

# iCare.com

## Application Programming Interface

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## Intended Audience

This document is intended to be used by software developers, solution architects and business analysts who would like to integrate their product with the iCare EHR.

## Terms of Use

**This API is made available to You by agreeing to these terms of use.** Apps and services developed using our API will be granted a limited license to connect to the iCare.com Enterprise Cloud EHR.

**Access to our API does not grant access to the iCare.com service and does not confer any rights to use, copy, or distribute iCare.com software.** Access to the production iCare.com service is not required to develop or test apps. Testing can be performed by connecting to the iCare.com development environment. Your registration of an app and receipt of documentation does not give you permission to access any iCare.com customer's system or any information stored in such systems.

**An app may be blocked temporarily or permanently for abuse or misuse of the API or information obtained from the API.** An app may be blocked for failure to follow reasonable security practices if so detected or reported to iCare.com or an iCare.com customer. Apps that make excessive or inefficient use of API resources may be limited in rate or duration of requests or blocked. An iCare.com customer may block an app for any reason.

**You agree to comply with app and service guidelines.** These guidelines can be expected to change as needed to comply with regulations; protect private health information; safeguard customer information and the iCare.com service; and provide a reliable, high-quality experience for iCare.com customers.

**You are responsible for compliance with all applicable laws, regulations and certification requirements for the specific use of your app.** Access through our API does not relieve you of any obligations under the 21st Century Cures Act (Cures Act), the Health Information Technology for Economic and Clinical Health (HITECH) Act, the Health Insurance Portability and Accountability Act (HIPAA), or any other relevant federal or state laws.

**You must display your service's privacy policy to people before they are permitted to download, install, or sign up to your app or service.** It must disclose at least the following information:

- The information that you collect from people who use your service
- How you use and share that information (including with iCare.com)
- How people can contact you with inquiries and requests regarding their information

**You must keep all API keys or other access credentials private.** You may not use, and may not encourage or facilitate others to use, API keys or other access credentials owned by others.

**Your license agreement with iCare.com limits your use of our API.** You may not exceed or circumvent rate limits, or any other limitations or restrictions described in this Policy or your agreement with iCare.com, listed in the iCare.com API Guide, or communicated to you by iCare.com.

**You may not remove or alter any proprietary notices or marks on iCare.com Content received via our API.** You may not display or transmit any information received from the iCare.com service which has been changed or modified from its original form.

**For data integrity and platform health reasons, you may not interfere with, intercept, disrupt, or disable any features of the iCare.com API or the iCare.com service.** In other words, use the APIs as intended and documented. Refer to the iCare.com API Guide for more details about acceptable use.

**You agree to indemnify, hold harmless and defend iCare.com, its affiliates, subsidiaries, and customers and their affiliates, and all of their employees, officers, directors, contractors and other personnel from and against any claim arising out of or relating, directly or indirectly, to you, your service, any of your apps, or any use of any of your apps or service.**

**iCare.com may grant or deny API access to information at any time for any reason.** We may implement control functions including but not limited to tracking and auditing access, disabling or blocking specific apps.

## General Comments

An application program must utilize a valid username and password to obtain a temporary security credential from iCare via the login operation. Afterwards, with the temporary security credential, patient search and patient data requests can be performed.

The response format for the patient search and individual criteria data requests are based on FHIR release 4 JSON. The response for the all criteria data request is a CCDA compliant XML document.

The API is accessible in test and production environments. Throughout this document, the <URL> variable corresponds to the protocol and domain name of the corresponding environment. For the test environment, <URL> is <https://ehr.icare.com>. For production, please contact iCare administrator.

## Login

- URI: /rest/appTokenRequest?username=<userid>&password=<password>

Example (curl):

```
curl -X POST -v \
"<URL>/iCareEHRWeb/rest/appTokenRequest?username=XXX&password=XXX"
```

- Method: POST
- Request Parameters: username, password
- Body: None
- Headers: None
- Output:
  - Success: HTTP 200 status is returned along with a security token that can be used for subsequent calls (corresponds to JSESSIONID cookie for session management)

Example (curl):

```
< HTTP/1.1 200 OK
< Server: nginx
< Date: Wed, 08 Jan 2020 16:50:47 GMT
< Content-Length: 40
< Connection: keep-alive
< Set-Cookie: route=fdf0addbbb1695096a6a309db1f6edcc; Path=/
< X-Powered-By: Undertow/1
< Set-Cookie: JSESSIONID=tZ-
kE6VZjgbDeZuzi_vtw9fRbxK5vvhEkzAANgTI.c1:wildfly-server-one;
path=/iCareEHRWeb; HttpOnly
<
* Connection #0 to host dev.icare.com left intact
TZ-kE6VZjgbDeZuzi_vtw9fRbxK5vvhEkzAANgTI
```

- Error: HTTP 402 status is returned.

## Patient Search

- URI:  
`/rest/extApp/Patient?given=<firstName>&family=<lastName>&gender=<gender>&dob=<dob>`
- Method: GET
- Request Parameters: **given**, first name of patient, **family**, last name of patient, **gender**, gender of patient as one of F, M, U, **dob**, patient's date of birth in one of the following formats: MM/dd/yyyy HH:mm or MM/dd/yyyy. At least one of gender, dob, family must be supplied. If given is supplied, family must also be supplied. Any patient in the output will match all the request parameters, i.e. adding more parameters will narrow down the response.

If a user is a patient, the output will return only data that pertains to the particular user.

Examples:

[<URL>/iCareEHRWeb/rest/extApp/Patient?family=larson&gender=F&dob=05/01/1970](#)

[<URL>/iCareEHRWeb/rest/extApp/Patient?dob=05/01/1990&gender=M](#)

- Headers:
  - **Cookie** set to JSESSIONID=<security token> where <security token> is from response of /rest/appTokenRequest.

Example:

JSESSIONID=tZ-kE6VZjgbDeZuzi\_vtw9fRbxK5vvhEkzAANgTI

- Output:
  - Success: HTTP status 202 is returned along with a FHIR Bundle resource where each entry corresponds to a matching patient, described as a FHIR Patient resource with the following attributes: id, name, gender, birthDate.

Example:

```
{  
  "resourceType": "Bundle",  
  "type": "searchset",  
  "entry": [  
    {
```

```
"resource": {
    "resourceType": "Patient",
    "id": "R83536",
    "name": [
        {
            "text": "LARSON,REBECCA JR"
        }
    ],
    "gender": "female",
    "birthDate": "1970-05-01"
},
{
    "resource": {
        "resourceType": "Patient",
        "id": "R83537",
        "name": [
            {
                "text": "LARSON,REBECCA JR"
            }
        ],
        "gender": "unknown",
        "birthDate": "1970-05-01"
    },
    ...
}
]
```

If no matching patients are found, the bundle will be empty, i.e.:

```
{
    "resourceType": "Bundle",
    "type": "searchset"
}
```

- Error:
  - HTTP 403 error status is returned if the security token is incorrect.

Example:

```
{
  "error": {
    "errorDescription": "Unknown error.",
    "errorDetail": "<URL>/auth/realms/awsdev/protocol/openid-connect/logout?redirect_uri=<URL>/iCareEHRWeb/login",
    "errorNumber": "403"
  }
}
```

- HTTP 500 error status is returned if any of the input parameters is missing.

Example:

```
{
  "error": {
    "errorDescription": "External application error.",
    "errorDetail": "Provide search criteria as family=<lastname>&given=<given name>",
    "errorNumber": "180"
  }
}
```

## Encounters

- URI: /rest/extApp/Encounter?id=<id>
- Method: GET
- Request Parameters: **id** must be set to id of the patient from response of /rest/extApp/Patient. If the user is a patient or designee, id must belong to the particular patient or a patient the designee is associated with. Otherwise, an error is returned.

Example:

<<URL>/iCareEHRWeb/rest/extApp/Encounter?id=R83688>

- Headers:
  - **Cookie** must be set to JSESSIONID=<security token> where <security token> is from response of /rest/appTokenRequest.

