

*Open Dental Software*

# **FHIR Interface Specification**

---

***For Open Dental 19.4***

**January 8, 2021**

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## About Open Dental FHIR

Open Dental has a RESTful API service that conforms to the FHIR standard defined by <https://www.hl7.org/fhir>. This FHIR service can be used to look up and create patient and appointments. For a detailed, technical description of Open Dental FHIR's capabilities, see the Capability Statement found at <https://api.opendental.com/fhir/v2/capabilitystatement/>.

This document describes the FHIR implementation in Open Dental v. 19.4. The version of FHIR used in this implementation is 4.0.0.

These are the resources currently accessible through the FHIR API:

- AllergyIntolerance
- Appointment
- Communication
- Condition
- Location
- Medication
- MedicationStatement
- Organization
- Patient
- Practitioner
- Procedure
- ServiceRequest
- Schedule
- Slot
- Subscription

All resources allow the GET method (meaning that the data can be retrieved through the API). Some resources additionally implement the POST and/or PUT method (resources can be created and updated through the API).

## Versions – What's Changed

In 19.4, the Communication resource was added to record communication events that occur with a patient.

## API Endpoint

The current version of the API has the following endpoint:

- <https://api.opendental.com/fhir/v2>

## Testing Credentials

Open Dental hosts a test database for developers to play with FHIR. The base URL is the same endpoint listed above. The Capability Statement on this server gives a detailed, technical description of Open Dental's FHIR capabilities.

The following test credentials can be used:

Developer Key: NFF6i0KrXrxDkZHt

Customer API Key: VzkmZEaUWOjnQX2z

## Request Format

Each API request must include an Authorization header in this format:

Authorization: ODFHIR {developerKey}/{customerAPIKey}

A browser extension or other software such as Postman or cURL is necessary to send request headers.

## Resources

### AllergyIntolerance

Risk of harmful or undesirable, physiological response which is unique to an individual and associated with exposure to a substance.

URL: <https://api.opendental.com/fhir/v2/allergyintolerance>

Operations Supported: Read

Version Added: 17.2

Search parameters:

| Name            | Type      | Comments  |
|-----------------|-----------|---|
| category        | token     | The category of this allergy. Either food, medication, or environment. Determined based on the allergy def allergy type (allergydef.SnomedType).  |
| clinical-status | token     | Whether the allergy is active or not. Possible values are active or inactive.   |
| code            | token     | Code that identifies the allergy or intolerance. Corresponds to the name of the allergy or the name of the medication or the RxCui of the medication (allergydef.Description, medication.MedName, or medication.RxCui). |
| date            | date      | Date record was believed accurate. Corresponds to the last time this row was updated (allergy.DateTStamp).  |
| identifier      | string    | The logical Id of the AllergyIntolerance. This is the same value as allergy.AllergyNum.   |
| last-date       | date      | The date a reaction was recorded. Corresponds to allergy.DateAdverseReaction.   |
| patient         | reference | Who the sensitivity is for (allergy.PatNum).  |
| type            | token     | The underlying mechanism (allergy or intolerance). Determined based on the allergy def allergy type   |

|  |  |                          |
|--|--|--------------------------|
|  |  | (allergydef.SnomedType). |
|--|--|--------------------------|

Example request:

<https://api.opendental.com/fhir/v2/allergyintolerance?patient=234>

AllergyIntolerance Fields supported:

| Field              | Comments   |
|--------------------|--|
| identifier         | The primary key of the database row (allergy.AllergyNum) |
| clinicalStatus     | active, inactive   |
| verificationStatus | Currently always confirmed                               |
| type               | allergy, intolerance, none                               |
| category           | food, medication, environment, none                      |
| code               | Text description of the allergy                          |
| patient            | The person who has the intolerance                       |
| recordedDate       | Date record was believed accurate                        |
| lastOccurance      | Date of last known occurrence of a reaction              |
| note               | Additional notes entered concerning the allergy          |
| reaction           | Adverse reaction events linked to exposure to substance  |

Example response:

```
{
  "resourceType": "AllergyIntolerance",
  "identifier": [
    {
      "use": "usual",
      "type": {
        "text": "Open Dental FK to allergy.AllergyNum"
      },
      "value": "1"
    }
  ],
  "clinicalStatus": {
    "coding": [
      {
        "system": "http://hl7.org/fhir/ValueSet/allergy-clinical-status",
        "code": "active",
        "display": "Active"
      }
    ],
    "text": "Active"
  },
  "verificationStatus": {
    "coding": [
      {
        "system": "http://hl7.org/fhir/ValueSet/allergyintolerance-
verification ",
        "code": "confirmed",
```

```

        "display": "Confirmed"
      }
    ],
    "text": "Confirmed"
  },
  "code": {
    "text": "Allergy - Morphine"
  },
  "patient": {
    "reference": "Patient/145",
    "display": "Arabella Figg"
  },
  "recordedDate": "2017-04-06T17:05:16",
  "lastOccurance": "2016-05-05T00:00:00",
  "id": "1"
}

```

Additional details: <https://www.hl7.org/fhir/allergyintolerance.html>

## Appointment

An appointment for a patient

URL: <https://api.opendental.com/fhir/v2/appointment>

Operations Supported: Read, Create, Update

Version Added: 16.3 (Read), 17.1 (Create), 18.4 (Update)

Fields supported:

| Field              | Comments  |
|--------------------|---|
| identifier         | Corresponds to appointment.AptNum   |
| status             | proposed, pending, booked, etc. See below for all statuses  |
| priority           | Scale of 1 to 9, 1 as highest, 9 as lowest  |
| start              | The beginning of the appointment  |
| end                | The end of the appointment  |
| minutesDuration    | The number of minutes the appointment lasts   |
| comment            | Corresponds to appointment.Note   |
| participant        | Used to specify the patient, provider, and operatory  |
| participant.status | On the patient participant, used to update the confirmation status on the appointment   |
| reasonReference    | These are a list of Procedure resources that are attached to this appointment. Added in 19.2.   |
| basedOn            | These are a list of ServiceRequest resources that are the reason for this appointment. Added in 19.2.   |
| plannedApptOrder   | For an appointment of status proposed, this is the priority/order of the planned appointment. If not specified, the appointment will be put at the end of the |

|  |       |
|--|-------|
|  | list. |
|--|-------|

Search parameters:

| Name         | Type      | Comments  |
|--------------|-----------|---|
| patient      | reference | The patient on the appointment. Corresponds to appointment.PatNum.  |
| location     | reference | The operatory in which the appointment is scheduled. Corresponds to appointment.Op.   |
| identifier   | string    | The logical Id of the appointment. This is the same value as appointment.AptNum.  |
| practitioner | reference | The provider or hygienist on the appointment. Corresponds to appointment.ProvNum or appointment.ProvHyg.  |
| status       | token     | The status of the appointment.  |
| date         | date      | The start time of the appointment. This corresponds to appointment.AptDateTime.   |
| _lastUpdated | date      | The last time any of the fields in the appointment were modified (this includes fields that are stored in the database and not transferred through FHIR). This corresponds to appointment.DateTStamp. |

