DIPS FHIR R4 Observation

API Documentation

DIPS AS

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Contents

Revision History

Date	Revision	Author	Description
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1. Introduction

The intended audience for this document is personnel developing integrations to FHIR R4 Observation module. This document contains information about the implemented API and authentication.

All integration through this resource is subjected to the access control mechanisms in DIPS. This means that results of operations reflect the access level of the calling user; e.g. the number of Procedures returned will be limited if the calling user is not authorized to view some of DIPS Procedures.

2. Authentication

All communications with FHIR R4 Core are required to be secure at the transport level. In addition, every interaction with a FHIR R4 Core application requires a token to identify the caller. The caller must be a known user entity in DIPS.

2.1. Transport Security

By default, all FHIR R4 Core applications are installed with security requirements. This means that the use of SSL is required for communicating with the services. The server is required to provide an SSL certificate when negotiating security with clients.

The use of client certificates is not a required feature of FHIR R4 Core, so any client certificate requirement should be considered at each separate deployment. The base URL for all requests is where the FHIR R4 server is installed.

2.2. Security Tokens

FHIR R4 Core requires the usage of “security tokens”. To find out which type of security token you are required to send, contact the organization you are integrating with. Different methods to add security tokens are described in chapter below.

2.2.1. Forms of Security Token

The security framework in FHIR R4 Core supports TicketHeader and OAuth token schemes, including the DIPS authentication ticket (AKA “ticket”) and federated security, using an OAuth 2.0 Bearer token. Failure to provide a security token, regardless of the mechanism used by FHIR R4 Core, will result in a failed request. The HTTP response status will be HTTP 401 “Unauthorized”. Details on failed authentication and authorization can also be found for each resource.

2.2.2. DIPS Ticket

This security token is the security token generated by the DIPS core system when a user is authenticated. The token is passed along with each call.

The ticket can be attached to the call in the following ways:

- As a custom HTTP header
- In the standard HTTP “Authorization” header

2.2.2.1. Ticket in a Custom HTTP Header

The ticket is sent in a custom HTTP header called “Auth-Ticket”:

```
POST https://localhost/DIPS-WebAPI/HL7/FHIR-R4/<resource> HTTP/1.1
Accept-Encoding: gzip,deflate
Auth-Ticket: E73CA55A-F8C7-4D81-8F55-A2C6FBD88C62
```

2.2.2.2. Ticket in an HTTP Authorize Header

The ticket is sent in the standard HTTP Authorization header, with a scheme named “Auth-Ticket”

```
POST https://localhost/DIPS-WebAPI/HL7/FHIR-R4/<resource> HTTP/1.1
Authorization: Auth-Ticket E73CA55A-F8C7-4D81-8F55-A2C6FBD88C62
```

2.2.3. Federated Security with OAuth 2.0 Bearer Token

Federated security in FHIR R4 Core requires Bearer tokens obtained from an OAuth 2.0 enabled authorization server if federated security is enabled.

See the section "Enable Federated Security" below for information about enabling federated security.

For a detailed description of federated security in FHIR R4 Core, please see the Administrator’s Guide.

A detailed description of OAuth 2.0 can be found here: https://tools.ietf.org/html/rfc6749

A detailed description of the Bearer Token usage can be found here: https://tools.ietf.org/html/rfc6750

A request for a FHIR resource using the Bearer token will use the standard HTTP Authorization header, but with the scheme Bearer:

```
POST https://localhost/DIPS-WebAPI/HL7/FHIR-R4/<resource> HTTP/1.1
Authorization: Bearer
eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJzdWIiOiIxMjM0NTY3ODkwIiwibmFtZSI6IkpvaG4gRG9lIiwiYW
RtaW4iOnRydWV9.TJVA95OrM7E2cBab30RMHrHDcEfxjoYZgeFONFh7HgQ
```

The Bearer token must be a Base64-encoded JSON Web Token (JWT). For detailed info about the JWT, please see here: https://tools.ietf.org/html/draft-ietf-oauth-json-web-token-32

When federated security is enabled, all other forms of authentication will be disabled

3. HTTP Status Codes

The service will respond with HTTP status codes which describe the result of the call to the service:

Name	Code	Description
OK	200	The request succeeded.
Bad Request	400	Invalid Request.
Unauthorized	401	The caller is not authorized to access the resource.
NotFound	404	Data not in the database.
Unprocessable Entity	422	The request contained values which were not accepted, or missing required properties.
Internal Server Error	500	A validation error or an unknown error occurred while processing the request.

4. FHIR Observation

Supporting the creation of Vital Signs is one of the main uses of Observation Resource. Vital Signs are known as a group of clinical measurements that indicate the status of the body's main life-keeping functions. They are included in several clinical processes and used in scores for early detection of deteriorating conditions.

4.1. Supported Resources

Supports the following resources

Table 1. Supported FHIR resources

Resources	Supported Interactions
Observation	Create, Read, Search, Update

Main Vital Sign profiles on the Observation resource are listed below with the capabilities.

Table 2. Summary of Capabilities

Vital Sign Profile	Create	Read	Search	Update
Blood Pressure	Yes	Yes	Yes	Yes
Body Height	Yes	Yes	Yes	Yes
Body Mass Index	Yes	Yes	Yes	Yes
Body Temperature	Yes	Yes	Yes	Yes
Body Weight	Yes	Yes	Yes	Yes
Level of Consciousness	Yes	Yes	Yes	Yes
Heart Rate	Yes	Yes	Yes	Yes
Oxygen Saturation	Yes	Yes	Yes	Yes
Respiratory Rate	Yes	Yes	Yes	Yes

4.2. Create Operation

This section describes the input, output, and explanation of properties of the Create method in FHIR Observation for the vital signs.

4.2.1. Create Request Information for Observation

- Auth-Ticket = Valid ticket from the database
- Content-type = application/json
- Method = POST
- URL = https://{SERVER}/DIPS-WebAPI/HL7/FHIR-R4/Observation?_profile=DIPSVitalSignsObservation&_format=json

4.2.2. Blood Pressure

This section illustrates the details on creating a Blood Pressure vital sign.