Example:

JSESSIONID=tZ-kE6VZjgbDeZuzi\_vtw9fRbxK5vvhEkzAANgTI

- Output:
  - Success: HTTP status 202 is returned along with a FHIR Bundle resource where each entry corresponds to an encounter, described as a FHIR Encounter resource where the period.start attribute gives start date/time of the encounter in yyyy-MM-dd'T'HH:mm:ss.XXX format.

Example:

```
{  
  "resourceType": "Bundle",  
  "type": "searchset",  
  "entry": [  
    {  
      "resource": {  
        "resourceType": "Encounter",  
        "period": {  
          "start": "2019-07-20T00:00:00-04:00"  
        }  
      }  
    },  
    {  
      "resource": {  
        "resourceType": "Encounter",  
        "period": {  
          "start": "2019-09-18T10:00:00-04:00"  
        }  
      }  
    },  
    {  
      "resource": {  
        "resourceType": "Encounter",  
        "period": {  
          "start": "2019-11-12T00:00:00-05:00"  
        }  
      }  
    },  
    ...  
  ]  
}
```

```

    "resource": [
        {
            "resourceType": "Encounter",
            "period": {
                "start": "2019-12-01T16:00:00-05:00"
            }
        }
    ]
}

```

If the patient does not have any encounters, the bundle will be empty, i.e.:

```
{
    "resourceType": "Bundle",
    "type": "searchset"
}
```

- Error:
  - HTTP 403 error status is returned if the security token is incorrect or the user is a patient and search is performed for an id that does not belong to the particular patient.

Example:

```
{
    "error": {
        "errorDescription": "External application error.",
        "errorDetail": "Unauthorized request.",
        "errorNumber": "180"
    }
}
```

- HTTP 500 error status is returned for other errors. For example, the following error is returned if id parameter is missing:

```
{
    "error": {
        "errorDescription": "External application error.",
        "errorDetail": "Please provide an id parameter.",
        "errorNumber": "180"
    }
}
```

## Criteria Data Request

- URI: One of
  - /rest/extApp/Clinical?id=<id>&category=<category>
  - /rest/extApp/Clinical?id=<id>&category=<category>&date=<encounter date>
  - /rest/extApp/Clinical?id=<id>&category=<category>&startDate=<start>&endDate=<end>

Examples:

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=problem

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=patient&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=patient&startDate=12/02/2019 00:00&endDate=12/03/2019 23:59

- Method: GET
- Request Parameters:
  - **id** must be set to the id of the patient from the response of /rest/extApp/Patient. If the user is a patient or designee, id must belong to the particular patient or a patient the designee is associated with. Otherwise, an error is returned.
  - **category** must be set to one or more of the following (if more than one is supplied, they should be separated by comma):
    - patient
    - careTeam
    - smokingStatus
    - problem
    - medication
    - medAllergy
    - labTest
    - labResult
    - vital
    - procedure
    - immunization
    - device
    - planOfTreatment
    - assessment
    - goal

■ healthConcern

Category	Description
patient	Patient name, sex, date of birth, race, ethnicity, preferred language
careTeam	Care team members
smokingStatus	Smoking status
problem	Problems
medication	Medications
medAllergy	Medication allergies
labTest	Planned lab tests
labResult	Lab test results
vital	Vital measurements
procedure	Procedures
immunization	Immunizations
device	Implanted devices
planOfTreatment	Care plan
assessment	Assessment
goal	Discharge goals
healthConcern	Health concerns (complaints and observations)

- **startDate, endDate** must be in MM/dd/yyyy HH:mm format, e.g. startDate=11/14/2019 00:00, endDate=11/24/2019 23:59. Response will return data associated with any encounter whose start date/time falls into the date/time range specified with startDate, endDate.
- **date** is MM/dd/yyyy format, e.g. 11/14/2019. Response will return data associated with any encounters that occurred in the specified date. That is equivalent to passing startDate as 00:00 hours and endDate as 23:59 hours for the particular date. For example, passing the date as 11/14/2019 is equivalent to passing startDate as 11/14/2019 00:00 and endDate as 11/14/2019 23:59.

If none of startDate, endDate, date is supplied the response will return data associated with all encounters.

- Headers:

- **Cookie** must be set to JSESSIONID=<security token> where <security token> is from response of /rest/appTokenRequest.

Example:

```
JSESSIONID=tZ-kE6VZjgbDeZuzi_vtw9fRbxK5vvhEkzAANgTI
```

- Output: Successful output will return 202 HTTP response header where the structure will depend on the category in request. Those are explained in the following sections.

Error will return 500 HTTP response header.

Incorrect id that does not correspond to an actual patient:

```
{  
  "error": {  
    "errorDescription": "External application error.",  
    "errorDetail": "Cannot find patient",  
    "errorNumber": "180"  
  }  
}
```

Missing id parameter:

```
{  
  "error": {  
    "errorDescription": "External application error.",  
    "errorDetail": "Please provide an id parameter",  
    "errorNumber": "180"  
  }  
}
```

The date is missing and at least one of startDate, endDate is missing:

```
{  
  "error": {  
    "errorDescription": "External application error.",  
    "errorDetail": "The date is missing and at least one of startDate, endDate is missing",  
    "errorNumber": "180"  
  }  
}
```

```

    "errorDetail": "Please provide either the date parameter or both startDate and endDate
parameters.",
    "errorNumber": "180"
}
}

```

The date is present and at least one of startDate, endDate is also supplied:

```

{
  "error": {
    "errorDescription": "External application error.",
    "errorDetail": "If the date parameter is present, neither startDate nor endDate can be
supplied.",
    "errorNumber": "180"
  }
}

```

## patient

### *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=patient&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=patient&startDate=12/02/2019
00:00&endDate=12/03/2019 23:59

### *Output*

A FHIR Bundle resource is returned that contains a Patient resource, which has individual attributes name, gender, date of birth, preferred language, ethnicity, race and granular race, address and phone numbers listed.

The patient category call is the only one across all categories where data is not listed under an encounter date. (See below sections for an explanation of how data for other categories are grouped under encounter dates.)

```
{
  "resourceType": "Bundle",
  "type": "searchset",
  "entry": [
    {

```

```
"resource": {
    "resourceType": "Patient",
    "extension": [
        {
            "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-race",
            "valueCodeableConcept": {
                "coding": [
                    {
                        "code": "2106-3"
                    }
                ],
                "text": "White"
            }
        },
        {
            "url": "urn:oid:2.16.840.1.113883.6.238",
            "valueCodeableConcept": {
                "coding": [
                    {
                        "code": "2108-9"
                    }
                ],
                "text": "European"
            }
        },
        {
            "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-ethnicity",
            "valueString": "NOT HISPANIC OR LATINO"
        }
    ],
    "name": [
        {
            "text": "Previous Name: ROBIN",
            "family": "LARSON",
            "given": [
                "REBECCA ",
                "JONES "
            ]
        }
    ],
    "gender": "female",
    "birthDate": "1970-05-01",
    "address": [
```

```
{  
    "line": [  
        "1357 Amber Dr "  
    ],  
    "city": "Beaverton",  
    "state": "97006-9700",  
    "postalCode": "OREGON"  
}  
],  
"contact": [  
    {  
        "telecom": [  
            {  
                "system": "phone",  
                "value": "555-723-1544",  
                "use": "home"  
            },  
            {  
                "system": "phone",  
                "value": "555-777-1234",  
                "use": "mobile"  
            }  
        ]  
    }  
],  
"communication": [  
    {  
        "language": {  
            "coding": [  
                {  
                    "system": "http://hl7.org/fhir/ValueSet/languages",  
                    "code": "en-US"  
                }  
            ]  
        }  
    }  
]
```

Note that the name attribute will list the first and middle names inside the given attribute. In addition, if a previous name exists, it will be listed inside a text attribute. The below example corresponds to a patient with the following attributes:

- First Name: Rebecca
- Last Name: Larson
- Middle Name: Jones
- Previous Name: Robin
- Suffix: JR

```
"name": [
  {
    "text": "Previous Name: ROBIN",
    "family": "LARSON",
    "given": [
      "REBECCA",
      "JONES"
    ],
    "suffix": [
      "JR"
    ]
  }
]
```

## smokingStatus

### *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=smokingStatus&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=smokingStatus&startDate=12/02/2019 00:00&endDate=12/03/2019 23:59

### *Output*

A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an encounter, a Composition resource consists of a section named Social History, that lists smoking status. The onset date of the status is given inside the section.text.div attribute and the particular code is given inside section.coding attribute.

