VersaSuite API

Version 9.X

11/26/2018
Universal Software Solutions, Inc.
VersaSuite

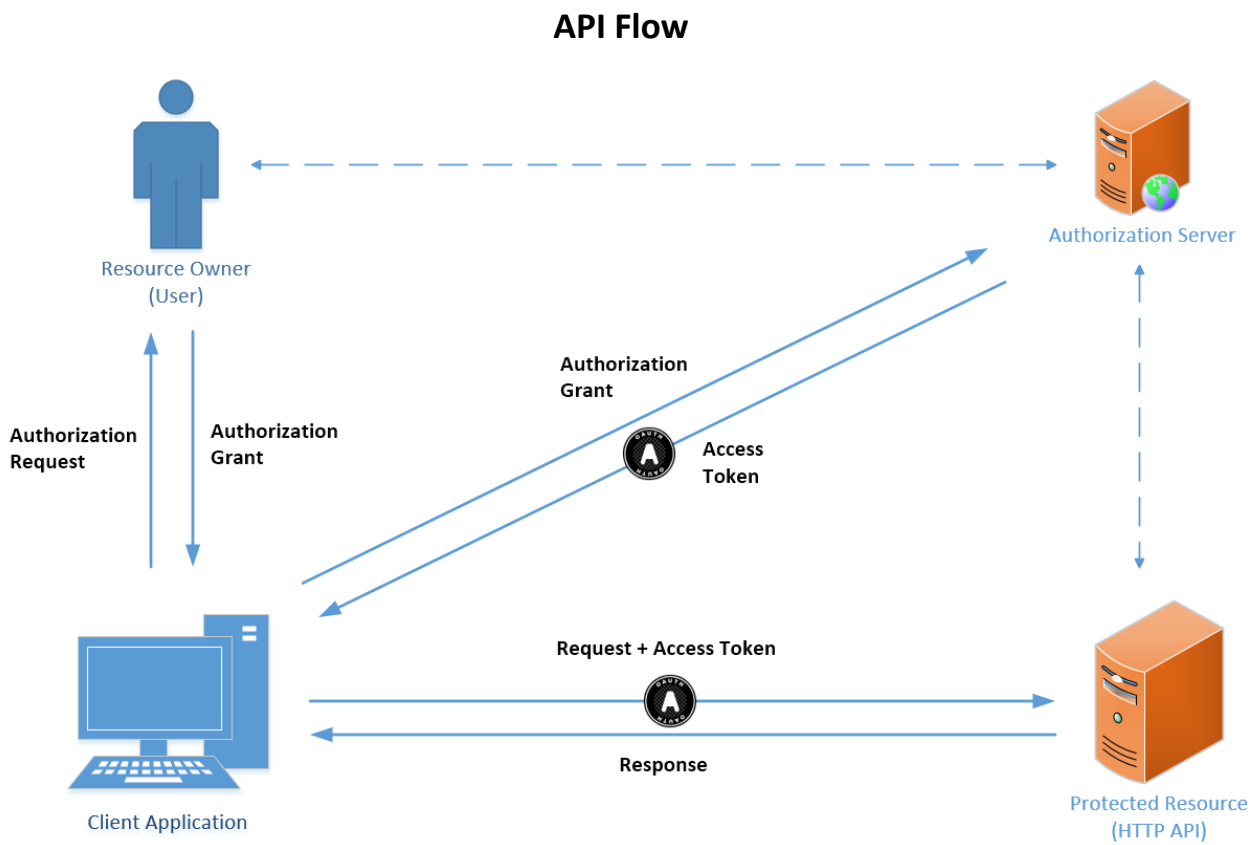
Table of Contents

API (Application Programming Interface) is a set of clearly defined methods of communication between **VersaSuite** software components. Below are instructions on setting up and executing API calls to and from the client.

Deployed are two servers for VersaSuite to complete a call from a client.

- **Authorization Server** (Identity Server) https://fihrtest.versasuite.com/
- **Client Application** https://ids.versasuite.com/
-

At this time, the third application is acting as a client application for **testing only**.



Introduction

Fast **H**ealthcare **I**nteroperability **R**esources, or **FHIR**, is a standard way of defining an API for healthcare resources. More information can be found at the FHIR website.

The VersaSuite FHIR API is based on DSTU 3, or version Release 3.0.1, of the FHIR standard. The VersaSuite FHIR API uses the Data Access Framework (DAF) profile that was originally developed for Meaningful Use 2 by ONC. Updates and definitions for use of DAF for Meaningful Use 3 can be found on the Argonaut Wiki.

The VersaSuite FHIR API is a RESTful implementation for an API. At a high level, this means several things.

- FHIR is resource-based. The resources are healthcare or related resources, for example patient or medication. All resources have an identifier that can be used to access or reference them.
- FHIR resources are accessed through HTTP and use the HTTP verbs. For example, to retrieve a resource you do a GET, to update a resource you do a POST, and so forth.

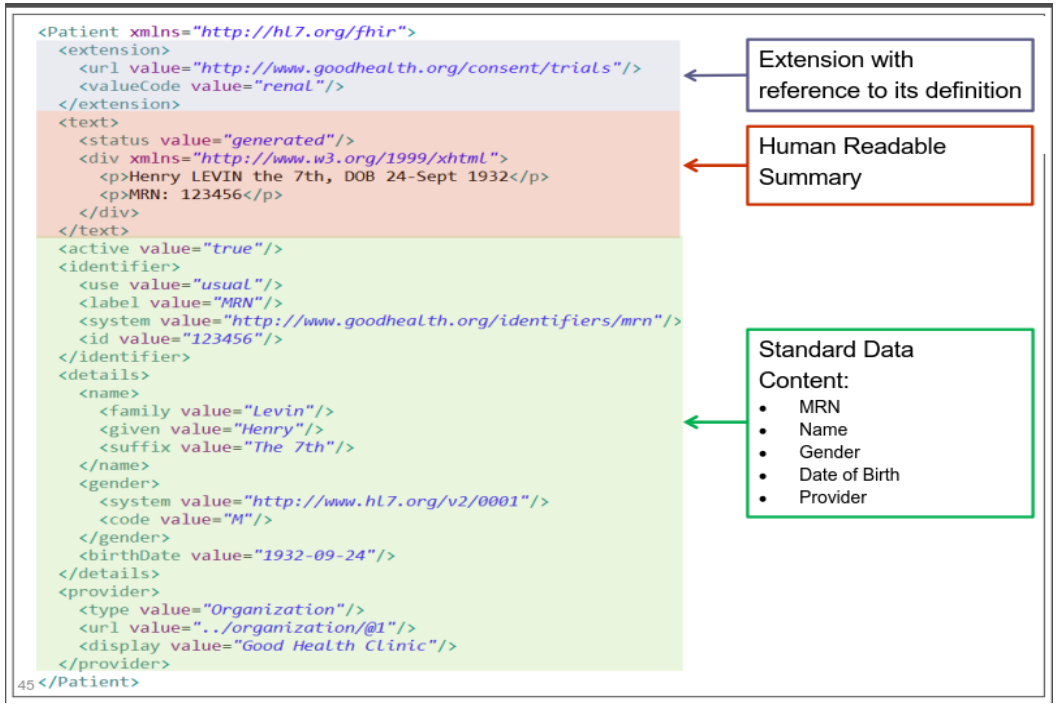
The following call will retrieve a patient with ID 1:

```
GET https://fhirtest.versasuite.com/api/patient/1
```

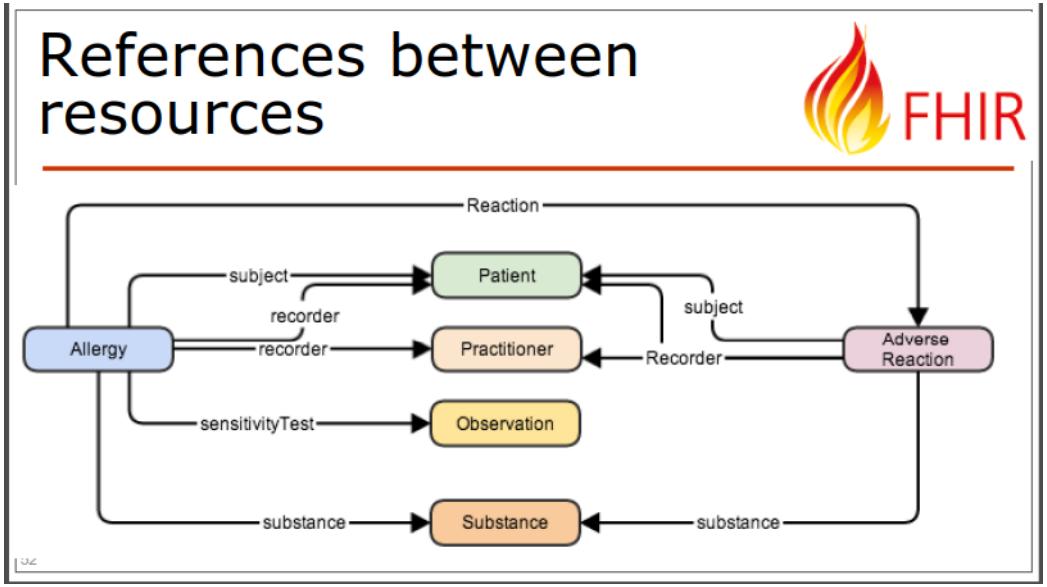
Examples of FHIR resources are Patient or Immunization.

Resources have three parts:

- Extensions
- Narrative
- Defined structured data



Resources can reference other resources.



Resources are independent. You do not need other resources to correctly interpret a resource. Resources reference each other extensively to form a web of information. You need to resolve references to fully understand the data. A reference is relative to a server based URL.

```
<Procedure xmlns="http://hl7.org/fhir">
 <subject>
   <reference value="Patient/23"/>
 </subject>
```

All resources carry an HTML representation of their content to ensure clinical safety in the case that the receiver does not understand the content.

Security

Like many RESTful APIs, the VersaSuite FHIR API uses OAuth 2 for security. This means that when making calls to any resource with the VersaSuite FHIR API, you must pass a Bearer token. This token is passed in the Authorization Header.

```
Authorization: Bearer <123.456.7890>
```

To obtain a Bearer token, you must call an Authorization Server. The authorization server typically exposes two endpoints:

- `authorize`: typically used to confirm the user's credentials
- `token`: used to obtain the Bearer token

As per the FHIR specification, the VersaSuite FHIR API supports both JSON and XML. However, for simplicity, we limit our examples to JSON.

Authentication and Authorization

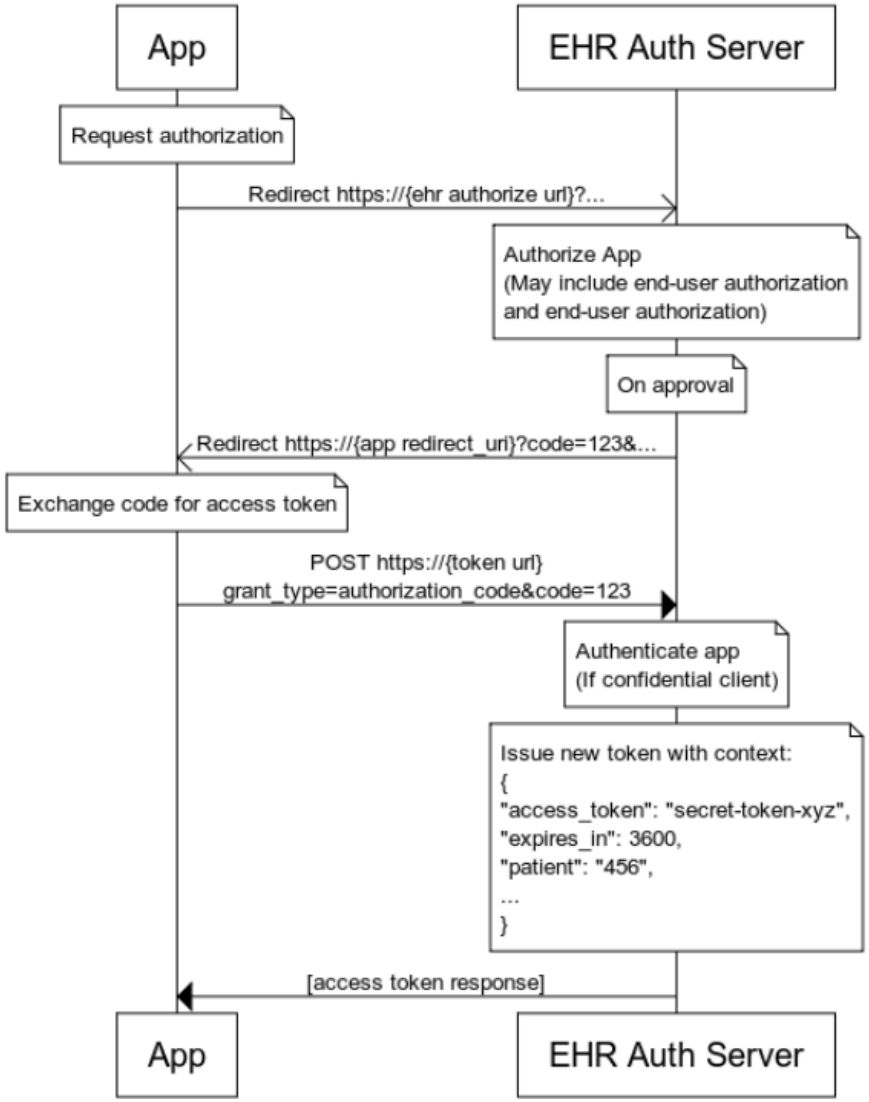
The VersaSuite FHIR API uses OAuth 2 and Open ID Connect and is based on the Smart Authorization description.

References:

- OAuth 2
- OpenID Connect
- Smart

The authorization code grant type is the only grant type supported in this release because it is considered secure. Other grant types, such as implicit flow, may be supported in future as the standards evolve.

The following diagram (from Smart) describes the authorization code flow:



Once the patient or provider (hereafter referred to as the user) launches the app, you must authenticate the user by calling the authorize endpoint on the authorization server used by the EHR.

During the authentication step, provide the app's client_id, but not the secret.

The `redirect_uri urn:ietf:wg:oauth:2.0:oob` is a special URL that is used in desktop clients. If you are developing a web client, you will use a URL pointing back to your website.

During the On Approval step, the user will be asked to log in. If they do not have credentials, they will be asked to confirm their identity before creating credentials. If this is the first time they have used the app, they will be asked to confirm that they want to use the application (authorizing the application).

After the user authenticates, you will receive an authorization code. You send the authorization code, along with the client_secret, to the token endpoint of the authorization server.

Scopes

The VersaSuite FHIR API authorization server uses the scopes defined for Smart on FHIR.