4.2.2.1. Sample POST Request body for creating Blood Pressure


```
{
  "resourceType":"Observation",
  "meta":{
    "lastUpdated":"2014-01-30T22:35:23+11:00",
    "versionId":"0",
    "source":"META_VISION"
  },
  "identifier":[
    {
      "system":"http://dips.no/fhir/namingsystem/externalId",
      "value":"External Id: testBPexternalId1"
    }
  ],
  "extension":[
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bloodpressure-bodypositionextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"33586001",
        "display":"Sitting position"
      }
    },
    {
      "url":"http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-cuffsizeextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"720740000",
        "display":"Lår voksne"
      }
    },
    {
      "url":"http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-diastolicendpointextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"1081871000202109",
        "display":"Phase IV"
      }
    },
```

```
    {
      "url":"http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-
sleepstatusextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"248218005",
        "display":"awake"
      }
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-headtiltextension",
      "valueQuantity":{
        "value":14,
        "unit":"deg"
      }
    },
    {
       "url": "http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-
levelofexertionextension",
        "valueCoding": {
          "system": "http://snomed.info/sct",
          "code": "154h",
          "display": "Hvile"
      }
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bloodpressure-
systolicformulaextension",
      "valueString":"sample formula 1"
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bloodpressure-
diastolicformulaextension",
      "valueString":"sample formula 2"
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bloodpressure-
meanarterialformulaextension",
      "valueString":"sample formula 3"
    }
  ],
  "status":"final",
  "code":{
    "coding":[
      {
        "system":"http://loinc.org",
        "code":"85354-9",
```

```
        "display":"Blood pressure (observable entity)"
      }
    ]
  },
  "category":[
    {
      "coding":[
        {
          "system":"http://terminology.hl7.org/CodeSystem/observation-category",
          "code":"vital-signs",
          "display":"vital-signs"
        }
      ]
    }
  ],
  "subject":{
    "reference":"Patient/cdp1000807",
    "identifier":[
      {
        "system":"http://dips.no/fhir/namingsystem/dips-patientid",
        "value":"1000807"
      }
    ]
  },
  "encounter":{
    "reference":"Encounter/agy1002679",
    "identifier":[
      {
        "system":"http://dips.no/fhir/namingsystem/dips-omsorgsepisodeid",
        "value":"1002679"
      }
    ]
  },
  "effectiveDateTime": "2021-11-16T08:03:00+05:30",
  "performer":[
    {
      "reference":"PractitionerRole/agb103",
      "identifier":[
        {
          "system":"urn:oid:1.3.6.1.4.1.9038.51.1",
          "value":"103"
        }
      ]
    },
    {
      "reference":"Organization/afa22",
      "identifier":[
```

```
        {
          "system":"urn:oid:1.3.6.1.4.1.9038.70.3",
          "value":"22"
        }
      ]
    }
  ],
  "note":{
    "text":"Demo Blood Pressure"
  },
  "bodySite":{
    "coding":[
      {
        "system":"http://snomed.info/sct",
        "code":"7569003",
        "display":"Finger structure (body structure)"
      }
    ]
  },
  "method":{
    "coding":[
      {
        "system":"http://snomed.info/sct",
        "code":"129436005",
        "display":"Auscultation - action (qualifier value)"
      }
    ]
  },
  "component":[
    {
      "code":{
        "coding":[
          {
            "system":"http://loinc.org",
            "code":"8480-6",
            "display":"Systolic blood pressure"
          },
          {
            "system":"http://acme.org/devices/clinical-codes",
            "code":"bp-s",
            "display":"Systolic Blood pressure"
          }
        ]
      },
      "valueQuantity":{
        "value":123,
        "unit":"mm[Hg]",
```

```
      "system":"http://unitsofmeasure.org",
      "code":"mm[Hg]"
    }
  },
  {
    "code":{
      "coding":[
        {
          "system":"http://loinc.org",
          "code":"8462-4",
          "display":"Diastolic blood pressure"
        }
      ]
    },
    "valueQuantity":{
      "value":78,
      "unit":"mm[Hg]",
      "system":"http://unitsofmeasure.org",
      "code":"mm[Hg]"
    }
  },
  {
    "code":{
      "coding":[
        {
          "system":"http://loinc.org",
          "code":"8478-0",
          "display":"Mean arterial pressure (observable entity)"
        }
      ]
    },
    "valueQuantity":{
      "value":93,
      "unit":"mm[Hg]",
      "system":"http://unitsofmeasure.org",
      "code":"mm[Hg]"
    }
  },
  {
    "code":{
      "coding":[
        {
          "system":"http://snomed.info/sct",
          "code":"4461000202102",
          "display":"The difference between the systolic and diastolic pressure."
        }
      ]
```

```
      },
      "valueQuantity":{
        "value":45,
        "unit":"mm[Hg]",
        "system":"http://unitsofmeasure.org",
        "code":"mm[Hg]"
      }
    }
  ]
}
```


4.2.2.2. Sample POST Response after creating Blood Pressure

Output

- A complete Observation object is received from the json response and it can be viewed from a Read Operation request.

4.2.3. Body Height

This section illustrates the details on creating a Body Height vital sign.

4.2.3.1. Sample POST Request body for creating Body Height


```
{
  "resourceType":"Observation",
  "meta":{
    "lastUpdated":"2014-01-30T22:35:23+11:00",
    "source":"META_VISION"
  },
  "identifier":[
    {
      "system":"http://dips.no/fhir/namingsystem/externalId",
      "value":"External Id: testBHexternalId2"
    }
  ],
  "extension":[
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bodyheight-bodypositionextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"4801000202104",
        "display":"Lying flat without tilt (finding)"
      }
    }
```

```
],
"status":"final",
"category":[
  {
    "coding":[
      {
        "system":"http://terminology.hl7.org/CodeSystem/observation-category",
        "code":"vital-signs",
        "display":"vital-signs"
      }
    ]
  }
],
"code":{
  "coding":[
    {
      "system":"http://loinc.org",
      "code":"8302-2",
      "display":"Body height measure (observable entity)"
    }
  ]
},
"subject":{
  "identifier":[
    {
      "system":"http://dips.no/fhir/namingsystem/dips-patientid",
      "value":"1000807"
    }
  ]
},
"encounter":{
  "reference":"Encounter/agy1002679",
  "identifier":[
    {
      "system":"http://dips.no/fhir/namingsystem/dips-omsorgsepisodeid",
      "value":"1002679"
    }
  ]
},
 "effectiveDateTime": "2021-11-16T08:15:00+05:30",
"performer":[
  {
    "identifier":[
      {
        "system":"urn:oid:2.16.578.1.12.4.1.2",
        "value":"889911"
      }
```

```
        ]
      },
      {
        "reference":"Organization/afa22",
        "identifier":[
          {
            "system":"urn:oid:1.3.6.1.4.1.9038.70.3",
            "value":"22"
          }
        ]
      }
    ],
    "note":{
      "text":"Demo Body Height"
    },
    "valueQuantity":{
      "value":156,
      "unit":"cm",
      "system":"http://unitsofmeasure.org",
      "code":"cm"
    }
}
```


4.2.3.2. Sample POST Response after creating Body Height.

Output

- A complete Observation object is received from the json response and it can be viewed from a Read Operation request.

4.2.4. Body Mass Index

This section illustrates the details on creating a Body Mass Index vital sign.

4.2.4.1. Sample POST Request body for creating Body Mass Index


```
{
  "resourceType":"Observation",
  "extension":[
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bodymassindex-formulaExtension",
      "valueString":"sample formula"
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bodymassindex-
```

```
confundingfactorextension",
        "valueString":"sample confounding factor"
      }
    ],
    "meta":{
      "lastUpdated":"2021-05-31T22:35:00+00:00",
      "versionId":"0",
      "source":"META_VISION"
    },
    "identifier":[
      {
        "system":"http://dips.no/fhir/namingsystem/externalId",
        "value":"External Id: testBMIexternalId8"
      }
    ],
    "status":"final",
    "code":{
      "coding":[
        {
          "system":"http://loinc.org",
          "code":"39156-5"
        }
      ]
    },
    "category":[
      {
        "coding":[
          {
            "system":"http://terminology.hl7.org/CodeSystem/observation-category",
            "code":"vital-signs",
            "display":"vital-signs"
          }
        ]
      }
    ],
    "subject":{
      "reference":"patient/cdp1000239",
      "identifier":[
        {
          "system":"http://dips.no/fhir/namingsystem/dips-patientid",
          "value":"1000239"
        }
      ]
    },
    "encounter":{
      "reference":"Encounter/agy1000245"
    },
```

```
  "effectiveDateTime": "2021-11-16T08:15:00+05:30",
  "performer":[
    {
      "identifier":[
        {
          "system":"urn:oid:1.3.6.1.4.1.9038.51.1",
          "value":"27"
        }
      ]
    },
    {
      "identifier":[
        {
          "system":"urn:oid:1.3.6.1.4.1.9038.70.3",
          "value":"22"
        }
      ]
    }
  ],
  "note":{
    "text":"Demo BMI"
  },
  "interpretation":{
    "text":"Obese"
  },
  "method":{
    "coding":[
      {
        "system":"http://snomed.info/sct",
        "code":"1xxxx",
        "display":"Automatisk registrering"
      }
    ]
  },
  "valueQuantity":{
    "value":32,
    "unit":"kg/m2",
    "system":"http://unitsofmeasure.org",
    "code":"kg/m2"
  }
}
```


4.2.4.2. Sample POST Response after creating Body Mass Index

- A complete Observation object is received from the json response and it can be viewed from a Read Operation request.

4.2.5. Body Temperature

This section illustrates the details on creating a Body Temperature vital sign.