Example response:

```
{
  "resourceType": "Appointment",
  "identifier": [
    {
      "use": "usual",
      "type": {
        "text": "Open Dental FK to appointment.AptNum"
      },
      "value": "43"
    }
  ],
  "status": "booked",
  "priority": 5,
  "description": "LimEx, CmpEx",
  "start": "2015-11-26T12:40:00",
  "end": "2015-11-26T13:30:00",
  "minutesDuration": 50,
  "participant": [
    {
      "type": [
        {
          "coding": [
            {
              "system": "http://hl7.org/fhir/participant-type",
              "code": "PART",
```



```

        "display": "Participation"
      }
    ]
  },
  "actor": {
    "reference": "Patient/76",
    "display": "Lavender Brown"
  },
  "required": "required",
  "status": "needsaction"
},
{
  "type": [
    {
      "coding": [
        {
          "system": "http://hl7.org/fhir/participant-type",
          "code": "PPRF",
          "display": "primary performer"
        }
      ]
    }
  ],
  "actor": {
    "reference": "Practitioner/1",
    "display": "Madame Pomprey, DMD"
  },
  "required": "required",
  "status": "accepted"
},
{
  "type": [
    {
      "coding": [
        {
          "system": "http://hl7.org/fhir/participant-type",
          "code": "PART",
          "display": "Participation"
        }
      ]
    }
  ],
  "actor": {
    "reference": "Location/3",
    "display": "OP-3"
  },
  "required": "required",
  "status": "accepted"
}
],
"id": "43",
"meta": {

```

```

    "lastUpdated": "2015-11-24T16:31:21"
  }
}

```

Additional details: <https://www.hl7.org/fhir/appointment.html>

See Use Case 3 to see an example of creating an appointment.

See Use Case 4 to see an example of updating an appointment.

The statuses on a FHIR Appointment resource correspond to the following appointment statuses in Open Dental:

- proposed – An appointment that is planned
- pending – An appointment on the Unscheduled List
- booked – An appointment with a status of Scheduled or ASAP
- arrived – An appointment that has a value in the Time Arrived field but not in the Time Dismissed field
- fulfilled – An appointment with a status of Complete
- cancelled – An appointment that has been deleted
- noshow – An appointment with a status of Broken

The statuses on the patient participant correspond to the following appointment confirmation statuses in Open Dental:

- needsaction – The office's default unconfirmed status
- accepted – The office's default confirmed status

When creating an appointment, the following fields are required: Patient, location (operatory), and status. If a practitioner is not specified, the provider scheduled in that operatory for that time slot is used. If there is none, the patient's primary provider is used. If a secondary provider is not specified, the hygienist for the operatory is used if the preference to use the secondary provider from the operatory is set. Otherwise, the patient's secondary provider is used.

When updating an appointment, all fields that are supported by Open Dental's FHIR implementation will be updated. See Use Case 4 for how to update a single field.

## Condition

Detailed information about conditions, problems or diagnoses. These are referred to as Problems in Open Dental.

URL: <https://api.opendental.com/fhir/v2/condition>

Operations Supported: Read

Version Added: 17.4

Fields supported:

| Field | Comments |
|-------|----------|
|-------|----------|

|                    |   |
|--------------------|---|
| identifier         | The primary key of the database row (disease.DiseaseNum)          |
| clinicalStatus     | active, inactive, resolved  |
| verificationStatus | Currently always confirmed  |
| code               | May contain the SNOMED, ICD9, or ICD10 code or a text description |
| subject            | The patient who has this condition                                |
| onsetDateTime      | The date the condition began                                      |
| abatementDateTime  | If/when in resolution/remission                                   |
| note               | Additional information about the Condition                        |

#### Search parameters:

| Name            | Type      | Comments   |
|-----------------|-----------|--|
| abatement-date  | date      | Date-related abatements as a dateTime. Equivalent to disease.DateStop.   |
| clinical-status | token     | The clinical status of the condition. Based on disease.ProbStatus.   |
| code            | token     | Code for the condition. Uses either diseasedef.SnomedCode, diseasedef.Icd10Code, diseasedef.ICD9Code, or diseasedef.DiseaseName. |
| identifier      | string    | The logical Id of the Condition. Equivalent to disease.DiseaseNum.   |
| onset-date      | date      | Date related onsets as a dateTime. Equivalent to disease.DateStart.  |
| patient         | reference | Who has the condition? Equivalent to disease.PatNum.   |
| subject         | reference | Who has the condition? Equivalent to disease.PatNum.   |

#### Example response:

```
{
  "resourceType": "Condition",
  "identifier": [
    {
      "use": "usual",
      "type": {
        "text": "Open Dental foreign key to disease.DiseaseNum"
      },
      "value": "2"
    }
  ],
  "clinicalStatus": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/condition-ver-status",
        "code": "confirmed",
        "display": "Confirmed"
      }
    ]
  }
}
```

```

    ],
    "text": "Confirmed"
  },
  "verificationStatus": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/condition-ver-status",
        "code": "confirmed",
        "display": "Confirmed"
      }
    ],
    "text": "Confirmed"
  },
  "code": {
    "text": "Atopic dermatitis"
  },
  "subject": {
    "reference": "Patient/110",
    "display": "Gilderoy Lockhart"
  },
  "note": [
    {
      "text": "Patient has had this since a small child."
    }
  ],
  "id": "2"
}

```

Additional details: <https://www.hl7.org/fhir/condition.html>

## Communication

A record of information transmitted from or to a patient.

URL: <https://api.opendental.com/fhir/v2/communication>

Operations Supported: Read, Create

Version Added: 19.4

Fields supported:

| Field      | Comments  |
|------------|---|
| identifier | The primary key of the database row (commlog.CommLogNum)  |
| Status     | Currently always 'completed'  |
| Medium     | The channel of communication. CodeableConcept using code system<br><a href="https://opendental.com/fhir/ValueSet/communication-medium">https://opendental.com/fhir/ValueSet/communication-medium</a><br>Possible values are:<br>email |

|           |  |
|-----------|--|
|           | mail<br>phone<br>in_person<br>text<br>email_and_text |
| sent      | When the communication was sent                      |
| received  | When the communication was received                  |
| sender    | Message sender. Reference (Patient).                 |
| recipient | Message recipient. Reference (Patient).              |
| payload   | Message payload.                                     |

#### Search parameters:

| Name       | Type      | Comments   |
|------------|-----------|--|
| sender     | reference | The patient who sent the communication. Reference must be of type Patient.     |
| recipient  | reference | The patient who received the communication. Reference must be of type Patient. |
| sent       | date      | The date and possibly time the communication was sent.                         |
| received   | date      | The date and possibly time the communication was received.                     |
| identifier | string    | The logical Id of the Communication. Equivalent to commlog.CommLogNum.         |

#### Example response:

```
{
  "resourceType": "Communication",
  "identifier": [
    {
      "use": "usual",
      "type": {
        "text": "Open Dental commlog.CommlogNum"
      },
      "value": "19"
    }
  ],
  "status": "completed",
  "medium": [
    {
      "coding": [
        {
          "system": "https://opendental.com/fhir/ValueSet/communication-medium",
          "code": "text",
          "display": "Text"
        }
      ]
    }
  ],
  "text": "Text"
}
```

```

    }
  ],
  "sent": "2019-03-25T16:40:33",
  "sender": {
    "reference": "patient/11",
    "display": "Grushenka Svetlov"
  },
  "payload": [
    {
      "contentString": "Text message received: Do you have any openings
next week?"
    }
  ],
  "id": "19"
}