Confidential and public clients

The VersaSuite FHIR API supports two type of clients: confidential clients and public clients.

Confidential clients are clients that can be trusted to keep the client_secret secure. Examples of confidential clients include:

- Web clients written as server side HTML and where the client secret is stored on the server
- Mobile clients written in the native technology of the platform

Public clients cannot be trusted to keep the secret safe.

Using a refresh token

To prevent a user from having to log in whenever the access token expires, use a refresh token. The refresh token will be valid for hours/days.

To get a new access token, call the token endpoint of the authorization server and present your bearer token.

If the bearer token has expired, you must call the authorization endpoint of the authorization server again so the user can login using their credentials.

Authorization for patient access

Certain resources and operation on the VersaSuite FHIR API are not specific to a patient. For example, searching for a patient.

However, most API calls are patient specific. For example, retrieving patient demographics or problems.

In those cases, the following authorization rules apply:

- If the user is a patient:
  - They have access to their own data.
  - They have access to patients for whom they are caregivers or guardian.
  - They will not have access to the data for any other patients.
- If the user is a provider or other EHR user:
  - They only have access to patients they are authorized to see in their EHR.
  - They do not have access to patients they are not authorized to see in their EHR.
  - Apps do not have access to the "**break glass**" privilege escalation functionality.

Searching for a patient

```
GET https://fhirtest.versasuite.com/Patient?given=Levin
GET https://fhirtest.versasuite.com/Patient?given=Alice&gender=female
GET https://fhirtest.versasuite.com/Patient?given=Allison&gender=female&birthdate=1984-01-01
```

The following parameters are specified in the search query:

Name	Required?	Type	Description
name	No	String	Portion of either the family or given name of the patient.
_id	No	String	Logical ID of the patient.
family	No	String	Portion of the family (last) name of the patient.
given	No	String	Portion of the given (first) name of the patient.
gender	No	Token	Patient's gender. For more information on this value set, see Administrative Gender ValueSet.
birthdate	No	Date	Patient's date of birth.
identifier	No	Token	Patient's identifier. For example, MRN.

The response is similar to the following:


```
{
"resourceType": "Bundle",
"type": "searchset",
"entry":[
    {
        "resource":{"resourceType": "Patient", "id": "47675", "language": "", "text":{"status": "generated",…}
    },
    {
        "resource":{"resourceType": "Patient", "id": "1556", "language": "", "text":{"status": "generated",…}
    },
    {
        "resource":{"resourceType": "Patient", "id": "27190", "language": "", "text":{"status": "generated",…}
    },
    {
        "resource":{"resourceType": "Patient", "id": "36530", "language": "", "text":{"status": "generated",…}
    }
]}
```

Searching for a patient ID

A patient ID can be used to query for additional information. The search function is described in the previous section.

If the response returns one or more patients, the response contains the patient ID (or patient IDs).

{ “resourceType”: “Bundle”, “type”: “searchset”, “entry”:[{ “resource”:{“resourceType”: “Patient”, “id”:“321”, “language”: “”, “text”:{“status”: “generated”,…} }]}

You can use the highlighted ID (321 in this example) in subsequent requests.

Retrieving a patient

The patient’s logical ID used to retrieve the patient is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id
```

Name	Required?	Type	Description
id	yes	URL	Patient’s logical ID. This is retrieved using the search function.

A DAF Patient is returned.

The following table describes the information returned for an individual or animal receiving health care services:

Name	Type	Cardinality	Description
identifier	Identifier	0..*	Patient's identifier. Patients are usually assigned a specific numerical identifier that is unique within the system.
active	boolean	0..1	Is the patient's record active? The default value is true. Need to be able to mark a patient record as not to be used because it was created in error. If a record is inactive, and linked to an active record, then future patient/record updates should occur on the other patient.
name	HumanName	0..*	Name associated with the patient.
telecom	ContactPoint	0..*	Patient contact communication detail. This indicates the value in any kind of telecom details field for the patient. If capturing a phone, fax, or similar contact point, the value is a properly formatted telephone number according to ITU-T E.123. However, this is frequently not possible due to legacy data and/or clerical practices when recording contact details. For this reason, phone, fax, page, and email addresses are not handled as formal URLs
gender	code	0..1	Patient's gender. Returns Male, Female, Other, or Unknown. For more information on this value

			set, see Administrative Gender ValueSet.
birthDate	date	0..1	Patient's date of birth. This indicates a specific calendar date or partial date (either a year or a month and year combination). Time zone is not included. Fuzzy (approximate) dates are not valid.
deceasedBoolean	boolean	0..1	Is the patient deceased? If a patient is deceased, it influences the clinical process and human communication. If this value is blank, most systems interpret the missing information as an indication that the patient is alive.
address	Address	0..*	Patient's postal address. Postal addresses are often used to record a location that can be visited to find a patient or person.
maritalStatus	CodeableConcept	0..1	Patient marital (civil) status. For more information on this value set, see Marital Status Codes.
multipleBirthBoolean	boolean	0..1	Was the patient part of a multiple birth?
contact		0..*	Patient's contact party. For example, Guardian, Partner, or Friend).
– contact.relationship	CodeableConcept	0..*	Patient contact's relationship with the patient. For more information on this value set, see patient-contact-relationship.

– contact.name	HumanName	0..1	Patient contact's name.
– contact.telecom	ContactPoint	0..*	Patient contact's detailed information.
– contact.address	Address	0..1	Patient contact's address.
communication.language	CodeableConcept	0..*	Language used to communicate with the patient about his or her health. For more information on this value set, see Language ValueSet.
careProvider	Reference(Practitioner)	0..*	Patient's nominated primary care provider.
us-core-race	CodeableConcept	0..1	Patient's race (category of humans sharing history, origin, or nationality). For more information on this value set, see DAF Race ValueSet
us-core-ethnicity	CodeableConcept	0..1	Patient's ethnicity (category of humans sharing heritage). For more information on this value set, see Ethnicity group.
us-core-religion	CodeableConcept	0..1	Patient's professed religious affiliation. For more information on this value set, see v3 Code System ReligiousAffiliation.

Condition

Detailed information about conditions, problems, or diagnoses

Retrieving a patient's conditions

The patient's logical ID used to retrieve the patient is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id/Condition
GET https://fhirtest.versasuite.com/Patient/id/Condition?category=problem
GET https://fhirtest.versasuite.com/Patient/id/Condition?date=eq2016-01-01
```

Name	Required?	Type	Description
ID	yes	URL	The patient's logical ID. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

A **DAF** condition (problem) is returned.

Name	Type	Cardinality	Description
identifier	Identifier	0..*	External ID for the condition. The ID is defined by business processes and/or used to refer to it when a direct URL reference to the resource itself is not appropriate. For example, in CDA documents or in written or printed documentation. This may include IMO, ICD9/10, or Medcin codes.
patient	Reference(Patient)	1..1	Patient name. This indicates the patient who the condition record is associated with. This is used for querying and retrieving patient demographic information.
encounter	Reference(Encounter)	0..1	Encounter during which the condition was first asserted.
asserter	Reference(Practitioner, Patient)	0..1	Individual who asserts the condition. This is a provider reference.

dateRecorded	date	0..1	Date when the condition was first recorded. This is not the date on which the condition was last updated.
code	CodeableConcept	1..1	ID of the condition, problem, or diagnosis. The value set includes content from SNOMED. For more information on this value set, see condition-code.
category	CodeableConcept	0..1	Condition category. Valid entries include: Complaint, Symptom, Finding, and Diagnosis. For more information on this value set, see condition-category.
clinicalStatus	code	0..1	Condition clinical status. Valid entries include: Active, Relapse, Remission, and Resolved. For more information on this value set, see condition-clinical.
verificationStatus	code	1..1	Condition verification status. Valid entries include: Provisional, Differential, Confirmed, Refuted, Entered-in-error, and Unknown. For more information on this value set, see condition-ver-status.
severity	CodeableConcept	0..1	Subjective severity of condition. Valid entries include the following SNOMED codes: 399166001 Fatal, 24484000 Severe, 6736007 Moderate, and 255604002 Mild. For more information on this value set, see condition-severity.
onsetDateTime	dateTime	0..1	Estimated or actual date, date-time, or age when the condition statement was documented. The Date Recorded indicates the date when this particular condition record was created in the EHR, not the date of the most recent update.
onsetQuantity	Quantity	0..1	Estimated or actual date, date-time, or age.
onsetPeriod	Period	0..1	Estimated or actual date, date-time, or age.
onsetRange	Hl7.Fhir.Model.Range	0..1	Estimated or actual date, date-time, or age.
onsetString	String	0..1	Estimated or actual date, date-time, or age.
abatementDateTime	dateTime	0..1	If/when in resolution/remission.
abatementQuantity	Quantity	0..1	If/when in resolution/remission.
abatementBoolean	Boolean	0..1	If/when in resolution/remission.
abatementPeriod	Period	0..1	If/when in resolution/remission.
abatementRange	Hl7.Fhir.Model.Range	0..1	If/when in resolution/remission.

abatementString	String	0..1	If/when in resolution/remission.
stage		0..1	Stage/grade, usually assessed formally.
– stage.summary	CodeableConcept	0..1	Simple summary (disease specific). For more information on this value set, see condition-stage.
– stage.assessment	Reference(ClinicalImpression, DiagnosticReport, Observation)	0..*	Formal record of assessment.
evidence		0..*	Supporting evidence.
– evidence.code	CodeableConcept	0..1	Manifestation/symptom. For more information on this value set, see manifestation-or-symptom.
– evidence.detail	Reference(Resource)	0..*	Supporting information found elsewhere.
bodySite	CodeableConcept	0..*	Anatomical location, if relevant. For more information on this value set, see body-site.
notes	string	0..1	Additional information about the condition.

Searching by Date

Dates are passed as query parameters on the URL. Since the URL parameters cannot handle comparators (for example, >, <=) these are passed in as part of the date.

```
date=eq2018-01-01
date=gt2018-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

To search for a date range, pass in the date twice.

e.g. `date=ge2018-01-01&date=le2018-12-31`

This search would include every day in the year 2018.

Immunizations

Retrieving a patient's immunizations

The logical ID of the patient to retrieve is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id/Immunization
GET https://fhirtest.versasuite.com/Patient/id/Immunization?date=eq2016-01-01
```

Name	Required?	Type	Description
id	yes	URL	Patient's logical ID. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

A DAF Immunization is returned.

Name	Type	Cardinality	Description
identifier		0..*	Immunization record unique identifier.
status	code	1..1	Immunization current status. Valid entries include: In-Progress, On-Hold, Completed, Entered-In-Error, and Stopped. For more information on this value set, see medication-admin-status.
date	dateTime	0..1	Date and time when the immunization was administered. When immunizations are patient reported, a specific date might not be known. Although partial dates are allowed, an adult patient might not be able to recall the year a childhood immunization was given.
vaccineCode	CodeableConcept	1..1	Vaccine product administered. Values come from vaccine-code.
patient	Reference(Patient)	1..1	Patient who received the immunization. Defines constraints and extensions on the patient resource for use in querying and retrieving patient demographic information.
wasNotGiven	boolean	1..1	Flag for whether immunization was given.
reported	boolean	1..1	Is this a self-reported record?
performer	Reference(Practitioner)	0..1	Who administered vaccine.
requester	Reference(Practitioner)	0..1	Who ordered vaccination.
encounter	Reference(Encounter)	0..1	Encounter administered as part of.

manufacturer	Reference(Organization)	0..1	Vaccine manufacturer.
location	Reference(Location)	0..1	Where vaccination occurred.
lotNumber	string	0..1	Vaccine lot number.
expirationDate	date	0..1	Vaccine expiration date.
site	CodeableConcept	0..1	Body site where the vaccine was administered, see immunization-site.
route	CodeableConcept	0..1	How the vaccine entered the body. immunization-route.
doseQuantity	Hl7.Fhir.Model.SimpleQuantity	0..1	Amount of vaccine administered.
note	Annotation	0..*	Vaccination notes.
explanation		0..1	Administration/non-administration reasons.
– explanation.reason	CodeableConcept	0..*	Reason why the immunization occurred. immunization-reason.
– explanation.reasonNotGiven	CodeableConcept	0..*	Reason why the immunization did not occur. For more information on this value set, see no-immunization-reason.
reaction		0..*	Details of a reaction that followed the immunization.
– reaction.date	dateTime	0..1	Date/time when the reaction started.
– reaction.detail	Reference(Observation)	0..1	Additional information about the reaction.
– reaction.reported	boolean	0..1	Was the reaction self-reported?

vaccinationProtocol		0..*	Protocol that was followed during the administration of the immunization.
– vaccinationProtocol.doseSequence	Hl7.Fhir.Model.PositiveInt	1..1	Dose number within the series.
– vaccinationProtocol.description	string	0..1	Details of vaccine protocol.
– vaccinationProtocol.authority	Reference(Organization)	0..1	Individual who is responsible for the immunization protocol.
– vaccinationProtocol.series	string	0..1	Name of vaccine series.
– vaccinationProtocol.seriesDoses	Hl7.Fhir.Model.PositiveInt	0..1	Recommended number of doses for immunity.
– vaccinationProtocol.targetDisease	CodeableConcept	1..*	Disease immunized against. For more information on this value set, see vaccination-protocol-dose-target.
– vaccinationProtocol.doseStatus	CodeableConcept	1..1	Indicates if the dose counts towards immunity. For more information on this value set, see vaccination-protocol-dose-status.
– vaccinationProtocol.doseStatusReason	CodeableConcept	0..1	Why dose does (not) count. For more information on this value set, see vaccination-protocol-dose-status-reason.

Searching by date

Dates are passed as query parameters on the URL. Since the URL parameters cannot handle comparators (for example, >, <=) these are passed as part of the date.

```
date=eq2016-01-01
date=gt2016-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

To search for a date range, pass in the date twice.

e.g. `date=ge2010-01-01&date=le2010-12-31`

This search would include every day in the year 2010.

Medication Statement

Record of medication being taken by a patient

Retrieving a patient's medication statements

The logical ID (of the patient to retrieve) is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id/MedicationStatement
GET https://fhirtest.versasuite.com/Patient/id/MedicationStatement?date=eq2016-01-01
```

Name	Required?	Type	Description
id	yes	URL	Patient's logical ID. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

A DAF MedicationStatement is returned.