4.2.5.1. Sample POST Request body for creating Body Temperature


```
{
  "resourceType":"Observation",
  "meta":{
    "lastUpdated":"2014-01-30T22:35:23+11:00",
    "versionId":"0",
    "source":"META_VISION"
  },
  "identifier":[
    {
      "system":"http://dips.no/fhir/namingsystem/externalId",
      "value":"External Id: testtempexternalId5"
    }
  ],
  "extension":[
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-
bodyexposureextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"5611000202100",
        "display":"Passende påkledning/tildekking"
      }
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-activeheating-
extension",
      "valueAnnotation":{
        "text":"active heating sample"
      }
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-
dayssincemenstruationstartextension",
      "valueQuantity":{
        "value":12
      }
    }
  ],
  "status":"final",
  "category":[
```

```
    {
      "coding":[
        {
          "system":"http://terminology.hl7.org/CodeSystem/observation-category",
          "code":"vital-signs"
        }
      ]
    }
  ],
  "code":{
    "coding":[
      {
        "system":"http://loinc.org",
        "code":"8310-5"
      }
    ],
    "text":"Body temperature"
  },
  "subject":{
    "identifier":[
      {
        "system":"http://dips.no/fhir/namingsystem/dips-patientid",
        "value":"1000239"
      }
    ]
  },
  "encounter":{
    "identifier":[
      {
        "system":"http://dips.no/fhir/namingsystem/dips-omsorgsepisodeid",
        "value":"1000245"
      }
    ]
  },
  "effectiveDateTime": "2021-11-16T08:15:00+05:30",
  "performer":[
    {
      "identifier":[
        {
          "system":"urn:oid:2.16.578.1.12.4.1.2",
          "value":"889911"
        }
      ]
    },
    {
      "reference":"Organization/afa22",
      "identifier":[
```

```
        {
          "system":"urn:oid:1.3.6.1.4.1.9038.70.3",
          "value":"22"
        }
      ]
    }
  ],
  "bodySite":{
    "coding":[
      {
        "system":"http://snomed.info/sct",
        "code":"34402009",
        "display":"Endetarm"
      }
    ]
  },
  "note":{
    "text":"Demo Body Temperature"
  },
  "valueQuantity":{
    "value":37,
    "unit":"Cel",
    "system":"http://unitsofmeasure.org",
    "code":"Cel"
  }
}
```


4.2.5.2. Sample POST Response after creating Body Temperature

- A complete Observation object is received from the json response and it can be viewed from a Read Operation request.

4.2.6. Body Weight

This section illustrates the details on creating a Body Weight vital sign.

4.2.6.1. Sample POST Request body for creating Body Weight


```
{
  "resourceType":"Observation",
  "meta":{
    "lastUpdated":"2014-01-30T22:35:23+11:00",
    "versionId":"0",
    "source":"META_VISION"
  },
  "identifier":[
```

```
    {
      "system":"http://dips.no/fhir/namingsystem/externalId",
      "value":"External Id: testBWexternalId3"
    }
  ],
  "extension":[
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-
clothingstateextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"1081791000202103",
        "display":"Fullt påkledd uten sko"
      }
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-
confoundingfactorextension",
      "valueString":"sample confounding factor"
    }
  ],
  "status":"final",
  "category":[
    {
      "coding":[
        {
          "system":"http://terminology.hl7.org/CodeSystem/observation-category",
          "code":"vital-signs",
          "display":"vital-signs"
        }
      ]
    }
  ],
  "code":{
    "coding":[
      {
        "system":"http://loinc.org",
        "code":"29463-7",
        "display":"Body weight"
      }
    ]
  },
  "subject":{
    "identifier":[
      {
        "system":"http://dips.no/fhir/namingsystem/dips-patientid",
        "value":"1000807"
```

```
        }
      ]
    },
    "encounter":{
      "identifier":[
        {
          "system":"http://dips.no/fhir/namingsystem/dips-omsorgsepisodeid",
          "value":"1002679"
        }
      ]
    },
    "effectiveDateTime": "2021-11-16T08:15:00+05:30",
    "performer":[
      {
        "identifier":[
          {
            "system":"urn:oid:2.16.578.1.12.4.1.2",
            "value":"889911"
          }
        ]
      },
      {
        "reference":"Organization/afa22",
        "identifier":[
          {
            "system":"urn:oid:1.3.6.1.4.1.9038.70.3",
            "value":"22"
          }
        ]
      }
    ],
    "note":{
      "text":"Demo Body Weight"
    },
    "valueQuantity":{
      "value":49000,
      "unit":"g",
      "system":"http://unitsofmeasure.org",
      "code":"g"
    }
  }
```


4.2.6.2. Sample POST Response after creating Body Weight.

Output

- A complete Observation object is received from the json response and can be viewed

from a Read Operation request.

4.2.7. Level of Consciousness

This section illustrates the details on creating a Level of Consciousness vital sign.

4.2.7.1. Sample POST Request body for creating Level of Consciousness


```
{
  "resourceType": "Observation",
  "meta": {
    "versionId": "0",
    "lastUpdated": "2014-01-30T11:35:23+00:00",
    "source": "META_VISION"
  },

  "identifier": [
        {
   "system":"http://dips.no/fhir/namingsystem/externalId",
    "value":"External Id: testLCexternalId5"
  }
  ],
  "status": "final",
  "category":  [
    {
      "coding":  [
        {
          "system": "http://terminology.hl7.org/CodeSystem/observation-category",
          "code": "survey",
          "display": "Survey"
        }
      ]
    }
  ],
  "code": {
    "coding":  [
      {
        "system": "http://snomed.info/sct",
        "code": "1104441000000107",
        "display": "The observation of the individual's level of consciousness"
      }
    ]
  },
  "subject": {
    "reference": "Patient/cdp1000807",
    "identifier": {
```

```
        "system": "http://dips.no/fhir/namingsystem/dips-patientid",
        "value": "1000807"
      }
    },
    "effectiveDateTime": "2021-11-16T08:15:00+05:30",
    "performer": [
      {
        "reference": "Organization/afa22",
        "identifier": {
          "system": "urn:oid:1.3.6.1.4.1.9038.70.3",
          "value": "22"
        }
      },
      {
        "reference": "PractitionerRole/agb103",
        "identifier": {
          "system": "urn:oid:1.3.6.1.4.1.9038.51.1",
          "value": "103"
        }
      }
    ],
    "valueCodeableConcept": {
        "coding":  [
            {
              "system": "http://dips.no/fhir/code",
              "code": "5",
              "display": "Våken"
            }
        ]
    }
}
```


4.2.7.2. Sample POST Response after creating Level of Consciousness.

Output

- A complete Observation object is received from the json response and can be viewed from a Read Operation request.

4.2.8. Heart Rate

This section illustrates the details on creating a Heart Rate vital sign.