{

```
"resourceType": "Bundle",
"type": "searchset",
"entry": [
{
  "resource": {
    "resourceType": "Bundle",
    "type": "searchset",
    "timestamp": "2019-07-20T00:00:00.000-04:00",
    "entry": [
      {
        "resource": {
          "resourceType": "Composition",
          "section": [
            {
              "title": "Social History",
              "section": [
                {
                  "title": "Current every day smoker",
                  "code": {
                    "coding": [
                      {
                        "system": "http://snomed.info/sct",
                        "code": "449868002",
                        "display": "Current every day smoker"
                      }
                    ]
                  },
                  "text": {
                    "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">Onset Date: 06/22/2015
00:00</div>"
                  }
                }
              ]
            }
          ]
        }
      }
    ]
  }
}
```

## problem

### *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=problem&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=problem&startDate=12/02/2019 00:00&endDate=12/03/2019 23:59

### *Output*

A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an encounter, a Composition resource consists of Condition resources, where each Condition corresponds to a problem. Status and onset date/time of the problem are given in clinicalStatus and onsetDateTime attributes, respectively, and the problem description and its SNOMED CT code are listed in coding attribute. Note that if the problem is completed, i.e. resolved status, clinicalStatus.coding.code attribute will read resolved and abatementString attribute will give the problem resolution date, if available.

```
{
  "resourceType": "Bundle",
  "type": "searchset",
  "entry": [
    {
      "resource": {
        "resourceType": "Bundle",
        "type": "searchset",
        "timestamp": "2020-01-01T00:00:00.000-05:00",
        "entry": [
          {
            "resource": {
              "resourceType": "Composition",
              "contained": [
                {
                  "resourceType": "Condition",
                  "id": "1",
                  "clinicalStatus": {
                    "coding": [
                      {
                        "system": "http://terminology.hl7.org/CodeSystem/condition-clinical",

```

```
        "code": "active"
    }
]
},
"code": {
    "coding": [
        {
            "system": "http://snomed.info/sct",
            "code": "59621000",
            "display": "Essential (primary) hypertension"
        }
    ]
},
"onsetDateTime": "2006-12-31T00:00:00-05:00"
},
{
    "resourceType": "Condition",
    "id": "2",
    "clinicalStatus": {
        "coding": [
            {
                "system": "http://terminology.hl7.org/CodeSystem/condition-clinical",
                "code": "active"
            }
        ]
    },
    "code": {
        "coding": [
            {
                "system": "http://snomed.info/sct",
                "code": "83986005",
                "display": "Severe hypothyroidism"
            }
        ]
    },
    "onsetDateTime": "2006-12-31T00:00:00-05:00"
},
{
    "resourceType": "Condition",
    "id": "3",
    "clinicalStatus": {
        "coding": [
            {
```

```
"system": "http://terminology.hl7.org/CodeSystem/condition-clinical",
  "code": "active"
}
]
},
"code": {
  "coding": [
    {
      "system": "http://snomed.info/sct",
      "code": "236578006",
      "display": "Chronic rejection of renal transplant"
    }
  ]
},
{
  "onsetDateTime": "2006-12-31T00:00:00-05:00"
},
{
  "resourceType": "Condition",
  "id": "4",
  "clinicalStatus": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/condition-clinical",
        "code": "active"
      }
    ]
  },
  "code": {
    "coding": [
      {
        "system": "http://snomed.info/sct",
        "code": "87522002",
        "display": "Chronic iron deficiency anemia"
      }
    ]
  },
  "onsetDateTime": "2006-12-31T00:00:00-05:00"
},
{
  "resourceType": "Condition",
  "id": "5",
  "clinicalStatus": {
    "coding": [
```

```
{  
    "system": "http://terminology.hl7.org/CodeSystem/condition-clinical",  
    "code": "active"  
}  
]  
},  
"code": {  
    "coding": [  
        {  
            "system": "http://snomed.info/sct",  
            "code": "64667001",  
            "display": "Interstitial pneumonitis"  
        }  
    ]  
},  
"onsetDateTime": "2006-12-31T00:00:00-05:00"  
},  
{  
    "resourceType": "Condition",  
    "id": "6",  
    "clinicalStatus": {  
        "coding": [  
            {  
                "system": "http://terminology.hl7.org/CodeSystem/condition-clinical",  
                "code": "resolved"  
            }  
        ]  
    },  
    "code": {  
        "coding": [  
            {  
                "system": "http://snomed.info/sct",  
                "code": "238131007",  
                "display": "Overweight"  
            }  
        ]  
    },  
    "onsetDateTime": "2006-12-31T00:00:00-05:00",  
    "abatementString": "06/01/2007 00:00"  
}  
],  
"title": "Problem",  
"section": [
```

```
{  
  "entry": [  
    {  
      "reference": "#1"  
    }  
  ]  
},  
{  
  "entry": [  
    {  
      "reference": "#2"  
    }  
  ]  
},  
{  
  "entry": [  
    {  
      "reference": "#3"  
    }  
  ]  
},  
{  
  "entry": [  
    {  
      "reference": "#4"  
    }  
  ]  
},  
{  
  "entry": [  
    {  
      "reference": "#5"  
    }  
  ]  
},  
{  
  "entry": [  
    {  
      "reference": "#6"  
    }  
  ]  
}
```

```

        }
    }
]
}
]
}
}
```

## medication

### *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=medication&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=medication&startDate=12/02/2019 00:00&endDate=12/03/2019 23:59