Name	Type	Cardinality	Description
identifier		0..*	External identifier. FHIR will generate its own internal identifiers (probably URLs) which do not need to be explicitly managed by the resource. The identifier is one that would be used by another non-FHIR system. For example, an automated medication pump would provide a record each time it operated; an administration while the patient was off the ward might be made with a different system and entered after the event. This is particularly important if these records have to be updated.
patient	Reference(Patient)	1..1	Patient who is or was taking the medication. Defines constraints and extensions on the patient resource for use in querying and retrieving patient demographic information.

informationSource	Reference(Patient, Practitioner, RelatedPerson)	0..1	Person who provided the information about the taking of this medication.
dateAsserted	dateTime	0..1	Date and time when the statement was asserted.
status	code	1..1	Valid entries include: Active, Completed, Entered-in-error, and Intended. For more information on this value set, see medication-statement-status.
wasNotTaken	boolean	0..1	Was the medication not taken? True if medication is/was not being taken.
reasonNotTaken	CodeableConcept	0..*	Instances are not expected or even encouraged to draw from the specified value set. The value set merely provides examples of the types of concepts intended to be included. A code indicating why the medication was not taken. A set of codes indicating the reason why the MedicationAdministration is negated. For example codes, see Reason Medication Not Given Codes. This value set has an inline code system codesystem-reason-medication-not-given-codes, which defines the following codes: Code “a” - Display “None” - No reason known, Code “b” - Display “Away” - The patient was not available when the dose was scheduled, Code “c” - Display “Asleep” - The patient was asleep when the dose was scheduled, and Code “d” - Display “Vomit” - The patient was given the medication and immediately vomited it back.
reasonForUseCodeableConcept	CodeableConcept	0..1	
reasonForUseReference	Reference(Condition)	0..1	

effectiveDateTime	dateTime	0..1	Date and time over which the medication was consumed.
effectivePeriod	Period	0..1	Interval of time during which it is being asserted that the patient was taking the medication (or was not taking, when the wasNotGiven element is true). If the medication is still being taken at the time the statement is recorded, the “end” date will be omitted.
note	string	0..1	Further information about the statement.
supportingInformation	Reference(Resource)	0..*	Additional supporting information.
medicationCodeableConcept	CodeableConcept	1..1	Medication that was taken. Defines constraints and extensions on the Medication resource for use in querying and retrieving patient’s medication information.
medicationReference	Reference(Medication)	1..1	Medication that was taken.
dosage		0..*	How the medication is/was used by the patient.
– dosage.text	string	0..1	Reported dosage information.
– dosage.timing	Hl7.Fhir.Model.Timing	0..1	When/how often was medication taken. The timing schedule for giving the medication to the patient. The Schedule data type allows many different expressions. For example, “Every 8 hours,” “Three times a day,” “1/2 an hour before breakfast for 10 days from 23-Dec 2011,” or “15 Oct 2013, 17 Oct 2013 and 1 Nov 2013”.
– dosage.asNeededBoolean	Boolean	0..1	Take “as needed” (for x).
– dosage.asNeededCodeableConcept	CodeableConcept	0..1	Take “as needed” (for x).
– dosage.siteCodeableConcept	CodeableConcept	0..1	Where (on body) medication is/was administered. Instances are encouraged to draw from the specified codes for

			interoperability purposes but are not required to do so to be considered conformant. A coded specification of the anatomic site where the medication first enters the body. This identifies the body site at which the substance was administered. The codes SHOULD be taken from Vaccine Administered Body Site. All codes from system https://www.snomed.org/snomed-ct/five-step-briefing. The value set includes codes from the following code systems (actual value set has > 1000 codes included): 91723000 - Anatomical structure (body structure), 280115004 - Acquired body structure (body structure), 258331007 - Anatomical site notations for tumor staging (body structure), 118956008 - Altered from its original anatomical structure (morphologic abnormality), or 91722005 - Entire physical anatomical entity (body structure).
– dosage.siteReference	Reference(BodySite)	0..1	Where (on body) medication is/was administered.
– dosage.route	CodeableConcept	0..1	Route by which the medication entered the body. Instances are encouraged to draw from the specified codes for interoperability purposes but are not required to do so to be considered conformant. Route of Administration value set is based upon FDA Drug Registration and Listing Database (FDA Orange Book) which are used in FDA structured product and labelling (SPL). This value set includes codes as defined in https://ncimeta.nci.nih.gov/ncimbrowser/.
– dosage.method	CodeableConcept	0..1	Technique used to administer the medication.

– dosage.quantityQuantity	Quantity	0..1	Amount administered in one dose.
– dosage.quantityRange	Hl7.Fhir.Model.Range	0..1	Amount administered in one dose.
– dosage.rateRatio	Hl7.Fhir.Model.Ratio	0..1	Speed with which the medication was or will be introduced into the patient. Typically the rate for an infusion e.g. 100 ml per 1 hour or 100 ml/hr. May also be expressed as a rate per unit of time e.g. 500 ml per 2 hours. Currently we do not specify a default of '1' in the denominator, but this is being discussed. Other examples: 200 mcg/min or 200 mcg/1 minute; 1 liter/8 hours.
– dosage.rateRange	Hl7.Fhir.Model.Range	0..1	Dose quantity per unit of time.
– dosage.maxDosePerPeriod	Hl7.Fhir.Model.Ratio	0..1	Maximum total quantity of a therapeutic substance that may be administered to a subject over the period of time. For example, 1000mg in 24 hours.

Searching by date

Dates are passed as query parameters on the URL. Since the URL parameters cannot handle comparators (for example, >, <=) these are passed in as part of the date.

```
date=eq2016-01-01
date=gt2016-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

To search for a date range, pass in the date twice.

e.g. `date=ge2010-01-01&date=le2010-12-31`

This search would include every day in the year 2010.

Allergy Intolerance

Allergy or intolerance (generally: risk of adverse reaction to a substance)

Retrieving a patient's allergy intolerances

The logical ID (of the patient to retrieve) is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id/AllergyIntolerance
GET https://fhirtest.versasuite.com/Patient/id/AllergyIntolerance?date=eq2016-01-01
```

Name	Required?	Type	Description
id	yes	URL	Patient's logical ID. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

A DAF AllergyIntolerance is returned.

Name	Type	Cardinality	Description
identifier		0..*	Identifier associated with the allergy/intolerance concern that are defined by the business processes and/or used to refer to it when a direct **URL** reference to the resource is not appropriate. For example, in **CDA** documents or in written/printed documentation.
onset	dateTime	0..1	Date and/or time of the onset of the allergy or intolerance.
recordedDate	dateTime	0..1	Date when the sensitivity was recorded.
recorder	Reference(Practitioner, Patient)	0..1	Individual who recorded the allergy and takes responsibility for its content. Options include either DAF-Practitioner profile or DAF-Patient profile.
patient	Reference(Patient)	1..1	Defines constraints and extensions on the patient resource for use in querying and retrieving patient demographic information.
reporter	Reference(Patient, RelatedPerson, Practitioner)	0..1	Source of the information about the allergy that is recorded.

substance	CodeableConcept	1..1	Identification of a substance or class of substances that is considered to be responsible for the adverse reaction risk. AllergyIntolerance.substance has an extensible binding to a value set consisting of: NDF-RT (codes for drug class allergies), RXNORM (codes limited to term types- TTY- such as BN or Brand Name, IN or Ingredient, MIN or multiple ingredient, and PIN or precise ingredient for drug ingredient allergies) or SNOMED CT (used when no other code from the other code systems is appropriate, such as No Known Allergies, No Known Food Allergies, No Known Drug Allergies, or No Known Environmental Allergies). For more information on this value set, see: allergyintolerance-substance-code.
status	code	0..1	Assertion about certainty associated with the propensity or potential risk of a reaction to the identified substance. The codes shall be taken from the AllergyIntoleranceStatus value set which includes: Active, Unconfirmed, Confirmed, Inactive, Resolved, Refuted, and Entered in Error. Decision support would typically raise alerts for Unconfirmed, Confirmed, and Resolved and ignore a Refuted reaction. In particular, Refuted may be useful for reconciliation of the Adverse Reaction List. Conformance is required and as such, some implementations may choose to make this field mandatory. For more information on this value set, see: allergy-intolerance-status.
criticality	code	0..1	Estimate of the potential clinical harm or seriousness of the reaction to the identified substance. The codes shall be taken from the AllergyIntoleranceCriticality value set with required conformance and include: CRITL-Low, CRITH-High, and CRITU-Unable to determine. For more information on this value set, see: allergy-intolerance-criticality.
type	code	0..1	Identification of the underlying physiological mechanism for a reaction risk. This value set includes two types: Allergy or Intolerance. For more information on this value set, see: allergy-intolerance-type.
category	code	0..1	Category of the allergy. Options include: Food, Medication, Environment, and Other. For more information on this value set, see: allergy-intolerance-category.

lastOccurence	dateTime	0..1	Date and time of the last known occurrence of the reaction.
note	Annotation	0..1	Additional text not captured in other fields.
reaction	Backbone element - LINK	0..*	Details about each adverse reaction event linked to exposure to the identified substance.
– reaction.substance	CodeableConcept	0..1	Identification of the specific substance considered to be responsible for the adverse reaction event. Note: The substance for a specific reaction may be different from the substance identified as the cause of the risk, but must be consistent with it. For instance, it may be a more specific substance such as a brand medication or a composite substance that includes the identified substance. It must be clinically safe to only process the AllergyIntolerance.substance and ignore the AllergyIntolerance.event.substance. For more information on this value set, see: ValueSet-substance-code.
– reaction.manifestation	CodeableConcept	1..*	Clinical symptoms and signs associated with the event. For more information on this value set, see: http://hl7.org/fhir/ValueSet/manifestation-codes.
– reaction.description	string	0..1	Description of the event as a whole.
– reaction.onset	dateTime	0..1	Date and time when manifestations showed.
– reaction.severity	code	0..1	Severity of the reaction or of the event as a whole. Options include: Mild, Moderate, or Severe. For more information on this value set, see: reaction-event-severity.
– reaction.exposureRoute	CodeableConcept	0..1	How the subject was exposed to the substance. For more information on this value set, see: http://hl7.org/fhir/ValueSet/route-codes.
– reaction.note	Annotation	0..1	Text about the event not captured in other fields.

Searching by date

Dates are passed as query parameters on the URL. Since the URL parameters cannot handle comparators (for example, >, <=) these are passed in as part of the date.

```
date=eq2016-01-01
date=gt2016-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

To search for a date range, pass in the date twice.

E.g. `date=ge2010-01-01&date=le2010-12-31`

This search would include every day in the year 2010.

Smoking Status

Retrieving a patient's observations

The patient's logical ID is passed as part of the URL. The logical ID is returned using the search function.

```
GET https://fhirtest.versasuite.com/Patient/id/Observation?code=72166-2
GET https://fhirtest.versasuite.com/Patient/id/Observation?code=72166-2&date=eq2016-01-01
```

Name	Required?	Type	Description
id	yes	URL	Patient's logical ID. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

Smoking status is returned in a DAF observation. The actual smoking status is returned in *valueCodeableConcept.*

Name	Type	Cardinality	Description
identifier		0..*	Observation's unique ID. This applies to the instance observation.
status	code	1..1	Observation's status. Values include Registered, Preliminary, Final, or Amended. For more information on this value set, see observation-status.
category	CodeableConcept	0..1	Observation's type of classification. For more information on this value set, see observation-category.
code	CodeableConcept	1..1	Observation's type or code. For more information on this value set, see observation-codes.
subject	Reference(Patient, Group, Device, Location)	0..1	Observation's subject. The patient's (or group of patients) location, or the device whose characteristics (direct or indirect) are described by the observation and into whose record the observation is placed.

Name	Type	Cardinality	Description
encounter	Reference(Encounter)	0..1	Observation's encounter. The healthcare event (a patient and healthcare provider interaction) during which the observation is made. For some observations it may be important to know the link between an observation and a particular encounter.
effectiveDateTime	dateTime	0..1	Clinically relevant time/time-period for observation.
effectivePeriod	Period	0..1	Clinically relevant time/time-period for the observation. The time or time-period the observed value is asserted as being true. For biological subjects (human patients) this is usually called the "physiologically relevant time." This is usually either the time of the procedure or of specimen collection, but very often the source of the date/time is not known, only the date/time itself.
issued	Hl7.Fhir.Model.Instant	0..1	Date/time the observation was made available. The date and time is typically after the results have been reviewed and verified.
performer	Reference(Practitioner, Organization, Patient, RelatedPerson)	0..*	Individual responsible for the observation.
valueCodeableConcept	CodeableConcept	0..1	The smoking status. Need to track the status of individual results. Some results are finalized before the whole report is finalized. For more information on this value set, see DAF Smoking Status Value Set.
comments	string	0..1	Comments about the result.

Searching by date

Dates are passed as query parameters on the URL. Since the URL parameters cannot handle comparators (for example, >, <=) these are passed in as part of the date.

```
date=eq2016-01-01
date=gt2016-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

To search for a date range, pass in the date twice.

e.g. `date=ge2010-01-01&date=le2010-12-31`

This search would include every day in the year 2010.