4.2.8.1. Sample POST Response after creating Heart Rate


```
{
```

```
  "resourceType":"Observation",
  "extension":[
    {
      "url":"http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-heartrhythmextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"271636001",
        "display":"Pulse regular (finding)"
      }
    },
    {
      "url":"http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-heartrhythmIrregularityextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"271638000",
        "display":"Heart regularly irregular (finding)"
      }
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-characterofheartrateextension",
      "valueAnnotation":{
        "text":"character sample"
      }
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-clinicaldescriptionextension",
      "valueAnnotation":{
        "text":"Clinical description sample"
      }
    },
    {
      "url":"http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-heartrate-bodypositionextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"33586001",
        "display":"Sitting position"
      }
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-levelofexertionextension",
      "valueCoding":{
```

```
        "system":"http://snomed.info/sct",
        "code":"251894003",
        "display":"Level of Exertion (attribute)"
      }
    }
  ],
  "meta":{
    "lastUpdated":"2014-01-30T22:35:23+11:00",
    "versionId":"0",
    "source":"META_VISION"
  },
  "identifier":[
    {
      "system":"http://dips.no/fhir/namingsystem/externalId",
      "value":"External Id: testpulseExternalId6"
    }
  ],
  "status":"final",
  "code":{
    "coding":[
      {
        "system":"http://loinc.org",
        "code":"8867-4",
        "display":"Heart rate (observable entity)"
      }
    ]
  },
  "category":{
    "coding":[
      {
        "system":"http://terminology.hl7.org/CodeSystem/observation-category",
        "code":"vital-signs"
      }
    ]
  },
  "subject":{
    "reference":"patient/cdp1000239",
    "identifier":[
      {
        "system":"http://dips.no/fhir/namingsystem/dips-patientid",
        "value":"1000239"
      }
    ]
  },
  "encounter":{
    "reference":"Encounter/agy1000245"
  },
```

```
"effectiveDateTime": "2021-11-16T08:15:00+05:30",
"performer":[
  {
    "identifier":[
      {
        "system":"urn:oid:2.16.578.1.12.4.1.2",
        "value":"889911"
      }
    ]
  },
  {
    "reference":"Organization/afa22",
    "identifier":[
      {
        "system":"urn:oid:1.3.6.1.4.1.9038.70.3",
        "value":"22"
      }
    ]
  }
],
"method":{
  "coding":[
    {
      "system":"http://snomed.info/sct",
      "code":"129434008",
      "display":"Palpation"
    }
  ]
},
"bodySite":{
  "coding":[
    {
      "system":"http://snomed.info/sct",
      "code":"7569003",
      "display":"Finger structure (body structure)"
    }
  ]
},
"note":{
  "text":"Demo heart rate"
},
"valueQuantity":{
  "value":61,
  "unit":"/min",
  "system":"http://unitsofmeasure.org",
  "code":"/min"
}
```

```
}
```

4.2.8.2. Sample POST Response after creating Heart Rate

- A complete Observation object is received from the json response and it can be viewed from a Read Operation request.

4.2.9. Oxygen Saturation

This section illustrates the details on creating an Oxygen Saturation vital sign.

4.2.9.1. Sample POST Request body for creating Oxygen Saturation

```
{
  "resourceType":"Observation",

  "meta":{
    "lastUpdated":"2014-01-30T22:35:23+11:00",
    "versionId":"0",
    "source":"META_VISION"
  },
  "identifier":[
    {
      "system":"http://dips.no/fhir/namingsystem/externalId",
      "value":"External Id: testOxySatexternalId5"
    }
  ],
  "extension":[
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-
levelofexertionextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"154h",
        "display":"Hvile"
      }
    },
    {
      "url":
"http://hl7.org/fhir/StructureDefinition/NoDomainVitalSignsObservationPrePostduktalExtension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"154d",
        "display":"Post-ductal"
      }
    },
```

```
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-
inspiredoxygenextension",
      "extension":[
        {
          "url":"http://dips.no/fhir/StructureDefinition/OxygenAdministrationMethodExtension",
          "valueString":"Oxygen administration method"
        },
        {
          "url":"http://dips.no/fhir/StructureDefinition/FlowExtension",
          "valueQuantity":{
            "value":6100,
            "unit":"ml/min"
          }
        },
        {
          "url":"http://dips.no/fhir/StructureDefinition/FiO2Extension",
          "valueRatio":{
            "numerator":{
              "value":21
            },
            "denominator":{
              "value":100
            }
          }
        },
        {
          "url":"http://dips.no/fhir/StructureDefinition/ProsentO2Extension",
          "valueRatio":{
            "numerator":{
              "value":21
            },
            "denominator":{
              "value":100
            }
          }
        }
      ]
    }
  ],
  "status":"final",
  "category":[
    {
      "coding":[
        {
          "system":"http://terminology.hl7.org/CodeSystem/observation-category",
          "code":"vital-signs",
```

```
            "display":"vital-signs"
          }
        ],
        "text":"Vital Signs"
      }
    ],
    "code":{
      "coding":[
        {
          "system":"http://loinc.org",
          "code":"2708-6",
          "display":"Pulse oximeter (physical object)"
        }
      ]
    },
    "subject":{
      "reference":"patient/cdp1000239",
      "identifier":[
        {
          "system":"http://dips.no/fhir/namingsystem/dips-patientid",
          "value":"1000239"
        }
      ]
    },
    "encounter":{
      "reference":"Encounter/agy1000245"
    },
    "effectiveDateTime": "2021-11-16T08:15:00+05:30",
    "performer":[
      {
        "identifier":[
          {
            "system":"urn:oid:2.16.578.1.12.4.1.2",
            "value":"889911"
          }
        ]
      },
      {
        "reference":"Organization/afa22",
        "identifier":[
          {
            "system":"urn:oid:1.3.6.1.4.1.9038.70.3",
            "value":"22"
          }
        ]
      }
    ],
```

```
  "bodySite":{
    "text":"Demo pulse oxymetri bodysite"
  },
  "note":{
    "text":"Demo pulse oxymetri"
  },
  "valueRatio":{
    "numerator":{
      "value":24
    },
    "denominator":{
      "value":25
    }
  }
}
```


4.2.9.2. Sample POST Response after creating Oxygen Saturation

- A complete Observation object is received from the json response and it can be viewed from a Read Operation request.

4.2.10. Respiratory Rate

This section illustrates the details on creating a Respiratory Rate vital sign.

4.2.10.1. Sample POST Request body for creating Respiratory Rate


```
{
  "resourceType":"Observation",
  "meta":{
    "lastUpdated":"2014-01-30T22:35:23+11:00",
    "versionId":"0",
    "source":"META_VISION"
  },
  "identifier":[
    {
      "system":"http://dips.no/fhir/namingsystem/externalId",
      "value":"External Id: testresprateExternalId7"
    }
  ],
  "extension":[
    {
      "url":"http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-respirationrate-bodypositionextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
```

```
        "code":"10904000",
        "display":"Stående/Oppreist"
      }
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-
respirationregularityextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"276888009",
        "display":"Regelmessig"
      }
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation--
respirationdepthextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"301284009",
        "display":"Normal"
      }
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-
clinicaldescriptionextension",
      "valueAnnotation":{
        "text":"Description of Respiration"
      }
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-
spontaneousbreathingextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"241700002",
        "display":"Tilstede"
      }
    },
          {
        "url": "http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-
levelofexertionextension",
        "valueCoding": {
          "system": "http://snomed.info/sct",
          "code": "251894003",
          "display": "Level of Exertion (attribute)"
        }
      },
```

```
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-
inspiredoxygenextension",
      "extension":[
        {
          "url":"http://dips.no/fhir/StructureDefinition/OxygenAdministrationMethodExtension",
          "valueString":"Oxygen administration method"
        },
        {
          "url":"http://dips.no/fhir/StructureDefinition/FlowExtension",
          "valueQuantity":{
            "value":6100,
            "unit":"ml/min"
          }
        },
        {
          "url":"http://dips.no/fhir/StructureDefinition/FiO2Extension",
          "valueRatio":{
            "numerator":{
              "value":21
            },
            "denominator":{
              "value":100
            }
          }
        },
        {
          "url":"http://dips.no/fhir/StructureDefinition/ProsentO2Extension",
          "valueRatio":{
            "numerator":{
              "value":21
            },
            "denominator":{
              "value":100
            }
          }
        }
      ]
    }
  ],
  "status":"final",
  "code":{
    "coding":[
      {
        "system":"http://loinc.org",
        "code":"9279-1",
        "display":"Respiratory rate"
```

```
      }
    ]
  },
  "category":[
    {
      "coding":[
        {
          "system":"http://terminology.hl7.org/CodeSystem/observation-category",
          "code":"vital-signs",
          "display":"vital-signs"
        }
      ]
    }
  ],
  "subject":{
    "reference":"patient/cdp1000239",
    "identifier":[
      {
        "system":"http://dips.no/fhir/namingsystem/dips-patientid",
        "value":"1000239"
      }
    ]
  },
  "encounter":{
    "reference":"Encounter/agy1000245"
  },
   "effectiveDateTime": "2021-11-16T08:15:00+05:30",
  "performer":[
    {
      "reference":"Practitioner/agb27",
      "identifier":[
        {
          "system":"urn:oid:1.3.6.1.4.1.9038.51.1",
          "value":"27"
        }
      ]
    },
    {
      "reference":"Organization/afa22",
      "identifier":[
        {
          "system":"urn:oid:1.3.6.1.4.1.9038.70.3",
          "value":"22"
        }
      ]
    }
  ],
```

```
  "interpretation":{
    "text":"Clinical interpretation of Respiration"
  },
  "note":{
    "text":"Demo Respiration"
  },
  "valueQuantity":{
    "value":14,
    "unit":"/min",
    "system":"http://unitsofmeasure.org",
    "code":"/min"
  }
}
```


4.2.10.2. Sample POST Response after creating Respiratory Rate

- A complete Observation object is received from the json response and it can be viewed from a Read Operation request.