### *Output*

A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an encounter, a Composition resource consists of MedicationStatement resources, where each MedicationStatement corresponds to an ordered medication. The display name and RXNORM code of a medication is given via the MedicationStatement.medicationCodeableConcept.coding attribute. The start date of the medication is given by MedicationStatement.effectiveDateTime attribute and the end date of the medication is given via a MedicationStatement.note attribute. Particular instructions associated with the medication including frequency and route are also given via a MedicationStatement.note attribute. The dosage of the medication is described via the MedicationStatement.dosage attribute.

```
{
  "resourceType": "Bundle",
  "type": "searchset",
  "entry": [
    {
      "resource": {
        "resourceType": "Bundle",
        "type": "searchset",
        "timestamp": "2020-01-01T00:00:00.000-05:00",
        "entry": [
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            "resource": {
              "resourceType": "Bundle",
              "type": "searchset",
              "timestamp": "2020-01-01T00:00:00.000-05:00",
              "entry": [
                {
                  "resource": {
                    "resourceType": "Bundle",
                    "type": "searchset",
                    "timestamp": "2020-01-01T00:00:00.000-05:00",
                    "entry": [
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                          "type": "searchset",
                          "timestamp": "2020-01-01T00:00:00.000-05:00",
                          "entry": [
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                              "resource": {
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                                "type": "searchset",
                                "timestamp": "2020-01-01T00:00:00.000-05:00",
                                "entry": [
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                                    "resource": {
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                                      "type": "searchset",
                                      "timestamp": "2020-01-01T00:00:00.000-05:00",
                                      "entry": [
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                                            "type": "searchset",
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                                            "entry": [
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                                                                                                                                "timestamp": "2020-01-01T00:00:00.000-05:00",
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                                                                                                                                      "timestamp": "2020-01-01T00:00:00.000-05:00",
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                                                                                                                                            "type": "searchset",
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                                                                                      "type": "searchset",
                                                                                      "timestamp": "2020-01-01T00:00:00.000-05:00",
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                                                                                            "type": "searchset",
                                                                                            "timestamp": "2020-01-01T00:00:00.000-05:00",
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                                                                                                  "type": "searchset",
                                                                                                  "timestamp": "2020-01-01T00:00:00.000-05:00",
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                                                                                                    {
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                                                                                                        "type": "searchset",
                                                                                                        "timestamp": "2020-01-01T00:00:00.000-05:00",
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                                                                                                          {
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                                                                                                              "type": "searchset",
                                                                                                              "timestamp": "2020-01-01T00:00:00.000-05:00",
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                                                                                                                    "type": "searchset",
                                                                                                                    "timestamp": "2020-01-01T00:00:00.000-05:00",
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                                                                                                                      "type": "searchset",
                                                                                                                      "timestamp": "2020-01-01T00:00:00.000-05:00",
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                                                                                                                            "timestamp": "2020-01-01T00:00:00.000-05:00",
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                                                                                                                                  "timestamp": "2020-01-01T00:00:00.000-05:00",
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                                                                                                                                    "type": "searchset",
                                                                                                                                    "timestamp": "2020-01-01T00:00:00.000-05:00",
                                                                                                                                    "entry": [
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                                                                                                                                          "type": "searchset",
                                                                                                                                          "timestamp": "2020-01-01T00:00:00.000-05:00",
                                                                                                                                          "entry": [
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                                                                                                                                              "resource": {
                                                                                                                                                "resourceType": "Bundle",
                                                                                                                                                "type": "searchset",
                                                                                                                                                "timestamp": "2020-01-01T00:00:00.000-05:00",
                                                                                                                                                "entry": [
                                                                                                                                                  {
                                                                                                                                                    "resource": {
................................................................
```

```
{  
  "resource": {  
    "resourceType": "Composition",  
    "contained": [  
      {  
        "resourceType": "MedicationStatement",  
        "id": "1",  
        "medicationCodeableConcept": {  
          "coding": [  
            {  
              "system": "http://www.nlm.nih.gov/research/umls/rxnorm",  
              "code": "977434",  
              "display": "EVEROLIMUS TAB "  
            }  
          ]  
        },  
        "effectiveDateTime": "2020-02-02T21:00:00-05:00",  
        "note": [  
          {  
            "text": "Direction: Give: 0.5 MG PO BID"  
          },  
          {  
            "text": "End Date: 02/16/2020 20:59"  
          }  
        ],  
        "dosage": [  
          {  
            "text": "one unit"  
          }  
        ]  
      },  
      {  
        "resourceType": "MedicationStatement",  
        "id": "2",  
        "medicationCodeableConcept": {  
          "coding": [  
            {  
              "system": "http://www.nlm.nih.gov/research/umls/rxnorm",  
              "code": "977434",  
              "display": "EVEROLIMUS TAB "  
            }  
          ]  
        },  
      }  
    ]  
  },  
}
```

```
"effectiveDateTime": "2020-01-30T09:00:00-05:00",
"note": [
  {
    "text": "Direction: Give: 0.5 MG PO BID"
  },
  {
    "text": "End Date: 02/13/2020 08:59"
  }
],
"dosage": [
  {
    "text": "one unit"
  }
]
},
{
  "resourceType": "MedicationStatement",
  "id": "3",
  "medicationCodeableConcept": {
    "coding": [
      {
        "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
        "code": "485023",
        "display": "MYCOPHENOLIC ACID TAB,EC "
      }
    ]
  },
  "effectiveDateTime": "2020-01-30T09:00:00-05:00",
  "note": [
    {
      "text": "Direction: Give: 360 MG PO BID"
    },
    {
      "text": "End Date: 02/13/2020 08:59"
    }
  ],
  "dosage": [
    {
      "text": "one unit"
    }
  ]
},
```

```
"resourceType": "MedicationStatement",
"id": "4",
"medicationCodeableConcept": {
  "coding": [
    {
      "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
      "code": "966201",
      "display": "LEVOTHYROXINE TAB "
    }
  ]
},
"effectiveDateTime": "2020-01-30T09:00:00-05:00",
"note": [
  {
    "text": "Direction: Give: 0.15 MG PO DAILY"
  },
  {
    "text": "End Date: 02/13/2020 08:59"
  }
],
"dosage": [
  {
    "text": "one unit"
  }
],
{
  "resourceType": "MedicationStatement",
  "id": "5",
  "medicationCodeableConcept": {
    "coding": [
      {
        "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
        "code": "198371",
        "display": "TORSEMIDE TAB "
      }
    ]
  },
  "effectiveDateTime": "2020-01-30T09:00:00-05:00",
  "note": [
    {
      "text": "Direction: Give: 20 MG PO DAILY"
    }
  ],
  "status": "active"
}
```



```
"system": "http://www.nlm.nih.gov/research/umls/rxnorm",
"code": "309090",
"display": "CEFTRIAXONE 100MG/ML INJ,SOLN "
}
]
},
"effectiveDateTime": "2020-01-30T09:00:00-05:00",
"note": [
{
"text": "Direction: Give: 10 GM/1 VIAL IM BID"
},
{
"text": "End Date: 02/13/2020 08:59"
}
],
"dosage": [
{
"text": "one unit"
}
]
},
{
"resourceType": "MedicationStatement",
"id": "8",
"medicationCodeableConcept": {
"coding": [
{
"system": "http://www.nlm.nih.gov/research/umls/rxnorm",
"code": "309090",
"display": "CEFTRIAXONE 100MG/ML INJ,SOLN "
}
]
},
"effectiveDateTime": "2020-01-30T09:00:00-05:00",
"note": [
{
"text": "Direction: Give: 10 GM/1 VIAL IM BID"
},
{
"text": "End Date: 02/13/2020 08:59"
}
],
"dosage": [
```

```
{  
    "text": "one unit"  
}  
]  
},  
{  
    "resourceType": "MedicationStatement",  
    "id": "9",  
    "medicationCodeableConcept": {  
        "coding": [  
            {  
                "system": "http://www.nlm.nih.gov/research/umls/rxnorm",  
                "code": "197511",  
                "display": "CIPROFLOXACIN TAB "  
            }  
        ]  
    },  
    "effectiveDateTime": "2020-01-30T14:00:00-05:00",  
    "note": [  
        {  
            "text": "Direction: Give: 250 MG PO TID"  
        },  
        {  
            "text": "End Date: 02/13/2020 13:59"  
        }  
    ],  
    "dosage": [  
        {  
            "text": "one unit"  
        }  
    ]  
},  
{  
    "resourceType": "MedicationStatement",  
    "id": "10",  
    "medicationCodeableConcept": {  
        "coding": [  
            {  
                "system": "http://www.nlm.nih.gov/research/umls/rxnorm",  
                "code": "284215",  
                "display": "CLINDAMYCIN CAP,ORAL"  
            }  
        ]  
    }
```

```
},
"effectiveDateTime": "2020-01-30T14:00:00-05:00",
"note": [
{
  "text": "Direction: Give: 300 MG PO TID"
},
{
  "text": "End Date: 02/13/2020 13:59"
}
],
"dosage": [
{
  "text": "one unit"
}
]
},
{
  "resourceType": "MedicationStatement",
  "id": "11",
  "medicationCodeableConcept": {
    "coding": [
      {
        "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
        "code": "860886",
        "display": "FENOFIBRIC ACID TAB "
      }
    ]
  },
  "effectiveDateTime": "2020-01-30T21:00:00-05:00",
  "note": [
{
  "text": "Direction: Give: 35 MG PO HS"
},
{
  "text": "End Date: 02/13/2020 20:59"
}
],
  "dosage": [
{
  "text": "one unit"
}
]
}
```

```
],
  "title": "Medication",
  "section": [
    {
      "entry": [
        {
          "reference": "#1"
        }
      ]
    },
    {
      "entry": [
        {
          "reference": "#2"
        }
      ]
    },
    {
      "entry": [
        {
          "reference": "#3"
        }
      ]
    },
    {
      "entry": [
        {
          "reference": "#4"
        }
      ]
    },
    {
      "entry": [
        {
          "reference": "#5"
        }
      ]
    },
    {
      "entry": [
        {
          "reference": "#6"
        }
      ]
    }
  ]
}
```

```
        ]
    },
{
    "entry": [
        {
            "reference": "#7"
        }
    ]
},
{
    "entry": [
        {
            "reference": "#8"
        }
    ]
},
{
    "entry": [
        {
            "reference": "#9"
        }
    ]
},
{
    "entry": [
        {
            "reference": "#10"
        }
    ]
},
{
    "entry": [
        {
            "reference": "#11"
        }
    ]
}
]
```

```
]
}
```

