
launch/patient	When launching outside the EHR, ask for a patient to be selected at launch time.
offline_access	Request a refresh_token that can be used to obtain a new access token to replace an expired one, even after the end-user no longer is online after the access token expires.

Here's an example of an authorization request using HTTP GET. You will replace the **[redirect_uri]**, **[client_id]**, **[launch_token]**, **[state]**, **[code_challenge]**, and **[audience]** placeholders with your own values.

Request

```
https://[SMART-BASE-URL]/oauth2/authorize?
&response_type=code
&client_id=app-client-id
&redirect_uri=https%3A%2F%2Fapp%2Fafter-auth
&launch=xyz123
&scope=launch+patient%2FObservation.rs+patient%2FPatient.rs+openid+fhirUser
&state=XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX
&aud=https://[FHIR-Base-URL]
```

e.g.

```
https://[SMART-BASE-URL]/oauth2/authorize
?response_type=code
&client_id=SAMPLE_CONFIDENTIAL_CLIENT_ID
&redirect_uri=https%3A%2F%2Finferno.healthit.gov%2Finferno%2Foauth2%2Fstatic%2Fredirect
&scope=launch%2Fpatient+openid+fhirUser+offline_access+patient%2FMedi
cation.read...patient%2FPractitionerRole.read
&state=XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX
&aud=https%3A%2F%2F[FHIR-Base-URL]
```

Response

The EHR's authorization server reviews the request from your application. If approved, the authorization server redirects the browser to the redirect URL supplied in the initial request and appends the following querystring parameter.

- **code**: This parameter contains the authorization code generated by EHR, which will be exchanged for the access token in the next step.
- **state**: The exact value received from the client.

Here is how redirect URL will look like

Location: `https://app/after-auth?code=123abc&state=98wrghuwuogerg97`

```
https://[SMART-BASE-URL]/oauth2/token
?code=SAMPLE_CODE_GOES_HERE
&state=XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX
```

After receiving the authorization code, your application trades the code for a JSON object containing an access token and contextual information by sending an HTTP POST to the token endpoint using a Content-Type header with value of "application/x-www-form-urlencoded".

Error codes

JSON response is returned from the FHIR Server along with the code

200: OK

401: Unauthorized

400: Bad Request

500: Internal Server Error

Obtain access token

For **public apps**, authentication not required because a client with no secret cannot prove its identity when it issues a call. (The end-to-end system can still be secure because the client comes from a known, https protected endpoint specified and enforced by the redirect uri.)

For **confidential apps**, authentication is required. Confidential clients SHOULD use [Asymmetric Authentication](#) if available, and MAY use [Symmetric Authentication](#).

There are two different requests to get access token based on authentication type. In case of Symmetric (“client secret”) authentication app issues an HTTP POST to the EHR authorization server’s token endpoint URL using content-type application/x-www-form-urlencoded. In case of Asymmetric authentication app, generate a client authentication assertion and prepare arguments for POST to token API:

Request

Parameters		
grant_type	required	Fixed value: authorization_code for symmetric and client_credentials for assymetric
Code	required	Code that the app received from the authorization server
redirect_uri	required	The same redirect_uri used in the initial authorization request
client_id	conditiona	Required for public apps . Omit for confidential apps .
client_assertion_type	conditiona	Required for asymmetric authentication. set to urn:ietf:params:oauth:client-assertion-type:jwt-bearer
client_assertion	conditiona	Required for asymmetric authentication. set to a JWT signed with your dynamic client’s private key
Scope	conditiona	system/*.read for backend services type of application (bulk operations)

Symmetric Authentication Request

[https://\[SMART-BASE-URL\]/oauth2/token](https://[SMART-BASE-URL]/oauth2/token)

Payload

grant_type=authorization_code&code=SAMPLE_CODE_GOES_HERE&redirect_uri=https%3A%2F%2Ffinferno.healthit.gov%2Ffinferno%2Foauth2%2Fstatic%2Fredirect

In case of Asymmetric authentication following is a request

client_assertion=eyJ0e.....DSBRA&client_assertion_type=urn%3Aietf%3Aparams%3Aoauth%3Aclient-assertion-type%3Ajwt-bearer&grant_type=client_credentials&scope=system%2F%2A.read

Response

The EHR authorization server SHALL return a JSON object that includes an access token or a message indicating that the authorization request has been denied. The JSON structure includes the following parameters:

Parameters

access_token	required	The access token issued by the authorization server
token_type	required	Fixed value: Bearer
expires_in	recommended	Lifetime in seconds of the access token, after which the token SHALL NOT be accepted by the resource server
scope	required	Scope of access authorized. Note that this can be different from the scopes requested by the app.
id_token	optional	Authenticated user identity and user details, if requested
refresh_token	optional	Token that can be used to obtain a new access token, using the same or a subset of the original authorization grants

Sample response

```
{
  "need_patient_banner": true,
  "smart_style_url": "https://launch.smarthealthit.org/smart-style.json",
  "user": null,
  "patient": "102",
  "encounter": null,
  "refresh_token": "eyJ0e.....YtsNZ",
  "token_type": "bearer",
  "scope": "launch openid fhirUser offline_access patient/Medication.read ..... patient/PractitionerRole.read",
  "client_id": " XXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX ",
  "expires_in": 300,
  "id_token": "eyJ0e..... 2tA25",
  "access_token": "eyJ0...eX0PL",
  "state": null
}
```

Error codes

JSON response is returned from the FHIR Server along with the code

200: OK

401: Unauthorized

400: Bad Request

500: Internal Server Error

At this point, **the authorization flow is complete.**

Access FHIR API

With a valid access token, the app can access protected EHR data by issuing a FHIR API call to the FHIR endpoint on the EHR's resource server. Only HTTP GET request types are supported while accessing FHIR Resource API. Following resources are supported

FHIR Resource

Allergies and Intolerances

Assessment and Plan of Treatment

Care Team Members

Clinical Notes - US Core [DocumentReference](#) Profile & US Core [DiagnosticReport](#) Profile for Report and Note Exchange

Goals - US Core [Goal](#) Profile

Health Concerns - US Core [Condition](#) Profile

Immunizations - US Core [Immunization](#) Profile

Laboratory - US Core [Laboratory Result Observation](#) Profile & US Core [DiagnosticReport](#) Profile for Laboratory Results Reporting

Medications - US Core [Medication](#) Profile, US Core [MedicationRequest](#) Profile, US Core [AllergyIntolerance](#) Profile

Patient Demographics - US Core [Patient](#) Profile

Problems - US Core [Condition](#) Profile

Procedures - US Core [Procedure](#) Profile

Provenance - US Core [Provenance](#) Profile

Smoking Status - US Core [Smoking Status Observation](#) Profile

Unique Device Identifier(s) for Patient's Implantable Device(s) - US Core [ImplantableDevice](#) Profile

Vital Signs - FHIR Core [VitalSigns](#) Profile

Request : Patient

Search Parameters

_id: GET [Base_URL]/Patient/_search?Patient=[id]

Identifier : GET [Base_URL]/Patient?identifier={system|}{code}

Name: GET [Base_URL]/Patient?name={string}

birthdate + name : GET [Base_URL]/Patient?birthdate=[date]&name={string}

gender + name : GET [Base_URL]/Patient?gender={system|}{code}&name={string}

Response

US Core Patient Profile as specified in the [US Core v6.1 Implementation Guide](#)

Code: 200 (Success)

```
{
  "resourceType": "Bundle",
  "id": "6f1d6f2d-c42b-453b-8f5a-8d74c24f6fb6",
  "type": "searchset",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://FHIR-Base-URL/api/v4/Patient?_count=10&_id=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b&_page=1"
    }
  ],
  "entry": [
    {

```

```

"id": "17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b",
"fullUrl": "https://FHIR-Base-URL/api/v4/Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b",
"resource": {
  "resourceType": "Patient",
  "id": "17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b",
  "meta": {
    "versionId": "3",
    "lastUpdated": "2022-03-24T10:50:49.231Z",
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-patient"
    ]
  },
  "text": {
    "status": "generated",
    "div": "<div xmlns='\"http://www.w3.org/1999/xhtml\"'>Generated by <a
href='\"https://github.com/synthetichealth/synthea\"'>Synthea</a>.Version identifier: v2.6.1-3-g50f4f58f\\n . Person seed:
4286870567281389426 Population seed: 3</div>"
  },
  "extension": [
    {
      "extension": [
        {
          "url": "ombCategory",
          "valueCoding": {
            "system": "urn:oid:2.16.840.1.113883.6.238",
            "code": "2106-3",
            "display": "White"
          }
        },
        {
          "url": "text",
          "valueString": "White"
        }
      ]
    },
    {
      "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-race"
    },
    {
      "extension": [
        {
          "url": "ombCategory",
          "valueCoding": {
            "system": "urn:oid:2.16.840.1.113883.6.238",
            "code": "2186-5",
            "display": "Non Hispanic or Latino"
          }
        },
        {
          "url": "text",
          "valueString": "Non Hispanic or Latino"
        }
      ]
    },
    {
      "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-ethnicity"
    },
    {
      "url": "http://hl7.org/fhir/StructureDefinition/patient-mothersMaidenName",
      "valueString": "Christen366 Murray856"
    },
    {
      "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-birthsex",
      "valueCode": "M"
    },
    {
      "url": "http://hl7.org/fhir/StructureDefinition/patient-birthPlace",
      "valueAddress": {
        "city": "Springfield",
        "state": "Massachusetts",