4.2.11. National Early Warning Scores (NEWS2)

The NEWS2 is based on a simple aggregate scoring system in which a score is allocated to physiological measurements, already recorded in routine practice, when patients present to, or are being monitored in hospital. Six simple physiological parameters plus an inspired oxygen observation form the basis of the scoring system:

- Inspired Oxygen
- Level of Consciousness
- Oxygen saturation
- Pulse rate
- Respiration rate
- Systolic Blood Pressure
- Temperature

4.2.11.1. NEWS2 Scoring system

The following chart shows how the scores are allocated to physical measurements to calculate the total score.

Physiological Parameter	Score						
	3	2	1	0	1	2	3
Respiration rate	≤8		9-11	12-20		21-24	≥25
SPO2 Scale 1	≤91	92-93	94-95	≥96			

Physiological Parameter	Score						
SPO2 Scale 2	≤83	84-85	86-87	88–92 eller ≥ 93 på luft	93–94 med oksygentilførsel	95-96 med oksygentilførsel	≥97 med oksygentilførsel
Air or Oxygen?		Oksygen		Romluft			
Systolic blood pressure	≤90	91-100	101-110	111-219			≥220
Pulse	≤40		41-50	51-90	91-110	111-130	≥131
Consciousness				A			CVPU
Temperature	≤35.0		35.1-36.0	36.1-38.0	38.1-39.0	≥39.1	

This section illustrates the details on creating a NEWS2.

4.2.11.2. Sample POST Request body for creating a NEWS2

```
{
   "resourceType": "Observation",
   "meta": {
      "versionId": "0",
      "lastUpdated": "2014-01-30T11:35:23+00:00",
       "source":"META_VISION"
   },
   "extension": [

      {
         "url": "http://hl7.no/fhir/StructureDefinition/hn-domain-vitalsignsobservation-news2score-clinical-ratio-extension",
         "valueString": "Høy"
      }
   ],
   "identifier": [
          {
    "system": "http://dips.no/fhir/namingsystem/externalId",
    "value": "External Id: testNEWS2"
   }
   ],
   "status": "final",
   "category":  [
      {
         "coding":  [
            {
               "system": "http://terminology.hl7.org/CodeSystem/observation-category",
               "code": "survey",
               "display": "Survey"
            }
```

```
        ]
      }
    ],
    "code": {
      "coding": [
        {
          "system": "http://snomed.info/sct",
          "code": "1104051000000101",
          "display": "NEWS2 (National Early Warning Score 2) total score"
        }
      ]
    },
    "subject": {
      "reference": "Patient/cdp1000807",
      "identifier": {
        "system": "http://dips.no/fhir/namingsystem/dips-patientid",
        "value": "1000807"
      }
    },
    "effectiveDateTime": "2021-11-16T08:30:00+05:30",
    "performer": [
      {
        "reference": "Organization/afa22",
        "identifier": {
          "system": "urn:oid:1.3.6.1.4.1.9038.70.3",
          "value": "22"
        }
      },
      {
        "reference": "PractitionerRole/agb103",
        "identifier": {
          "system": "urn:oid:1.3.6.1.4.1.9038.51.1",
          "value": "103"
        }
      }
    ],
  "valueQuantity": {
      "value": 20,
      "system": "http://unitsofmeasure.org",
      "code": "score",
      "unit": "score"
    },
    "component": [
      {
        "code": {
          "coding": [
            {
```

```
            "system": "http://snomed.info/sct",
            "code": "1104301000000104",
            "display": "NEWS2 (National Early Warning Score 2) - respiration rate score"
          }
        ]
      },
      "valueQuantity": {
        "value": 3,
        "unit": "ScoreOf",
        "system": "http://unitsofmeasure.org",
        "code": "{ScoreOf}"
      },
      "interpretation": [
        {
          "text": "≥25"
        }
      ]
    },
  {
      "code": {
        "coding":  [
          {
            "system": "http://snomed.info/sct",
            "code": "1104321000000108",
            "display": " NEWS2 (National Early Warning Score 2) - oxygen saturation scale 2 score"
          }
        ]
      },
      "valueQuantity": {
        "value": 3,
        "unit": "ScoreOf",
        "system": "http://unitsofmeasure.org",
        "code": "{ScoreOf}"
      },
      "interpretation": [
        {
          "text": "93–94 med oksygentilførsel"
        }
      ]
    },

    {
      "code": {
        "coding":  [
          {
            "system": "http://snomed.info/sct",
            "code": "1104331000000105",
```

```
            "display": "NEWS2 (National Early Warning Score 2) - air or oxygen score"
          }
        ]
      },
      "valueQuantity": {
        "value": 2,
        "unit": "ScoreOf",
        "system": "http://unitsofmeasure.org",
        "code": "{ScoreOf}"
      },
      "interpretation": [
        {
          "text": "Oksygen"
        }
      ]
    },
    {
      "code": {
        "coding": [
          {
            "system": "http://snomed.info/sct",
            "code": "1104351000000103",
            "display": "NEWS2 (National Early Warning Score 2) - pulse score"
          }
        ]
      },
      "valueQuantity": {
        "value": 3,
        "unit": "ScoreOf",
        "system": "http://unitsofmeasure.org",
        "code": "{ScoreOf}"
      },
      "interpretation": [
        {
          "text": "≤40"
        }
      ]
    },
    {
      "code": {
        "coding": [
          {
            "system": "http://snomed.info/sct",
            "code": "1104341000000101",
            "display": "NEWS2 (National Early Warning Score 2) - systolic blood pressure score"
          }
        ]
```

```
    },
    "valueQuantity": {
      "value": 3,
      "unit": "ScoreOf",
      "system": "http://unitsofmeasure.org",
      "code": "{ScoreOf}"
    },
    "interpretation": [
      {
        "text": "≤90"
      }
    ]
  },
  {
    "code": {
      "coding":  [
        {
          "system": "http://snomed.info/sct",
          "code": "1104361000000100",
          "display": "NEWS2 (National Early Warning Score 2) - consciousness score"
        }
      ]
    },
    "valueQuantity": {
      "value": 3,
      "unit": "ScoreOf",
      "system": "http://unitsofmeasure.org",
      "code": "{ScoreOf}"
    },
    "interpretation": [
      {
        "text": "C, V, P eller U"
      }
    ]
  },
  {
    "code": {
      "coding":  [
        {
          "system": "http://snomed.info/sct",
          "code": "1104371000000107",
          "display": "NEWS2 (National Early Warning Score 2) - temperature score"
        }
      ]
    },
    "valueQuantity": {
      "value": 3,
```

```
            "unit": "ScoreOf",
            "system": "http://unitsofmeasure.org",
            "code": "{ScoreOf}"
          },
          "interpretation": [
            {
              "text": "≤35.0"
            }
          ]
        }
      ]
    }
```

4.2.11.3. Sample POST Response after creating NEWS2.

- A complete Observation object is received from the json response and it can be viewed from a Read Operation request.