## medAllergy

### *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=medAllergy&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=medAllergy&startDate=12/02/2019 00:00&endDate=12/03/2019 23:59

### *Output*

A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an encounter, a Composition resource consists of AllergyIntolerance resources, where each AllergyIntolerance corresponds to an allergy. The status of an allergy is given by the AllergyIntolerance.status attribute, display name and RXNORM code of the allergy is given by the AllergyIntolerance.code attribute, the onset date of the allergy is given by the AllergyIntolerance.onsetDateTime attribute and the display name and SNOMED CT code of the corresponding reaction is given by the AllergyIntolerance.reaction attribute.

```
{
  "resourceType": "Bundle",
  "type": "searchset",
  "entry": [
    {
      "resource": {
        "resourceType": "Bundle",
        "type": "searchset",
        "timestamp": "2019-12-02T00:00:00.000-05:00",
        "entry": [
          {
            "resource": {
              "resourceType": "Composition",
              "contained": [
                {
                  "resourceType": "AllergyIntolerance",
                  "id": "1",

```

```
"clinicalStatus": {
    "coding": [
        {
            "system": "http://terminology.hl7.org/CodeSystem/allergyintolerance-clinical",
            "code": "active",
            "display": "Active"
        }
    ]
},
"code": {
    "coding": [
        {
            "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
            "code": "7980",
            "display": "PENICILLIN [PENICILLIN G]"
        }
    ]
},
"onsetDateTime": "2019-12-06T01:18:00-05:00",
"reaction": [
    {
        "description": "HIVES (SNOMED CT: 247472004)",
        "severity": "moderate"
    }
]
},
{
    "resourceType": "AllergyIntolerance",
    "id": "2",
    "clinicalStatus": {
        "coding": [
            {
                "system": "http://terminology.hl7.org/CodeSystem/allergyintolerance-clinical",
                "code": "active",
                "display": "Active"
            }
        ]
    },
    "code": {
        "coding": [
            {
                "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
                "code": "733",
                "display": "Penicillin"
            }
        ]
    }
}
```

```
        "display": "AMPICILLIN"
    }
]
},
"onsetDateTime": "2019-12-06T01:18:00-05:00",
"reaction": [
{
    "description": "HIVES (SNOMED CT: 247472004)",
    "severity": "moderate"
}
]
},
],
"title": "Allergy",
"section": [
{
    "entry": [
{
    "reference": "#1"
}
]
},
{
    "entry": [
{
    "reference": "#2"
}
]
}
]
}
]
```

## labTest

### *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=labTest&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=labTest&startDate=12/02/2019  
00:00&endDate=12/03/2019 23:59

### *Output*

A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an encounter, a CarePlan resource describes the planned lab tests. Each entry in the CarePlan.activity array corresponds to a planned test. The activity.detail.code.coding attribute further describes the test with a SNOMED CT code and description. The activity.detail.scheduledString attribute describes when the test was scheduled.

```
{
  "resourceType": "Bundle",
  "type": "searchset",
  "entry": [
    {
      "resource": {
        "resourceType": "Bundle",
        "type": "searchset",
        "timestamp": "2019-07-20T00:00:00.000-04:00",
        "entry": [
          {
            "resource": {
              "resourceType": "CarePlan",
              "activity": [
                {
                  "detail": {
                    "kind": "ServiceRequest",
                    "code": {
                      "coding": [
                        {
                          "system": "http://loinc.org",
                          "code": "24357-6",
                          "display": "URINALYSIS URINE LC ONCE LB #3945"
                        }
                      ]
                    },
                    "scheduledString": "07/24/2019 02:00",
                    "description": "Laboratory Test"
                  }
                }
              ]
            }
          }
        ]
      }
    }
  ]
}
```

```
        }
    },
    {
        "detail": {
            "kind": "ServiceRequest",
            "code": {
                "coding": [
                    {
                        "system": "http://loinc.org",
                        "code": "24357-6",
                        "display": "URINALYSIS URINE LC ONCE LB #3944"
                    }
                ]
            },
            "scheduledString": "07/24/2019 02:00",
            "description": "Laboratory Test"
        }
    }
}
```

## labResult

## *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=labResult&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=labResult&startDate=12/02/2019 00:00&endDate=12/03/2019 23:59

## *Output*

A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an

encounter, a Composition resource consists of DiagnosticReport, Observation and Organization resources.

- There are an equal number of DiagnosticReport and Observation resources as each distinct DiagnosticReport references a unique Observation resource. Each of such pairs corresponds to a lab test result. The DiagnosticReport.code attribute gives the lab test name and its LOINC code. The DiagnosticReport.effectiveDateTime describes when the test was performed. The Observation.note attribute describes the results of the test.
- The Organization resource describes the laboratory that performed the tests.

```
{  
  "resourceType": "Bundle",  
  "type": "searchset",  
  "entry": [  
    {  
      "resource": {  
        "resourceType": "Bundle",  
        "type": "searchset",  
        "timestamp": "2019-12-02T00:00:00.000-05:00",  
        "entry": [  
          {  
            "resource": {  
              "resourceType": "Composition",  
              "contained": [  
                {  
                  "resourceType": "DiagnosticReport",  
                  "id": "1",  
                  "category": [  
                    {  
                      "coding": [  
                        {  
                          "system": "http://terminology.hl7.org/CodeSystem/v2-0074",  
                          "code": "LAB",  
                          "display": "Laboratory"  
                        }  
                      ]  
                    }  
                  ]  
                }  
              ],  
              "code": {  
                "coding": [  
                  {  
                    "system": "http://loinc.org",  
                    "code": "33765-9",  
                    "display": "WBC"  
                  }  
                ]  
              }  
            }  
          ]  
        ]  
      }  
    ]  
  ]  
}
```

```
        }
    ],
},
"effectiveDateTime": "2019-12-03T00:00:00-05:00",
"result": [
    {
        "reference": "#2"
    }
],
},
{
    "resourceType": "Observation",
    "id": "2",
    "note": [
        {
            "text": "Value: 12.3, Unit: 10*3/uL"
        }
    ]
},
{
    "resourceType": "DiagnosticReport",
    "id": "3",
    "category": [
        {
            "coding": [
                {
                    "system": "http://terminology.hl7.org/CodeSystem/v2-0074",
                    "code": "LAB",
                    "display": "Laboratory"
                }
            ]
        }
    ],
    "code": {
        "coding": [
            {
                "system": "http://loinc.org",
                "code": "5803-2",
                "display": "URINE PH"
            }
        ]
    },
    "effectiveDateTime": "2019-12-03T00:00:00-05:00",
```

```
"result": [
  {
    "reference": "#4"
  }
],
{
  "resourceType": "Observation",
  "id": "4",
  "note": [
    {
      "text": "Value: 5.0, Unit: [PH]"
    }
  ]
},
{
  "resourceType": "Organization",
  "id": "5",
  "name": "ICARE HEALTH SYSTEM",
  "address": [
    {
      "line": [
        "33301 4TH Street"
      ],
      "city": "Sunrise",
      "state": "FL",
      "postalCode": "33073"
    }
  ]
},
],
"title": "Test Result",
"section": [
  {
    "title": "Laboratory",
    "entry": [
      {
        "reference": "#1"
      },
      {
        "reference": "#3"
      }
    ]
  }
]
```

```
        },
        {
            "title": "Reporting Laboratory",
            "entry": [
                {
                    "reference": "#5"
                }
            ]
        }
    ]
}
}
```

vital

## *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=vital&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=vital&startDate=12/02/2019  
00:00&endDate=12/03/2019 23:59