```

```
    "country": "US"
  }
},
"identifier": [
  {
    "system": "https://github.com/synthetichealth/synthea",
    "value": "e91975f5-9445-c11f-cabf-c3c6dae161f2"
  },
  {
    "type": {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
          "code": "MR",
          "display": "Medical Record Number"
        }
      ],
      "text": "Medical Record Number"
    },
    "system": "http://hospital.smarthealthit.org",
    "value": "e91975f5-9445-c11f-cabf-c3c6dae161f2"
  },
  {
    "type": {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
          "code": "SS",
          "display": "Social Security Number"
        }
      ],
      "text": "Social Security Number"
    },
    "system": "http://hl7.org/fhir/sid/us-ssn",
    "value": "999-61-9798"
  },
  {
    "type": {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
          "code": "DL",
          "display": "Driver's License"
        }
      ],
      "text": "Driver's License"
    },
    "system": "urn:oid:2.16.840.1.113883.4.3.25",
    "value": "S99940282"
  }
],
"name": [
  {
    "use": "official",
    "family": "Harry",
    "given": [
      "Tom"
    ],
    "prefix": [
      "Mr."
    ],
    "suffix": [
      "Jr."
    ]
  }
],
```

```

{
  "use": "maiden",
  "given": [
    "Alex"
  ]
},
"telecom": [
  {
    "system": "phone",
    "value": "555-770-2787",
    "use": "home"
  }
],
"gender": "male",
"birthDate": "1941-09-05",
"address": [
  {
    "extension": [
      {
        "extension": [
          {
            "url": "latitude",
            "valueDecimal": 42.1343534042923
          },
          {
            "url": "longitude",
            "valueDecimal": -72.67217549422628
          }
        ],
        "url": "http://hl7.org/fhir/StructureDefinition/geolocation"
      }
    ],
    "line": [
      "599 Schowalter Promenade"
    ],
    "city": "West Springfield",
    "state": "MA",
    "postalCode": "01089",
    "country": "US",
    "period": {
      "start": "1940-09-05"
    }
  }
],
"maritalStatus": {
  "coding": [
    {
      "system": "http://terminology.hl7.org/CodeSystem/v3-MaritalStatus",
      "code": "M",
      "display": "M"
    }
  ],
  "text": "M"
},
"multipleBirthBoolean": false,
"communication": [
  {
    "language": {
      "coding": [
        {
          "system": "urn:ietf:bcp:47",
          "code": "en-US",
          "display": "English"
        }
      ]
    }
  }
],

```

```
      "text": "English"
    }
  ]
},
"search": {
  "mode": "match",
  "score": 1
}
}
```

Request : AllergyIntolerance

Search Parameters

GET GET [Base_URL]/AllergyIntolerance?Patient=[id]

Response

Each resource returned from the first search is expected to conform to the [US Core AllergyIntolerance Profile](#).

Code: 200 (Success)

```
{
  "resourceType": "AllergyIntolerance",
  "id": "17e7758c319-7955ecfe-94da-4071-8488-4ef21425ed85",
  "meta": {
    "versionId": "1",
    "lastUpdated": "2022-01-20T11:56:52.889Z",
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-allergyintolerance"
    ]
  },
  "clinicalStatus": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/allergyintolerance-clinical",
        "code": "inactive"
      }
    ]
  },
  "verificationStatus": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/allergyintolerance-verification",
        "code": "confirmed"
      }
    ]
  },
  "type": "allergy",
  "category": [
    "food"
  ],
  "criticality": "low",
  "code": {
    "coding": [
      {
        "system": "http://snomed.info/sct",
        "code": "300916003",
        "display": "Latex allergy"
      }
    ],
    "text": "Latex allergy"
  },
  "patient": {
    "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882dfdb2be4b"
  },
  "recordedDate": "1941-10-14T18:33:18-05:00",
  "reaction": [
    {
      "manifestation": [
        {
          "coding": [
            {
              "system": "http://snomed.info/sct",
              "code": "271807003",
              "display": "skin rash"
            }
          ]
        }
      ]
    }
  ],
}
```

```
    "text": "skin rash"  
  }  
}  
}  
]
```

Request : CarePlan

GET [Base_URL]/AllergyIntolerance?CarePlan=assess-plan&patient=[id]

e.g.

[https://\[Base_URL\]/CarePlan?category=assess-plan&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b](https://[Base_URL]/CarePlan?category=assess-plan&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b)

Response

Each resource returned from the first search is expected to conform to the [US Core CarePlan Profile](#).

Code: 200 (Success)

```
{
  "resourceType": "Bundle",
  "id": "79d7a78e-de9b-4c5c-b51d-45b72963ae1f",
  "type": "searchset",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://fhir.novomedici.com:9443/fhir-server/api/v4/CarePlan?_count=10&category=assess-plan&patient=Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b&_page=1"
    }
  ],
  "entry": [
    {
      "id": "17e776e13ff-1ea7505d-f475-4f49-adde-30e69df86734",
      "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/CarePlan/17e776e13ff-1ea7505d-f475-4f49-adde-30e69df86734",
      "resource": {
        "resourceType": "CarePlan",
        "id": "17e776e13ff-1ea7505d-f475-4f49-adde-30e69df86734",
        "meta": {
          "versionId": "2",
          "lastUpdated": "2022-01-21T10:56:06.304Z",
          "profile": [
            "http://hl7.org/fhir/us/core/StructureDefinition/us-core-careplan"
          ]
        },
        "text": {
          "status": "generated",
          "div": "<div xmlns='\"http://www.w3.org/1999/xhtml\"'>Care Plan for Fracture care.<br/>Activities: <ul><li>Fracture care</li><li>Fracture care</li></ul><br/>Care plan is meant to treat Fracture of clavicle.</div>"
        },
        "status": "active",
        "intent": "order",
        "category": [
          {
            "coding": [
              {
                "system": "http://hl7.org/fhir/us/core/CodeSystem/careplan-category",
                "code": "assess-plan"
              }
            ]
          }
        ],
        {
          "coding": [
            {
              "system": "http://snomed.info/sct",
              "code": "384758001",
              "display": "Self-care interventions (procedure)"
            }
          ]
        },
        "text": "Self-care interventions (procedure)"
      }
    ]
  ],
}
```

```
"subject": {
  "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
},
"encounter": {
  "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
},
"period": {
  "start": "1941-10-02T18:33:18-05:00"
},
"careTeam": [
  {
    "reference": "CareTeam/17e775e7546-36e6a4cd-264e-4a94-92fa-cdf1b2fa30c1"
  }
],
"activity": [
  {
    "detail": {
      "code": {
        "coding": [
          {
            "system": "http://snomed.info/sct",
            "code": "409002",
            "display": "Food allergy diet"
          }
        ],
        "text": "Food allergy diet"
      },
      "status": "in-progress",
      "location": {
        "reference": "Location/17e7750e68f-6266aec8-0cd3-443e-adb9-be37f3bf25f2",
        "display": "HOLYOKE MEDICAL CENTER"
      }
    }
  },
  {
    "detail": {
      "code": {
        "coding": [
          {
            "system": "http://snomed.info/sct",
            "code": "58332002",
            "display": "Allergy education"
          }
        ],
        "text": "Allergy education"
      },
      "status": "in-progress",
      "location": {
        "reference": "Location/17e7750e68f-6266aec8-0cd3-443e-adb9-be37f3bf25f2",
        "display": "HOLYOKE MEDICAL CENTER"
      }
    }
  },
  {
    "detail": {
      "code": {
        "coding": [
          {
            "system": "http://snomed.info/sct",
            "code": "58332002",
            "display": "Allergy education"
          }
        ],
        "text": "Allergy education"
      },
      "status": "in-progress",
```

```
    "location": {
      "reference": "Location/17e7750e68f-6266aec8-0cd3-443e-adb9-be37f3bf25f2",
      "display": "HOLYOKE MEDICAL CENTER"
    }
  }
},
"search": {
  "mode": "match",
  "score": 1
}
}
```

Request : CareTeam

GET [Base_URL]/CareTeam?patient=[id]&status=active

e.g.

https://[Base_URL]/CareTeam?patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b&status=active

Response

Each resource returned from the first search is expected to conform to the [US Core CareTeam Profile](#)

Code: 200 (Success)

```
{
  "resourceType": "Bundle",
  "id": "492509fd-0650-4e2e-834f-41fc7b132a5e",
  "type": "searchset",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://fhir.novomedici.com:9443/fhir-server/api/v4/CareTeam?_count=10&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b&status=http://hl7.org/fhir/care-team-status%7Cactive&_page=1"
    }
  ],
  "entry": [
    {
      "id": "17e775e7546-36e6a4cd-264e-4a94-92fa-cdf1b2fa30c1",
      "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/CareTeam/17e775e7546-36e6a4cd-264e-4a94-92fa-cdf1b2fa30c1",
      "resource": {
        "resourceType": "CareTeam",
        "id": "17e775e7546-36e6a4cd-264e-4a94-92fa-cdf1b2fa30c1",
        "meta": {
          "versionId": "1",
          "lastUpdated": "2022-01-20T12:03:06.182Z",
          "profile": [
            "http://hl7.org/fhir/us/core/StructureDefinition/us-core-careteam"
          ]
        },
        "status": "active",
        "subject": {
          "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
        },
        "encounter": {
          "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
        },
        "period": {
          "start": "1941-10-02T18:33:18-05:00"
        },
        "participant": [
          {
            "role": [
              {
                "coding": [
                  {
                    "system": "http://snomed.info/sct",
                    "code": "116154003",
                    "display": "Patient"
                  }
                ],
                "text": "Patient"
              }
            ]
          }
        ],
        "member": {
          "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b",

```

```

    "display": "Mr. Dustin31 Ritchie586"
  }
},
{
  "role": [
    {
      "coding": [
        {
          "system": "http://snomed.info/sct",
          "code": "223366009",
          "display": "Healthcare professional (occupation)"
        }
      ],
      "text": "Healthcare professional (occupation)"
    }
  ],
  "member": {
    "reference": "Practitioner/17e774bb850-6b7b7f50-ed52-4523-a3a8-60fb0ef71c5b",
    "display": "Dr. Patricia625 Kilback373"
  }
},
{
  "role": [
    {
      "coding": [
        {
          "system": "http://snomed.info/sct",
          "code": "224891009",
          "display": "Healthcare services (qualifier value)"
        }
      ],
      "text": "Healthcare services (qualifier value)"
    }
  ],
  "member": {
    "reference": "Organization/17e774dca91-e7e4e9e3-390e-4c10-83ae-88beabc176e2",
    "display": "HOLYOKE MEDICAL CENTER"
  }
},
"managingOrganization": [
  {
    "reference": "Organization/17e774dca91-e7e4e9e3-390e-4c10-83ae-88beabc176e2",
    "display": "HOLYOKE MEDICAL CENTER"
  }
],
"search": {
  "mode": "match",
  "score": 1
}
}
]
}

```

Request: Problems / Health Concern

Search Parameters

```
GET [base]/Condition?patient=[id]&category={system|}{code]
GET [base]/Condition?patient=[id]&category=http://terminology.hl7.org/CodeSystem/condition-category|problem-list-item
GET [base]/Condition?patient=[id]&category=http://hl7.org/fhir/us/core/CodeSystem/condition-category|health-concern
GET [base]/Condition?patient=[id]&category=http://terminology.hl7.org/CodeSystem/condition-category|encounter-diagnosis
e.g
[Base_URL]/Condition?patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b&category=http://hl7.org/fhir/us/core/CodeSystem/condition-category|health-concern
```