Prescription of medication for patient

Retrieving a patient's medication orders

The logical ID of the patient to retrieve is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id/MedicationOrder
GET https://fhirtest.versasuite.com/id/MedicationOrder?date=eq2016-01-01
```

Name	Required?	Type	Description
id	yes	URL	Patient's logical ID. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

A DAF MedicationOrder is returned.

Name	Type	Cardinality	Description
identifier		0..*	External identifier. This would be used by another non-FHIR system. For example, a reimbursement system might issue its own ID for each prescription that is created. This is particularly important where FHIR only provides part of an entire workflow process where records have to be tracked through an entire system.
dateWritten	dateTime	0..1	Date and time when the prescription was authorized.
status	code	0..1	Medication status. Valid entries include: Active, On-Hold, Completed, Entered-In-Error, Stopped, and Draft.

Name	Type	Cardinality	Description
			For more information on this value set, see medication-order-status.
dateEnded	dateTime	0..1	Date and time when the prescription was stopped.
reasonEnded	CodeableConcept	0..1	Reason why the prescription was stopped.
patient	Reference(Patient)	0..1	Link to a resource representing the person to whom the medication will be given.
prescriber	Reference(Practitioner)	0..1	Healthcare professional responsible for authorizing the prescription.
encounter	Reference(Encounter)	0..1	Link to a resource that identifies the particular occurrence of contact between patient and health care provider.
reasonCodeableConcept	CodeableConcept	0..1	Reason or indication for writing the prescription. To be conformant, instances of this element shall include a code from the specified value set if any of the codes within the value set can apply to the concept being communicated. If the value set does not cover the concept (based on human review), an alternate system.code may be used instead. All orderable medication formulations represented using either a generic or brand-specific concept. This includes RxNorm codes whose Term Type is SCD (semantic clinical drug), SBD (semantic brand drug), GPCK (generic pack), BPCK (brand pack), SCDG (semantic clinical drug group), SBDG (semantic brand drug

Name	Type	Cardinality	Description
			group), SCDF (semantic clinical drug form), or SBDF (semantic brand drug form).
reasonReference	Reference(Condition)	0..1	Reason or indication for writing the prescription.
note	string	0..1	Information about the prescription.
medicationCodeableConcept	CodeableConcept	1..1	Medication to be taken. To be conformant, instances of this element shall include a code from the specified value set if any of the codes within the value set can apply to the concept being communicated. If the value set does not cover the concept (based on human review), an alternate system.code may be used instead. All orderable medication formulations represented using either a generic or brand-specific concept. This includes RxNorm codes whose Term Type is SCD (semantic clinical drug), SBD (semantic brand drug), GPCK (generic pack), BPCK (brand pack), SCDG (semantic clinical drug group), SBDG (semantic brand drug group), SCDF (semantic clinical drug form), or SBDF (semantic brand drug form). This value set includes codes RxNorm Codes where TTY in SCD,SBD,GPCK,BPCK,SCDG,SBDG,SCDF,SBDF.
medicationReference	Reference(Medication)	1..1	Medication being administered. This is a link to a resource that represents the medication which may be the details of the medication or simply an attribute carrying a code that identifies the medication from a known list of medications. If only a code is specified, then it needs to be a code for a specific product. If

Name	Type	Cardinality	Description
			more information is required, then the use of the medication resource is recommended. Note: do not use Medication.name to describe the prescribed medication. When the only available information is a text description of the medication, Medication.code.text should be used.
dosageInstruction		0..*	How the medication is to be used by the patient. When the dose or rate is intended to change over the entire administration period (for example, tapering dose prescriptions) multiple instances of dosage instructions will need to be supplied to convey the different doses/rates. Another common example in institutional settings is 'titration' of an IV medication dose to maintain a specific stated hemodynamic value or range (for example, drug x to be administered to maintain AM (arterial mean) greater than 65).
– dosageInstruction.text	string	0..1	Free text dosage instructions can be used for cases where the instructions are too complex to code. The content of this attribute does not include the name or description of the medication. When coded instructions are present, the free text instructions may still be present for display to humans taking or administering the medication. It is expected that the text instructions will always be populated. If the dosage.timing attribute is also populated, then the dosage.text should reflect the same information as the timing.

Name	Type	Cardinality	Description
– dosageInstruction.additionalInstructions	CodeableConcept	0..1	Supplemental instructions. For example, “with meals.”
– dosageInstruction.timing	Hl7.Fhir.Model.Timing	0..1	Timing schedule for giving the medication to the patient. The schedule data type allows many different expressions. For example, “Every 8 hours,” “Three times a day,” “1/2 an hour before breakfast for 10 days from 23-Dec 2011,” or “15 Oct 2013, 17 Oct 2013 and 1 Nov 2013”. Note: This attribute may not always be populated while the DosageInstruction.text is expected to be populated. If both are populated, then the DosageInstruction.text should reflect the content of the Dosage.timing.
– dosageInstruction.asNeededBoolean	Boolean	0..1	Instances are not expected or even encouraged to draw from the specified value set. The value set merely provides examples of the types of concepts intended to be included. Indicates whether the Medication is only taken when needed within a specific dosing schedule (Boolean option), or it indicates the precondition for taking the Medication (CodeableConcept). A coded concept identifying the precondition that should be met or evaluated prior to consuming or administering a medication dose. For example “pain,” “30 minutes prior to sexual intercourse,” “on flare-up,” and so forth. Specifically if ‘boolean’ datatype is selected, then the following logic applies: If set to True, this indicates that the medication is only taken when needed, within the specified schedule.

Name	Type	Cardinality	Description
– dosageInstruction.asNeededCodeableConcept	CodeableConcept	0..1	Instances are encouraged to draw from the specified codes for interoperability purposes but are not required to do so to be considered conformant. A coded specification of the anatomic site where the medication first enters the body. This identifies the body site at which the substance was administered. The codes should be taken from Vaccine Administered Body Site. All codes from system Snomeds. The value set includes codes from the following code systems (actual value set has > 1000 codes included): 91723000 - Anatomical structure (body structure), 280115004 - Acquired body structure (body structure), 258331007 - Anatomical site notations for tumor staging (body structure), 118956008 - Altered from its original anatomical structure (morphologic abnormality), and 91722005 - Entire physical anatomical entity (body structure).
– dosageInstruction.siteCodeableConcept	CodeableConcept	0..1	Body site to administer the medication.
– dosageInstruction.siteReference	Reference(BodySite)	0..1	Body site to administer the medication.
– dosageInstruction.route	CodeableConcept	0..1	Route by which the drug should enter the body. For more information on this value set, see route-codes.
– dosageInstruction.method	CodeableConcept	0..1	Technique for administering the medication.
– dosageInstruction.doseRange	Hl7.Fhir.Model.Range	0..1	Amount of medication per dose.

Name	Type	Cardinality	Description
– dosageInstruction.doseQuantity	Quantity	0..1	Amount of medication per dose.
– dosageInstruction.rateRatio	Hl7.Fhir.Model.Ratio	0..1	Speed with which the medication was or will be introduced into the patient. Typically the rate for an infusion. For example, 100 ml per 1 hour or 100 ml/hr. May also be expressed as a rate per unit of time. For example, 500 ml per 2 hours. Currently we do not specify a default of '1' in the denominator, but this is being discussed. Other examples: 200 mcg/min or 200 mcg/1 minute; 1 liter/8 hours. It is possible to supply both a rate and a doseQuantity to provide full details about how the medication is to be administered and supplied. If the rate is intended to change over time, depending on local rules/regulations, each change should be captured as a new version of the MedicationOrder with an updated rate, or captured with a new MedicationOrder with the new rate.
– dosageInstruction.rateRange	Hl7.Fhir.Model.Range	0..1	Amount of medication per unit of time.
– dosageInstruction.maxDosePerPeriod	Hl7.Fhir.Model.Ratio	0..1	Upper limit on medication per unit of time.
dispenseRequest		0..1	Specific details for the dispense or medication supply part of a medication order (also known as a Medication Prescription). Note that this information is not always sent with the order. There may be in some settings (for example, hospitals) institutional or system support for completing the dispense details in the pharmacy department.

Name	Type	Cardinality	Description
– dispenseRequest.medicationCodeableConcept	CodeableConcept	0..1	Product to be supplied.
– dispenseRequest.medicationReference	Reference(Medication)	0..1	Product to be supplied.
– dispenseRequest.validityPeriod	Period	0..1	Validity period of a prescription (stale dating the Prescription). Indicates when the Prescription becomes valid, and when it ceases to be a dispensable Prescription. It reflects the prescriber perspective for the validity of the prescription. Dispenses must not be made against the prescription outside of this period. The lower-bound of the Dispensing Window signifies the earliest date that the prescription can be filled for the first time. If an upper-bound is not specified then the Prescription is open-ended or will default to a stale-date based on regulations.
– dispenseRequest.numberOfRepeatsAllowed	Hl7.Fhir.Model.PositiveInt	0..1	Integer indicating the number of additional times (aka refills or repeats) the patient can receive the prescribed medication. Usage Notes: This integer does NOT include the original order dispense. This means that if an order indicates dispense 30 tablets plus “3 repeats”, then the order can be dispensed a total of 4 times and the patient can receive a total of 120 tablets. If displaying “number of authorized refills”, subtract 1 from this number. Positive integer.
– dispenseRequest.quantity	Hl7.Fhir.Model.SimpleQuantity	0..1	Amount that is to be dispensed for one fill.

Name	Type	Cardinality	Description
– dispenseRequest.expectedSupplyDuration	Hl7.Fhir.Model.Duration	0..1	Period of time over which the supplied product is expected to be used, or the length of time the dispense is expected to last. In some situations, this attribute may be used instead of quantity to identify the amount supplied by how long it is expected to last, rather than the physical quantity issued, e.g. 90 days supply of medication (based on an ordered dosage) When possible, it is always better to specify quantity, as this tends to be more precise. expectedSupplyDuration will always be an estimate that can be influenced by external factors.
substitution		0..1	Restrictions on medication substitution.
– substitution.type	CodeableConcept	1..1	Valid entries include Generic and Formulary +. For more information on this value set, see v3-ActSubstanceAdminSubstitutionCode.
– substitution.reason	CodeableConcept	0..1	Why should (not) substitution be made. For more information on this value set, see v3-SubstanceAdminSubstitutionReason.
priorPrescription	Reference(MedicationOrder)	0..1	Order/prescription that this supersedes.

Searching by date

Dates are passed as query parameters on the URL. Since the URL parameters cannot handle comparators (for example, >, <=) these are passed in as part of the date.

```
date=eq2016-01-01
date=gt2016-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

To search for a date range, pass in the date twice.

e.g. `date=ge2010-01-01&date=le2010-12-31`

This search would include every day in the year 2010.