## *Output*

A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an encounter, a Composition resource consists of Observation resources. The Observation.code attribute gives name and LOINC code of the vital, the Observation.issued attribute states when observation was made, and Observation.note.text attribute gives the measured value and unit of the vital.

```
{  
  "resourceType": "Bundle",  
  "type": "searchset",  
  "entry": [  
    {
```

```
"resource": {
    "resourceType": "Bundle",
    "type": "searchset",
    "timestamp": "2019-12-02T00:00:00.000-05:00",
    "entry": [
        {
            "resource": {
                "resourceType": "Composition",
                "contained": [
                    {
                        "resourceType": "Observation",
                        "id": "1",
                        "code": {
                            "coding": [
                                {
                                    "system": "http://loinc.org",
                                    "code": "3150-0",
                                    "display": "FIO2"
                                }
                            ]
                        },
                        "issued": "2019-12-05T07:22:00.000-05:00",
                        "note": [
                            {
                                "text": "Value: 45, Unit: %"
                            }
                        ],
                        "note": [
                            {
                                "text": "Value: 45, Unit: %"
                            }
                        ]
                    },
                    {
                        "resourceType": "Observation",
                        "id": "2",
                        "code": {
                            "coding": [
                                {
                                    "system": "http://loinc.org",
                                    "code": "59408-5",
                                    "display": "Pulse Oximetry"
                                }
                            ]
                        },
                        "issued": "2019-12-03T03:00:00.000-05:00",
                        "note": [
                            {

```

```
        "text": "Value: 95, Unit: %"
    }
]
},
...
],
{
  "title": "Vital Sign",
  "section": [
    {
      "entry": [
        {
          "reference": "#1"
        }
      ]
    },
    {
      "entry": [
        {
          "reference": "#2"
        }
      ]
    },
    ...
  ]
}
]
}
```

## procedure

### *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=procedure&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=procedure&startDate=12/02/2019 00:00&endDate=12/03/2019 23:59

### Output

A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an encounter, a Composition resource consists of Procedure resources. The Procedure.coding attribute describes the procedure. The Procedure.status attribute gives the procedure status and Procedure.performedDateTime gives when procedure was performed. The Procedure.performer describes the provider who performed the procedure. If available, the Procedure.bodySite attribute describes the body site where the procedure was performed.

```
{
  "resourceType": "Bundle",
  "type": "searchset",
  "entry": [
    {
      "resource": {
        "resourceType": "Bundle",
        "type": "searchset",
        "timestamp": "2020-01-01T00:00:00.000-05:00",
        "entry": [
          {
            "resource": {
              "resourceType": "Composition",
              "contained": [
                {
                  "resourceType": "Procedure",
                  "id": "1",
                  "status": "completed",
                  "code": {
                    "coding": [
                      {
                        "system": "http://snomed.info/sct",
                        "code": "168731009",
                        "display": "Standard chest X-ray"
                      }
                    ]
                  },
                  "performedDateTime": "2020-02-03T00:00:00-05:00",
                  "performer": [
                    {
                      "actor": {

```

```
"display": "GEORGE,ROSILY 1002 Healthcare Dr PORTLAND OREGON 97266
"
        }
    ],
    "bodySite": [
        {
            "coding": [
                {
                    "system": "http://snomed.info/sct",
                    "code": "82094008",
                    "display": "Lower respiratory tract structure (body structure)"
                }
            ]
        }
    ],
    "note": [
        {
            "text": "Provider Organization: DEV_LOCAL_INSTITUTION 123 New Brand Store
Miami FL 33301 "
        }
    ]
},
{
    "resourceType": "Procedure",
    "id": "2",
    "status": "completed",
    "code": {
        "coding": [
            {
                "system": "http://snomed.info/sct",
                "code": "175135009",
                "display": "Transvenous implantation of cardiac pacemaker system"
            }
        ]
    },
    "performedDateTime": "2020-01-30T00:00:00-05:00",
    "performer": [
        {
            "actor": {
                "display": "SHIYAL,ARTI      "
            }
        }
    ]
}
```

```
],
  "bodySite": [
    {
      "coding": [
        {
          "system": "http://snomed.info/sct",
          "code": "9454009",
          "display": "Structure of subclavian vein (body structure)"
        }
      ]
    }
  ],
  "note": [
    {
      "text": "Provider Organization: DEV_LOCAL_INSTITUTION 123 New Brand Store  
Miami FL 33301 "
    }
  ],
  {
    "resourceType": "Procedure",
    "id": "3",
    "status": "completed",
    "code": {
      "coding": [
        {
          "system": "http://snomed.info/sct",
          "code": "10847001",
          "display": "BRONCHOSCOPY"
        }
      ]
    },
    "performedDateTime": "2020-01-30T00:00:00-05:00",
    "performer": [
      {
        "actor": {
          "display": "SHIYAL,ARTI      "
        }
      }
    ],
    "bodySite": [
      {
        "coding": [
```

```
{  
    "system": "http://snomed.info/sct",  
    "code": "91724006",  
    "display": "Tracheobronchial structure (body structure)"  
}  
]  
}  
],  
"note": [  
    {  
        "text": "Provider Organization: DEV_LOCAL_INSTITUTION 123 New Brand Store  
Miami FL 33301 "  
    }  
]  
}  
]  
},  
]  
"title": "Procedure",  
"section": [  
    {  
        "entry": [  
            {  
                "reference": "#1"  
            }  
        ]  
    },  
    {  
        "entry": [  
            {  
                "reference": "#2"  
            }  
        ]  
    },  
    {  
        "entry": [  
            {  
                "reference": "#3"  
            }  
        ]  
    }  
]  
]
```

```

        }
    }
]
}
}
```

## careTeam

### *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=careTeam&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=careTeam&startDate=12/02/2019 00:00&endDate=12/03/2019 23:59

### *Output*

A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an encounter, a CareTeam resource describes care team members. Each member is described as a member attribute inside CareTeam.participant array. The member.display attribute details the member as:

<first name> <last name> <addr1> <addr2> <addr3> <city> <state> <zip> Phone 1: <phone1>  
Phone 2: <phone2>

```
{
  "resourceType": "Bundle",
  "type": "searchset",
  "entry": [
    {
      "resource": {
        "resourceType": "Bundle",
        "type": "searchset",
        "timestamp": "2020-01-01T00:00:00.000-05:00",
        "entry": [
          {
            "resource": {
              "resourceType": "CareTeam",
              "participant": [
                {
                  "member": {

```

```
        "display": "Mary McDonald, 1002 Healthcare Dr, Portland, Oregon 97266-0000,  
Phone 1: 5557568768"  
    }  
},  
{  
    "member": {  
        "display": "Henry Seven, 4456 Uphills Road, Fountain Hills, Chicago, Illinois 63068-  
0000, Phone 1: (781)271-3000"  
    }  
}  
],  
"note": [  
    {  
        "text": "Care Team"  
    }  
]  
}  
}  
]  
}  
}
```

## immunization

## *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=immunization&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=immunization&startDate=12/02/2019 00:00&endDate=12/03/2019 23:59

## *Output*

A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an encounter, a Composition resource consists of Immunization resources. The Immunization.status

attribute gives status of the immunization and the Immunization.vaccineCode attribute gives the vaccine CVX code and description.