Response

Each resource returned from the first search is expected to conform to the US Core [Condition](#) Profile

Code: 200 (Success)

```
{
  "resourceType": "Bundle",
  "id": "f537c30e-fab7-45f0-8167-4ab7a48386ec",
  "type": "searchset",
  "total": 2,
  "link": [
    {
      "relation": "self",
      "url": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Condition?_count=10&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b&_page=1"
    }
  ],
  "entry": [
    {
      "id": "17e7777ce8c-c66752fb-ee1b-40c2-ba5a-2e6ee89b3e1a",
      "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Condition/17e7777ce8c-c66752fb-ee1b-40c2-ba5a-2e6ee89b3e1a",
      "resource": {
        "resourceType": "Condition",
        "id": "17e7777ce8c-c66752fb-ee1b-40c2-ba5a-2e6ee89b3e1a",
        "meta": {
          "versionId": "1",
          "lastUpdated": "2022-01-20T12:30:47.436Z",
          "profile": [
            "http://hl7.org/fhir/us/core/StructureDefinition/us-core-condition"
          ]
        },
        "clinicalStatus": {
          "coding": [
            {
              "system": "http://terminology.hl7.org/CodeSystem/condition-clinical",
              "code": "resolved"
            }
          ]
        },
        "verificationStatus": {
          "coding": [
            {
              "system": "http://terminology.hl7.org/CodeSystem/condition-ver-status",
              "code": "confirmed"
            }
          ]
        },
        "category": [
          {
            "coding": [
              {
                "system": "http://terminology.hl7.org/CodeSystem/condition-category",
                "code": "encounter-diagnosis",

```

```

        "display": "Encounter Diagnosis"
    }
}
},
"code": {
    "coding": [
        {
            "system": "http://snomed.info/sct",
            "code": "444814009",
            "display": "Viral sinusitis (disorder)"
        }
    ],
    "text": "Viral sinusitis (disorder)"
},
"subject": {
    "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882dfb2be4b"
},
"encounter": {
    "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
},
"onsetDateTime": "1940-11-09T18:33:18-05:00",
"abatementDateTime": "1940-11-30T18:33:18-05:00",
"recordedDate": "1940-11-09T18:33:18-05:00"
},
"search": {
    "mode": "match",
    "score": 1
}
},
{
    "id": "17eb029f925-40603327-0ac3-48dd-972b-6c882b8751f5",
    "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Condition/17eb029f925-40603327-0ac3-48dd-972b-6c882b8751f5",
    "resource": {
        "resourceType": "Condition",
        "id": "17eb029f925-40603327-0ac3-48dd-972b-6c882b8751f5",
        "meta": {
            "versionId": "1",
            "lastUpdated": "2022-01-31T12:44:07.847Z",
            "profile": [
                "http://hl7.org/fhir/us/core/StructureDefinition/us-core-condition"
            ]
        },
        "clinicalStatus": {
            "coding": [
                {
                    "system": "http://terminology.hl7.org/CodeSystem/condition-clinical",
                    "code": "resolved"
                }
            ]
        },
        "verificationStatus": {
            "coding": [
                {
                    "system": "http://terminology.hl7.org/CodeSystem/condition-ver-status",
                    "code": "confirmed"
                }
            ]
        },
        "category": [
            {
                "extension": [
                    {
                        "url": "http://hl7.org/fhir/StructureDefinition/data-absent-reason",
                        "valueCode": "unknown"
                    }
                ]
            }
        ]
    }
}

```

```
]
}
],
"code": {
  "coding": [
    {
      "system": "http://snomed.info/sct",
      "code": "195662009",
      "display": "Acute viral pharyngitis (disorder)"
    }
  ],
  "text": "Acute viral pharyngitis (disorder)"
},
"subject": {
  "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
},
"encounter": {
  "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
},
"onsetDateTime": "1961-06-25T01:11:45-04:00",
"abatementDateTime": "1961-07-07T01:11:45-04:00",
"recordedDate": "1961-06-25T01:11:45-04:00"
},
"search": {
  "mode": "match",
  "score": 1
}
}
]
```

Request: Implantable Device

Search Parameters

GET [Base_URL]/Device?patient=[id]

e.g. [Base_URL]/Device?patient=17e77411359-8837d878-ea1e-45b5-bb89-882dfb2be4b

Response

Each resource returned from the first search is expected to conform to the US Core [ImplantableDevice](#) Profile

Code: 200 (Success)

```
{
  "resourceType": "Bundle",
  "id": "5804551e-120d-4164-b05b-9705fad44fa5",
  "type": "searchset",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Device?_count=10&patient=17e77411359-8837d878-ea1e-45b5-bb89-882dfb2be4b&_page=1"
    }
  ],
  "entry": [
    {
      "id": "17e777b3f34-04bc3627-92d3-43bb-92e7-35533110f750",
      "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Device/17e777b3f34-04bc3627-92d3-43bb-92e7-35533110f750",
      "resource": {
        "resourceType": "Device",
        "id": "17e777b3f34-04bc3627-92d3-43bb-92e7-35533110f750",
        "meta": {
          "versionId": "1",
          "lastUpdated": "2022-01-20T12:34:32.884Z",
          "profile": [
            "http://hl7.org/fhir/us/core/StructureDefinition/us-core-implantable-device"
          ]
        },
        "udiCarrier": [
          {
            "deviceIdentifier": "43069338026389",
            "carrierHRF": "(01)43069338026389(11)000302(17)250317(10)1134(21)842026117977"
          }
        ],
        "status": "active",
        "distinctIdentifier": "43069338026389",
        "manufactureDate": "2000-03-02T18:33:18-05:00",
        "expirationDate": "2025-03-17T19:33:18-04:00",
        "lotNumber": "1134",
        "serialNumber": "842026117977",
        "deviceName": [
          {
            "name": "Implantable defibrillator, device (physical object)",
            "type": "user-friendly-name"
          }
        ],
        "type": {
          "coding": [
            {
              "system": "http://snomed.info/sct",
              "code": "72506001",
              "display": "Implantable defibrillator, device (physical object)"
            }
          ]
        },
        "text": "Implantable defibrillator, device (physical object)"
      }
    }
  ]
}
```

```
    },
    "patient": {
      "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882dfb2be4b"
    }
  },
  "search": {
    "mode": "match",
    "score": 1
  }
}
}
```

Request: Diagnostic Report/ Clinical Notes/ DocumentReference

Search Parameters

patient : GET [Base_URL]/DiagnosticReport?patient=[id]
patient + code : GET [Base_URL]/DiagnosticReport?patient=[id]&code={system | }[code]
patient + category: GET [Base_URL]/DiagnosticReport?patient=[id]&category=LAB
patient : GET [Base_URL]/ DocumentReference?patient=[id]

e.g.

[https://\[Base_URL\]/DiagnosticReport?category=LP29684-5&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b](https://[Base_URL]/DiagnosticReport?category=LP29684-5&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b)
[https://\[Base_URL\]/DiagnosticReport?category=LP7839-6&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b](https://[Base_URL]/DiagnosticReport?category=LP7839-6&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b)
[https://\[Base_URL\]/DiagnosticReport?category=LP29708-2&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b](https://[Base_URL]/DiagnosticReport?category=LP29708-2&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b)
[https://\[Base_URL\]/DocumentReference?patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b](https://[Base_URL]/DocumentReference?patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b)

Category and codes details can be obtained from [US Core DiagnosticReport Profile for Report and Note exchange](#)

Response

Each resource returned from the first search is expected to conform to the [US Core DiagnosticReport Profile for Report and Note exchange](#).

Code: 200 (Success)

```
{
  "resourceType": "Bundle",
  "id": "a87a8318-2dfc-488d-9f0a-6b07d7c29271",
  "type": "searchset",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://fhir.novomedici.com:9443/fhir-server/api/v4/DiagnosticReport?_count=10&category=LP29684-5&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b&_page=1"
    }
  ],
  "entry": [
    {
      "id": "17e7b6e6f1c-119e9b8b-11b9-448b-b760-dc116013b654",
      "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/DiagnosticReport/17e7b6e6f1c-119e9b8b-11b9-448b-b760-dc116013b654",
      "resource": {
        "resourceType": "DiagnosticReport",
        "id": "17e7b6e6f1c-119e9b8b-11b9-448b-b760-dc116013b654",
        "meta": {
          "versionId": "1",
          "lastUpdated": "2022-01-21T06:59:02.053Z",
          "profile": [
            "http://hl7.org/fhir/us/core/StructureDefinition/us-core-diagnosticreport-note"
          ]
        },
        "status": "final",
        "category": [
          {
            "coding": [
              {
                "system": "http://loinc.org",
                "code": "LP29684-5",
                "display": "Radiology"
              }
            ],
            "text": "Radiology"
          }
        ],
        "code": {
          "coding": [
            {