4.2.12. Mandatory Properties

This section describes the mandatory properties of the Create method in FHIR Observation for the vital signs.

Table 3. Mandatory Properties

Property	Description	Example	Acceptable Values/Units
resourceType	Unique identifier of FHIR resource	Observation	
meta.lastUpdated	Last Updated time of the Observation from Meta Vision	2014-01-30T22:35:23+11:00	
meta.versionId	Version of the Observation	0	
meta.source	Name of the external source	meta vision	
status	Status of the Observation	final	final
category.coding.system	Identity of the terminology system	http://terminology.hl7.org/CodeSystem/observation-category	
category.coding.code	Code of measured vital signs which indicates what is being measured	vital-signs	vital-signs,survey
code.coding.system	Identity of the terminology system	http://loinc.org	

Property	Description	Example	Acceptable Values/Units
code.coding.code	Code defined by the http://loinc.org system	85354-9	
subject.reference	The reference value of who/what is the subject of the document	Patient/cdp1000807	
subject.identifier.system	Identifier associated with the subject	http://dips.no/fhir/namingsystem/dips-patientid	FNR, DNR, HNR, patientId identifiers
subject.identifier.value	The value associated with the identifier	1000807	
effectiveDateTime	Time of the event associated with the Observation	2021-05-10	
performer(Author).reference	The reference value of who and/or what authored the document	PractitionerRole/agb103	
performer(Author).identifier.system	Identifier associated with the author	urn:oid:1.3.6.1.4.1.9038.51.1	HPR, HCP, HER, HCPCode identifiers
performer(Author).identifier.value	Value defined by the Author Identifier system	103	
performer(Organization).reference	Value referred by the Organization	Organization/afa22	
performer(Organization).identifier.system	Identifier associated with the Organization	urn:oid:1.3.6.1.4.1.9038.70.3	RSH, StandardNumber, ShortName, DIPSDepartmentId identifiers
performer(Organization).identifier.value	Value defined by the Organization Identifier system	22	

Any failure of specifying mandatory fields within the request will result in a request failure followed by a detailed error "**OperationOutcome**" in the response. Corrective actions should be taken accordingly.

4.2.12.1. Mandatory properties of Blood Pressure

Property	Description	Example	Acceptable Values/Units
component(SystolicBP).code.coding.system	Identity of the terminology system	http://loinc.org	

Property	Description	Example	Acceptable Values/Units
component(SystolicBP).code.coding.code	Code defined by the http://loinc.org system	8480-6	
component(SystolicBP).valueQuantity.value	Measured Systolic BP value	123	
component(SystolicBP).valueQuantity.unit	Unit of the Systolic BP measurement	mm[Hg]	mm[Hg]
component(SystolicBP).valueQuantity.system	System value associated with the unit	http://unitsofmeasure.org	
component(SystolicBP).valueQuantity.code	Code defined by the http://unitsofmeasure.org system	mm[Hg]	mm[Hg]
component(DiastolicBP).code.coding.system	Identity of the terminology system	http://loinc.org	
component(DiastolicBP).code.coding.code	Code defined by the http://loinc.org system	8462-4	
component(DiastolicBP).valueQuantity.value	Measured Diastolic BP value	78	
component(DiastolicBP).valueQuantity.unit	Unit of the Diastolic BP measurement	mm[Hg]	mm[Hg]
component(DiastolicBP).valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	
component(DiastolicBP).valueQuantity.code	Code defined by the http://unitsofmeasure.org system	mm[Hg]	mm[Hg]
component(MeanArterialPressure).code.coding.system	Identity of the terminology system	http://loinc.org	
component(MeanArterialPressure).code.coding.code	Code defined by the http://loinc.org system	8478-0	
component(MeanArterialPressure).valueQuantity.value	Measured mean arterial pressure value	93	
component(MeanArterialPressure).valueQuantity.unit	Unit of the mean arterial pressure measurement	mm[Hg]	mm[Hg]
component(MeanArterialPressure).valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	
component(MeanArterialPressure).valueQuantity.code	Code defined by the http://unitsofmeasure.org system	mm[Hg]	mm[Hg]
component(PulsePressure).code.coding.system	Identity of the terminology system	http://snomed.info/sct	
component(PulsePressure).code.coding.code	Code defined by the http://snomed.info/sct system	4461000202102	

Property	Description	Example	Acceptable Values/Units
component(PulsePressure).valueQuantity.value	Measured pulse pressure value	45	
component(PulsePressure).valueQuantity.unit	Unit of the pulse pressure measurement	mm[Hg]	mm[Hg]
component(PulsePressure).valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	
component(PulsePressure).valueQuantity.code	Code defined by the http://unitsofmeasure.org system	mm[Hg]	mm[Hg]

4.2.12.2. Mandatory properties of Body Height

Property	Description	Example	Acceptable Values/Units
valueQuantity.value	Measured height in value	156	
valueQuantity.unit	Unit of the height measurement	cm	cm, [in_i]
valueQuantity.system	System value associated with the unit	http://unitsofmeasure.org	
valueQuantity.code	Code defined by the http://unitsofmeasure.org system	cm	cm, [in_i]

4.2.12.3. Mandatory properties of Body Mass Index

Property	Description	Example	Acceptable Values/Units
valueQuantity.value	Measured Body Mass Index in value	32	
valueQuantity.unit	Unit of the Body Mass Index measurement	kg/m2	kg/m2
valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	
valueQuantity.code	Code defined by the http://unitsofmeasure.org system	kg/m2	kg/m2

4.2.12.4. Mandatory properties of Body Temperature

Property	Description	Example	Acceptable Values/Units
valueQuantity.value	Measured temperature in value	37	
valueQuantity.unit	Unit of the temperature measurement	Cel	Cel, [degF]
valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	
valueQuantity.code	Code defined by the http://unitsofmeasure.org system	Cel	Cel, [degF]

4.2.12.5. Mandatory properties of Body Weight

Property	Description	Example	Acceptable Values/Units
valueQuantity.value	Measured weight in value	49000	
valueQuantity.unit	Unit of the weight measurement	g	kg, g, [lb_av]
valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	
valueQuantity.code	Code defined by the http://unitsofmeasure.org system	g	kg, g, [lb_av]

4.2.12.6. Mandatory properties of Level of Consciousness

Property	Description	Example	Acceptable Values/Units
valueCodeableConcept.coding.system	System value associated with code	http://dips.no/fhir/code	http://dips.no/fhir/code
valueCodeableConcept.coding.code	Code defined by the http://dips.no/fhir/code	5	5, 6, 7, 8
valueCodeableConcept.coding.display	Display value of Level of Consciousness	Våken	Våken, Tiltale, Smerte, Reagerer ikke

4.2.12.7. Mandatory properties of Heart Rate

Property	Description	Example	Acceptable Values/Units
valueQuantity.value	Measured Heart Rate in value	61	

Property	Description	Example	Acceptable Values/Units
valueQuantity.unit	Unit of the Heart Rate measurement	/min	/min
valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	
valueQuantity.code	Code defined by the http://unitsofmeasure.org system	/min	/min

4.2.12.8. Mandatory properties of Oxygen Saturation

Property	Description	Example	Acceptable Values/Units
valueRatio.numerator.value	Numerator of the value	24	
valueRatio.denominator.value	Denominator of the value	25	

4.2.12.9. Mandatory properties of Respiratory Rate

Property	Description	Example	Acceptable Values/Units
valueQuantity.value	Measured respiratory rate in value	14	
valueQuantity.unit	Unit of the respiratory rate measurement	/min	/min
valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	
valueQuantity.code	Code defined by the http://unitsofmeasure.org system	/min	/min