If Immunization.status equals completed, the Immunization.occurrenceDateTime describes when immunization was performed. If immunization was not completed, e.g. because the patient refused it, the Immunization.occurrenceDateTime describes when the unsuccessful attempt was made.

```
{
  "resourceType": "Bundle",
  "type": "searchset",
  "entry": [
    {
      "resource": {
        "resourceType": "Bundle",
        "type": "searchset",
        "timestamp": "2020-01-01T00:00:00.000-05:00",
        "entry": [
          {
            "resource": {
              "resourceType": "Composition",
              "contained": [
                {
                  "resourceType": "Immunization",
                  "id": "1",
                  "status": "completed",
                  "vaccineCode": {
                    "coding": [
                      {
                        "system": "CVX",
                        "code": "88",
                        "display": "INFLUENZA VIRUS VACCINE"
                      }
                    ]
                  },
                  "occurrenceDateTime": "2014-05-10T00:00:00-04:00"
                },
                {
                  "resourceType": "Immunization",
                  "id": "2",
                  "status": "completed",
                  "vaccineCode": {
                    "coding": [

```

```
{  
    "system": "CVX",  
    "code": "106",  
    "display": "TETANUS AND DIPHTHERIA TOXOIDS"  
}  
]  
},  
"occurrenceDateTime": "2012-01-04T00:00:00-05:00"  
},  
{  
    "resourceType": "Immunization",  
    "id": "3",  
    "status": "not-done",  
    "vaccineCode": {  
        "coding": [  
            {  
                "system": "CVX",  
                "code": "166",  
                "display": "INFLUENZA, INTRADERMAL, QUADRIVALENT, PRESERVATIVE  
FREE"  
            }  
        ]  
    },  
    "occurrenceDateTime": "2015-06-22T00:00:00-04:00",  
    "note": [  
        {  
            "text": "Immunization was not given - Patient rejected immunization "  
        }  
    ]  
},  
],  
"title": "Immunization",  
"section": [  
    {  
        "entry": [  
            {  
                "reference": "#1"  
            }  
        ]  
    },  
    {  
        "entry": [  
            {  
                "text": "Immunization was not given - Patient rejected immunization "  
            }  
        ]  
    }  
]
```

```
        "reference": "#2"
    }
]
},
{
  "entry": [
    {
      "reference": "#3"
    }
  ]
}
]
}
]
}
}
]
```

## device

## *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=device&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=device&startDate=12/02/2019 00:00&endDate=12/03/2019 23:59

## *Output*

A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an encounter, a Composition resource consists of Device resources. The Device.udiCarrier.deviceIdentifier attribute gives UDI of the device and the Device.udiCarrier.issuer attribute gives the name of the assigning authority.

```
"resourceType": "Bundle",  
"type": "searchset",  
"entry": [
```

```
{  
  "resource": {  
    "resourceType": "Bundle",  
    "type": "searchset",  
    "timestamp": "2020-01-01T00:00:00.000-05:00",  
    "entry": [  
      {  
        "resource": {  
          "resourceType": "Composition",  
          "contained": [  
            {  
              "resourceType": "Device",  
              "id": "1",  
              "udiCarrier": [  
                {  
                  "deviceIdentifier": "(01)00643169007222(17)160128(21)BLC200461H",  
                  "issuer": "FDA"  
                }  
              ]  
            }  
          ],  
          "title": "Medical Device",  
          "section": [  
            {  
              "entry": [  
                {  
                  "reference": "#1"  
                }  
              ]  
            }  
          ]  
        }  
      ]  
    }  
  }  
}
```

## planOfTreatment

### *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=planOfTreatment&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=planOfTreatment&startDate=12/02/2019 00:00&endDate=12/03/2019 23:59

### *Output*

A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an encounter, a CarePlan resource describes the care plan. The CarePlan.activity array consists of specific activities planned. A planned activity could be a medication, lab test, procedure or a general task. If the planned activity is one of medication, lab test or procedure the activity.detail.kind attribute is set to ServiceRequest. If the planned activity is a general task, the activity.detail.kind attribute is set to Task.

If activity.detail.kind equals ServiceRequest, activity.detail.code.coding further describes the activity with a SNOMED CT code and description. The activity.detail.description is also set to one of Medication, Laboratory Test or Procedure depending on type of the planned activity. The activity.detail.scheduledString attribute describes when the planned activity was scheduled.

If activity.detail.kind equals Task, activity.detail.description gives a textual description of the task.

```
{  
  "resourceType": "Bundle",  
  "type": "searchset",  
  "entry": [  
    {  
      "resource": {  
        "resourceType": "Bundle",  
        "type": "searchset",  
        "timestamp": "2019-11-29T00:00:00.000-05:00",  
        "entry": [  
          {  
            "resource": {  
              "resourceType": "CarePlan",  
              "activity": [  
                {  
                  "id": "R83688",  
                  "name": "Plan of Treatment",  
                  "status": "planned",  
                  "activity": [  
                    {  
                      "id": "R83689",  
                      "name": "Medication",  
                      "status": "planned",  
                      "detail": {  
                        "kind": "ServiceRequest",  
                        "code": {  
                          "coding": [{"system": "SNOMEDCT", "code": "39156007"}]  
                        },  
                        "description": "Take Metformin 500mg PO daily",  
                        "scheduled": "2019-11-29T00:00:00.000-05:00"  
                      }  
                    ]  
                  ]  
                ]  
              ]  
            ]  
          ]  
        ]  
      ]  
    ]  
  ]  
}
```

```
"detail": {
    "kind": "ServiceRequest",
    "code": {
        "coding": [
            {
                "system": "http://snomed.info/sct",
                "code": "173830003",
                "display": "STOMACH IRRIGATION"
            }
        ]
    },
    "scheduledString": "12/02/2019 05:48",
    "description": "Procedure"
},
{
    "detail": {
        "kind": "ServiceRequest",
        "code": {
            "coding": [
                {
                    "system": "http://snomed.info/sct",
                    "code": "168731009",
                    "display": "Standard chest X-ray"
                }
            ]
        },
        "scheduledString": "12/03/2019 07:49",
        "description": "Procedure"
    }
},
{
    "detail": {
        "kind": "ServiceRequest",
        "code": {
            "coding": [
                {
                    "system": "http://snomed.info/sct",
                    "code": "363248001",
                    "display": "Extraction of Right Pleura, Open Approach"
                }
            ]
        },
    }
},
```

```
        "scheduledString": "12/03/2019 00:06",
        "description": "Procedure"
    }
},
{
    "detail": {
        "kind": "Task",
        "description": "Plan of Treatment for the month"
    }
}
]
}
}
]
}
}
}
]
```

## assessment

## *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=assessment&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=assessment&startDate=12/02/2019 00:00&endDate=12/03/2019 23:59

## *Output*

A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an encounter, a RiskAssessment resource provides the assessment in note.text attribute.

```
"type": "searchset",
"timestamp": "2020-01-01T00:00:00.000-05:00",
"entry": [
{
  "resource": {
    "resourceType": "RiskAssessment",
    "note": [
      {
        "text": "i. The patient was found to have Anemia and Dr Seven and his staff diagnosed the condition and treated Ms Rebecca for Anemia during the 2 day stay at Community Health Hospitals. Ms Rebecca recovered from Anemia during the stay and is being discharged in a stable condition. If there is fever greater than 101.5 F or onset of chest pain/breathlessness the patient is advised to contact emergency."
      }
    ]
  }
}
]
```

## **assessment,planOfTreatment**

## *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=assessment,planOfTreatment&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=assessment,planOfTreatment  
&startDate=12/02/2019 00:00&endDate=12/03/2019 23:59