```

```
"system": "http://loinc.org",  
"code": "34117-2",  
"display": "History and physical note"  
}  
],  
"text": "History and physical note"  
},  
"subject": {  
  "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdfb2be4b"  
},  
"encounter": {  
  "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"  
},  
"effectiveDateTime": "1974-01-24T19:33:18-04:00",  
"issued": "1974-01-24T19:33:18.715-04:00",  
"performer": [  
  {  
    "reference": "Practitioner/17e774bb850-6b7b7f50-ed52-4523-a3a8-60fb0ef71c5b",  
    "display": "Dr. Blossom971 Christiansen251"  
  },  
  {  
    "reference": "Practitioner/17e774bb850-6b7b7f50-ed52-4523-a3a8-60fb0ef71c5b"  
  },  
  {  
    "reference": "Organization/17e774dca91-e7e4e9e3-390e-4c10-83ae-88beabc176e2"  
  }  
],  
"presentedForm": [  
  {  
    "contentType": "text/plain",  
    "data":  
  
"CjE5NzQtMDEtMjQKCiMgQ2hpZWYgQ29tcGxhaW50Ci0GRGVjcmVhc2VkIGluEp1ZGdlbWVuudAotIENvbmZ1c2lrbgotIE5hc2FsIENvbmdlc3Rpb24KLSTBmVlemluzyBGaXRzCiOGtmFzYWwgRGJzY2hhcmdlCiOgQ291Z2gKCgojlEHpc3Rvcnkgb2YgUHLjc2VudCBjbGxuZXNZCkR1c3RpbjMxIGlzIGEgmzmGeVVhci1vbGQqbm9uLWhpc3BhbmljiHdoaXRIIG1hbGUuIFBhdGlbnQgaGFzIGEgaGlzdG9yeSBvZiBhY3V0ZSBhbGxlcmdpYyByZWJjdGlviwgiWN1dGUgYnJvbmnNoaXRpcyAoZGlzb3JkZXIpLCBsYWNlcmF0aW9uIG9mIHROaWdoLCBvdGI0aXMgbWVkaWEsiHZpcmFiHNpbnVzaXRpcyAoZGlzb3JkZXIpLCBzcHJaHaW4gb2YgYW5rbcUsIGZpcnNOIGRIZ3JIZSbidXJuLCBmcmmFjdHVyZSBvZiBhbmtsZSwgY2hpbGRob29kiGFzdGhtYS4KiMGU29jaWFslEHpc3RvcnkKUGF0aWVudCBpcyBtYXJyaWVklLiBQYXRpZW50IGZlHRibXBvcmFyaWx5IGHvbWVsZXNZLiBQYXRpZW50IGZlIGFuIGFjdGllZSBzbW9rZXlgYW5kiGZlIGFuIGFsY29ob2xpYy4gUGF0aWVudCBpZGVudGlmaWVziGFzIGhldGVyb3NieHVhbC4KClBhdGlbnQgY29tZXMcgZnJvbSBhiG1pZGRsZSBzb2Npb2Vjb25vbWljIGhyY2ncm91bmQuIFBhdGlbnQgZGkiGSvdCBmaW5pc2ggaGlnaCBzY2hvb2wuIFBhdGlbnQgY3VyccmVudGx5IGhhcyBBZRXuRS4KiMgQWxsZXJnaWVzCmxhdGV4IGFsbgVvyZksilGFsbGvYyZkdG8gc29SYQoKIyBNZWRpY2F0aW9ucwphY2VOYW1pbn9waGVuIDMyNSBtZyBVcmFslHRhmYmxIdDsgMTlwIGFjdHVhdCBmbHV0aWNhc29uZSBwcmm9waW9uYXRlIDAuMDQ0IG1nL2FjdHVhdCBtZXRIcmVklGRvc2UgaW5oYWxlcjsghmRhMDIwNTAzlDIwMCBhY3R1YXQgYWxidXRlcm9sIDAuMDkgbWcvYWN0dWF0IG1ldGVyZWQgZG9zZSBpbmhbbGvYyOyBwcmVkbmlzb25lIDUgbWcgbi3JhbCB0YWJsZXQ7IGFzcGliYW4gODEgbWcgbi3JhbCB0YWJsZXQKCiMgQXNZXNXnbWVuudCBhbmQgUGxhbgoKIiMjFlFBsYW4KUgF0aWVudCB3YXMcgZlZlZW4gdGhlIGZvbGxvd2luZYBpbW11bmliGYXRpb25zOiBpbmZsdWVuemEsiHNIYXNVbmFSLCBpbmply3RhYmxlLCBwcmVzZXJ2YXRpdmgZnJlZS4gClRoZSBmb2xsb3dpbmcmcCHjvY2VkdXJlciB3ZXJIIGNvbmmR1Y3RlZDoKLSBtZWRpY2F0aW9uUlHIJY29uY2lsaWF0aW9uIchwcm9jZWR1cmUpClRoZSBwyXRpZW50IHdhcyBwcmVzY3JpVmVklIROzSBmb2xsb3dpbmcbWVkaWNhdGlvbnM6Ci0gMTlwIGFjdHVhdCBmbHV0aWNhc29uZSBwcmm9waW9uYXRlIDAuMDQ0IG1nL2FjdHVhdCBtZXRIcmVklGRvc2UgaW5oYWxlcgtIGSkYTAYMDUwMyAyMDAgYWN0dWF0IGFsYnV0ZXJvbCAwLjA5lIG1nL2FjdHVhdCBtZXRIcmVklGRvc2UgaW5oYWxlcgo="
```

Request: Laboratory Result Observation

Search Parameters

patient : GET [Base_URL]/DiagnosticReport?patient=[id]
patient + code : GET [Base_URL]/DiagnosticReport?patient=[id]&code={system | }[code]
patient + category: GET [Base_URL]/DiagnosticReport?patient=[id]&category=LAB
e.g.

https://[Base_URL]/DiagnosticReport?category=http://terminology.hl7.org/CodeSystem/v2-0074%7CLAB&patient=17e77411359-8837d878-ea1e-45b5-bb89-882dfdb2be4b
https://[Base_URL]/DiagnosticReport?category=LAB&patient=17e77411359-8837d878-ea1e-45b5-bb89-882dfdb2be4b
https://[Base_URL]/DiagnosticReport?category=LAB&patient=Patient/17e77411359-8837d878-ea1e-45b5-bb89-882dfdb2be4b

Category and codes details can be obtained from [US Core DiagnosticReport Profile for Laboratory Results Reporting](#).

Response

Each resource returned from the first search is expected to conform to the [US Core DiagnosticReport Profile for Laboratory Results Reporting](#)

Code: 200 (Success)

```
{
  "resourceType": "Bundle",
  "id": "019290b1-c4e1-4025-862c-60ffc3a6160b",
  "type": "searchset",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://fhir.novomedici.com:9443/fhir-server/api/v4/DiagnosticReport?_count=10&category=http://terminology.hl7.org/CodeSystem/v2-0074%7CLAB&patient=17e77411359-8837d878-ea1e-45b5-bb89-882dfdb2be4b&_page=1"
    }
  ],
  "entry": [
    {
      "id": "17e7b7b7e66-36f4cf84-3482-4e36-8cca-13cc832b3bed",
      "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/DiagnosticReport/17e7b7b7e66-36f4cf84-3482-4e36-8cca-13cc832b3bed",
      "resource": {
        "resourceType": "DiagnosticReport",
        "id": "17e7b7b7e66-36f4cf84-3482-4e36-8cca-13cc832b3bed",
        "meta": {
          "versionId": "1",
          "lastUpdated": "2022-01-21T07:13:17.926Z",
          "profile": [
            "http://hl7.org/fhir/us/core/StructureDefinition/us-core-diagnosticreport-lab"
          ]
        },
        "status": "final",
        "category": [
          {
            "coding": [
              {
                "system": "http://terminology.hl7.org/CodeSystem/v2-0074",
                "code": "LAB",
                "display": "Laboratory"
              }
            ]
          }
        ],
        "code": {
          "coding": [
            {
              "system": "http://loinc.org",
              "code": "51990-0",
              "display": "Basic Metabolic Panel"
            }
          ]
        }
      }
    }
  ]
}
```

```
    }
  ],
  "text": "Basic Metabolic Panel"
},
"subject": {
  "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882dfb2be4b"
},
"encounter": {
  "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
},
"effectiveDateTime": "2017-09-28T19:33:18-04:00",
"issued": "2017-09-28T19:33:18.715-04:00",
"performer": [
  {
    "reference": "Organization/17e774dca91-e7e4e9e3-390e-4c10-83ae-88beabc176e2",
    "display": "PCP170967"
  },
  {
    "reference": "Practitioner/17e774bb850-6b7b7f50-ed52-4523-a3a8-60fb0ef71c5b"
  },
  {
    "reference": "Organization/17e774dca91-e7e4e9e3-390e-4c10-83ae-88beabc176e2"
  }
],
"result": [
  {
    "reference": "Observation/17e77809e90-d5cfd26d-ab5d-4f36-bc32-1ee799b2c278",
    "display": "Glucose"
  },
  {
    "reference": "Observation/17e7785ea69-6c9f88d9-0553-4216-be17-f908ebe0b371",
    "display": "Urea Nitrogen"
  }
]
},
"search": {
  "mode": "match",
  "score": 1
}
}
```

Request: GOAL

GET https://[Base_URL]/Goal?patient=[id]

e.g. https://[Base_URL]/Goal?patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b

Response

Each resource returned from the first search is expected to conform to the [US Core Goal Profile](#)

Code: 200 (Success)

```
{
  "resourceType": "Bundle",
  "id": "6f2db230-b4f4-4447-856b-3f398377a95f",
  "type": "searchset",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Goal?_count=10&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b&_page=1"
    }
  ],
  "entry": [
    {
      "id": "17e7b8b62f8-a4f77df6-b97e-4ece-82ff-36480c9cc38c",
      "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Goal/17e7b8b62f8-a4f77df6-b97e-4ece-82ff-36480c9cc38c",
      "resource": {
        "resourceType": "Goal",
        "id": "17e7b8b62f8-a4f77df6-b97e-4ece-82ff-36480c9cc38c",
        "meta": {
          "versionId": "1",
          "lastUpdated": "2022-01-21T07:30:39.48Z",
          "profile": [
            "http://hl7.org/fhir/us/core/StructureDefinition/us-core-goal"
          ]
        },
        "lifecycleStatus": "active",
        "description": {
          "coding": [
            {
              "system": "http://snomed.info/sct",
              "code": "281004",
              "display": "Alcoholic dementia"
            }
          ],
          "text": "Alcoholic dementia"
        },
        "subject": {
          "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
        },
        "target": [
          {
            "dueDate": "2020-12-07"
          }
        ]
      },
      "search": {
        "mode": "match",
        "score": 1
      }
    }
  ]
}
```

Request: Immunization

GET [https://\[Base_URL\]/Immunization?patient=\[id\]](https://[Base_URL]/Immunization?patient=[id])

e.g. [https://\[Base_URL\]/Immunization?patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b](https://[Base_URL]/Immunization?patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b)

Response

Each resource returned from the first search is expected to conform to the US Core [Immunization](#) Profile

Code: 200 (Success)

```
{
  "resourceType": "Bundle",
  "id": "206f31dc-9636-4e6f-a652-40c307eebe40",
  "type": "searchset",
  "total": 2,
  "link": [
    {
      "relation": "self",
      "url": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Immunization?_count=10&patient=Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b&_page=1"
    }
  ],
  "entry": [
    {
      "id": "17e7b8dc9ab-8abc85e3-0ab1-470f-ae8-1f4e9a3597bb",
      "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Immunization/17e7b8dc9ab-8abc85e3-0ab1-470f-ae8-1f4e9a3597bb",
      "resource": {
        "resourceType": "Immunization",
        "id": "17e7b8dc9ab-8abc85e3-0ab1-470f-ae8-1f4e9a3597bb",
        "meta": {
          "versionId": "1",
          "lastUpdated": "2022-01-21T07:33:16.843Z",
          "profile": [
            "http://hl7.org/fhir/us/core/StructureDefinition/us-core-immunization"
          ]
        },
        "status": "not-done",
        "statusReason": {
          "coding": [
            {
              "system": "http://terminology.hl7.org/CodeSystem/v3-ActReason",
              "code": "OSTOCK",
              "display": "product out of stock"
            }
          ],
          "text": "product out of stock"
        },
        "vaccineCode": {
          "coding": [
            {
              "system": "http://terminology.hl7.org/CodeSystem/data-absent-reason",
              "code": "unknown",
              "display": "Unknown"
            }
          ],
          "text": "Unknown"
        },
        "patient": {
          "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
        },
        "encounter": {
          "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
        },
        "occurrenceString": "1946-08-29T19:33:18-04:00",
        "primarySource": true,
        "location": {
          "reference": "Location/17e7750e68f-6266aec8-0cd3-443e-adb9-be37f3bf25f2",