Lab Results

Retrieving a patient's laboratory result observations

The logical ID (of the patient to retrieve) is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id/Observation?category=laboratory
GET https://fhirtest.versasuite.com/Patient/id/Observation?category=laboratory&date=eq2016-01-01
```

Name	Required?	Type	Description
id	yes	URL	The logical ID of the patient. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

A DAF Observation is returned.

Name	Type	Cardinality	Description
identifier		0..*	Unique identifier for the simple observation instance. This allows observations to be distinguished and referenced. If this is used, then the attributes associated to identifier are required (use, system, value); External ID- is for a lab vendor who sends the results such that this be the ID that they send.
— use		1..1	Purpose of this identifier. Identifies the purpose for this identifier, if known. The codes shall be taken from IdentifierUse. Allows the appropriate identifier for a particular context of use to be selected from among a set of identifiers. Note: This is labeled as

Name	Type	Cardinality	Description
			“Is Modifier” because applications should not mistake a temporary ID for a permanent one. Applications can assume that an identifier is permanent unless it explicitly says that it is temporary. This value set has an inline code system which defines the following codes: Usual, Official, Temp, and Secondary. For more information on this value set, see http://hl7.org/fhir/identifier-use.
— system		1..1	System attribute establishes the namespace in which set of possible ID values is unique. There are many sequences of identifiers. To perform matching, we need to know what sequence we’re dealing with. The system identifies a particular sequence or set of unique identifiers. For example, http://www.acme.com/identifiers/patient or urn:ietf:rfc:3986 if the Identifier.value itself is a full URI, Uniform Resource Identifier Reference (RFC 3986). Note: URIs are case sensitive. For UUID (urn:uuid:53fefa32-fcbb-4ff8-8a92-55ee120877b7) use all lowercase.
— value	http://www.hl7.org/fhir/daf/daf-resultobs-definitions.html#daf-resultobs.Observation.identifier.value	1..1	Portion of the identifier typically displayed to the user and which is unique within the context of the system. If the value is a full URI, then the system shall be urn:ietf:rfc:3986. For example: 123456.
status	code	1..1	Status of the result value or codes providing the status of an observation. The codes shall be taken

Name	Type	Cardinality	Description
			from ObservationStatus value set and are used to track the status of individual results as some results are finalized before the whole report is finalized. This value set has an inline code system which defines the following codes: Registered , Preliminary , Final , Amended, Cancelled, Entered in Error, and Unknown. For more information on this value set, see: observation-status.
category	CodeableConcept	1..1	Fixed category.coding.system that includes several options as to where the observation could have been made such as Social History, Vital Signs, Imaging, Laboratory, Procedure, Survey, Exam and Therapy. For the Lab Results profile, the category is a fixed cateogry.coding.code for Laboratory. For more information on this value set, see: =”observation-category“.
code	CodeableConcept	1..1	Code refers to the test that was performed. This is element is bound to LOINC codes (US Laboratory Observation Profile Observation Name Codes) and the conformance is extensible such that, if the data type is a CodeableConcept, then one of the coding values shall be from the specified value set if a code applies, but if no suitable code exists in the value set, alternate code(s) may be provided in its place. If no codes, including local codes, are available, then just text may be used. For more information on this value set, see observation-codes.

Name	Type	Cardinality	Description
— coding	http://www.hl7.org/fhir/daf/daf-resultobs-definitions.html#daf-resultobs.Observation.code.coding	1..1	Standard and local codes may be included here by repeating the coding element with a different coding.system. Requirements allow for translations and alternate encodings within a code system. This also supports communication of the same instance to systems requiring different encodings. NOTE: Codes may be defined very casually in enumerations, or code lists, up to very formal definitions such as SNOMED CT. See the HL7 v3 Core Principles for more information. Ordering of codings is undefined and shall not be used to infer meaning. Generally, at most only one of the coding values will be labelled as UserSelected = true.
subject	Reference(Patient, Group, Device, Location)	1..1	Patient, or group of patients, location, or device whose characteristics (direct or indirect) are described by the observation and into whose record the observation is placed. Comments: Indirect characteristics may be those of a specimen, fetus, donor, other observer (for example a relative or EMT), or any observation made about the subject. One would expect this element to be a cardinality of 1..1. The only circumstance in which the subject can be missing is when the observation is made by a device that does not know the patient. In this case, the observation shall be matched to a patient through some context/channel matching technique, and at this point, the observation should be updated. If the target of the observation is different

Name	Type	Cardinality	Description
			than the subject, the general extension observation-focal-subject. may be used. However, the distinction between the patient's own value for an observation versus that of the fetus, or the donor or blood product unit, etc., are often specified in the observation code.
encounter	Reference(Encounter)	0..1	Healthcare event (such as a patient and healthcare provider interaction) during which this observation is made. For some observations it may be important to know the link between an observation and a particular encounter.
effectiveDateTime	dateTime	0..1	For lab tests this is the specimen collection date. For Ask at Order Entry Questions (AOE)'s this is the date the question was asked.
effectivePeriod	Period	0..1	For lab tests this is the specimen collection period. At least a date should be present unless this observation is a historical report.
issued	Hl7.Fhir.Model.Instant	0..1	Date and time this observation was made available to providers, typically after the results have been reviewed and verified. Minimum Precision to Day and updated when the result is updated.
performer	Reference(Practitioner, Organization, Patient, RelatedPerson)	0..*	Who was responsible for asserting the observed value as "true". May give a degree of confidence in

Name	Type	Cardinality	Description
			the observation and also indicates where follow-up questions should be directed.
valueQuantity	Quantity	0..1	An observation exists to have a value, though it may not if it is in error, or it represents a group of observations. Quantity is a measured amount (or an amount that can potentially be measured). The value contains the numerical value of the quantity, including an implicit precision. If no comparator is specified, the value is a point value (i.e. '='). The comparator element can never be ignored.
valueCodeableConcept	CodeableConcept	0..1	Actual result. If codeableConcept, valueCodeableConcept must be selected from SNOMED CT.
valueString	String	0..1	Actual result in the form of a sequence of Unicode characters. Note that strings shall not exceed 1MB in size.
valueRange	Hl7.Fhir.Model.Range	0..1	Range is a set of ordered Quantity values defined by a low and high limit. A Range specifies a set of possible values; usually, one value from the range applies (e.g. "give the patient between 2 and 4 tablets"). Ranges are typically used in instructions. The unit and code/system elements of the low or high elements shall match. If the low or high elements are missing, the meaning is that the low or

Name	Type	Cardinality	Description
			high boundaries are not known and therefore neither is the complete range.
valueRatio	Hl7.Fhir.Model.Ratio	0..1	Relationship between two Quantity values expressed as a numerator and a denominator. Common factors in the numerator and denominator are not automatically cancelled out. The Ratio data type is used for titers (e.g. “1:128”) and other quantities produced by laboratories that truly represent ratios. Ratios are not simply “structured numbers” - for example blood pressure measurements (e.g. “120/60”) are not ratios. In addition, ratios are used where common factors in the numerator and denominator do not cancel out.
valueSampledData	Hl7.Fhir.Model.SampledData	0..1	Data that comes from a series of measurements taken by a device, with upper and lower limits. There may be more than one dimension in the data. A SampledData provides a concise way to handle the data produced by devices that sample a physical particular state at a high frequency. A typical use for this is for the output of an ECG or EKG device.
valueAttachment	Hl7.Fhir.Model.Attachment	0..1	Type is for containing or referencing attachments - additional data content defined in other formats. The most common use of this type is to include images or reports in some report format such as PDF. However it can be used for any data that has a MIME type. The actual content of an Attachment

Name	Type	Cardinality	Description
			can be conveyed directly using the data element or a URL reference can be provided. If both are provided, the reference shall point to the same content as found in the data. The reference can never be reused to point to some different data (i.e. the reference is version specific). The URL reference shall point to a location that resolves to actual data; some URIs such as cid: meet this requirement. If the URL is a relative reference, it is interpreted in the same way as a resource reference.
valueTime	Time	0..1	Time during the day, with no date specified (can be converted to a Duration since midnight). Seconds must be provided due to schema type constraints but may be zero-filled and may be ignored. The time “24:00” is not allowed, and neither is a time zone.
valueDateTime	dateTime	0..1	Date, date-time or partial date (e.g. just year or year + month) as used in human communication. If hours and minutes are specified, a time zone shall be populated. Seconds must be provided due to schema type constraints but may be zero-filled and may be ignored. Dates shall be valid dates. The time “24:00” is not allowed.
valuePeriod	Period	0..1	Time period defined by a start and end date/time. A period specifies a range of times. The context of use will specify whether the entire range applies (e.g. “the patient was an inpatient of the hospital for this

Name	Type	Cardinality	Description
			time range") or one value from the period applies (e.g. "give to the patient between 2 and 4 pm on 24-Jun 2013").
dataAbsentReason	CodeableConcept	0..1	Provides a reason why the expected value in the element Observation.value[x] is missing. Codes specifying why the result (Observation.value[x]) is missing. The codes shall be taken from Observation Value Absent Reason value set and include: Unknown, Asked, Temp, Not Asked, Masked, Unsupported, As Text, Error, and Not a Number. Other codes may be used where these codes are not suitable. For more information on this value set, see: observation-valueabsentreason.
interpretation	CodeableConcept	0..1	Assessment made based on the result of the observation. Intended as a simple compact code often placed adjacent to the result value in reports and flow sheets to signal the meaning/normalcy status of the result. The codes shall be taken from Observation Value Absent Reason value set and include: High, Low, Normal, and so forth. For more information on this value set, see: observation-interpretation.
comments	string	0..1	May include statements about significant, unexpected or unreliable values, or information about the source of the value where this may be relevant to the interpretation of the result.

Name	Type	Cardinality	Description
bodySite	CodeableConcept	0..1	Site on the subject's body where the observation was made (i.e. the target site). Codes describing anatomical locations. May include laterality. Only used if not implicit in code found in Observation.code. For example codes, see the SNOMED CT Body Structures value set: valueset-body-site . If the use case requires BodySite to be handled as a separate resource instead of an inline coded element (for example, to identify and track separately) then use the standard extension body-site-instance extension: extension-body-site-instance.
method	CodeableConcept	0..1	Mechanism used to perform the observation. In some cases, method can impact results and is thus used for determining whether results can be compared or determining significance of results. For more information on the Observation Method value set, see: observation-methods.
specimen	Reference(Specimen)	0..1	Specimen that was used when this observation was made. Observations are not made on specimens themselves; they are made on a subject, but usually by the means of a specimen. Note that although specimens are often involved, they are not always tracked and reported explicitly. Also note that observation resources may be used in contexts that track the specimen explicitly (for example, a Diagnostic Report).

Name	Type	Cardinality	Description
referenceRange		0..*	Guidance on how to interpret the value by comparison to a normal or recommended range. Knowing what values are considered “normal” can help evaluate the significance of a particular result. Need to be able to provide multiple reference ranges for different contexts. Most observations only have one generic reference range. Systems MAY choose to restrict to only supplying the relevant reference range based on knowledge about the patient (e.g. specific to the patient’s age, gender, weight and other factors), but this may not be possible or appropriate. Whenever more than one reference range is supplied, the differences between them SHOULD be provided in the reference range and/or age properties.
– referenceRange.low	Hl7.Fhir.Model.SimpleQuantity	0..1	Low range, if relevant. The value of the low bound of the reference range. The low bound of the reference range endpoint is inclusive of the value (e.g. reference range is >=5 - <=9). If the low bound is omitted, it is assumed to be meaningless (e.g. reference range is <=2.3).
– referenceRange.high	Hl7.Fhir.Model.SimpleQuantity	0..1	High range, if relevant. The value of the high bound of the reference range. The high bound of the reference range endpoint is inclusive of the value (e.g. reference range is >=5 - <=9). If the high bound is omitted, it is assumed to be meaningless (e.g. reference range is >= 2.3).

Name	Type	Cardinality	Description
– referenceRange.meaning	CodeableConcept	0..1	Meaning/use of this range of this range. For more information on this value set, see: referencerange-meaning.
– referenceRange.age	Hl7.Fhir.Model.Range	0..1	Applicable age range, if relevant. The age at which this reference range is applicable. This is a neonatal age (e.g. number of weeks at term) if the meaning says so.
– referenceRange.text	string	0..1	Text based reference range in an observation which may be used when a quantitative range is not appropriate for an observation. An example would be a reference value of “Negative” or a list or table of ‘normals’.
related		0..*	Set of related observations that together form the panel or battery of this observation. Normally, an observation will have either a value or a set of related observations. A few observations (e.g. Apgar score) may have both a value and a set of related observations or sometimes QuestionnaireResponse from which the measure is derived.
– related.type	code	1..1	Code specifying the kind of relationship that exists with the target resource. The codes shall be taken from the ObservationRelationshipType value set and include: Has-member, Derived-from, Sequel-to, Replaces, Qualified-by, and Interfered-by. For more

Name	Type	Cardinality	Description
			information on this value set, see: observation-relationshiptypes.
– related.target	Reference(Observation, QuestionnaireResponse)	1..1	Resource (US DAF Component observations) that is related to this one.
component		0..*	Some observations have multiple component observations. These component observations are expressed as separate code value pairs that share the same attributes. Examples include systolic and diastolic component observations for blood pressure measurement and multiple component observations for genetics observations. Component observations share the same attributes in the Observation resource as the primary observation and are always treated a part of a single observation (they are not separable). However, the reference range for the primary observation value is not inherited by the component values and is required when appropriate for each component observation.
– component.code	CodeableConcept	1..1	Laboratory test that was performed. This is element and codes are bound to LOINC (US Laboratory Observation Profile Observation Name Codes); however, other codes may be used where these codes are not suitable. For more information on this value set, see: observation-codes.

Name	Type	Cardinality	Description
Observation.component.value[x]	http://www.hl7.org/fhir/daf/daf-resultobs-definitions.html#daf-resultobs.Observation.component.value[x]	0..1	Information determined as a result of making the observation, if the information has a simple value. Choice of: Quantity, CodeableConcept, string, Range, Ratio, SampledData, Attachment, time, dateTime, Period. Normally, an observation will have either a value or a set of related observations. A few observations (e.g. Apgar score) may have both a value and related observations (for an Apgar score, the observations from which the measure is derived). If a value is present, the datatype for this element should be determined by Observation.code. A CodeableConcept with just a text would be used instead of a string if the field was usually coded, or if the type associated with the Observation.code defines a coded value. For boolean values use valueCodeableConcept and select codes from v2-0136 (These “yes/no” concepts can be mapped to the display name “true/false” or other mutually exclusive terms that may be needed”). The element, Observation.value[x], has a variable name depending on the type as follows: valueQuantity, valueCodeableConcept, valueRatio, valueChoice, valuePeriod, valueSampleData, or valueString (The name format is “‘value’ + the type name” with a capital on the first letter of the type).
– component.valueQuantity	Quantity	0..1	Actual component result or a measured amount (or an amount that can potentially be measured). The value contains the numerical value of the quantity,

Name	Type	Cardinality	Description
			including an implicit precision. If no comparator is specified, the value is a point value (i.e. '='). The comparator element can never be ignored.
– component.valueCodeableConcept	CodeableConcept	0..1	Actual component result.
– component.valueString	String	0..1	Actual component result.
– component.valueRange	Hl7.Fhir.Model.Range	0..1	Set of ordered Quantity values defined by a low and high limit. A Range specifies a set of possible values; usually, one value from the range applies (e.g. "give the patient between 2 and 4 tablets"). Ranges are typically used in instructions. The unit and code/system elements of the low or high elements shall match. If the low or high elements are missing, the meaning is that the low or high boundaries are not known and therefore neither is the complete range. The low and the high values are inclusive, and are assumed to have arbitrarily high precision; e.g. the range 1.5 to 2.5 includes 1.50, and 2.50 but not 1.49 or 2.51.
– component.valueRatio	Hl7.Fhir.Model.Ratio	0..1	Relationship between two Quantity values expressed as a numerator and a denominator. Common factors in the numerator and denominator are not automatically cancelled out. The Ratio data type is used for titers (e.g. "1:128") and other quantities produced by laboratories that truly represent ratios. Ratios are not simply "structured

Name	Type	Cardinality	Description
			numbers" - for example blood pressure measurements (e.g. "120/60") are not ratios. In addition, ratios are used where common factors in the numerator and denominator do not cancel out. A proper ratio has both a numerator and a denominator; however these are not mandatory in order to allow an invalid ratio with an extension with further information.
– component.valueSampledData	Hl7.Fhir.Model.SampledData	0..1	Data that comes from a series of measurements taken by a device, with upper and lower limits. There may be more than one dimension in the data. A SampledData provides a concise way to handle the data produced by devices that sample a physical particular state at a high frequency. A typical use for this is for the output of an ECG or EKG device.
– component.valueAttachment	Hl7.Fhir.Model.Attachment	0..1	Type for containing or referencing attachments - additional data content defined in other formats. The most common use of this type is to include images or reports in some report format such as PDF. However it can be used for any data that has a MIME type.
– component.valueTime	Time	0..1	Time during the day, with no date specified (can be converted to a Duration since midnight). Seconds must be provided due to schema type constraints but may be zero-filled and may be ignored. The time "24:00" is not allowed, and neither is a time zone.

Name	Type	Cardinality	Description
– component.valueDateTime	dateTime	0..1	Date, date-time or partial date (e.g. just year or year + month) as used in human communication. If hours and minutes are specified, a time zone shall be populated. Seconds must be provided due to schema type constraints but may be zero-filled and may be ignored. Dates shall be valid dates. The time “24:00” is not allowed.
– component.valuePeriod	Period	0..1	Time period defined by a start and end date/time. A period specifies a range of times. The context of use will specify whether the entire range applies (e.g. “the patient was an inpatient of the hospital for this time range”) or one value from the period applies (e.g. “give to the patient between 2 and 4 pm on 24-Jun 2013”). If the start element is missing, the start of the period is not known. If the end element is missing, it means that the period is ongoing, or the start may be in the past, and the end date in the future, which means that period is expected/planned to end at the specified time. The end value includes any matching date/time. For example, the period 2011-05-23 to 2011-05-27 includes all the times from the start of the 23rd May through to the end of the 27th of May.
– component.dataAbsentReason	CodeableConcept	0..1	Reason why the expected value in the element Observation.value[x] is missing. The codes shall be taken from the ObservationValueAbsentReason value set and include the following 9 values:

Name	Type	Cardinality	Description
			Unknown, Asked, Temp, Not Asked, Masked, Unsupported, As Text, Error, Not a Number. For more information on this value set, see: observation-valueabsentreason.
– component.referenceRange		0..*	Guidance on how to interpret the value by comparison to a normal or recommended range. Knowing what values are considered “normal” can help evaluate the significance of a particular result. Need to be able to provide multiple reference ranges for different contexts. Most observations only have one generic reference range. Systems MAY choose to restrict to only supplying the relevant reference range based on knowledge about the patient (e.g. specific to the patient’s age, gender, weight and other factors), but this may not be possible or appropriate. Whenever more than one reference range is supplied, the differences between them SHOULD be provided in the reference range and/or age properties.

Searching by date

Dates are passed as query parameters on the URL. Since the URL parameters cannot handle comparators (for example, >, <=) these are passed as part of the date.

```
date=eq2016-01-01
date=gt2016-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

To search for a date range, pass in the date twice.

e.g. `date=ge2010-01-01&date=le2010-12-31`

This search would include every day in the year 2010.