## *Output*

Assessment and plan of treatment can be obtained together by setting category=assessment,planOfTreatment. A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an encounter, a CarePlan resource describes the care plan and a RiskAssessment resource provides the assessment in note.text attribute.

```
{  
  "resourceType": "Bundle",  
  "type": "searchset",  
  "entry": [  
    {  
      "resource": {  
        "resourceType": "Bundle",  
        "type": "searchset",  
        "timestamp": "2019-11-29T00:00:00.000-05:00",  
        "entry": [  
          {  
            "resource": {  
              "resourceType": "CarePlan",  
              "activity": [  
                {  
                  "detail": {  
                    "kind": "ServiceRequest",  
                    "code": {  
                      "coding": [  
                        {  
                          "system": "http://snomed.info/sct",  
                          "code": "173830003",  
                          "display": "STOMACH IRRIGATION"  
                        }  
                      ]  
                    },  
                    "scheduledString": "12/02/2019 05:48",  
                    "description": "Procedure"  
                  }  
                },  
                {  
                  "detail": {  
                    "kind": "ServiceRequest",  
                    "code": {  
                      "coding": [  
                        {  
                          "system": "http://snomed.info/sct",  
                          "code": "168731009",  
                          "display": "Standard chest X-ray"  
                        }  
                      ]  
                    },  
                    "scheduledString": "12/03/2019 07:49",  
                    "description": "Procedure"  
                  }  
                }  
              ]  
            }  
          ]  
        ]  
      }  
    ]  
  ]  
}
```

```
        "description": "Procedure"
    }
},
{
    "detail": {
        "kind": "ServiceRequest",
        "code": {
            "coding": [
                {
                    "system": "http://snomed.info/sct",
                    "code": "363248001",
                    "display": "Extraction of Right Pleura, Open Approach"
                }
            ]
        },
        "scheduledString": "12/03/2019 00:06",
        "description": "Procedure"
    }
},
{
    "detail": {
        "kind": "Task",
        "description": "Plan of Treatment for the month"
    }
}
],
}
},
{
    "resource": {
        "resourceType": "RiskAssessment",
        "note": [
            {
                "text": "i. The patient was found to have Anemia and Dr Seven and his staff diagnosed the condition and treated Ms Rebecca for Anemia during the 2 day stay at Community Health Hospitals. Ms Rebecca recovered from Anemia during the stay and is being discharged in a stable condition. If there is fever greater than 101.5 F or onset of chest pain/breathlessness the patient is advised to contact emergency."
            }
        ]
    }
}
]
```

```

        }
    }
]
}

```

## goal

### *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=goal&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=goal&startDate=12/02/2019  
00:00&endDate=12/03/2019 23:59

### *Output*

A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an encounter, a Goal resource provides goals set for the patient. In particular, Goal.description.coding.display attribute gives goals as free form text.

```

{
  "resourceType": "Bundle",
  "type": "searchset",
  "entry": [
    {
      "resource": {
        "resourceType": "Bundle",
        "type": "searchset",
        "timestamp": "2019-12-02T00:00:00.000-05:00",
        "entry": [
          {
            "resource": {
              "resourceType": "Goal",
              "lifecycleStatus": "planned",
              "description": {
                "coding": [
                  {
                    "display": "a. Need to gain more energy to do regular activities.\nb. Negotiated Goal  
to keep Body Temperature at 98-99 degrees Fahrenheit with regular monitoring."
                  }
                ]
              }
            }
          }
        ]
      }
    }
  ]
}

```

# healthConcern

## *Input Examples*

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=healthConcern&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/Clinical?id=R83688&category=healthConcern&startDate=12/02/2019 00:00&endDate=12/03/2019 23:59

## *Output*

A FHIR Bundle resource is returned that contains a distinct Bundle resource for each encounter that has its start date occurring in the range specified by startDate, endDate parameters, or start date occurring on the date specified by date parameter. Inside each Bundle corresponding to an encounter, a Composition resource lists health concerns. For that purpose, a section is created inside the Composition resource, entitled "Health Concern". Each health concern could be a 'complaint' or 'observation'.

For health concerns of type ‘complaint’, a HealthConcern.Complaints section is created that consists of individual complaints each entitled Complaint. Each such section has Status, Description, Start Date and Comment sections, describing status of the complaint (one of active, inactive, resolved), description of the complaint, start date of the complaint, and any comments, respectively.

Similarly, for health concerns of type ‘observation’, a HealthConcern.Observations section is created that consists of individual observations in separate sections, each entitled Observation. Each such section has Status, Description, Start Date and Comment sections, describing status

of the observation (one of active, inactive, resolved), description of the observation, start date of the observation, and any comments, respectively.

```
{
  "resourceType": "Bundle",
  "type": "searchset",
  "entry": [
    {
      "resource": {
        "resourceType": "Bundle",
        "type": "searchset",
        "timestamp": "2019-12-02T00:00:00.000-05:00",
        "entry": [
          {
            "resource": {
              "resourceType": "Composition",
              "section": [
                {
                  "title": "Health Concern",
                  "section": [
                    {
                      "title": "Complaints",
                      "section": [
                        {
                          "title": "Complaint",
                          "section": [
                            {
                              "title": "Status",
                              "text": {
                                "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">active</div>"
                              }
                            },
                            {
                              "title": "Comment",
                              "text": {
                                "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">i. Documented Hypertension problem ii. Documented Hypothyroidism problem iii. Watch Weight of patient iv. Documented Anemia problem</div>"
                              }
                            },
                            {
                              "title": "Description",
                              "text": {
                                "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">"
                              }
                            }
                          ]
                        }
                      ]
                    }
                  ]
                }
              ]
            }
          ]
        ]
      }
    }
  ]
}
```

```
        "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">Chronically  
unwell</div>"  
    }  
},  
{  
    "title": "Start Date",  
    "text": {  
        "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">12/02/2019  
00:00</div>"  
    }  
}  
]  
}  
]  
},  
{  
    "title": "Observations",  
    "section": [  
        {  
            "title": "Observation",  
            "section": [  
                {  
                    "title": "Status",  
                    "text": {  
                        "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">active</div>"  
                    }  
                },  
                {  
                    "title": "Comment"  
                },  
                {  
                    "title": "Description",  
                    "text": {  
                        "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">Chronic malaise</div>"  
                    }  
                },  
                {  
                    "title": "Start Date",  
                    "text": {  
                        "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">12/03/2019  
00:00</div>"  
                    }  
                }  
            ]  
        }  
    ]  
}
```

]} } ] } } ] } } } } }

## All Criteria Data Request

Users can choose to return results for all criteria instead of filtering them individually. Response is CCDA compliant XML document.

- URI: One of
    - /rest/extApp/ClinicalCCDA?id=<id>
    - /rest/extApp/ClinicalCCDA?id=<id>&date=<encounter date>
    - /rest/extApp/ClinicalCCDA?id=<id>&startDate=<start>&endDate=<end>

## Examples:

<URL>/iCareEHRWeb/rest/extApp/ClinicalCCDA?id=R83688

<URL>/iCareEHRWeb/rest/extApp/ClinicalCCDA?id=R83688&date=12/02/2019

<URL>/iCareEHRWeb/rest/extApp/ClinicalCCDA?id=R83688&startDate=12/02/2019  
00:00&endDate=12/03/2019 23:59

- Method: GET
  - Request Parameters:
    - **id** must be set to the id of the patient from the response of /rest/extApp/Patient. If the user is a patient or designee, id must belong to the particular patient or a patient the designee is associated with. Otherwise, an error is returned.

- **startDate, endDate** must be in MM/dd/yyyy HH:mm format, e.g. startDate=11/14/2019 00:00, endDate=11/24/2019 23:59. Response will return data associated with the most recent encounter with start date/time in the date/time range specified with startDate, endDate.
- **date** is MM/dd/yyyy format, e.g. 11/14/2019. Response will return data associated with the most recent encounter that occurred in the specified date. That is equivalent to passing startDate as 00:00 hours and endDate as 23:59 hours for the particular date. For example, passing the date as 11/14/2019 is equivalent to passing startDate as 11/14/2019 00:00 and endDate as 11/14/2019 23:59.

If none of startDate, endDate, date is supplied the response will return data associated with the most recent encounter.

- Headers:

- **Cookie** set to JSESSIONID=<security token> where <security token> is from response of /rest/appTokenRequest.

Example:

JSESSIONID=tZ-kE6VZjgbDeZuzi\_vtw9fRbxK5vhEkzAANgTI

- Output: Successful output will return 202 HTTP response header. Error will return 500 HTTP response header. Successful output is a CCDA compliant XML document.

## Logout

- URI: /rest/logout

Example (curl):

```
curl -X POST -v "<URL>/iCareEHRWeb/rest/logout"
```

- Method: POST
- Request Parameters: none
- Body: {"dfn":"general"}
- Headers:

- **Cookie** set to JSESSIONID=<security token> where <security token> is from response of /rest/appTokenRequest.

Example:

JSESSIONID=tZ-kE6VZjgbDeZuzi\_vtw9fRbxK5vvhEkzAANgTI

- **Content-Type** set to application/json
- Output: Successful logout will return HTTP 202 response code.