```

```

      "display": "RIVER BEND MEDICAL GROUP - CHICOPEE OFFICE - URGENT CARE"
    }
  },
  "search": {
    "mode": "match",
    "score": 1
  }
},
{
  "id": "17eb02c0f47-3b8a6c05-ae47-4002-9001-fd61626bfca5",
  "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Immunization/17eb02c0f47-3b8a6c05-ae47-4002-9001-fd61626bfca5",
  "resource": {
    "resourceType": "Immunization",
    "id": "17eb02c0f47-3b8a6c05-ae47-4002-9001-fd61626bfca5",
    "meta": {
      "versionId": "1",
      "lastUpdated": "2022-01-31T12:46:24.583Z",
      "profile": [
        "http://hl7.org/fhir/us/core/StructureDefinition/us-core-immunization"
      ]
    },
    "status": "not-done",
    "statusReason": {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/v3-ActReason",
          "code": "OSTOCK",
          "display": "product out of stock"
        }
      ],
      "text": "product out of stock"
    },
    "vaccineCode": {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/data-absent-reason",
          "code": "unknown",
          "display": "Unknown"
        }
      ],
      "text": "Unknown"
    },
    "patient": {
      "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
    },
    "encounter": {
      "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
    },
    "occurrenceString": "1946-08-29T19:33:18-04:00",
    "primarySource": true,
    "location": {
      "reference": "Location/17e7750e68f-6266aec8-0cd3-443e-adb9-be37f3bf25f2",
      "display": "RIVER BEND MEDICAL GROUP - CHICOPEE OFFICE - URGENT CARE"
    }
  },
  "search": {
    "mode": "match",
    "score": 1
  }
}
]
}

```

Request: Medication

GET [https://\[Base_URL\]/MedicationRequest?patient=\[id\]](https://[Base_URL]/MedicationRequest?patient=[id])

e.g. [https://\[Base_URL\]/MedicationRequest?patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b&intent=order&status=active](https://[Base_URL]/MedicationRequest?patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b&intent=order&status=active)
Response

Each resource returned from the first search is expected to conform to the US Core [Medication](#) Profile, US Core [MedicationRequest](#) Profile
Code: 200 (Success)

```
{
  "resourceType": "MedicationRequest",
  "id": "17e7b9b263e-9cd8f64f-f7e1-447e-8583-a753342d13c6",
  "meta": {
    "versionId": "1",
    "lastUpdated": "2022-01-21T07:47:52.51Z",
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-medicationrequest"
    ]
  },
  "status": "stopped",
  "intent": "plan",
  "reportedBoolean": true,
  "medicationCodeableConcept": {
    "coding": [
      {
        "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
        "code": "2123111",
        "display": "NDA020503 200 ACTUAT Albuterol 0.09 MG/ACTUAT Metered Dose Inhaler"
      }
    ],
    "text": "NDA020503 200 ACTUAT Albuterol 0.09 MG/ACTUAT Metered Dose Inhaler"
  },
  "subject": {
    "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
  },
  "authoredOn": "2020-08-13T19:33:18-04:00",
  "requester": {
    "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
  },
  "reasonReference": [
    {
      "reference": "Condition/17e7777ce8c-c66752fb-ee1b-40c2-ba5a-2e6ee89b3e1a"
    }
  ],
  "dosageInstruction": [
    {
      "sequence": 1,
      "text": "Take as needed.",
      "asNeededBoolean": true
    }
  ]
}
```

Request: Smoking Status

GET [https://\[Base_URL\]/Observation?code=72166-2&patient=\[id\]](https://[Base_URL]/Observation?code=72166-2&patient=[id])

e.g. [https://\[Base_URL\]/Observation?code=72166-2&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b](https://[Base_URL]/Observation?code=72166-2&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b)

Response

Each resource returned from the first search is expected to conform to the US Core [Smoking Status Observation](#) Profile
Code: 200 (Success)

```
{
  "resourceType": "Bundle",
```

```
"id": "2ea85043-b450-40f1-8d2d-751af1c10abb",
"type": "searchset",
"total": 2,
"link": [
  {
    "relation": "self",
    "url": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Observation?_count=10&code=72166-2&patient=17e77411359-8837d878-
ea1e-45b5-bb89-882fdb2be4b&_page=1"
  }
],
"entry": [
  {
    "id": "17e77809e90-d5cfd26d-ab5d-4f36-bc32-1ee799b2c278",
    "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Observation/17e77809e90-d5cfd26d-ab5d-4f36-bc32-1ee799b2c278",
    "resource": {
      "resourceType": "Observation",
      "id": "17e77809e90-d5cfd26d-ab5d-4f36-bc32-1ee799b2c278",
      "meta": {
        "versionId": "1",
        "lastUpdated": "2022-01-20T12:40:24.976Z",
        "profile": [
          "http://hl7.org/fhir/us/core/StructureDefinition/us-core-smokingstatus"
        ]
      },
      "status": "final",
      "category": [
        {
          "coding": [
            {
              "system": "http://terminology.hl7.org/CodeSystem/observation-category",
              "code": "survey",
              "display": "survey"
            }
          ]
        }
      ],
      "code": {
        "coding": [
          {
            "system": "http://loinc.org",
            "code": "72166-2",
            "display": "Tobacco smoking status NHIS"
          }
        ]
      },
      "text": "Tobacco smoking status NHIS"
    },
    "subject": {
      "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
    },
    "encounter": {
      "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
    },
    "effectivePeriod": {
      "start": "1940-09-05T19:33:18-04:00",
      "end": "1940-09-05T20:33:18-04:00"
    },
    "issued": "1940-09-05T19:33:18.715-04:00",
    "valueCodeableConcept": {
      "coding": [
        {
          "system": "http://snomed.info/sct",
          "code": "266919005",
          "display": "Never smoker"
        }
      ]
    },
    "text": "Never smoker"
  }
]
```

```

    }
  },
  "search": {
    "mode": "match",
    "score": 1
  }
},
{
  "id": "17e7785ea69-6c9f88d9-0553-4216-be17-f908ebe0b371",
  "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Observation/17e7785ea69-6c9f88d9-0553-4216-be17-f908ebe0b371",
  "resource": {
    "resourceType": "Observation",
    "id": "17e7785ea69-6c9f88d9-0553-4216-be17-f908ebe0b371",
    "meta": {
      "versionId": "1",
      "lastUpdated": "2022-01-20T12:46:12.073Z",
      "profile": [
        "http://hl7.org/fhir/us/core/StructureDefinition/us-core-smokingstatus"
      ]
    },
    "status": "final",
    "category": [
      {
        "coding": [
          {
            "system": "http://terminology.hl7.org/CodeSystem/observation-category",
            "code": "survey",
            "display": "survey"
          }
        ]
      }
    ],
    "code": {
      "coding": [
        {
          "system": "http://loinc.org",
          "code": "72166-2",
          "display": "Tobacco smoking status NHIS"
        }
      ],
      "text": "Tobacco smoking status NHIS"
    },
    "subject": {
      "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882dfb2be4b"
    },
    "encounter": {
      "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
    },
    "effectivePeriod": {
      "start": "1940-09-05T19:33:18-04:00",
      "end": "1940-09-05T20:33:18-04:00"
    },
    "issued": "1940-09-05T19:33:18.715-04:00",
    "valueCodeableConcept": {
      "coding": [
        {
          "system": "http://snomed.info/sct",
          "code": "266919005",
          "display": "Never smoker"
        }
      ],
      "text": "Never smoker"
    }
  },
  "search": {
    "mode": "match",

```

```
    "score": 1  
  }  
}  
]
```

Request: Procedure

GET [https://\[Base_URL\]/Procedure?patient=\[id\]](https://[Base_URL]/Procedure?patient=[id])

e.g. [https://\[Base_URL\]/Procedure?patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b](https://[Base_URL]/Procedure?patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b)

Response

Each resource returned from the first search is expected to conform to the US Core [Procedure](#) Profile

Code: 200 (Success)

```
{
  "resourceType": "Bundle",
  "id": "ed4425dd-7479-4b52-b404-502697281ee0",
  "type": "searchset",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Procedure?_count=10&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b&_page=1"
    }
  ],
  "entry": [
    {
      "id": "17e7ba24dee-bf67ef6b-6419-4c7c-b905-a107b26bf8fb",
      "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Procedure/17e7ba24dee-bf67ef6b-6419-4c7c-b905-a107b26bf8fb",
      "resource": {
        "resourceType": "Procedure",
        "id": "17e7ba24dee-bf67ef6b-6419-4c7c-b905-a107b26bf8fb",
        "meta": {
          "versionId": "1",
          "lastUpdated": "2022-01-21T07:55:41.422Z",
          "profile": [
            "http://hl7.org/fhir/us/core/StructureDefinition/us-core-procedure"
          ]
        },
        "status": "completed",
        "code": {
          "coding": [
            {
              "system": "http://snomed.info/sct",
              "code": "430193006",
              "display": "Medication Reconciliation (procedure)"
            }
          ],
          "text": "Medication Reconciliation (procedure)"
        },
        "subject": {
          "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
        },
        "encounter": {
          "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
        },
        "performedDateTime": "1941-02-13T18:33:18-05:00",
        "location": {
          "reference": "Location/17e7750e68f-6266aec8-0cd3-443e-adb9-be37f3bf25f2",
          "display": "PCP170967"
        }
      }
    }
  ],
  "search": {
    "mode": "match",
    "score": 1
  }
}
```


Request: Provenance

GET https://[Base_URL]/Provenance/[id]

e.g.

https://[Base_URL]/Provenance/17e8adbdd12-21675728-3f52-4320-8b3b-d5977915336c

Response

Each resource returned from the first search is expected to conform to the US Core [Provenance](#) Profile