Retrieving a patient's vital signs

The logical ID (of the patient to retrieve) is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id/Observation?category=vital-signs
GET https://fhirtest.versasuite.com/Patient/id/Observation?category=vital-signs&date=eq2016-01-01
```

Name	Required?	Type	Description
id	yes	URL	The logical ID of the patient. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

A DAF Observation is returned.

Name	Type	Cardinality	Description
identifier		0..*	Unique identifier for the simple observation instance. Allows observations to be distinguished and referenced.
status	code	1..1	Status of the vital sign result value. The status of individual results needs to be tracked. Some results are finalized before the whole report is finalized. The conformance on this value set is required. Values include: Registered, Preliminary, Final, Amended, Cancelled, Entered in Error, and Unknown. For more

Name	Type	Cardinality	Description
			information on this value set, see: http://hl7.org/fhir/ValueSet/observation-status.
category	CodeableConcept	0..1	Classification of type of observation. Clinical observations measure the body's basic functions such as such as blood pressure, heart rate, respiratory rate, height, weight, body mass index, head circumference, pulse oximetry, temperature, and body surface area. For more information on this value set, see: http://hl7.org/fhir/ValueSet/observation-category.
code	CodeableConcept	1..1	Vital sign result type. Coded responses are from C-CDA Vital Sign Results. 1. Shall contain exactly one [1..1] code, where the @code should be selected from ValueSet HITSP Vital Sign Result Type. This value set indicates the allowed vital sign result types. The vocabulary selected for this value set aligns with requirements in the Meaningful Use (MU) Stage 2. Note the concept

Name	Type	Cardinality	Description
			Blood pressure systolic and diastolic (55284-4) is used to group the related observations Systolic blood pressure (8480-6) and Diastolic blood pressure (8462-4). It shall not be used alone, but both 8480-6 and 8462-2 shall also be valued. The codes shall be taken from C-CDA Vital Sign Result; other codes may be used where these codes are not suitable. For more information on this value set, see: http://hl7.org/fhir/ValueSet/observation-codes.
subject	Reference(Patient, Group, Device, Location)	0..1	Who and/or what this vital is for. The patient, or group of patients, location, or device whose characteristics (direct or indirect) are described by the observation and into whose record the observation is placed. Indirect characteristics may be those of a specimen, fetus, donor, other observer (for example a relative or EMT), or any observation made about the subject. Observations have no value if you don't know who or what they're

Name	Type	Cardinality	Description
			about. Note: One would expect this element to be a cardinality of 1..1. The only circumstance in which the subject can be missing is when the observation is made by a device that does not know the patient. In this case, the observation shall be matched to a patient through some context/channel matching technique, and at this point, the observation should be updated.
encounter	Reference(Encounter)	0..1	The healthcare event (for example, a patient and healthcare provider interaction) during which this vital was obtained. For some observations it may be important to know the link between the vital sign and a particular encounter.
effectiveDateTime	dateTime	0..1	Clinically relevant time/time-period for observation. Often just a dateTime for Vital Signs. Knowing when an observation was deemed true is important to its relevance as well as determining trends. At least a date should be present unless this observation is a historical report.

Name	Type	Cardinality	Description
effectivePeriod	Period	0..1	Clinically relevant time/time-period for observation. Often a dateTime for Vital Signs is preferred but if it is a historical instance, then a time period is sufficient.
issued	Hl7.Fhir.Model.Instant	0..1	Date/Time this was made available.
performer	Reference(Practitioner, Organization, Patient, RelatedPerson)	0..*	Who is responsible for the observation or obtaining the vital sign. May give a degree of confidence in the observation and also indicates where follow-up questions should be directed.
valueQuantity	Quantity	0..1	Vital Sign Value recorded with UCUM. Common UCUM units for recording Vital Signs. The codes shall be taken from Common UCUM units as defined in http://unitsofmeasure.org Examples include % (percent), cm (centimeter), kg (kilogram), mm(Hg) (millimeter of mercury), /min (per minute) and kg/m2 (kilogram). Note: Normally, an observation will have either a value or a set of related observations. A few observations (e.g. Apgar score)

Name	Type	Cardinality	Description
			may have both a value and related observations (for an Apgar score, the observations from which the measure is derived). If a value is present, the datatype for this element should be determined by Observation.code. This element has a variable name depending on the type as follows: valueQuantity, valueCodeableConcept, valueString, valueRange, valueRatio, valueSampledData, valueAttachment, valueTime, valueDateTime, or valuePeriod. (The name format is "'value' + the type name" with a capital on the first letter of the type).
valueQuantity.value	http://www.hl7.org/fhir/daf/daf-vitalsigns-definitions.html#daf-vitalsigns.Observation.valueQuantity.value	0..1	The value of the measured amount. The value includes an implicit precision in the presentation of the value. Precision is handled implicitly in almost all cases of measurement. The implicit precision in the value should always be honored. Monetary values have their own rules for handling precision (refer to standard accounting text books).

Name	Type	Cardinality	Description
valueQuantity.unit	http://www.hl7.org/fhir/daf/daf-vitalsigns-definitions.html#daf-vitalsigns.Observation.valueQuantity.unit	0..1	A human-readable form of the unit. There are many representations for units of measure and in many contexts, particular representations are fixed and required. For example, mcg for micrograms.
valueQuantity.system	http://www.hl7.org/fhir/daf/daf-vitalsigns-definitions.html#daf-vitalsigns.Observation.valueQuantity.system	0..1	The identification of the system that provides the coded form of the unit. Need to know the system that defines the coded form of the unit. Fixed value http://unitsofmeasure.org.
valueQuantity.code	http://www.hl7.org/fhir/daf/daf-vitalsigns-definitions.html#daf-vitalsigns.Observation.valueQuantity.code	0..1	Coded responses from the common UCUM units for vital signs value set. Need a computable form of the unit that is fixed across all forms. UCUM provides this for quantities, but SNOMED CT provides many units of interest. The preferred system is UCUM, but SNOMED CT can also be used (for customary units) or ISO 4217 for currency. The context of use may additionally require a code from a particular system.

Name	Type	Cardinality	Description
dataAbsentReason	CodeableConcept	0..1	Provides a reason why the expected value in the element Observation.value[x] is missing. Codes specifying why the result (Observation.value[x]) is missing. The codes shall be taken from Observation Value Absent Reason value set, however other codes may be used where these codes are not suitable. This value set contains 9 concepts. For more information on this value set, see http://hl7.org/fhir/ValueSet/observation-valueabsentreason.
interpretation	CodeableConcept	0..1	This value set defines the set of codes that can be used to indicate the meaning/use of a reference range. The value set is extensible and contains 33 concepts. Examples include A (Abnormal), H (High), L (Low), and N (Normal). For more information on this value set, see http://hl7.org/fhir/ValueSet/observation-interpretation.
referenceRange	BackboneElement http://www.hl7.org/fhir/daf/daf-vitalsigns-definitions.html#daf-vitalsigns.Observation.referenceRange	0..*	Guidance on how to interpret the value by comparison to a normal or

Name	Type	Cardinality	Description
			recommended range. Knowing what values are considered “normal” can help evaluate the significance of a particular result. Need to be able to provide multiple reference ranges for different contexts. Most observations only have one generic reference range. Systems may choose to restrict to only supplying the relevant reference range based on knowledge about the patient (for example, specific to the patient’s age, gender, weight, and other factors), but this may not be possible or appropriate. Whenever more than one reference range is supplied, the differences between them should be provided in the reference range and/or age properties.
—referenceRange.Low	SimpleQuantity http://www.hl7.org/fhir/daf/daf-vitalsigns-definitions.html#daf-vitalsigns.Observation.referenceRange.low	0..1	Indication that the vital result is lower than the defined reference range. Binding is common UCUM units for recording Vital Signs.
—referenceRange.High	SimpleQuantity http://www.hl7.org/fhir/daf/daf-vitalsigns-definitions.html#daf-vitalsigns.Observation.referenceRange.high	0..1	Indication that the vital result is higher than the defined reference

Name	Type	Cardinality	Description
			range. Binding is common UCUM units for recording Vital Signs.
Respiratory rate	http://argonautwiki.hl7.org/index.php?title=Vital_Signs_Respiratory_Rate_Example	0..1	Recorded under LOINC Code 9279-1 using UOM of (breaths)/min.
Heart rate	http://argonautwiki.hl7.org/index.php?title=Vital_Signs_Heart_Rate_Example	0..1	Recorded under LOINC Code 8867-4 using UOM of (beats)/min.
Oxygen saturation	http://argonautwiki.hl7.org/index.php?title=Vital_Signs_Oxygen_Saturation_Example	0..1	Recorded under LOINC Code 59408-5 using UOM of % Oxygen saturation in Arterial blood by Pulse oximetry.
Body temperature	http://argonautwiki.hl7.org/index.php?title=Vital_Signs_Body_Temperature_Example	0..1	Recorded under LOINC Code 8310-5 using UOM of Cel or [degF].
Body height	http://argonautwiki.hl7.org/index.php?title=Vital_Signs_Body_height_Example	0..1	Recorded under LOINC Code 8302-2 using UOM cm or [in].
Body weight	http://argonautwiki.hl7.org/index.php?title=Vital_Signs_Body_Weight_Example	0..1	Recorded under LOINC Code 29463-7 using UOM g, kg or lb.
Body mass index	http://argonautwiki.hl7.org/index.php?title=Vital_Body_Mass_Example	0..1	Recorded under LOINC Code 39156-5 using UOM kg/m2.
Blood pressure systolic and diastolic	http://argonautwiki.hl7.org/index.php?title=Vital_Signs_Blood_Pressure_Example	1..1	Recorded under LOINC Code 55284-4 using UOM mm[Hg].

Name	Type	Cardinality	Description
Systolic blood pressure	http://argonautwiki.hl7.org/index.php?title=Vital_Signs_Blood_Pressure_Example	1..1	Recorded under LOINC Code 8480-6 using UOM mm[Hg]. When recording a blood pressure using systolic and diastolic as separate entities, both must be recorded in order for the blood pressure to be valid.
Diastolic blood pressure	http://argonautwiki.hl7.org/index.php?title=Vital_Signs_Blood_Pressure_Example	1..1	Recorded under LOINC Code 8462-4 using UOM mm[Hg]. When recording a blood pressure using systolic and diastolic as separate entities, both must be recorded in order for the blood pressure to be valid.
related	code http://www.hl7.org/fhir/daf/daf-vitalsigns-definitions.html#daf-vitalsigns.Observation.related.type	1..1	Codes specifying how two observations are related. This is used when reporting systolic and diastolic blood pressure. The codes shall be taken from the ObservationRelationshipType value set. For more information on this value set, see http://www.hl7.org/fhir/valueset-observation-relationshiptypes.html.

Searching by date

Dates are passed as query parameters on the URL. Since the URL parameters cannot handle comparators (for example, >, <=) these are passed in as part of the date.

```
date=eq2016-01-01
date=gt2016-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

To search for a date range, pass in the date twice.

e.g. `date=ge2010-01-01&date=le2010-12-31`

This search would include every day in the year 2010.

Procedures

Retrieving a patient's procedures

The logical ID (of the patient to retrieve) is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id/Procedure
GET https://fhirtest.versasuite.com/Patient/id/Procedure?date=eq2016-01-01
```

Name	Required?	Type	Description
id	yes	URL	Patient's logical ID. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

A DAF Procedure is returned.

Name	Type	Cardinality	Description
identifier		0..*	Procedure identifier. These identifiers are defined by business processes and/or used to refer to it when a direct URL reference to the resource itself is not appropriate (for example, in CDA documents, or in written/printed documentation).
subject	Reference(Patient, Group)	1..1	Person, animal, or group on which the procedure was performed.
status	code	1..1	In-progress, aborted, completed, or entered-in-error. For more information on this value set, see procedure-status.
category	CodeableConcept	0..1	Classification of the procedure. For more information on this value set, see procedure-category.

Name	Type	Cardinality	Description
code	CodeableConcept	1..1	Identification code of the procedure. The value set defines a set of codes that can be used to indicate the type of procedure: a specific code indicating type of procedure performed from CPT, SNOMED CT, and ICD10-PCS. For more information on this value set, see procedure-code.
notPerformed	boolean	0..1	Was the procedure not performed as scheduled? (Yes if not scheduled.)
reasonNotPerformed	CodeableConcept	0..*	Reason procedure was not performed. For more information on this value set, see procedure-not-performed-reason.
bodySite	CodeableConcept	0..*	Target body sites. For more information on this value set, see body-site.
reasonCodeableConcept	CodeableConcept	0..1	Reason why the procedure was performed.
reasonReference	Reference(Condition)	0..1	Reason for the procedure.
performer		0..*	Individual who performed the procedure. This must be a real person, not equipment.
– performer.actor	Reference(Practitioner, Organization, Patient, RelatedPerson)	0..1	Reference to the practitioner.
– performer.role	CodeableConcept	0..1	Role the actor was in. Values come from performer-role.

Name	Type	Cardinality	Description
performedDateTime	dateTime	0..1	Date/time period over which the procedure was performed. Allows a period to support complex procedures that span more than one date, and also allows for the length of the procedure to be captured.
performedPeriod	Period	0..1	Date/time period during which the procedure was performed.
encounter	Reference(Encounter)	0..1	Encounter during which the procedure was performed.
location	Reference(Location)	0..1	Location where the procedure was performed.
outcome	CodeableConcept	0..1	Result of the procedure. For more information on this value set, see procedure-outcome.
report	Reference(DiagnosticReport)	0..*	Any report resulting from the procedure.
complication	CodeableConcept	0..*	Complication following the procedure. For more information on this value set, see condition-code.
followUp	CodeableConcept	0..*	Instructions for follow up. For more information on this value set, see procedure-followup.
request	Reference(CarePlan, DiagnosticOrder, ProcedureRequest, ReferralRequest)	0..1	Request for the procedure.
notes	Annotation	0..*	Additional information about the procedure.
focalDevice		0..*	Device changed during the procedure.
– focalDevice.action	CodeableConcept	0..1	Kind of change to device. For more information on this value set, see device-action.

Name	Type	Cardinality	Description
– focalDevice.manipulated	Reference(Device)	1..1	Device that was changed during the procedure.
used	Reference(Device, Medication, Substance)	0..*	Items used during the procedure.

Searching by date

Dates are passed as query parameters on the URL. Since the URL parameters cannot handle comparators (for example, >, <=) these are passed in as part of the date.

```
date=eq2016-01-01
date=gt2016-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

To search for a date range, pass in the date twice. e.g. `date=ge2010-01-01&date=le2010-12-31`

Assessment and Plan of Treatment

Retrieving a patient's assessment and plan of treatments

The logical ID (of the patient to retrieve) is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id/CarePlan?category=assess-plan
GET https://fhirtest.versasuite.com/Patient/id/CarePlan?category=assess-plan&date=eq2016-01-01
```

Name	Required?	Type	Description
id	yes	url	The logical ID of the patient. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

A DAF CarePlan is returned. The Argonaut Assessment and Plan of Treatment IG provides the API documentation for searching for and fetching patient assessment and plan of treatment data using the CarePlan resource. The search supports the narrative elements of the Assessment and Plan section which is the minimal necessary criteria to support the 2015 Edition ONC Certification criterion Data Category Request 170.315(g)(8).

Name	Type	Cardinality	Description
identifier		0..*	External IDs for this plan. This is a business identifier, not a resource identifier. This records identifiers associated with this care plan that are defined by business processes and/or used to refer to it when a direct URL reference to the resource itself is not appropriate. For example, in CDA documents or in written/printed documentation.
subject	Reference(Patient, Group)	0..1	Who the care plan is for. This identifies the patient or group whose intended care is described by the plan.

Name	Type	Cardinality	Description
status	code	1..1	Indicates hether the plan is currently acted upon, represents future intentions, or is now a historical record. It allows clinicians to determine whether the plan is actionable or not. Conformance is required, and the valid statuses include: Proposed, Pending, Active, Completed, and Cancelled. For more information on this value set, see: care-plan-status.
category	CodeableConcept	0..*	Identifies what kind of plan this is to support differentiation between multiple co-existing plans. For example, “Home health”, “psychiatric”, “asthma”, “disease management”, “wellness plan”, and so forth. There may be multiple axis of categorization, and one plan may serve multiple purposes. In some cases, this may be redundant with references to CarePlan.concern. This value set contains 21 concepts. For more information on this value set, see: care-plan-category.
narrative summary	string	0..1	Text or HTML description of the assessment and plan. CarePlan.text.status is either Generated or Additional. This tool uses Generated. For more information on this value set, see: narrative-status, which defines the following codes: Generated, Extensions, Additional, and Empty.

Searching by Date

Dates are passed in as query parameters on the URL. Since the URL parameters cannot handle comparators (for example, >, <=), these are passed as part of the date.