```

Additional example response:

```

{
  "resourceType": "Communication",
  "identifier": [
    {
      "use": "usual",
      "type": {
        "text": "Open Dental commlog.CommlogNum"
      },
      "value": "113"
    }
  ],
  "status": "completed",
  "medium": [
    {
      "coding": [
        {
          "system": "https://opendental.com/fhir/ValueSet/communication-
medium",
          "code": "phone",
          "display": "Phone"
        }
      ],
      "text": "Phone"
    }
  ],
  "received": "2019-12-11T12:07:00",
  "recipient": [
    {
      "reference": "patient/61",
      "display": "Pasha Antipov"
    }
  ],
  "payload": [
    {
      "contentString": "Called patient to discuss most recent statement."
    }
  ]
}

```

```

    }
  ],
  "id": "113"
}

```

Additional details: <https://www.hl7.org/fhir/condition.html>

Requirements when creating a Communication:

- Only 'sender' or 'recipient' can be included.
- Either 'sender' or 'recipient' is required.
- When 'sender' is included, 'sent' is required.
- When 'recipient' is included, 'received' is required.
- The 'payload' field must not be empty.

## Location

A location corresponds to an operatory within Open Dental.

URL: <https://api.opendental.com/fhir/v2/location>

Operations Supported: Read

Version Added: 16.3

Fields supported:

| Field                | Comments  |
|----------------------|---|
| identifier           | Corresponds to operatory.OpNum                              |
| status               | active, inactive  |
| name                 | Correspondes to operatory.OpName                            |
| description          | Correspondes to operatory.OpName                            |
| mode                 | Always instance   |
| telecom              | Contact information for the clinic the operatory belongs to |
| address              | Always room   |
| managingOrganization | The clinic the operatory belongs to                         |

Search parameters:

| Name               | Type   | Comments   |
|--------------------|--------|--|
| address            | string | The physical address of the clinic to which the operatory is assigned. Corresponds to any value in clinic.Address, clinic.Address2, clinic.City, clinic.State, clinic.Zip. |
| address-city       | string | The city of the clinic to which the operatory is assigned. Corresponds to clinic.City.   |
| address-postalcode | string | The zip code of the clinic to which the operatory is assigned. Corresponds to clinic.Zip.  |
| address-state      | string | The state of the clinic to which the operatory is assigned. Corresponds to clinic.State.   |
| identifier         | string | The logical Id of the location. This is the same value as  |

|              |           |   |
|--------------|-----------|---|
|              |           | operator.OperatorNum.   |
| name         | string    | The name or abbreviation of the operator. Corresponds to operator.OpName or operator.Abbrev.  |
| organization | reference | The clinic to which the operator is assigned. Corresponds to operator.ClinicNum.  |
| status       | token     | The status 'active' corresponds to an operator that is not hidden. The status 'inactive' corresponds to an operator that is hidden. |

Example response:

```
{
  "resourceType": "Location",
  "identifier": [
    {
      "use": "usual",
      "type": {
        "text": "Open Dental FK to operator.OperatorNum"
      },
      "value": "3"
    }
  ],
  "status": "active",
  "name": "Emergency Operator",
  "mode": "instance",
  "telecom": [
    {
      "system": "phone",
      "value": "3332221111",
      "use": "work",
      "rank": 1
    },
    {
      "system": "email",
      "value": "dentalclinic@example.com",
      "use": "work",
      "rank": 2
    }
  ],
  "address": {
    "use": "work",
    "type": "physical",
    "line": [
      "123 Lake Drive"
    ],
    "city": "Hogsmeade",
    "state": "BI",
    "postalCode": "99669"
  },
  "physicalType": {
    "coding": [
      {

```



```

      "system": "http://hl7.org/fhir/location-physical-type",
      "code": "ro",
      "display": "Room"
    }
  ],
  "managingOrganization": {
    "reference": "Organization/1",
    "display": "Washington Hospital"
  },
  "id": "3"
}

```

Additional details: <https://www.hl7.org/fhir/location.html>

## Medication

Definition of a Medication.

URL: <https://api.opendental.com/fhir/v2/medication>

Operations Supported: Read

Version Added: 17.4

Fields supported:

| Field  | Comments                               |
|--------|--|
| code   | Either an RxNorm or a text description |
| status | Currently always active                |

Search parameters:

| Name       | Type   | Comments  |
|------------|--------|---|
| code       | token  | Codes that identify this medication. Corresponds to the name of the medication or the RxCui of the medication (medication.MedName or medication.RxCui). |
| identifier | string | The logical Id of the Medication. This is the same value as medication.MedicationNum.   |

Example response:

```

{
  "resourceType": "Medication",
  "code": {
    "text": "Levothyroxine"
  },
  "status": "active",
  "id": "4",
  "meta": {
    "lastUpdated": "2011-07-13T13:55:27"
  }
}

```

Additional details: <https://www.hl7.org/fhir/medication.html>

## MedicationStatement

Record of medication being taken by a patient.

URL: <https://api.opendental.com/fhir/v2/medicationstatement>

Operations Supported: Read

Version Added: 17.4

Fields supported:

| Field                     | Comments   |
|---------------------------|--|
| identifier                | The primary key of the database row (medicationpat.MedicationPatNum) |
| status                    | active, completed  |
| medicationCodeableConcept | A text description of the medication                                 |
| medicationReference       | Reference to the Medication resource                                 |
| effectivePeriod           | The interval when the medication was taken                           |
| effectiveDateTime         | The date when the medication was taken                               |
| dateAsserted              | When the statement was asserted                                      |
| subject                   | The patient who is taking the medication                             |
| note                      | Further information about the medication                             |

Search parameters:

| Name       | Type      | Comments  |
|------------|-----------|---|
| code       | token     | Returns statements of this medication code. Equivalent to medicationpat.MedName.                                    |
| effective  | date      | Date when patient was taking (or not taking) the medication. Based on medication.DateStart and medication.DateStop. |
| identifier | string    | The logical Id of the Medication. This is the same value as medicationpat.MedicationPatNum.                         |
| medication | reference | Returns statements of this medication reference. Equivalent to medicationpat.MedicationNum.                         |
| patient    | reference | Returns statements for a specific patient. Equivalent to medicationpat.PatNum.                                      |
| status     | token     | Returns statements that match the given status. Only 'active' and 'completed' are supported.                        |
| subject    | reference | Returns statements for a specific patient. Equivalent to medicationpat.PatNum.                                      |

Example response:

```
{  
  "resourceType": "MedicationStatement",  
}
```

```

"identifier": [
  {
    "use": "usual",
    "type": {
      "text": "Open Dental FK to medicationpat.MedicationPatNum"
    },
    "value": "2"
  }
],
"status": "active",
"medicationReference": {
  "reference": "Medication/345",
  "display": "Albuterol"
},
"dateAsserted": "2015-12-24T09:28:44",
"subject": {
  "reference": "Patient/1",
  "display": "Hermione Granger"
},
"id": "2"
}

```

Additional details: <https://www.hl7.org/fhir/medicationstatement.html>

Each MedicationStatement will have an effectivePeriod present when the start and the stop dates are entered for the medication and it will have an effectiveDateTime when only the start date is entered.

## Organization

One Organization represents the practice as entered within Open Dental under Setup -> Practice. Every other Organization resource is a clinic within Open Dental.