Code: 200 (Success)

```
{
  "resourceType": "Provenance",
  "id": "17e8adbdd12-21675728-3f52-4320-8b3b-d5977915336c",
  "meta": {
    "versionId": "5",
    "lastUpdated": "2022-01-31T12:51:12.934Z",
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-provenance"
    ]
  },
  "target": [
    {
      "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
    },
    {
      "reference": "Location/17e7750e68f-6266aec8-0cd3-443e-adb9-be37f3bf25f2"
    },
    {
      "reference": "Organization/17e774dca91-e7e4e9e3-390e-4c10-83ae-88beabc176e2"
    },
    {
      "reference": "Practitioner/17e774bb850-6b7b7f50-ed52-4523-a3a8-60fb0ef71c5b"
    },
    {
      "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
    },
    {
      "reference": "AllergyIntolerance/17e7758c319-7955ecfe-94da-4071-8488-4ef21425ed85"
    },
    {
      "reference": "CareTeam/17e775e7546-36e6a4cd-264e-4a94-92fa-cdf1b2fa30c1"
    },
    {
      "reference": "CarePlan/17e776e13ff-1ea7505d-f475-4f49-adde-30e69df86734"
    },
    {
      "reference": "Condition/17e7777ce8c-c66752fb-ee1b-40c2-ba5a-2e6ee89b3e1a"
    },
    {
      "reference": "Condition/17eb029f925-40603327-0ac3-48dd-972b-6c882b8751f5"
    },
    {
      "reference": "Device/17e777b3f34-04bc3627-92d3-43bb-92e7-35533110f750"
    },
    {
      "reference": "Observation/17e77809e90-d5cfd26d-ab5d-4f36-bc32-1ee799b2c278"
    },
    {
      "reference": "Observation/17e7785ea69-6c9f88d9-0553-4216-be17-f908ebe0b371"
    },
    {
      "reference": "Observation/17e778a9113-66c19e50-1b3f-41fd-a4da-ef86393fb0b2"
    },
    {
      "reference": "Observation/17e778d42db-92528d6f-7103-40fb-99ca-b2ac8837210d"
    }
  ],
}
```

```
{
  "reference": "Observation/17e7791dd19-11eaf5c1-a5c0-429c-9867-f3110c743572"
},
{
  "reference": "Observation/17e77947034-7677a2e6-33af-4e06-83ae-a6727ac79885"
},
{
  "reference": "Observation/17e7797685b-e707227d-0cb5-4b28-bab2-ca1f4a1ba111"
},
{
  "reference": "Observation/17e7799a564-8f9ed437-d396-46bf-8f68-bf728955654c"
},
{
  "reference": "Observation/17e779bc672-37c76705-1f73-4531-bfcb-ee3cd3e25bfd"
},
{
  "reference": "Observation/17e77a065f3-77947ea0-1b53-47a5-9a9e-10f6e169f292"
},
{
  "reference": "Observation/17e77a29d41-85ec6814-a99a-4a73-ae02-f6a494a11468"
},
{
  "reference": "Observation/17e77a53c30-b356fe0d-d90b-42ed-91f9-5ed08c8047ca"
},
{
  "reference": "Observation/17e7c606d8a-9aeab44c-0261-465d-8930-4a218b201bf5"
},
{
  "reference": "DiagnosticReport/17e7b6e6f1c-119e9b8b-11b9-448b-b760-dc116013b654"
},
{
  "reference": "DiagnosticReport/17e7b741f29-4b6b813d-d11e-4597-8178-5bc5996ac4e4"
},
{
  "reference": "DiagnosticReport/17e7b7b7e66-36f4cf84-3482-4e36-8cca-13cc832b3bed"
},
{
  "reference": "DiagnosticReport/17e7d0e6d1d-c0e0136b-81d4-4164-a8b8-863694276a4f"
},
{
  "reference": "DocumentReference/17e7b838c61-4be99b80-0f94-4b26-a086-a30ed78c91ce"
},
{
  "reference": "DocumentReference/17e7d144d28-7d79ed3e-ca9e-400d-a9ed-add23f5cef07"
},
{
  "reference": "DocumentReference/17e7d19866c-dbbaa2e9-4d81-44bb-af5d-ec2e829e9c72"
},
{
  "reference": "DocumentReference/17e7d1c49cd-bfb30b25-9f98-40c7-9d94-977b7b803f21"
},
{
  "reference": "DocumentReference/17e7d24c947-205cd8e5-3a93-4ab9-8662-5e92b0080af7"
},
{
  "reference": "Goal/17e7b8b62f8-a4f77df6-b97e-4ece-82ff-36480c9cc38c"
},
{
  "reference": "Immunization/17e7b8dc9ab-8abc85e3-0ab1-470f-ae8-1f4e9a3597bb"
},
{
  "reference": "Immunization/17eb02c0f47-3b8a6c05-ae47-4002-9001-fd61626bfca5"
},
{
  "reference": "Medication/17e7b8f47d0-2bf2943a-123e-4725-b5dd-f5200df6c3a2"
},
}
```

```

{
  "reference": "MedicationRequest/17e7b94dd8d-d3b0e43a-de55-4822-8bb5-07e5fd6177d9"
},
{
  "reference": "MedicationRequest/17e7b990c43-4525f6a4-81a0-40f7-97c7-7dbebff6e34b"
},
{
  "reference": "MedicationRequest/17e7b9b263e-9cd8f64f-f7e1-447e-8583-a753342d13c6"
},
{
  "reference": "MedicationRequest/17e7ba05cb1-0a5defbd-deb9-4792-9952-8f7f0e5bc74b"
},
{
  "reference": "Procedure/17e7ba24dee-bf67ef6b-6419-4c7c-b905-a107b26bf8fb"
},
{
  "reference": "Observation/17e81e97c4b-ea761488-0b67-43d0-a0d7-346dea549bee"
},
{
  "reference": "Observation/17e81ebac04-75d9f0f2-fcb2-4e2f-9c22-87fb7ddf5f5e"
},
{
  "reference": "Observation/17e81ed9c56-bcda0427-df92-4b58-b3ae-ac11c22f4d7d"
},
{
  "reference": "Observation/17e81ef5b5e-40df3e7d-19bc-4c2a-94bc-9a04ff93537c"
},
{
  "reference": "Observation/17e81f0fd34-6fc95b32-8346-4aec-9de3-072d12c992a5"
},
{
  "reference": "Observation/17e81f291e7-c99c91ac-57dd-47f6-b7f7-a365d2c087d7"
},
{
  "reference": "Observation/17e81f4a61d-ff3926f2-e35b-466a-bb6c-62a061425258"
},
{
  "reference": "Observation/17e8501692e-8c2d145f-fb69-4ae3-85d1-ef31ebf4a6a2"
},
{
  "reference": "Observation/17e8502f180-3c7e4770-3630-4654-922a-3f802c2939b1"
}
},
"recorded": "2020-12-10T18:33:18.715-05:00",
"agent": [
  {
    "type": {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/provenance-participant-type",
          "code": "author",
          "display": "Author"
        }
      ],
      "text": "Author"
    },
    "who": {
      "reference": "Practitioner/17e774bb850-6b7b7f50-ed52-4523-a3a8-60fb0ef71c5b",
      "display": "Dr. Blossom971 Christiansen251"
    },
    "onBehalfOf": {
      "reference": "Organization/17e774dca91-e7e4e9e3-390e-4c10-83ae-88beabc176e2",
      "display": "PCP170967"
    }
  },
  {

```

```
"type": {
  "coding": [
    {
      "system": "http://hl7.org/fhir/us/core/CodeSystem/us-core-provenance-participant-type",
      "code": "transmitter",
      "display": "Transmitter"
    }
  ],
  "text": "Transmitter"
},
"who": {
  "reference": "Practitioner/17e774bb850-6b7b7f50-ed52-4523-a3a8-60fb0ef71c5b",
  "display": "Dr. Blossom971 Christiansen251"
},
"onBehalfOf": {
  "reference": "Organization/17e774dca91-e7e4e9e3-390e-4c10-83ae-88beabc176e2",
  "display": "PCP170967"
}
]
}
```

Request: Vital Signs

patient + code: GET [https://\[Base_URL\]/Observation?code=85354-9&patient=\[id\]](https://[Base_URL]/Observation?code=85354-9&patient=[id])

patient + category + date : GET [https://\[Base_URL\]/Observation?category=vital-signs&date=\[leYYYY-MM-DD\]&patient=\[id\]](https://[Base_URL]/Observation?category=vital-signs&date=[leYYYY-MM-DD]&patient=[id])

e.g.

[https://\[Base_URL\]/Observation?code=85354-9&patient=Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b](https://[Base_URL]/Observation?code=85354-9&patient=Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b)

[https://\[Base_URL\]/Observation?code=85354-9&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b](https://[Base_URL]/Observation?code=85354-9&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b)

[https://\[Base_URL\]/Observation?category=vital-signs&date=gt1994-05-18T19:33:18-04:00&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b](https://[Base_URL]/Observation?category=vital-signs&date=gt1994-05-18T19:33:18-04:00&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b)

Response

Each resource returned from the first search is expected to conform to the FHIR Core [VitalSigns](#) Profile