4.2.12.10. Mandatory properties of NEWS2

Property	Description	Example	Acceptable Values / Units
extension.url	Overral category representing the urgency and the scale of the clinical response in response to the physiological variables.	http://hl7.no/fhir/StructureDefinition/hn-domain-vitalsignsobservation-news2score-clinical-ratio-extension	
extension.valueString	Display value of the clinical ratio	Høy	Lav, Lav-middels, Middels, Høy

Property	Description	Example	Acceptable Values / Units
valueQuantity.value	The sum of points assigned for each physical measurements	5	0-20
valueQuantity.system	System value associated unit	http://unitsofmeasure.org	
valueQuantity.code	Code defined by the http://unitsofmeasure.org system	score	
valueQuantity.unit	Unit of the calculated score	score	
code.coding.system	Identity of the terminology system	http://snomed.info/sct	
code.coding.code	Code defined by the http://snomed.info/sct system	1104051000000101	
component(Respiration rate).code.coding.system	Identity of the terminology system	http://snomed.info/sct	
component(Respiration rate).code.coding.code	Code defined by the http://snomed.info/sct	1104301000000104	
component(Respiration rate).valueQuantity.display	Display name of the code	NEWS2 (National Early Warning Score 2) - respiration rate score	
valueQuantity.value	Assigned score for respiration rate in value	3	0, 1, 2, 3
valueQuantity.unit	ScoreOf	ScoreOf	
valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	
valueQuantity.code	Code defined by the http://unitsofmeasure.org system	{ScoreOf}	
interpretation.text	Corresponding display value for the assigned score	≥25	≤8, 9-11, 12-20, 21-24, ≥25
component(Oxygen Saturation Scale 1).code.coding.system	Identity of the terminology system	http://snomed.info/sct	
component(Oxygen Saturation Scale 1).code.coding.code	Code defined by the http://snomed.info/sct	1104321000000108	
component(Oxygen Saturation Scale 1).valueQuantity.display	Display name of the code	NEWS2 (National Early Warning Score 2) - oxygen saturation scale 1 score	

Property	Description	Example	Acceptable Values / Units
valueQuantity.value	Assigned score for oxygen saturation scale 1 in value	3	0, 1, 2, 3
valueQuantity.unit	ScoreOf	ScoreOf	
valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	
valueQuantity.code	Code defined by the http://unitsofmeasure.org system	{ScoreOf}	
interpretation.text	Corresponding display value for the assigned score	≤91	≤91, 92-93, 94-95, ≥96
component(Oxygen Saturation Scale 2).code.coding.system	Identity of the terminology system	http://snomed.info/sct	
component(Oxygen Saturation Scale 2).code.coding.code	Code defined by the http://snomed.info/sct	1104321000000108	
component(Oxygen Saturation Scale 2).valueQuantity.display	Display name of the code	NEWS2 (National Early Warning Score 2) - oxygen saturation scale 2 score	
valueQuantity.value	Assigned score for oxygen saturation scale 2 in value	3	0, 1, 2, 3
valueQuantity.unit	ScoreOf	ScoreOf	
valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	
valueQuantity.code	Code defined by the http://unitsofmeasure.org system	{ScoreOf}	
interpretation.text	Corresponding display value for the assigned score	≤83	≤83, 84-86, 86-87, 88–92 eller ≥ 93 på luft, 93–94 med oksygentilførsel, 95-96 med oksygentilførsel , ≥97 med oksygentilførsel
component(air or oxygen score).code.coding.system	Identity of the terminology system	http://snomed.info/sct	

Property	Description	Example	Acceptable Values / Units
component(air or oxygen score).code.coding.code	Code defined by the http://snomed.info/sct	1104331000000105	
component(air or oxygen score).valueQuantity.display	Display name of the code	NEWS2 (National Early Warning Score 2) - air or oxygen score	
valueQuantity.value	Assigned score for air or oxygen in value	2	0, 2
valueQuantity.unit	ScoreOf	ScoreOf	
valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	
valueQuantity.code	Code defined by the http://unitsofmeasure.org system	{ScoreOf}	
interpretation.text	Corresponding display value for the assigned score	Oksygen	Romluft, Oksygen
component(Pulse).code.coding.system	Identity of the terminology system	http://snomed.info/sct	
component(Pulse).code.coding.code	Code defined by the http://snomed.info/sct	1104351000000103	
component(Pulse).valueQuantity.display	Display name of the code	NEWS2 (National Early Warning Score 2) - pulse score	
valueQuantity.value	Assigned score for pulse in value	3	0, 1, 2, 3
valueQuantity.unit	ScoreOf	ScoreOf	
valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	
valueQuantity.code	Code defined by the http://unitsofmeasure.org system	{ScoreOf}	
interpretation.text	Corresponding display value for the assigned score	≤40	≤40, 41-50, 51-90, 91-110, 111-130, ≥131
component(Systolic Blood Pressure).code.coding.system	Identity of the terminology system	http://snomed.info/sct	
component(Systolic Blood Pressure).code.coding.code	Code defined by the http://snomed.info/sct	1104341000000101	
component(Systolic Blood Pressure).valueQuantity.display	Display name of the code	NEWS2 (National Early Warning Score 2) - systolic blood pressure score	

Property	Description	Example	Acceptable Values / Units
valueQuantity.value	Assigned score for systolic blood pressure in value	3	0, 1, 2, 3
valueQuantity.unit	ScoreOf	ScoreOf	
valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	
valueQuantity.code	Code defined by the http://unitsofmeasure.org system	{ScoreOf}	
interpretation.text	Corresponding display value for the assigned score	≤90	≤90, 91-100, 101-110, 111-219, ≥220
component(Consciousness).code.coding.system	Identity of the terminology system	http://snomed.info/sct	
component(Consciousness).code.coding.code	Code defined by the http://snomed.info/sct	1104361000000100	
component(Consciousness).valueQuantity.display	Display name of the code	NEWS2 (National Early Warning Score 2) - consciousness score	
valueQuantity.value	Assigned score for consciousness in value	3	0, 3
valueQuantity.unit	ScoreOf	ScoreOf	
valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	
valueQuantity.code	Code defined by the http://unitsofmeasure.org system	{ScoreOf}	
interpretation.text	Corresponding display value for the assigned score	C, V, P eller U	C, V, P eller U, A
component(Temperature).code.coding.system	Identity of the terminology system	http://snomed.info/sct	
component(Temperature).code.coding.code	Code defined by the http://snomed.info/sct	1104371000000107	
component(Temperature).valueQuantity.display	Display name of the code	NEWS2 (National Early Warning Score 2) - temperature score	
valueQuantity.value	Assigned score for temperature in value	3	0, 1, 2, 3
valueQuantity.unit	ScoreOf	ScoreOf	
valueQuantity.system	System value associated with unit	http://unitsofmeasure.org	

Property	Description	Example	Acceptable Values / Units
valueQuantity.code	Code defined by the http://unitsofmeasure.org system	{ScoreOf}	
interpretation.text	Corresponding display value for the assigned score	≤35.0	≤35.0, 35.1-36.0, 36.1-38.0, 38.1-39.0 , ≥39.1

4.2.13. Optional Properties

This section describes the optional properties of the Create method in FHIR Observation for the vital signs.

Table 4. Optional Properties

Property	Description	Example	Acceptable Values/Units
note.text	Additional text about the measurement, which is not covered by other fields	Demo Blood Pressure	
encounter.reference	Encounter of the Observation	Encounter/agy1002679	
encounter.identifier.system	Identifier associated with the encounter	http://dips.no/fhir/namingsystem/dips-omsorgsepisodeid	EpisodeOfCare, PlannedContact identifiers
encounter.identifier.value	The value associated with the encounter	1002679	

The above-mentioned fields are optional to be added to the request. Please refer Example Requests to see the exact format on how requests should be sent.