URL: <https://api.opendental.com/fhir/v2/organization>

Operations Supported: Read

Version Added: 16.3

Fields supported:

| Field      | Comments   |
|------------|--|
| identifier | 0 if this Organization is the practice, otherwise clinic.ClinicNum |
| name       | Correspondes to clinic.Abbbr.                                      |
| telecom    | The practice or clinic phone number                                |
| address    | The practice or clinic physical address                            |
| partOf     | If this is a clinic, will point to the practice                    |

Search parameters:

| Name | Type | Comments |
|------|------|----------|
|------|------|----------|

|                    |           |   |
|--------------------|-----------|---|
| address            | string    | The physical or billing address of the clinic or practice. Corresponds to any value in clinic.Address, clinic.Address2, clinic.City, clinic.State, clinic.Zip, clinic.BillingAddress, clinic.BillingAddress2, clinic.BillingCity, clinic.BillingState, clinic.BillingZip. |
| address-city       | string    | The city of the clinic or practice. Corresponds to clinic.City or clinic.BillingCity.   |
| address-postalcode | string    | The zip code of the clinic or practice. Corresponds to clinic.Zip or clinic.BillingZip.   |
| identifier         | string    | The logical Id of the clinic or practice. This is the same value as clinic.ClinicNum, however the dental practice can be represented as a Clinic resource with a logical Id of 0.   |
| name               | string    | The name of the clinic or practice. Corresponds to clinic.Abbbr.  |
| partof             | reference | All clinics are a partof the practice Organization.   |

Example response:

```
{
  "resourceType": "Organization",
  "identifier": [
    {
      "use": "usual",
      "type": {
        "text": "Open Dental FK to clinic.ClinicNum."
      },
      "value": "4"
    }
  ],
  "active": true,
  "name": "Diagon Alley Old Tyme Healings",
  "address": [
    {
      "use": "work",
      "type": "physical",
      "line": [
        " "
      ]
    },
    {
      "use": "work",
      "type": "postal",
      "line": [
        " "
      ]
    }
  ],
  "partOf": {
    "reference": "Organization/0",
  }
}
```

```

    "display": "Magical Dental"
  },
  "id": "4"
}

```

Additional details: <https://www.hl7.org/fhir/organization.html>

## Patient

An individual for whom care is provided

URL: <https://api.opendental.com/fhir/v2/patient>

Operations Supported: Read, Create

Version Added: 16.3 (Read), 17.1 (Create)

Fields supported:

| Field                | Comments   |
|----------------------|--|
| identifier           | An identifier for this patient. Corresponds to patient.PatNum  |
| active               | Whether this patient's record is in active use.  |
| name                 | A name associated with the patient.  |
| telecom              | A contact detail for the individual.   |
| gender               | AdministrativeGender   |
| birthDate            | The date of birth for the individual.  |
| deceasedDateTime     | The date time deceased for the individual.   |
| address              | Address for the individual. Can include multiple lines. The first will correspond to the patient.address and the second, if included, will be put in the patient.address2. |
| maritalStatus        | Marital (civil) status of a patient.   |
| photo                | Image of the patient. Must include the parameter includePhoto=true   |
| communication        | The patient's preferred language   |
| careProvider         | Patient's nominated primary care provider.   |
| managingOrganization | Patient's assigned clinic.   |

Search parameters:

| Name         | Type   | Comments   |
|--------------|--------|--|
| active       | token  | Whether a patient is active or not. A value of 'true' corresponds to a patient.PatStatus of Patient. A value of 'false' corresponds to a patient.PatStatus of anything other than Patient. |
| address      | string | The address of the patient. Corresponds to any value in patient.Address, patient.Address2, patient.City, patient.State, patient.Zip, or patient.Country.                                   |
| address-city | string | The patient's city. Corresponds to patient.City.   |
| address-     | string | The patient's zip code. Corresponds to patient.Zip.  |

|               |           |   |
|---------------|-----------|---|
| postalcode    |           |   |
| address-state | string    | The patient's state. Corresponds to patient.State.  |
| birthdate     | date      | The patient's birthdate. This corresponds to patient.Birthdate.   |
| careprovider  | reference | The patient's primary provider. Corresponds to patient.PriProv.   |
| deathdate     | date      | The date time the patient passed away. This corresponds to patient.DateTimeDeceased.  |
| deceased      | token     | Whether a patient deceased or not. A value of 'true' corresponds to a patient.PatStatus of Deceased or a value is entered in patient.DateTimeDeceased. A value of 'false' corresponds to a patient.PatStatus of anything other than Deceased and no value is entered in papatient.DateTimeDeceased. |
| email         | string    | The patient's email. Corresponds to patient.Email.  |
| family        | string    | The patient's family (last) name. Corresponds to patient.LName.   |
| gender        | token     | The patient's gender. Corresponds to patient.Gender. The genders 'other' and 'unknown' corresponds to Unknown in Open Dental.   |
| given         | string    | The patient's given (first or middle) name. Corresponds to patient.FName or patient.MiddleI.  |
| identifier    | string    | This can match either the business id of the patient or the patient's Social Security Number. This corresponds to patient.PatNum or patient.SSN. If intending to search for the SSN, the token's system should be 'http://hl7.org/fhir/sid/us-ssn'.   |
| language      | string    | The patient's primary language. A two- or three-letter ISO language tag is accepted. Because Open Dental only stores a patient's language and not their language region, searches for en-US, en-UK, or en-CA will match all patients whose language is English.                                     |
| name          | string    | The patient's name. Corresponds to a portion of patient.FName, patient.MiddleI, or patient.LName.   |
| organization  | reference | The clinic to which the patient is assigned. Corresponds to patient.ClinicNum.  |
| phone         | string    | A patient's phone number. Corresponds to patient.HmPhone, patient.WkPhone, or patient.WirelessPhone.  |
| telecom       | string    | A patient's phone number or email. Corresponds to patient.HmPhone, patient.WkPhone, patient.WirelessPhone, or patient.Email.  |
| _lastUpdated  | date      | The last time any of the fields in for the patient were modified (this includes fields that are stored in the database and not transferred through FHIR). This  |

|                  |       |   |
|------------------|-------|---|
|                  |       | corresponds to patient.DateTStamp.  |
| includePhoto     | token | Custom search parameter. To reduce bandwidth, the Patient.photo element is excluded by default. To have the photo included, this parameter must be included with a value of 'true'.                           |
| phoneNumberMatch | token | Custom search parameter. This parameter can be used to search for patients whose phone number is a partial match. Any non-digit characters are ignored both in the parameter value and in the database value. |

#### Example response:

```
{
  "resourceType": "Patient",
  "identifier": [
    {
      "use": "usual",
      "type": {
        "text": "Open Dental patient.PatNum"
      },
      "value": "8"
    }
  ],
  "active": true,
  "name": [
    {
      "use": "usual",
      "text": "Neville Longbottom",
      "family": "Longbottom",
      "given": "Neville"
    }
  ],
  "telecom": [
    {
      "system": "email",
      "value": "neville@example.com",
      "use": "home",
      "rank": 0
    }
  ],
  "gender": "male",
  "birthDate": "1992-05-24T00:00:00",
  "address": [
    {
      "use": "home",
      "line": [
        ""
      ],
      "postalCode": "22458"
    }
  ],
  "maritalStatus": {
```

```

    "coding": [
      {
        "system": "http://hl7.org/fhir/marital-status",
        "code": "S",
        "display": "Never Married"
      }
    ],
    "careProvider": [
      {
        "reference": "Practitioner/1",
        "display": "Madame Pomprey, DMD"
      }
    ],
    "managingOrganization": {
      "reference": "Organization/1",
      "display": "Washington Hospital"
    },
    "id": "8",
    "meta": {
      "lastUpdated": "2018-11-12T11:00:22"
    }
  }
}

```

Additional details: <https://www.hl7.org/fhir/patient.html>

See Use Case 3 to see an example of creating a patient.