```
date=eq2016-01-01
date=gt2016-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

To search for a date range, pass in the date twice.

e.g. `date=ge2010-01-01&date=le2010-12-31`

This search would include every day in the year 2010.

Care Team

Retrieving a patient's care team(s)

The logical ID of the patient to retrieve is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id/CarePlan?category=careteam
GET https://fhirtest.versasuite.com/Patient/id/CarePlan?category=careteam&date=eq2016-01-01
```

Name	Required?	Type	Description
id	yes	URL	The logical ID of the patient. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

A DAF care plan is returned. Since we are using the CarePlan Resource for identifying the care team members, constraints on that resource are defined for this purpose only. For example, creating a care team profile using care plan.

Name	Type	Cardinality	Description
identifier		0..*	External IDs for this plan. This records identifiers associated with this care team that are defined by business processes and/or used to refer to it when a direct URL reference to the resource itself is not appropriate. This is a business identifier, not a resource identifier.
subject	Reference(Patient, Group)	0..1	Who the care team is for. Identifies the patient whose intended care is handled by the team.
status	code	1..1	Indicates whether the plan is currently being acted upon, represents future intentions, or is now a historical record. It also allows clinicians to determine whether the plan is actionable or not. Statuses returned include: Proposed, Draft

Name	Type	Cardinality	Description
			(Pending), Active, Completed, and Cancelled. For more information on this value set, see: care-plan-status.
category	CodeableConcept	0..*	Options could include Problem, Health Concern, Care Team, or Assessment and Plan of Treatment. A type of plan which utilizes “Assessment and Plan of Treatment” - the clinical conclusions and assumptions that guide the patient’s treatment and the clinical activities formulated for a patient. Where the category is just “Assessment and Plan,” only the category “Assessment and Plan” will be returned. Values come from Argonaut Extension Codes for Care Plan Argonaut_Extension_Codes.
participant		0..*	Members of the team. Identifies all people and organizations who are expected to be involved in the care team. Allows representation of care teams, and helps scope the care plan. In some cases, this may be a determiner of access permissions.
– participant.role	CodeableConcept	0..1	Indicates the specific responsibility of an individual within the care team, such as primary physician, team coordinator, or caregiver. Roles may be inferred by type of practitioner. These are relationships that hold only within the context of the care team. General relationships should be handled as properties of the patient resource directly. For more information on this value set, see participant-role.
– participant.member	Reference(Practitioner, RelatedPerson, Patient, Organization)	0..1	The specific person or organization who is participating in or expected to participate in the care team. The patient only needs to be listed if they have a role other than subject of care. Member is optional because some participants may be known only by their role, particularly in draft plans.

Searching by date

Dates are passed as query parameters on the URL. Since the URL parameters cannot handle comparators (e.g. >, <=), these are passed in as part of the date.

```
date=eq2016-01-01
date=gt2016-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

To search for a date range, pass in the date twice:

e.g. `date=ge2010-01-01&date=le2010-12-31`

This search would include every day in the year 2010.

Retrieving a patient's laboratory result diagnostic reports

Diagnostic report: a combination of requested information, atomic results, images, interpretation, and formatted reports.

The logical ID of the patient to retrieve is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id/DiagnosticReport?category=LAB
GET https://fhirtest.versasuite.com/Patient/id/DiagnosticReport?category=LAB&date=eq2016-01-01
```

Name	Required?	Type	Description
id	yes	URL	The logical ID of the patient. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

A DAF DiagnosticReport is returned.

Name	Type	Cardinality	Description
identifier		0..*	Local ID assigned to the report by the order filler, usually by the information system of the diagnostic service provider. You must know what identifier to use when making queries about this report from the source laboratory and for linking to the report outside FHIR context. Alternate name: ReportID.
status	code	1..1	Status of the diagnostic report as a whole. Diagnostic services routinely issue provisional/incomplete reports, and sometimes withdraw previously released reports. This is labeled as "Is Modifier" because applications need to take appropriate action if a report is withdrawn. The codes shall be taken from the DiagnosticReportStatus value set, which includes the following statuses: Registered, Partial, Final, Corrected, Appended, Cancelled, and Entered-in-Error. For more information on this value set, see: diagnostic-report-status.

Name	Type	Cardinality	Description
category	CodeableConcept	0..1	Code that classifies the clinical discipline, department, or diagnostic service that created the report. For example, cardiology, biochemistry, hematology, or MRI. This is used for searching, sorting, and displaying purposes. The level of granularity is defined by the category concepts in the DiagnosticServiceSectionCodes value set. More filtering is performed using the metadata and/or terminology hierarchy in DiagnosticReport.code. Alternate names: Department, Sub-department, service, discipline. Example codes include: AU- Audiology, CH- Chemistry, MB- Microbiology, and HM- Hematology. For more information on this value set, see: diagnostic-service-sections.
code	CodeableConcept	1..1	Test, panel, or battery that was ordered. The typical patterns for codes are: 1) a LOINC code either as a translation from a “local” code or as a primary code, 2) a local code only if no suitable LOINC exists, or 3) both the local and the LOINC translation. Systems shall be capable of sending the local code if one exists. The codes shall be taken from US Laboratory Observation Profile Observation Name Codes. Other codes may be used where these codes are not suitable. This value set has more than 1000 codes. For more information on this value set, see: report-codes.
subject	Reference(Patient, Group, Device, Location)	1..1	Subject of the report. Usually this is a patient. However, diagnostic services also perform analyses on specimens collected from a variety of other sources.
encounter	Reference(Encounter)	0..1	Link to the healthcare event (encounter) when the order was made.
effectiveDateTime	dateTime	1..1	Specimen Collection Datetime which is the physically relevant dateTime for laboratory tests. If the diagnostic procedure was performed on the patient, this is the time it was performed. If there are specimens, the diagnostically relevant time can be derived from the specimen collection times, but the specimen

Name	Type	Cardinality	Description
			information is not always available, and the exact relationship between the specimens and the diagnostically relevant time is not always automatic.
effectivePeriod	Period	1..1	Specimen Collection Period which is the physically relevant dateTime for laboratory tests. If the diagnostic procedure was performed on the patient, this is the time it was performed. If there are specimens, the diagnostically relevant time can be derived from the specimen collection times, but the specimen information is not always available, and the exact relationship between the specimens and the diagnostically relevant time is not always automatic. If the start element is missing, the start of the period is not known. If the end element is missing, it means that the period is ongoing, or the start may be in the past, and the end date in the future, which means that period is expected/planned to end at the specified time.
issued	Hl7.Fhir.Model.Instant	1..1	Date and time that this version of the report was released from the source diagnostic service. Clinicians must be able to check the date that the report was released. This may be different from the update time of the resource itself, because that is the status of the record (potentially a secondary copy), not the actual release time of the report. Alternate names: Date Created, Date published, Date Issued.
performer	Reference(Practitioner, Organization)	1..1	Diagnostic service that is responsible for issuing the report. This is helpful to know who to contact if there are queries about the results. You may need to track the source of reports for secondary data analysis. This is not necessarily the source of the atomic data items. It is the entity that takes responsibility for the clinical report. Alternate names: Laboratory, Service, Practitioner, Department, Company.

Name	Type	Cardinality	Description
request	Reference(DiagnosticOrder, ProcedureRequest, ReferralRequest)	1..*	Details concerning a test or procedure requested. You need to be able to track completion of requests based on reports issued and also to report what diagnostic tests were requested (not always the same as what is delivered). You need to be able to track completion of requests based on reports issued and also to report what diagnostic tests were requested (not always the same as what is delivered).
specimen	Reference(Specimen)	0..*	Details about the specimens on which this diagnostic report is based. If the specimen is sufficiently specified with a code in the test result name, then this additional data may be redundant. If there are multiple specimens, these may be represented per observation or group.
result	Reference(Observation)	0..*	Observations that are part of this diagnostic report. Observations can be simple name/value pairs (for example, “atomic” results), or they can be grouping observations that include references to other members of the group (such as “panels”). You need to support individual results, or report groups of results, where the result grouping is arbitrary, but meaningful. This structure is recursive in that observations can contain observations. Alternate names: Data, Atomic Value, Result, Atomic result, Data, Test, Analyte, Battery, or Organizer.
imagingStudy	Reference(ImagingStudy, ImagingObjectSelection)	0..*	One or more links to full details of any imaging performed during the diagnostic investigation. Typically, this is imaging performed by DICOM enabled modalities, but this is not required. A fully enabled PACS viewer can use this information to provide views of the source images. ImagingStudy and ImageObjectStudy and the image element are somewhat overlapping - typically, the list of image references in the image element will also be found in one of the imaging study resources. However each caters to different types of displays for different types of purposes. Neither, either, or both may be provided.

Name	Type	Cardinality	Description
image		0..*	List of key images associated with this report. The images are generally created during the diagnostic process, and may be directly of the patient, or of treated specimens (for example, slides of interest).
– image.comment	string	0..1	Comment about the image. Typically this is used to provide an explanation for why the image is included, or to draw the viewer's attention to important features. The provider of the report should make a comment about each image included in the report. The comment should be displayed with the image. It would be common for the report to include additional discussion of the image contents in other sections such as the conclusion.
– image.link	Reference(Media)	1..1	Reference to the image source.
conclusion	string	0..1	Concise and clinically contextualized narrative interpretation of the diagnostic report. You need to be able to provide a conclusion that is not lost among the basic result data. Typically, a report is either [all data, no narrative (e.g. Core lab)] or [a mix of data with some concluding narrative (e.g. Structured Pathology Report, Bone Density)], or [all narrative (e.g. typical imaging report, histopathology)]. In all of these cases, the narrative goes in "text".
codedDiagnosis	CodeableConcept	0..*	Codes for the conclusion which are SNOMED CT findings codes provided as adjunct diagnosis to the report. The codes should be taken from SNOMED CT Clinical Findings. Included are codes from Snomeds where concept is-a 404684003. For more information on this value set, see: clinical-findings.
presentedForm	Hl7.Fhir.Model.Attachment	0..*	Rich text representation of the entire result as issued by the diagnostic service. Multiple formats are allowed but they shall be semantically equivalent. This gives the laboratory the ability to provide its own fully formatted report for

Name	Type	Cardinality	Description
			clinical fidelity. Note: “application/pdf” is recommended as the most reliable and interoperable in this context.

Searching by Date

Dates are passed as query parameters on the URL. Since the URL parameters cannot handle comparators (for example, >, <=) these are passed as part of the date.

```
date=eq2016-01-01
date=gt2016-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

To search for a date range, pass in the date twice.

```
date=ge2010-01-01&date=le2010-12-31
```

This search would include every day in the year 2010.

Goals

Retrieving a patient's goals

The logical ID (of the patient to retrieve) is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id/Goal
GET https://fhirtest.versasuite.com/Patient/id/Goal?date=eq2016-01-01
```

Name	Required?	Type	Description
id	yes	URL	The logical ID of the patient. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

A DAF Goal is retuned

Name	Type	Cardinality	Description
identifier		0..*	External ID for this goal. This is a business identifier, not a resource identifier. This records identifiers associated with this care plan that are defined by business processes and/or used to refer to it when a direct URL reference to the resource itself is not appropriate (for example, in CDA documents, or in written/printed documentation).
subject	Reference(Patient, Group, Organization)	0..1	Who the goal is intended for. Subject identifies the patient, group, or organization for whom the goal is being established,

Name	Type	Cardinality	Description
			typically the patient. Subject is optional to support anonymized reporting.
startDate	Date	0..1	When the goal pursuit begins. A date or partial date (for example, just year or year + month) as used in human communication. There is no time zone. Dates shall be valid dates.
startCodeableConcept	CodeableConcept	0..1	When the goal pursuit begins. This option is a codable concept that identifies types of events that might trigger the start of a goal as defined in Snomed Info. For example, Admission to the hospital (32485007), Childbirth (386216000), or Completion time of procedure (442137000).
targetDate	Date	0..1	Reach goal on or before. Indicates either the date or the duration after the start by which the goal should be met. This identifies when the goal should be evaluated. This can be a target date (or partial) or a duration of time.
targetQuantity	Quantity	0..1	Reach goal on or before. Indicates either the date or the duration after start by which the goal should be met. This identifies when the goal should be evaluated. This can be a target date (or partial) or a duration of time.
category	CodeableConcept	0..*	Indicates a category the goal falls within, and allows goals to be filtered and sorted based on

Name	Type	Cardinality	Description
			a particular category. Examples of category include: Treatment, Dietary, or Behavioral. For more information on this value set, see goal-category.
description	string	1..1	Desired outcome. This is a human-readable description of a specific desired objective of care. Without a description of what's trying to be achieved, the element has no purpose.
status	code	1..1	Indicates whether the goal has been reached and is still considered relevant. Options include: Proposed, Planned, Accepted, Rejected, In-progress, Achieved, Sustaining, On-hold, and Cancelled. For more information on this value set, see goal-status.
statusDate	date)	0..1	When goal status took effect. This identifies the current status. For example, when the goal was initially created, when the goal was achieved, when the goal was cancelled, and so on.
statusReason	CodeableConcept	0..1	Captures the reason for the current status. This is typically captured for statuses such as Rejected, On-hold, or Cancelled but could be present for others. Conformance is set as example. For more information on this value set, see: goal-status-reason.

Name	Type	Cardinality	Description
author	Reference(Patient, Practitioner- https://www.hl7.org/fhir/Practitioner.html or Related Person- https://www.hl7.org/fhir/RelatedPerson.html	0..1	Who is responsible for creating the goal. This indicates whose goal this is: patient goal, practitioner goal, related person goal, and so on. This is the individual responsible for establishing the goal, not necessarily who recorded it. (For that, use the provenance resource.)
priority	CodeableConcept	0..1	Identifies the mutually agreed level of importance associated with reaching and/or sustaining the goal. This is used for sorting and presenting goals. Extensions are available to track priorities as established by each participant. For example, priority from the patient's perspective, different practitioners' perspectives, or family member's perspectives. The ordinal extension on coding can be used to convey a numerically comparable ranking to priority. Conformance is preferred and defines the following codes: High, Medium, and Low. Different coding systems may use "low value=important." For more information on this value set, see: goal-priority.
addresses	Reference(Condition, Observation, MedicationStatement, NutritionOrder, ProcedureRequest, RiskAssessment)	0..*	Identified conditions and other health record elements that are intended to be addressed by the goal. This allows specific goals to be explicitly linked to the concerns they're

Name	Type	Cardinality	Description
			dealing with which makes the goal more understandable. Reference profiles include: Condition, Observation, MedicationStatement, NutritionOrder, ProcedureRequest, and RiskAssessment.
note	Annotation	0..*	Comments or annotation about the goal. Must capture information about the goal that doesn't actually describe the goal. May be used for progress notes, concerns, or other related information that doesn't actually describe the goal itself. This is also an MU requirement, which determines the narrative portion of the goal.
outcome		0..*	The end result of goal. Outcome identifies the change (or lack of change) at the point where the goal was deemed to be cancelled or achieved. Outcome tracking is a key aspect of care planning. Note that this should not duplicate the goal status.
– outcome.resultCodeableConcept	CodeableConcept	0..1	Code or observation that resulted from goal.
– outcome.resultReference	Reference(Observation)	0..1	Code or observation that resulted from the goal. This describes what has or has not changed. GoalOutcome: The result of the goal. For example, "25% increase in shoulder

Name	Type	Cardinality	Description
			mobility," "Anxiety reduced to moderate levels," or "15 kg weight loss sustained over 6 months."

Searching by date

Dates are passed as query parameters on the URL. Since the URL parameters cannot handle comparators (for example, >, <=) these are passed in as part of the date.