Code: 200 (Success)

```
{
  "resourceType": "Bundle",
  "id": "231df7ad-8e46-4371-99cc-4ce0dc9c5cb0",
  "type": "searchset",
  "total": 6,
  "link": [
    {
      "relation": "self",
      "url": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Observation?_count=10&category=vital-signs&date=gt1994-05-18T19:33:18-04:00&patient=17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b&_page=1"
    }
  ],
  "entry": [
    {
      "id": "17e7797685b-e707227d-0cb5-4b28-bab2-ca1f4a1ba111",
      "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Observation/17e7797685b-e707227d-0cb5-4b28-bab2-ca1f4a1ba111",
      "resource": {
        "resourceType": "Observation",
        "id": "17e7797685b-e707227d-0cb5-4b28-bab2-ca1f4a1ba111",
        "meta": {
          "versionId": "1",
          "lastUpdated": "2022-01-20T13:05:18.427Z",
          "profile": [
            "http://hl7.org/fhir/StructureDefinition/bodytemp",
            "http://hl7.org/fhir/StructureDefinition/vitalsigns"
          ]
        },
        "status": "final",
        "category": [
          {
            "coding": [
              {
                "system": "http://terminology.hl7.org/CodeSystem/observation-category",
                "code": "vital-signs",
                "display": "vital-signs"
              }
            ]
          }
        ],
        "code": {
          "coding": [
            {
              "system": "http://loinc.org",
              "code": "8310-5",
              "display": "Body temperature"
            },
            {
              "system": "http://loinc.org",
              "code": "8331-1",
              "display": "Oral temperature"
            }
          ]
        }
      }
    }
  ]
}
```

```

    },
    "text": "Body temperature"
  },
  "subject": {
    "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
  },
  "encounter": {
    "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
  },
  "effectiveDateTime": "2009-08-19T19:33:18-04:00",
  "issued": "2009-08-19T19:33:18.715-04:00",
  "valueQuantity": {
    "value": 37.799,
    "unit": "Cel",
    "system": "http://unitsofmeasure.org",
    "code": "Cel"
  }
},
"search": {
  "mode": "match",
  "score": 1
}
},
{
  "id": "17e7799a564-8f9ed437-d396-46bf-8f68-bf728955654c",
  "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Observation/17e7799a564-8f9ed437-d396-46bf-8f68-bf728955654c",
  "resource": {
    "resourceType": "Observation",
    "id": "17e7799a564-8f9ed437-d396-46bf-8f68-bf728955654c",
    "meta": {
      "versionId": "1",
      "lastUpdated": "2022-01-20T13:07:45.124Z",
      "profile": [
        "http://hl7.org/fhir/StructureDefinition/bp",
        "http://hl7.org/fhir/StructureDefinition/vitalsigns"
      ]
    },
    "status": "final",
    "category": [
      {
        "coding": [
          {
            "system": "http://terminology.hl7.org/CodeSystem/observation-category",
            "code": "vital-signs",
            "display": "vital-signs"
          }
        ]
      }
    ],
    "code": {
      "coding": [
        {
          "system": "http://loinc.org",
          "code": "85354-9",
          "display": "Blood Pressure"
        }
      ],
      "text": "Blood Pressure"
    },
    "subject": {
      "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
    },
    "encounter": {
      "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
    },
    "effectiveDateTime": "1994-05-19T19:33:18-04:00",

```

```

"issued": "1994-05-19T19:33:18.715-04:00",
"component": [
  {
    "code": {
      "coding": [
        {
          "system": "http://loinc.org",
          "code": "8462-4",
          "display": "Diastolic Blood Pressure"
        }
      ],
      "text": "Diastolic Blood Pressure"
    },
    "valueQuantity": {
      "value": 85,
      "unit": "mm[Hg]",
      "system": "http://unitsofmeasure.org",
      "code": "mm[Hg]"
    }
  },
  {
    "code": {
      "coding": [
        {
          "system": "http://loinc.org",
          "code": "8480-6",
          "display": "Systolic Blood Pressure"
        }
      ],
      "text": "Systolic Blood Pressure"
    },
    "valueQuantity": {
      "value": 129,
      "unit": "mm[Hg]",
      "system": "http://unitsofmeasure.org",
      "code": "mm[Hg]"
    }
  }
],
"search": {
  "mode": "match",
  "score": 1
},
{
  "id": "17e77a29d41-85ec6814-a99a-4a73-ae02-f6a494a11468",
  "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Observation/17e77a29d41-85ec6814-a99a-4a73-ae02-f6a494a11468",
  "resource": {
    "resourceType": "Observation",
    "id": "17e77a29d41-85ec6814-a99a-4a73-ae02-f6a494a11468",
    "meta": {
      "versionId": "1",
      "lastUpdated": "2022-01-20T13:17:32.865Z",
      "profile": [
        "http://hl7.org/fhir/StructureDefinition/hearttrate",
        "http://hl7.org/fhir/StructureDefinition/vitalsigns"
      ]
    },
    "status": "final",
    "category": [
      {
        "coding": [
          {
            "system": "http://terminology.hl7.org/CodeSystem/observation-category",
            "code": "vital-signs",

```

```

        "display": "vital-signs"
      }
    ]
  },
  "code": {
    "coding": [
      {
        "system": "http://loinc.org",
        "code": "8867-4",
        "display": "Heart rate"
      }
    ],
    "text": "Heart rate"
  },
  "subject": {
    "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
  },
  "encounter": {
    "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
  },
  "effectiveDateTime": "2003-07-10T19:33:18-04:00",
  "issued": "2003-07-10T19:33:18.715-04:00",
  "valueQuantity": {
    "value": 65,
    "unit": "/min",
    "system": "http://unitsofmeasure.org",
    "code": "/min"
  }
},
"search": {
  "mode": "match",
  "score": 1
}
},
{
  "id": "17e81ef5b5e-40df3e7d-19bc-4c2a-94bc-9a04ff93537c",
  "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Observation/17e81ef5b5e-40df3e7d-19bc-4c2a-94bc-9a04ff93537c",
  "resource": {
    "resourceType": "Observation",
    "id": "17e81ef5b5e-40df3e7d-19bc-4c2a-94bc-9a04ff93537c",
    "meta": {
      "versionId": "1",
      "lastUpdated": "2022-01-22T13:17:34.43Z",
      "source": "#iLFSV7OLv0KF8dmQ",
      "profile": [
        "http://hl7.org/fhir/StructureDefinition/vitalsigns",
        "http://hl7.org/fhir/StructureDefinition/bodytemp"
      ]
    },
    "status": "final",
    "category": [
      {
        "coding": [
          {
            "system": "http://terminology.hl7.org/CodeSystem/observation-category",
            "code": "vital-signs",
            "display": "vital-signs"
          }
        ]
      }
    ],
    "code": {
      "coding": [
        {
          "system": "http://loinc.org",

```

```

      "code": "8310-5",
      "display": "Body temperature"
    },
    {
      "system": "http://loinc.org",
      "code": "8331-1",
      "display": "Oral temperature"
    }
  ],
  "text": "Body temperature"
},
"subject": {
  "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
},
"encounter": {
  "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
},
"effectiveDateTime": "2009-08-19T19:33:18-04:00",
"issued": "2009-08-19T19:33:18.715-04:00",
"dataAbsentReason": {
  "coding": [
    {
      "system": "http://terminology.hl7.org/CodeSystem/data-absent-reason",
      "code": "unknown",
      "display": "Unknown"
    }
  ],
  "text": "Unknown"
}
},
"search": {
  "mode": "match",
  "score": 1
}
},
{
  "id": "17e81f0fd34-6fc95b32-8346-4aec-9de3-072d12c992a5",
  "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Observation/17e81f0fd34-6fc95b32-8346-4aec-9de3-072d12c992a5",
  "resource": {
    "resourceType": "Observation",
    "id": "17e81f0fd34-6fc95b32-8346-4aec-9de3-072d12c992a5",
    "meta": {
      "versionId": "1",
      "lastUpdated": "2022-01-22T13:19:21.396Z",
      "source": "#iLFSV7OLv0KF8dmQ",
      "profile": [
        "http://hl7.org/fhir/StructureDefinition/vitalsigns",
        "http://hl7.org/fhir/StructureDefinition/bp"
      ]
    },
    "status": "final",
    "category": [
      {
        "coding": [
          {
            "system": "http://terminology.hl7.org/CodeSystem/observation-category",
            "code": "vital-signs",
            "display": "vital-signs"
          }
        ]
      }
    ],
    "code": {
      "coding": [
        {
          "system": "http://loinc.org",

```

```

    "code": "85354-9",
    "display": "Blood Pressure"
  }
],
"text": "Blood Pressure"
},
"subject": {
  "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
},
"encounter": {
  "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
},
"effectiveDateTime": "1994-05-19T19:33:18-04:00",
"issued": "1994-05-19T19:33:18.715-04:00",
"dataAbsentReason": {
  "coding": [
    {
      "system": "http://terminology.hl7.org/CodeSystem/data-absent-reason",
      "code": "unknown",
      "display": "Unknown"
    }
  ],
  "text": "Unknown"
},
"component": [
  {
    "code": {
      "coding": [
        {
          "system": "http://loinc.org",
          "code": "8462-4",
          "display": "Diastolic Blood Pressure"
        }
      ],
      "text": "Diastolic Blood Pressure"
    },
    "dataAbsentReason": {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/data-absent-reason",
          "code": "unknown",
          "display": "Unknown"
        }
      ],
      "text": "Unknown"
    }
  },
  {
    "code": {
      "coding": [
        {
          "system": "http://loinc.org",
          "code": "8480-6",
          "display": "Systolic Blood Pressure"
        }
      ],
      "text": "Systolic Blood Pressure"
    },
    "dataAbsentReason": {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/data-absent-reason",
          "code": "unknown",
          "display": "Unknown"
        }
      ],
    },
  ],

```

```

      "text": "Unknown"
    }
  }
],
},
"search": {
  "mode": "match",
  "score": 1
}
},
{
  "id": "17e8502f180-3c7e4770-3630-4654-922a-3f802c2939b1",
  "fullUrl": "https://fhir.novomedici.com:9443/fhir-server/api/v4/Observation/17e8502f180-3c7e4770-3630-4654-922a-3f802c2939b1",
  "resource": {
    "resourceType": "Observation",
    "id": "17e8502f180-3c7e4770-3630-4654-922a-3f802c2939b1",
    "meta": {
      "versionId": "1",
      "lastUpdated": "2022-01-23T03:37:49.696Z",
      "source": "#iLFSV7OLvOKF8dmQ",
      "profile": [
        "http://hl7.org/fhir/StructureDefinition/vitalsigns",
        "http://hl7.org/fhir/StructureDefinition/hearttrate"
      ]
    },
    "status": "final",
    "category": [
      {
        "coding": [
          {
            "system": "http://terminology.hl7.org/CodeSystem/observation-category",
            "code": "vital-signs",
            "display": "vital-signs"
          }
        ]
      }
    ],
    "code": {
      "coding": [
        {
          "system": "http://loinc.org",
          "code": "8867-4",
          "display": "Heart rate"
        }
      ],
      "text": "Heart rate"
    },
    "subject": {
      "reference": "Patient/17e77411359-8837d878-ea1e-45b5-bb89-882fdb2be4b"
    },
    "encounter": {
      "reference": "Encounter/17e77566282-0c9c236b-f0bd-45e0-9c61-80991a376967"
    },
    "effectiveDateTime": "2003-07-10T19:33:18-04:00",
    "issued": "2003-07-10T19:33:18.715-04:00",
    "dataAbsentReason": {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/data-absent-reason",
          "code": "unknown",
          "display": "Unknown"
        }
      ],
      "text": "Unknown"
    }
  }
},

```

```
"search": {  
  "mode": "match",  
  "score": 1  
}  
}  
]  
}
```

Error Handling

Error	Description
200 - OK	Everything worked as expected.
401 - Unauthorized	No valid Bearer token provided.
404 - Not Found	The requested resource doesn't exist.
5xx - Server Error	Something went wrong on FHIR Server side.