## Practitioner

A Practitioner corresponds to a provider in Open Dental, usually a dentist or a hygienist.

URL: <https://api.opendental.com/fhir/v2/practitioner>

Operations Supported: Read

Version Added: 16.3

Fields supported:

| Field            | Comments  |
|------------------|---|
| identifier       | Corresponds to provider.ProvNum   |
| active           | True or false   |
| name             | The first and last name of the provider   |
| gender           | Currently this field will be always unknown   |
| practitionerRole | role will be either 'provider' or 'hygienist'.<br>Specialty is drawn from the provider specialties within Open Dental. These specialties are user-editable and do not conform to any code system. |

Search parameters:

| Name | Type | Comments |
|------|------|----------|
|------|------|----------|



|            |        |   |
|------------|--------|---|
| family     | string | The practitioner's family (last) name. Corresponds to provider.LName.   |
| given      | string | The practitioner's given (first or middle) name. Corresponds to provider.FName or provider.MI.  |
| identifier | string | The logical id of the practitioner. This is the same value as provider.ProvNum.   |
| name       | string | The practitioner's name. Corresponds to a portion of provider.FName, provider.MI, or patient.provider.  |
| role       | token  | The provider's role in the practice. The parameter values supported are 'provider' and hygienist'. The former corresponds to provider.IsSecondary=0 and the latter corresponds to provider.IsSecondary=1. |
| specialty  | string | The provider's specialty. These parameter values are the values set up within Open Dental as provider specialties.  |

Example response:

```
{
  "resourceType": "Practitioner",
  "identifier": [
    {
      "use": "usual",
      "type": {
        "text": "Open Dental FK to provider.ProvNum."
      },
      "value": "7"
    }
  ],
  "active": false,
  "name": {
    "text": "Fin Stessire",
    "family": "Stessire",
    "given": "Fin"
  },
  "gender": "unknown",
  "practitionerRole": [
    {
      "role": {
        "coding": [
          {
            "code": "hygienist",
            "display": "Hygienist"
          }
        ]
      },
      "specialty": [
        {
          "coding": [
            {
              "code": "generalist",
              "display": "Generalist"
            }
          ]
        }
      ]
    }
  ]
}
```

```

    }
  ]
}
]
}
],
"id": "7"
}

```

Additional details: <https://www.hl7.org/fhir/practitioner.html>

## Procedure

A Procedure corresponds to a completed procedure in Open Dental.

URL: <https://api.opendental.com/fhir/v2/procedure>

Operations Supported: Read, Create, Update

Version Added: 19.1

Fields supported:

| Field             | Comments  |
|-------------------|---|
| identifier        | Corresponds to procedurelog.ProcNum.  |
| partOf            | Corresponds to attached procedure (procgroupitem table) if the current procedure is a Group Note.   |
| status            | Corresponds to procedurelog.ProcStatus. Always a status of "completed".   |
| category          | Corresponds to procedurecode.ProcCat and the matching name of the definition. Only included with read requests. Cannot update.  |
| code              | Corresponds to procedurecode.ProcCode.  |
| subject           | Reference to the patient attached to the procedure. Corresponds to procedurelog.PatNum.   |
| performedDateTime | The date the procedure was performed. Corresponds to procedurelog.ProcDate.   |
| performer         | The performer of the procedure. In this case, the actor corresponds to the practitioner (procedurelog.ProvNum). The onBehalfOf field represents the Organization attached to this procedure (procedurelog.ClinicNum). |
| bodySite          | The location on the body where the procedure occurred. Can correspond to procedurelog.Surf or procedurelog.ToothNum. See section below on Reading/Writing the bodySite.   |
| location          | Corresponds to the OpNum of the appointment this procedure is attached to. Only included with read requests. Cannot update.   |
| note              | Corresponds to the procnote table. The most recent  |

|  |
|--|
| procnote will be included in the read request. |
|--|

#### Search parameters:

| Name       | Type      | Comments   |
|------------|-----------|--|
| code       | token     | The code of the procedure. Corresponds to procedurecode.ProcCode.  |
| patient    | reference | The patient for this procedure. Corresponds to procedurelog.PatNum.  |
| date       | date      | The date this procedure occurred. Corresponds to procedurelog.ProcDate.  |
| identifier | string    | The id of the procedure. Corresponds to procedurelog.ProcNum.  |
| performer  | reference | The performer for the procedure. Must be a practitioner. Corresponds to procedurelog.ProvNum.  |
| location   | reference | The location for the procedure. Corresponds to the operatory number of the appointment this procedure is attached to (appointment.op). |

#### Example response:

```
{
  "resourceType": "Procedure",
  "identifier": [
    {
      "use": "usual",
      "type": {
        "text": "Open Dental procedurelog.ProcNum"
      },
      "value": "78"
    }
  ],
  "status": "completed",
  "category": {
    "text": "Exams & Xrays"
  },
  "code": {
    "coding": [
      {
        "system": "http://hl7.org/fhir/us/sid/cdt",
        "code": "D0140",
        "display": "limited oral evaluation - problem focused"
      }
    ],
    "text": "limited oral evaluation - problem focused"
  },
  "subject": {
    "reference": "Patient/22",
    "display": "Dean Thomas"
  },
}
```

```

"performedDateTime": "2019-09-14T00:00:00",
"performer": [
  {
    "actor": {
      "reference": "Practitioner/1",
      "display": "Madame S. Pomprey, DMD"
    },
    "onBehalfOf": {
      "reference": "Organization/0",
      "display": "Magical Dental"
    }
  }
],
"id": "78",
"meta": {
  "lastUpdated": "2019-08-14T14:30:57"
}
}

```

Additional details: <http://hl7.org/fhir/procedure.html>

See Use Case 5 for an example of inserting and updating a procedure.

#### Reading/Writing the bodySite:

The bodySite field can store information in the procedurelog.Surf and/or procedurelog.ToothNum. FHIR uses two code systems to implement surface and tooth number. The system for surface will be stored in procedurelog.Surf. If the exact surface is not in the system, such as MOL, multiple surfaces can be included and will be concatenated together (include M, O, and L ). The tooth number system will be used to set procedurelog.ToothNum when specifying a specific tooth. The quadrants can also be specified and will be set in procedurelog.Surf. Only set the quadrant if the procedure applies to the entire section of the mouth. See Use Case 5 for an example of inserting and updating the bodySite.

When updating a procedure, all fields that are supported by Open Dental's FHIR implementation will be updated sans location and category. This means if a field is omitted in the update request, it will be set back to its default value.

## ServiceRequest

A ServiceRequest corresponds to a treatment planned procedure in Open Dental. This resource was named ProcedureRequest in version 19.1 of Open Dental.