```
date=eq2016-01-01
date=gt2016-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

To search for a date range, pass in the date twice.

e.g. `date=ge2010-01-01&date=le2010-12-31` This search would include every day in the year 2010.

Implantable device/UDI

Retrieving a patient's implantable devices/UDI

The logical ID of the patient to retrieve is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id/Device
GET https://fhirtest.versasuite.com/Patient/id/Device?date=eq2016-01-01
```

Name	Required?	Type	Description
id	yes	URL	The logical ID of the patient. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

A DAF Device is returned.

Name	Type	Cardinality	Description
identifier		0..*	Unique instance identifier assigned to a device by organizations like manufacturers or owners. If the identifier indicates the type of device, Device.type should be used. This is a business identifier, not a resource identifier, often fixed to the device as a barcode, and may include names given to the device in local usage. Note that some of the barcodes affixed to the device identify its type, not its instance. For the FDA mandated Unique Device Identifier (UDI), use the Device.udi element.
type	CodeableConcept	1..1	Code or identifier to indicate a kind of device. For the FDA mandated Unique Device Identifier (UDI), use the Device.udi element.
note	Annotation	0..*	Device notes and comments, including annotations.

Name	Type	Cardinality	Description
status	code	0..1	Status of the device availability. This value set has an inline system that defines the following codes: Available, Not Available, and Entered-in-Error. For more information on this value set, see devicestatus.
manufacturer	string	0..1	Name of device manufacturer.
model	string	0..1	Model ID assigned by the manufacturer.
version	string	0..1	Version number. For example, software.
manufactureDate	dateTime	0..1	Manufacture date.
expiry	dateTime	0..1	Date and time of expiration of this device, if applicable.
udi	string	0..1	FDA mandated Unique Device Identifier.
lotNumber	string	0..1	Lot number of manufacturer.
owner	Reference(Organization)	0..1	Organization responsible for device.
location	Reference(Location)	0..1	Where the resource is found.
patient	Reference(Patient)	0..1	If the resource is affixed to a person.
contact	ContactPoint	0..*	Details for human/organization for support.
url	URI	0..1	Network address to contact device.

Searching by Date

Dates are passed as query paramters on the URL. Since the URL parameters cannot handle comparators (for example, >, <=) these are passed as pat of the date.

```
date=eq2016-01-01
date=gt2016-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

To search for a date range, pass in the date twice.

```
date=ge2010-01-01&date=le2010-12-31
```

This search would include every day in the year 2010.

Document reference (CCDA)

Retrieving a patient's CCDA documents

The logical ID of the patient to retrieve is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id/DocumentReference
GET https://fhirtest.versasuite.com/Patient/id/DocumentReference?date=eq2016-01-01
```

Name	Required?	Type	Description
id	yes	URL	The logical ID of the patient. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

A FHIR DocumentReference is returned.

Name	Type	Cardinality AAA	Description
masterIdentifier	Identifier	0..1	Master Version Specific Identifier.
identifier	Identifier	0..*	Other identifiers for the document.
subject	Reference(Patient)	0..1	Who/what is the subject of the document.
type	CodeableConcept	1..1	Kind of document. The value set includes content from LOINC. For more information on this value set, see condition-code.
indexed	Instant	1..1	When this document reference was created

Name	Type	Cardinality AAA	Description
status	code	1..1	Status of the document. Values include current, superseded, and entered-in-error. For more information on this value set, see document-reference-status.
description	String	0..1	Human-readable description. The HTML version of the document.
content		1..*	Document referenced
– content.attachment	attachment	0..1	Where/How to access the document. See below for more detail.
– content. format	code	0..1	Format of the document. For more information on this value set, see formatcodes.

Searching by date

Dates are passed as query parameters on the URL. Since the URL parameters cannot handle comparators (for example, >, <=) these are passed in as part of the date.

```
date=eq2016-01-01
date=gt2016-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

To search for a date range, pass in the date twice.

e.g. `date=ge2010-01-01&date=le2010-12-31`

This search would include every day in the year 2010.

Get the CCDA document

The actual document is return as an attachment and can in the data element of the content.

```
"content": [{"attachment":       {
         "contentType": "application/hl7-sda+xml",
         "language": "en-US",
         "data": "PD94bWwtc3R5bGVzaGVldCB0eXBlPSJ0ZXh0L3h .... "
}}]
```

The CCDA is Base64 encoded.

Health Concerns

Retrieving a patient's health concerns

The logical ID of the patient to retrieve is passed as part of the URL. The logical ID is found as the result of a search.

```
GET https://fhirtest.versasuite.com/Patient/id/Condition?category=health-concern
GET https://fhirtest.versasuite.com/Patient/id/Condition?category=health-concern&date=eq2016-01-01
```

Name	Required?	Type	Description
id	yes	URL	The logical ID of the patient. This is retrieved using the search function.
date	no	string	A string representing a date to include in the search. See below for more information.

A DAF Condition (Problem) is retuned

Name	Type	Cardinality	Description
identifier		0..*	Identifier associated with this condition that is defined by business processes and/or used to refer to it when a direct URL reference to the resource itself is not appropriate. For example, in CDA documents or in written/printed documentation.
patient	Reference(Patient)	1..1	Patient who the condition record is associated with. This defines constraints and extensions on the patient resource for use in querying and retrieving patient demographic information.
encounter	Reference(Encounter)	0..1	Encounter during which the condition was first asserted.

Name	Type	Cardinality	Description
asserter	Reference(Practitioner, Patient)	0..1	Individual who is making the condition statement. This could be a provider or patient reference.
dateRecorded	date)	0..1	Date when this condition record was created in the EHR, not the date of the most recent updates in severity, abatement, and so forth were specified. The date of the last record modification can be retrieved from the resource metadata.
code	CodeableConcept	1..1	Identification of the condition, problem, or diagnosis. For more information on this value set, see condition-code.
category	CodeableConcept	0..1	Category assigned to the condition. The categorization is often highly contextual and may appear poorly differentiated or not very useful in other contexts. The value set conformance is preferred and options include: Complaint, Symptom, Finding, and Diagnosis. For more information on this value set, see condition-category.
clinicalStatus	code	0..1	Clinical status of the condition. The value set conformance is preferred and options include: Active, Relapse, Remission, and Resolved. For more information on this value set, see condition-clinical.
verificationStatus	code	1..1	Verification status of the condition or rather, the verification status to support or decline the clinical status of the condition or diagnosis. The value set conformance is required and options include: Provisional, Differential, Confirmed, Refuted, Entered-in-error, and Unknown. For more information on this value set, see condition-ver-status.

Name	Type	Cardinality	Description
severity	CodeableConcept	0..1	Subjective severity of the condition. The value set conformance is extensible and options include: Fatal, Severe, Moderate, and Mild. Extensions are allowed. For more information on this value set, see condition-severity.
onsetDateTime	dateTime	0..1	Estimated or actual date, date-time, or age. A date, when the condition statement was documented. The date recorded represents the date when this particular condition record was created in the EHR, not the date of the most recent updates in severity, abatement, etc. were specified. The date of the last record modification can be retrieved from the resource metadata.
onsetQuantity	Quantity	0..1	Code if there is a value, and it shall be an expression of time. If system is present, it shall be UCUM. If value is present, it shall be positive. The context of use may frequently define what kind of quantity this is and therefore what kind of units can be used. In this case, it is used to define the onset of the condition.
onsetPeriod	Period	0..1	A time period defined by a start and end date/time. A period specifies a range of times. The context of use will specify whether the entire range applies (for example, “the patient was an inpatient of the hospital for this time range”) or one value from the period applies For example, “give to the patient between 2 and 4 pm on 24-Jun 2013.”
onsetRange	Hl7.Fhir.Model.Range	0..1	Set of ordered quantity values defined by a low and high limit. A range specifies a set of possible values; usually one value from the range applies. For example, “give the patient between 2 and 4 tablets.” Ranges are typically used in instructions.
onsetString	String	0..1	Sequence of Unicode characters to convey the estimated onset of when the condition started.

Name	Type	Cardinality	Description
abatementDateTime	dateTime	0..1	Estimated or actual date or date-time when the condition statement was resolved or in remission.
abatementQuantity	Quantity	0..1	Code if there is a value and it shall be an expression of time. If system is present, it shall be UCUM. If value is present, it shall be positive. The context of use may frequently define what kind of quantity this is and therefore what kind of units can be used. In this case, it is used to indicate when the condition was resolved or in remission.
abatementBoolean	Boolean	0..1	There is no explicit distinction between resolution and remission because in many cases the distinction is not clear. Age is generally used when the patient reports an age at which the Condition abated. If there is no abatement element, it is unknown whether the condition was resolved or in remission; applications and users should generally assume that the condition is still valid.
abatementPeriod	Period	0..1	Time period defined by a start and end date/time. A period specifies a range of times for if or when the condition was resolved or in remission.
abatementRange	Hl7.Fhir.Model.Range	0..1	Set of ordered quantity values defined by a low and high limit. A range specifies a set of possible values; usually one value from the range applies. In this case, the range defines if and when the condition was resolved or in remission.
abatementString	String	0..1	Sequence of Unicode characters to convey when the condition was resolved or in remission.
stage		0..1	Set of codified values for which the conformance is example and is typically used to indicate stages of cancer and other conditions. Stage/grade, usually

Name	Type	Cardinality	Description
			assessed formally. For more information on this value set, see valueset-condition-stage.
– stage.summary	CodeableConcept	0..1	Simple summary of the stage such as “Stage 3.” The determination of the stage is disease-specific. For more information on this value set, see condition-stage.
– stage.assessment	Reference(ClinicalImpression, DiagnosticReport, Observation)	0..*	Reference to a formal record of the evidence on which the staging assessment is based. Reference resources include: ClinicalImpression, DiagnosticReport, and Observation.
evidence		0..*	Supporting evidence or manifestations that are the basis on which this condition is suspected or confirmed. The evidence may be a simple list of coded symptoms/manifestations, references to observations or formal assessments, or both.
– evidence.code	CodeableConcept	0..1	Manifestation or symptom that led to the recording of this condition. This includes a value set where the conformance is examples that describe the manifestations or symptoms. For more information on this value set, see manifestation-or-symptom.
– evidence.detail	Reference(Resource)	0..*	Supporting information found elsewhere, such as links to other relevant information, including pathology reports.
bodySite	CodeableConcept	0..*	Anatomical location, if relevant. This value set includes all the Anatomical Structure SNOMED CT codes. For example, codes with an is-a relationship with 91723000: Anatomical structure. For more information on this value set, see body-site.

Name	Type	Cardinality	Description
notes	string	0..1	Additional information about the condition. This is a general note or comment entry for further description of the condition, diagnosis, and prognosis.

Searching by date

Dates are passed as query parameters on the URL. Since the URL parameters cannot handle comparators (for example, >, <=) these are passed in as part of the date.

```
date=eq2016-01-01
date=gt2016-01-01
```

The following comparators are supported:

Comparator	Description
eq	equal
gt	greater than
ge	greater than or equal
lt	less than
le	less than or equal

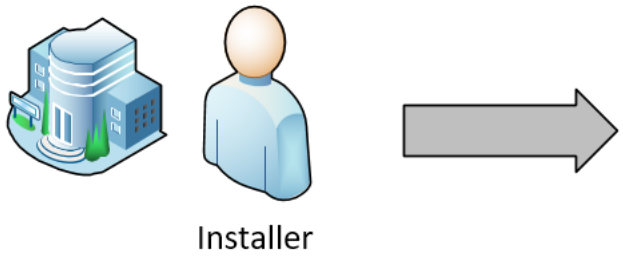
To search for a date range, pass in the date twice. e.g. `date=ge2010-01-01&date=le2010-12-31`

This search would include every day in the year 2010.

How do patients login

Patients can log into VersaSuite FHIR with their VersaSuite Credentials that are handed to them by their Hospital.

The process involves inviting a patient, described in the diagram below:



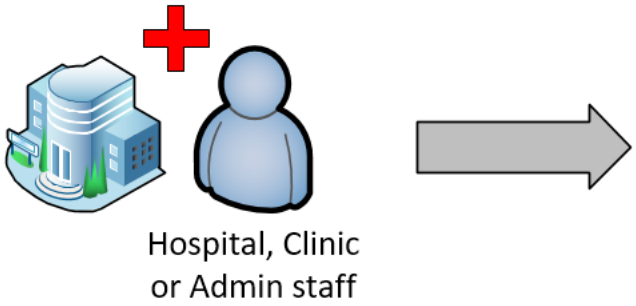
1. Go to https://ids.versasuite.com
2. Click on Registration Client App button.

   Registration Client App

3. Fill out all the information requested. All of this is **required**.
   (Implicit is for (web based) simple page application)
4. When done, click on the Register button at the bottom.
   (After registering, API admin will validate the application and you will receive a validation email)

   Register

5. Link will be included in the email to confirm email address.



1. The next steps will be your instructions on how you want the patient to receive the invitation code (handed or emailed to the patient).

For more information, please contact VersaSuite

Considerations

HTTP response codes

Codes	Meaning
200	The request was processed appropriately.
400	Invalid parameters.
401	The request did not have a valid authorization token or none was provided.
403	The user is not authorized for the operation.
4xx	Authorization error.

Revision History

Version #	Date	Author	Comments
9.X	11/27/2018	Throck Robertson	