[OperationOutcome](#) explains the error reported

Profile audience and scope

This profile is intended to be used by developers of apps that need to access user identity information or other FHIR resources by requesting authorization from OAuth 2.0 compliant authorization servers.

The profile defines a method through which an app requests authorization to access a FHIR resource, and then uses that authorization to retrieve the resource. Synchronization of patient context is not addressed; for use cases that require context synchronization (e.g., learning about when the in-context patient changes within an EHR session) In other words, if the patient chart is changed during the session, the application will not inherently be updated.

Security and Privacy Considerations

App Protection

The app is responsible for protecting itself from potential misbehaving or malicious values passed to its redirect URL (e.g., values injected with executable code, such as SQL) and for protecting authorization codes, access tokens, and refresh tokens from unauthorized access and use. The app developer must be aware of potential threats, such as malicious apps running on the same platform, counterfeit authorization servers, and counterfeit resource servers, and implement countermeasures to help protect both the app itself and any sensitive information it may hold. For background, see the [OAuth 2.0 Threat Model and Security Considerations](#).

Specific requirements are:

- Apps SHALL ensure that sensitive information (authentication secrets, authorization codes, tokens) is transmitted ONLY to authenticated servers, over TLS V1.2 or above-secured channels.
- Apps SHALL generate an unpredictable **state** parameter for each user session; SHALL include **state** with all authorization requests; and SHALL validate the **state** value for any request sent to its redirect URL.
- An app SHALL NOT execute untrusted user-supplied inputs as code.
- App SHALL NOT forward values passed back to its redirect URL to any other arbitrary or user-provided URL (a practice known as an "open redirector").
- An app SHALL NOT store bearer tokens in cookies that are transmitted as clear text.
- Apps SHOULD persist tokens and other sensitive data in app-specific storage locations only, and SHOULD NOT persist them in system-wide-discoverable locations.

Terms of Use

1. TERMS ACCEPTANCE AND REPRESENTATION

- a. Accepting the Terms. These Terms of Use ("Terms") govern your access to and use of the Certified NOVOCLINICAL EHR API, documentation, services, etc. By accessing or using the Certified **NOVOCLINICAL** APIs, you agree to be bound by these Terms. "Certified NOVOCLINICAL EHR API" means the API provided by NOVOCLINICAL to allow authorized access to query our Client(s) Electronic Health Record system. You represent and warrant that you are at least 18 years of age and that you possess the legal right and ability to agree to these Terms and to use the Certified NOVOCLINICAL APIs in accordance with these Terms.
- b. Entity Representation. If you are using the Certified NOVOCLINICAL API on behalf of a legal entity (i.e. a Clinical software services company), you represent that you have proper authority to act on behalf of and bind the entity to these Terms, and by accepting, you accept on behalf of the entity (and all references to "you" in the Terms refer to the entity).

2. REPRESENTATIONS AND RESPONSIBILITIES

- a. Compliance. You agree to be financially responsible for your use of the Certified NOVOCLINICAL EHR APIs and to comply with your responsibilities and obligations as stated in these Terms. You agree to comply at all times with all applicable laws, rules and regulations relating to the use of the Certified NOVOCLINICAL EHR APIs. You hereby grant NOVOCLINICAL the right to monitor and periodically audit in a reasonable manner your use of the Certified NOVOCLINICAL APIs, your App and other activities related to your obligations under these Terms.
- b. Virus Warranty. You warrant that your Apps will not contain any viruses or other malicious computer instructions, devices, or techniques that can or were designed to threaten, infect, damage, disable, or shut down the NOVOCLINICAL EHR APIs, any technology, software, solution, equipment or any computer system.

3. GENERAL

- a. Changes. NOVOCLINICAL may, in its sole and absolute discretion, make changes, modifications or updates to the Certified NOVOCLINICAL EHR API (including without limitation changes to the capabilities and tech specs), without notice to you.
- b. Global Availability. NOVOCLINICAL makes no representations that the Certified NOVOCLINICAL EHR APIs are appropriate or available for use in locations outside of the United States, and access to them from such territories is at your own risk. Those who choose to access the Certified NOVOCLINICAL APIs from locations outside of the United States do so at their own initiative and are responsible for compliance with applicable local laws.
- c. Intellectual Property Rights. You acknowledge and agree that the Certified NOVOCLINICAL EHR APIs and NOVOCLINICAL's software, products and services are proprietary in nature, that NOVOCLINICAL claims all intellectual property rights therein as well as in all modifications, enhancements and alterations thereto, and that NOVOCLINICAL neither grants nor otherwise transfers any rights of ownership therein to you or any third party. No rights or licenses are granted by NOVOCLINICAL other than those rights expressly granted in these Terms, and NOVOCLINICAL reserves all rights not expressly granted.
- d. Waiver, Release and Limitation of Liability. You acknowledge and agree that neither NOVOCLINICAL nor any of its affiliates will have any responsibility or liability with respect to your or any third party's distribution, implementation, commercialization, use, or other form of exploitation of any app, software, solution, service or other technology created by you or another third party. As between you and NOVOCLINICAL, you are solely responsible and liable for all representations, warranties, support and other obligations made by you to any third party related to any app, software, solution, service or other technology created by you, including claims arising from product liability, breach of warranty, and intellectual property infringement. YOU HEREBY RELEASE AND FOREVER WAIVE ANY AND ALL CLAIMS YOU MAY HAVE AGAINST NOVOCLINICAL, ITS OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, INFORMATION PROVIDERS OR SUPPLIERS FOR LOSSES OR DAMAGES YOU SUSTAIN IN CONNECTION WITH YOUR USE OF THE CERTIFIED NOVOCLINICAL EHR API AND ANY NOVOCLINICAL WEBSITES. NOVOCLINICAL MAKES NO REPRESENTATIONS ABOUT THE SUITABILITY, RELIABILITY, AVAILABILITY, TIMELINESS AND ACCURACY OF THE CERTIFIED NOVOCLINICAL APIs OR OTHER INFORMATION, TECHNOLOGY, SOFTWARE, PRODUCTS AND SERVICES PROVIDED BY NOVOCLINICAL FOR ANY PURPOSE. ALL SUCH TECHNOLOGY, INFORMATION, SOFTWARE, PRODUCTS AND SERVICES ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND. NOVOCLINICAL HEREBY DISCLAIMS ALL WARRANTIES AND CONDITIONS WITH REGARD TO THE CERTIFIED NOVOCLINICAL APIs, OTHER TECHNOLOGY, INFORMATION, SOFTWARE, SOLUTIONS, PRODUCTS AND SERVICES, INCLUDING ALL IMPLIED WARRANTIES AND CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NON-INFRINGEMENT. TO THE FULLEST EXTENT PERMITTED BY LAW, IN NO EVENT SHALL NOVOCLINICAL, ITS OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, AND/OR ITS SUPPLIERS BE LIABLE FOR ANY DIRECT, INDIRECT, PUNITIVE, INCIDENTAL, SPECIAL, CONSEQUENTIAL DAMAGES OR ANY OTHER DAMAGES WHATSOEVER INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF USE, DATA OR PROFITS, ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE ACCESS, USE OR PERFORMANCE OF THE CERTIFIED NOVOCLINICAL APIs, WITH THE DELAY OR INABILITY TO USE THE CERTIFIED NOVOCLINICAL EHR APIs OR RELATED TECHNOLOGY, SOFTWARE OR SERVICES, THE PROVISION OF OR FAILURE TO PROVIDE THE CERTIFIED NOVOCLINICAL APIs, SOFTWARE OR SERVICES, OR FOR ANY INFORMATION, SOFTWARE, PRODUCTS AND SERVICES OBTAINED FROM NOVOCLINICAL, OR OTHERWISE ARISING OUT OF THE USE OF THE CERTIFIED NOVOCLINICAL APIs, WHETHER BASED ON CONTRACT, TORT, NEGLIGENCE, STRICT

LIABILITY OR OTHERWISE, EVEN IF NOVOCLINICAL HAS BEEN ADVISED OF THE POSSIBILITY OF DAMAGES. BECAUSE SOME STATES/JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATION MAY NOT APPLY TO YOU. IF YOU ARE DISSATISFIED WITH ANY PORTION OF THE CERTIFIED CLINCMAX EHR APIs, OR WITH THESE TERMS OF USE, YOUR SOLE AND EXCLUSIVE REMEDY IS TO DISCONTINUE USING THE CERTIFIED NOVOCLINICAL EHR APIs. NOTWITHSTANDING THE FOREGOING PARAGRAPH, THE TOTAL LIABILITY OF NOVOCLINICAL, ITS OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, INFORMATION PROVIDERS AND SUPPLIERS, IF ANY, FOR LOSSES OR DAMAGES SHALL NOT EXCEED THE FEES PAID BY YOU FOR THE USE OF THE PARTICULAR TECHNOLOGY, SOFTWARE, PRODUCT, INFORMATION OR SERVICE PROVIDED BY NOVOCLINICAL.

- e. Indemnification. YOU AGREE TO INDEMNIFY, DEFEND AND HOLD HARMLESS NOVOCLINICAL, ITS OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, INFORMATION PROVIDERS AND SUPPLIERS FROM AND AGAINST ALL CLAIMS, LIABILITIES, LOSSES, EXPENSES, DAMAGES AND COSTS, INCLUDING REASONABLE ATTORNEYS' FEES, RESULTING FROM ANY VIOLATION OF THESE TERMS OR ANY ACTIVITY RELATED TO YOUR USE OF THE CERTIFIED NOVOCLINICAL APIs OR THE NOVOCLINICAL WEB SITES.
 - f. Term and Termination. Either you or NOVOCLINICAL may terminate your right to use the Certified NOVOCLINICAL EHR APIs at any time, with or without cause, upon notice. NOVOCLINICAL also reserves the right to disable your API access in a production environment at any time, with or without cause. NOVOCLINICAL reserves the right to disable access to the NOVOCLINICAL EHR APIs if your App poses any security, privacy, or patient safety risks. The provisions concerning Indemnification, Waiver, Release and Limitation of Liability, and General shall survive any termination of these Terms.
 - g. Governing Law. These Terms are governed by US federal law or the laws of the State of California
4. Application developer affirmations to Certified API Developers regarding the ability of their applications to secure a refresh token, a client secret, or both, must be treated in a good faith manner