URL: <https://api.opendental.com/fhir/v2/servicerequest>

Operations Supported: Read, Create

Version Added: 19.2

Fields supported:

| Field      | Comments  |
|------------|---|
| identifier | Corresponds to procedurelog.ProcNum.                    |
| status     | Corresponds to procedurelog.ProcStatus. Always a status |

|                    |  |
|--------------------|--|
|                    | of “active”.   |
| intent             | The intent of the procedure request. Always set to intent of “proposal”.   |
| category           | Currently this field will be always unknown  |
| code               | Corresponds to procedurecode.ProcCode.   |
| subject            | Reference to the patient attached to the procedure. Corresponds to procedurelog.PatNum.  |
| occurrenceDateTime | The date the procedure will occur. Corresponds to procedurelog.ProcDate.   |
| authoredOn         | The date the procedure was initially created. Only included with read requests. Cannot update.   |
| performer          | The performer of the procedure. In this case, the actor corresponds to the practitioner (procedurelog.ProvNum).  |
| bodySite           | The location on the body where the procedure occurred. Can correspond to procedurelog.Surf or procedurelog.ToothNum. See section in Procedure: Reading/Writing the bodySite. |
| note               | Corresponds to the procnote table. The most recent procnote will be included in the read request.  |

#### Search parameters:

| Name       | Type      | Comments  |
|------------|-----------|---|
| code       | token     | The code of the service request. Corresponds to procedurecode.ProcCode.                             |
| patient    | reference | The patient for this service request. Corresponds to procedurelog.PatNum.                           |
| occurrence | date      | The date this service request will occur. Corresponds to procedurelog.ProcDate.                     |
| identifier | string    | The id of the service request. Corresponds to procedurelog.ProcNum.                                 |
| performer  | reference | The performer for the service request. Must be a practitioner. Corresponds to procedurelog.ProvNum. |

#### Example response:

```
{
  "resourceType": "ServiceRequest",
  "identifier": [
    {
      "use": "usual",
      "type": {
        "text": "Open Dental procedurelog.ProcNum"
      },
      "value": "1442"
    }
  ]
}
```

```

],
"status": "active",
"intent": "proposal",
"category": [
  {
    "text": "Fillings"
  }
],
"code": {
  "coding": [
    {
      "system": "http://hl7.org/fhir/us/sid/cdt",
      "code": "D2331",
      "display": "resin-based composite - two surfaces, anterior"
    }
  ],
  "text": "resin-based composite - two surfaces, anterior"
},
"subject": {
  "reference": "Patient/1",
  "display": "Hermione Granger"
},
"occurrenceDateTime": "2019-11-08T00:00:00",
"authoredOn": "2016-02-16T00:00:00",
"performer": [
  {
    "reference": "Practitioner/1",
    "display": "Madame S. Pomfrey, DMD"
  }
],
"bodySite": [
  {
    "coding": [
      {
        "system": "http://hl7.org/fhir/ex-tooth",
        "code": "26",
        "display": "26"
      },
      {
        "system": "http://hl7.org/fhir/FDI-surface",
        "code": "D",
        "display": "Distal"
      },
      {
        "system": "http://hl7.org/fhir/FDI-surface",
        "code": "L",
        "display": "Lingual"
      }
    ]
  }
],
"id": "1442",
"meta": {

```

```
"lastUpdated": "2019-11-08T08:45:58"
}
```

Additional details: <http://hl7.org/fhir/servicerequest.html>

## Schedule

A Schedule resource represents a day that an operator or provider can be scheduled.

URL: <https://api.opendental.com/fhir/v2/schedule>

Operations Supported: Read

Version Added: 16.3

Fields supported:

| Field           | Comments  |
|-----------------|---|
| identifier      | An alphanumeric string that identifies the date and provider/location |
| actor           | Can include a Location and/or Practitioner.                           |
| planningHorizon | One full day  |

Search parameters:

| Name       | Type      | Comments  |
|------------|-----------|---|
| actor      | reference | The actor on the schedule.  |
| date       | date      | The date of the schedule. Unless an identifier parameter is included, the dates being searched must be a finite date range. |
| identifier | string    | The logical id of the schedule.   |

Example response:

```
{
  "resourceType": "Schedule",
  "actor": [
    {
      "reference": "Location/1"
    }
  ],
  "planningHorizon": {
    "start": "2019-12-12T00:00:00",
    "end": "2019-12-12T23:59:59"
  },
  "id": "20191212L1"
}
```

Additional details: <https://www.hl7.org/fhir/schedule.html>

A Schedule resource will exist for a Practitioner if the provider has a schedule set for that day within

Open Dental. Every operatory in Open Dental will have a Schedule resource for every day. If no date range is specified for a GET call, then the schedules for the next 28 days will be returned.

## Slot

A Slot resource represents a slice of time that is either available for scheduling or busy.

URL: <https://api.opendental.com/fhir/v2/slot>

Operations Supported: Read

Version Added: 16.3

Fields supported:

| Field        | Comments   |
|--------------|--|
| identifier   | An alphanumeric string that identifies the date, provider/location, and the start and end. |
| schedule     | Reference to the Schedule resource for this Slot   |
| freeBusyType | free, busy   |
| start        | The start date and time of the slot  |
| end          | The end date and time of the slot  |
| overbooked   | If the provider is scheduled for multiple appointments at this time, will be true          |

Search parameters:

| Name       | Type      | Comments   |
|------------|-----------|--|
| identifier | string    | A Slot Identifier. The logical id of the Slot. A parameter of either 'identifier' or 'schedule' must be included.                              |
| schedule   | reference | The Schedule Resource that we are seeking a slot within. A parameter of either 'identifier' or 'schedule' must be included.                    |
| start      | date      | The start time of the slot.  |
| status     | token     | The free/busy status of the appointment. The code system must be <a href="http://hl7.org/fhir/slotstatus">http://hl7.org/fhir/slotstatus</a> . |

Example response:

```
{
  "resourceType": "Slot",
  "identifier": [
    {
      "value": "20191212L208000810"
    }
  ],
  "schedule": {
    "reference": "Schedule/20191212L2"
  },
  "status": "free",
  "start": "2019-12-12T08:00:00",
  "end": "2019-12-12T08:10:00",
}
```



```

    "overbooked": false,
    "id": "20191212L208000810"
  }

```

Additional details: <https://www.hl7.org/fhir/slot.html>

Slots are divided into five, ten, or fifteen minute intervals (depending on the appointment time increment preference). A Slot that is linked to a Schedule that is linked to a Practitioner will be considered free if there is a schedule within Open Dental for that provider during that time and the provider is not scheduled for an appointment during that time. A Slot that is linked to a Location will be considered free if that operator has a provider scheduled for that time and the operator is an operator considered for Web Sched and there is no appointment or blockout of type 'Do Not Schedule' in that Slot.

## Subscription

Subscriptions can be used to be notified of changes to patients and appointments.

URL: <https://api.opendental.com/fhir/v2/subscription>

Operations Supported: Read, Create, Update, Delete

Version Added: 16.3

Fields supported:

| Field    | Comments   |
|----------|--|
| criteria | The rules for this subscription                        |
| contact  | Contact details for the subscription                   |
| reason   | Description of why this subscription was created       |
| status   | requested, active, error, off                          |
| error    | Latest error note                                      |
| channel  | The channel on which to report matches to the criteria |
| end      | When to automatically delete the subscription          |

Search parameters:

| Name       | Type   | Comments   |
|------------|--------|--|
| contact    | string | The value for a contact field for the Subscription.  |
| criteria   | string | Rule for server push criteria.   |
| payload    | string | Mimetype to send, or blank for no payload.   |
| status     | token  | The status of the Subscription. System must be <a href="http://hl7.org/fhir/ValueSet/subscription-status">http://hl7.org/fhir/ValueSet/subscription-status</a> .                   |
| type       | token  | The type of the Subscription channel. System must be <a href="http://hl7.org/fhir/ValueSet/subscription-channel-type">http://hl7.org/fhir/ValueSet/subscription-channel-type</a> . |
| url        | uri    | The endpoint of the Subscription channel.  |
| identifier | string | The logical id of the practitioner.  |

Example response:

```
{
  "resourceType": "Subscription",
  "criteria": "patient?careProvider=Practitioner/1",
  "contact": [
    {
      "system": "email",
      "value": "andrew@example.com",
      "use": "work",
      "rank": 1,
      "period": {
        "start": "2016-08-01T00:00:00"
      }
    }
  ],
  "reason": "To provider surveys to the practitioner's patients to determine her quality of care",
  "status": "active",
  "channel": {
    "type": "rest-hook",
    "endpoint": "https://www.example.com/fhirpatients"
  },
  "end": "2020-01-01T00:00:00",
  "id": "3"
}
```

Additional details: <https://www.hl7.org/fhir/subscription.html>

Subscriptions can be used to find out about changes that occur to Patients and Appointments. The channel type that is supported is rest-hook, so when a change occurs, an empty POST request is sent to the channel endpoint. A notification will be sent anytime there is a change in the Patient or Appointment database tables, so it is possible that a notification will be sent even though the resource as returned by FHIR has the exact same fields.

The interval at which the service sends out notifications can be set in the Open Dental program in Setup -> Advanced Setup -> FHIR.

## Use Cases

All the following use cases can be performed on the demo server using the specified URLs.

### Use Case 1 – Appointments for Date

**Find all appointments scheduled for clinic Washington Hospital for January 3rd, 2018.**

- The client will find out the id for the Washington Hospital clinic by querying the Organization resource:  
<https://api.opendental.com/fhir/v2/organization?name=Washington%20Hospital>
- Then the client will need all the Locations that have Washington Hospital for their organization (we'll say the id for Washington Hospital is 1):

<https://api.opendental.com/fhir/v2/location?organization=Organization/1>

- The client can now query the Appointment resources (suppose that the location returned above has the id of 2 and 3):

<https://api.opendental.com/fhir/v2/appointment?location=2,3&date=2018-01-03&status=booked>

## Use Case 2 – List of Patients Webhook Subscription

### Keep an updated list of patients who have Madame Pomfrey as a provider

- The client will find out the id for Madame Pomfrey by querying the Practitioner resource:  
<https://api.opendental.com/fhir/v2/practitioner?family=pomfrey&given=madame>
- This will return a Practitioner resource. In this case the id for that resource will be 1.
- The client will then issue a query against the patient resources like the following:  
<https://api.opendental.com/fhir/v2/patient?careprovider=Practitioner/1>
- To be informed of new patients that are assigned Madame Pomfrey as their provider, the client then creates a Subscription resource like this one:

```
{
  "criteria": "patient?careProvider=Practitioner/1",
  "contact": [
    {
      "system": "email",
      "value": "andrew@friendsofopendental.com",
      "use": "work",
      "rank": 1,
      "period": {
        "start": "2016-08-01T08:00:00"
      }
    }
  ],
  "reason": "To provider surveys to Madame Pomfrey's patients to determine her quality of care",
  "status": "requested",
  "channel": {
    "type": "rest-hook",
    "endpoint": "http://www.friendsofopendental.com/fhirpatients"
  },
  "end": "2018-01-01T00:00:00"
}
```

Then the client will perform a POST request it to this URL:

<https://api.opendental.com/fhir/v2/opendentalfhir/subscription>

- Every few minutes Open Dental's EConnector will check active subscriptions and if any match the criteria, it will send an empty POST request to the endpoint URL (<http://www.friendsofopendental.com/fhirpatients>) that was included when the Subscription was created.
- When the client receives that POST request, it can issue the same query with a parameter for the time that it last checked:

[https://api.opendental.com/fhir/v2/patient?careprovider=Practitioner/1&\\_lastupdated=ge2016-09-21T18:37:10](https://api.opendental.com/fhir/v2/patient?careprovider=Practitioner/1&_lastupdated=ge2016-09-21T18:37:10)

### Use Case 3 – Find an opening and create an appointment

**Find a time where an appointment is not scheduled in the operatory named ‘Madame Pomfrey’s Operatory’ for March 17<sup>th</sup>, 2017, and create an appointment for a patient named Penelope Clearwater with the provider Madame Pomfrey. Create the patient if she does not exist.**

- The client will first find the operatory id for the operatory using this query:  
<https://api.opendental.com/fhir/v2/location?name=madame+pomfrey%27s+operatory>
- Using the returned id of 1, issue a query for the schedule for that location for that day:  
<https://api.opendental.com/fhir/v2/schedule?actor=Location/1&date=2017-03-17>
- The id from that resource will be 20170317L1. That id will be used for the ‘schedule’ parameter for the Slot resource:  
<https://api.opendental.com/fhir/v2/slot?schedule=20170317L1&status=free>
- Using the list of available slots, we can now pick a time for the appointment. We’ll pick 8:00 AM for this example.
- Then to find the patient for this appointment, we will issue this query:  
<https://api.opendental.com/fhir/v2/patient?family=clearwater&given=penelope>
- If this returns 0 results, we will need to create the patient by submitting a POST request to  
<https://api.opendental.com/fhir/v2/patient>

```
{
  "name": [
    {
      "use": "usual",
      "family": "Clearwater",
      "given": "Penelope"
    }
  ],
  "telecom": [
    {
      "system": "phone",
      "value": "(123) 456-7890",
      "use": "home"
    }
  ],
  "gender": "female",
  "birthDate": "1996-09-19"
}
```

- The value from the Location header of the response will be the id for the patient on the appointment (in this case, 157).
- The next step is to find the id for the provider Madam Pomfrey. This is the query that will be used: <https://api.opendental.com/fhir/v2/practitioner?family=pomfrey&given=madame>
- Using the id of 1 returned from the last query, we can construct the appointment resource.

```
{
```

```

"status": "booked",
"priority": 5,
"start": "2017-03-17T08:00:00",
"end": "2017-03-17T08:40:00",
"minutesDuration": 40,
"participant": [
  {
    "type": [
      {
        "code": [
          {
            "system": "http://hl7.org/fhir/participant-type",
            "code": "PART"
          }
        ]
      }
    ],
    "actor": {
      "reference": "Patient/157"
    },
    "status": "needsaction"
  },
  {
    "type": [
      {
        "code": [
          {
            "system": "http://hl7.org/fhir/participant-type",
            "code": "PPRF"
          }
        ]
      }
    ],
    "actor": {
      "reference": "Practitioner/1"
    }
  },
  {
    "type": [
      {
        "code": [
          {
            "system": "http://hl7.org/fhir/participant-type",
            "code": "PART"
          }
        ]
      }
    ],
    "actor": {
      "reference": "Location/1"
    }
  }
]

```

```
}
```

- Now, posting to <https://api.opendental.com/fhir/v2/appointment> should return an HTTP status code of 201.

## Use Case 4 – Updating an appointment status

**Find a specific appointment through a GET request, modify the appointment status field, and PUT the update to the server while including all unmodified fields.**

- First, we need to get the appointment we want to modify. In this case, the appointment we want is at ID 4. Send a GET request to the following URL:  
<https://api.opendental.com/fhir/v2/appointment/4>
- Now, we need to modify the appointment status field in the returned payload. We want to set the status to “Complete” in Open Dental which is represented by fulfilled.

```
{
  "status": "fulfilled",
  "priority": 5,
  "start": "2017-03-17T08:00:00",
  "end": "2017-03-17T08:40:00",
  "minutesDuration": 40,
  "participant": [
    {
      "type": [
        {
          "code": [
            {
              "system": "http://hl7.org/fhir/participant-type",
              "code": "PART"
            }
          ]
        }
      ],
      "actor": {
        "reference": "Patient/1"
      },
      "status": "needsaction"
    },
    {
      "type": [
        {
          "code": [
            {
              "system": "http://hl7.org/fhir/participant-type",
              "code": "PPRF"
            }
          ]
        }
      ],
      "actor": {
        "reference": "Practitioner/6"
      }
    }
  ]
}
```

```

    },
    {
      "type": [
        {
          "code": [
            {
              "system": "http://hl7.org/fhir/participant-type",
              "code": "PART"
            }
          ]
        }
      ],
      "actor": {
        "reference": "Location/1"
      }
    }
  ]
}

```

- Now, PUTing to <https://api.opendental.com/fhir/v2/appointment/4> should return an HTTP status code of 200.

## Use Case 5 – Creating and updating a procedure

Use a POST request to post a procedure. Then, use a PUT request to modify the procedure by changing its tooth, surface, and attached provider.

- First, we need to create the procedure for the given patient. We will send the post request to the following URL:  
<https://api.opendental.com/fhir/v2/procedure>

```

{
  "status": "completed",
  "code": {
    "coding": [
      {
        "system": "http://hl7.org/fhir/us/sid/cdt",
        "code": "D2331",
        "display": "resin-based composite - two surfaces, anterior"
      }
    ]
  },
  "subject": {
    "reference": "Patient/5",
    "display": "Harry Potter"
  },
  "performedDateTime": "2016-07-27T00:00:00",
  "performer": [
    {
      "actor": {
        "reference": "Practitioner/1",
        "display": "Madame S. Pomfrey, DMD"
      }
    }
  ]
}

```

```

    },
    "onBehalfOf":{
      "reference":"Organization/1",
      "display":"Washington Hospital"
    }
  ],
  "bodySite":[
    {
      "coding":[
        {
          "system":"http://hl7.org/fhir/ex-tooth",
          "code":"36",
          "display":"36"
        },
        {
          "system":"http://hl7.org/fhir/FDI-surface",
          "code":"D",
          "display":"Distal"
        },
        {
          "system":"http://hl7.org/fhir/FDI-surface",
          "code":"L",
          "display":"Lingual"
        }
      ]
    }
  ],
  "note":[
    {
      "text":"This is the note."
    }
  ]
}

```

- Now, this procedure has been inserted into the database. Take the id received in the response and use it to post the update. We want to update the tooth to 46, the surface to MOD, and the provider to Practitioner/2.  
NOTE: We can simply use the code MOD as it is one of the predefined surfaces for this system. If the surface is not predefined, update the surface similar to how we created it above.
- Send the following JSON as a PUT Request to:  
[https://api.opendental.com/fhir/v2/procedure/ID\\_Goes\\_here](https://api.opendental.com/fhir/v2/procedure/ID_Goes_here)
- A 200 status should be received, and the result should include the updated fields.

```

{
  "status":"completed",
  "code":{
    "coding":[
      {

```



```

        "system":"http://hl7.org/fhir/us/sid/cdt",
        "code":"D2331",
        "display":"resin-based composite - two surfaces, anterior"
    }
]
},
"subject":{
    "reference":"Patient/5",
    "display":"Harry Potter"
},
"performedDateTime":"2016-07-27T00:00:00",
"performer":[
    {
        "actor":{
            "reference":"Practitioner/2"
        },
        "onBehalfOf":{
            "reference":"Organization/1",
            "display":"Washington Hospital"
        }
    }
],
"bodySite":[
    {
        "coding":[
            {
                "system":"http://hl7.org/fhir/ex-tooth",
                "code":"46",
                "display":"46"
            },
            {
                "system":"http://hl7.org/fhir/FDI-surface",
                "code":"MOD"
            }
        ]
    }
],
"note":[
    {
        "text":"This is the note."
    }
]
}

```

## Setting up FHIR

As of 18.4, the FHIR web service is hosted at Open Dental headquarters. All requests will be routed through this address to the appropriate office. This moves away from the old method of each office hosting their own FHIR service. The API Key specified in the Authorization header is linked to a specific office.

## Steps to Enable FHIR

In order to use FHIR, the office must have an eConnector running. See <https://www.opendental.com/manual/econnector.html> for installation instructions.

1. Launch the Open Dental program. Enable FHIR by going to Setup -> Advanced Setup -> FHIR and checking the Enabled checkbox.
2. If using subscriptions for appointments or patients, enter a value in the "Process subscription interval in minutes".

## API Keys

When requesting data from the FHIR server, an API key must be present in the request header. API keys are created by the 3<sup>rd</sup>-party developer from Open Dental's developer portal: <https://api.opendental.com/portal/gwt/fhirportal.html>. The API keys created from the developer portal can be entered into the Open Dental program to assign that API key to a customer. Requests to our API using these keys must then include the developer API key and the customer API key. To obtain a developer API key, contact [vendor.relations@opendental.com](mailto:vendor.relations@opendental.com). Please include the details below.

Developer name:

Company name:

Email address:

A list of the API Resources you need access to, the level of access such as read/write/update:

A description of the application you are intending to build (type and purpose):

To assign an API key to an Open Dental customer, go to Setup -> Advanced Setup -> FHIR. Click the Add Key in the lower left. Here is where you paste a key generated from the developer portal. The customer has the ability to enable or disable a key. The customer can view permissions granted to that key, but they cannot change those permissions.

## Change History

| Date       | OD version | Description  |
|------------|------------|--|
| 01/07/2019 | 19.4       | Added Communication resource   |
| 09/15/2109 | 19.3       | Developers can create their own API keys for customers.  |
| 06/21/2019 | 19.2       | Appointments can include attached procedures. ProcedureRequest renamed to ServiceRequest.              |
| 03/16/2019 | 19.1       | Added ability to create completed and treatment planned procedures                                     |
| 12/10/2018 | 18.4       | All requests go through a common endpoint. Added ability to update appointment confirmations.          |
| 12/15/2017 | 17.4       | Added Medication, MedicationStatement, and Condition resources   |
| 06/04/2017 | 17.2       | Added AllergyIntolerance resource  |
| 03/05/2017 | 17.1       | Added ability to create appointments and patients  |
| 09/20/2016 | 16.3       | New resources Appointment, Patient, Practitioner, Location, Organization, Slot, Schedule, Subscription |