4.2.13.1. Optional Properties of Blood Pressure

Property	Description	Example	Acceptable Values/Units
bodySite.coding.system	Anatomical site where blood pressure is measured	http://snomed.info/sct	
bodySite.coding.code	Code defined by the http://snomed.info/sct system	7569003	

Property	Description	Example	Acceptable Values/Units
bodySite.coding.display	Display value of body site	Finger structure (body structure)	
method.coding.system	Method of measuring blood pressure	http://snomed.info/sct	
method.coding.code	Code defined by the http://snomed.info/sct system	129436005	
method.coding.display	Display value of the method	Auscultation - action (qualifier value)	
extension(bodyPosition).url	Anatomical position of the body at the time of measurement	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bloodpressure-bodypositionextension	
extension(bodyPosition).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(bodyPosition).valueCoding.code	Code defined by the http://snomed.info/sct system	33586001	
extension(bodyPosition).valueCoding.display	Display value of the Body Position	Sitting position	
extension(cuffSize).url	Size of the blood pressure cuff used for blood pressure measurement	http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-cuffsizeextension	
extension(cuffSize).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(cuffSize).valueCoding.code	Code defined by the http://snomed.info/sct system	720740000	
extension(cuffSize).valueCoding.display	Display value of cuff size	Lår voksne	
extension(diastolicEndPoint).url	Registration of which of the Korotkofi is used to determine the diastolic blood pressure using auscultation	http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-diastolicendpointextension	
extension(diastolicEndPoint).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(diastolicEndPoint).valueCoding.code	Code defined by the http://snomed.info/sct system	1081871000202109	

Property	Description	Example	Acceptable Values/Units
extension(diastolicEndPoint).valueCoding.display	Display value of the diastolic endpoint	Phase IV	
extension(levelOfExertion).url	Details of physical activity at the time of measurement	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-levelofexertionextension	
extension(levelOfExertion).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(levelOfExertion).valueCoding.code	Code defined by the http://snomed.info/sct system	154h	
extension(levelOfExertion).valueCoding.display	Display value of Level of Extertion	Hvile	
extension(headTiltAngle).url	Kranio-caudal tilt of the surface on which the individual resides at the time of blood pressure measurement	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-headtiltextension	
extension(headTiltAngle).valueQuantity.value	Value of the head tilt angle	14	
extension(headTiltAngle).valueQuantity.unit	Unit of head tilt angle measurement	deg	deg
extension(sleepStatus).url	Sleep status at the time of blood pressure measurement	http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-sleepstatusextension	
extension(sleepStatus).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(sleepStatus).valueCoding.code	Code defined by the http://snomed.info/sct system	248218005	
extension(sleepStatus).valueCoding.display	Display value of sleep status	awake	
extension(systolicformulaextension).url	Formula used to calculate the systolic BP from mean arterial pressure	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bloodpressure-systolicformulaextension	
extension(systolicformulaextension).valueString	Formula value	sample formula 1	

Property	Description	Example	Acceptable Values/Units
extension(diastolicformulaextension).url	Formula used to calculate the diastolic BP from mean arterial pressure	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bloodpressure-diastolicformulaextension	
extension(diastolicformulaextension).valueString	Formula value	sample formula 2	
extension(meanarterialformulaextension).url	Formula used to calculate the mean arterial pressure	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bloodpressure-meanarterialformulaextension	
extension(meanarterialformulaextension).valueString	Formula value	sample formula 3	

4.2.13.2. Optional properties of Body Height

Property	Description	Example	Acceptable Values/Units
extension(bodyPosition).url	Anatomical position of the body at the time of measurement	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bodyheight-bodypositionextension	
extension(bodyPosition).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(bodyPosition).valueCoding.code	Code defined by the http://snomed.info/sct system	4801000202104	
extension(bodyPosition).valueCoding.display	Display value of body position	Lying flat without tilt (finding)	

4.2.13.3. Optional properties of Body Mass Index

Property	Description	Example	Acceptable Values/Units
interpretation.text	Brief clinical description of Body Mass Index	Obese	
method.coding.system	Method of measuring Body Mass Index	http://snomed.info/sct	
method.coding.code	Code defined by the http://snomed.info/sct system	1xxxx	

Property	Description	Example	Acceptable Values/Units
method.coding.display	Display the method of entering the Body Mass Index	Automatisk registrering	
extension(formula).url	Formula used to derive the Body Mass Index	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bodymassindex-formulaExtension	
extension(formula).valueString	Formula value	sample formula	
extension(confoundingFactor).url	An issue or factor that impacts on body weight measurement	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bodymassindex-confoundingfactorextension	
extension(confoundingFactor).valueString	Value of the confounding factor	Sample confounding factor	

4.2.13.4. Optional properties of Body Temperature

Property	Description	Example	Acceptable Values/Units
bodySite.coding.system	Anatomical site where body temperature is measured	http://snomed.info/sct	
bodySite.coding.code	Code defined by the http://snomed.info/sct system	34402009	
bodySite.coding.display	Display the value of body site	Endetarm	
extension(bodyExposure).url	The degree of exposure of the individual at the time of measurement	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bodyexposureextension	
extension(bodyExposure).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(bodyExposure).valueCoding.code	Code defined by the http://snomed.info/sct system	5611000202100	
extension(bodyExposure).valueCoding.display	Display value of the body exposure	Passende påkledning/tildekking	

Property	Description	Example	Acceptable Values/Units
extension(daysSinceMenstruationStart).url	Number of days since menstruation start at the time of measurement	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-dayssincemenstruationstartextension	
extension(daysSinceMenstruationStart).valueQuantity.value	Current day of the menstrual cycle	12	
extension(levelOfExertion).url	Details of physical activity at the time of measurement	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-levelofexertionextension	
extension(levelOfExertion).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(levelOfExertion).valueCoding.code	Code defined by the http://snomed.info/sct system	154h	
extension(levelOfExertion).valueCoding.display	Display value of Level of Extertion	Hvile	
extension(activeHeating).url	Assisted thermoregulation	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-activeheating-extension	
extension(activeHeating).valueAnnotation.text	Display of active heating	Active heating sample	

4.2.13.5. Optional properties of Body Weight

Property	Description	Example	Acceptable Values/Units
extension(clothingState).url	Person's state of the dress at the time of measurement	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-clothingstateextension	
extension(clothingState).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(clothingState).valueCoding.code	Code defined by the http://snomed.info/sct system	1081791000202103	
extension(clothingState).valueCoding.display	Value of clothing state at the time of measurement	Fullt påkledd uten sko	

Property	Description	Example	Acceptable Values/Units
extension(confoundingFactor).url	An issue or factor that impacts body weight measurement	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-confoundingfactorextension	
extension(confoundingFactor).valueString	Value of the confounding factor	Sample confounding factor	

4.2.13.6. Optional properties of Heart Rate

Property	Description	Example	Acceptable Values/Units
bodySite.coding.system	Anatomical site where the heart rate or heartbeat is observed	http://snomed.info/sct	
bodySite.coding.code	Code defined by the http://snomed.info/sct system	7569003	
bodySite.coding.display	Display value of body site	Finger structure (body structure)	
method.coding.system	Method of measuring heart rate	http://snomed.info/sct	
method.coding.code	Code defined by the http://snomed.info/sct system	129434008	
method.coding.display	Display value of the method	Palpation	
extension(heartRhythm).url	Observed regularity of pulse or heart rate	http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-heartrhythmextension	
extension(heartRhythm).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(heartRhythm).valueCoding.code	Code defined by the http://snomed.info/sct system	271636001	
extension(heartRhythm).valueCoding.display	Display value of heart rhythm	Pulse regular (finding)	
extension(bodyPosition).url	Anatomical position of the body at the time of measurement	http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-heartrate-bodypositionextension	

Property	Description	Example	Acceptable Values/Units
extension(bodyPosition).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(bodyPosition).valueCoding.code	Code defined by the http://snomed.info/sct system	33586001	
extension(bodyPosition).valueCoding.display	Display value of body position	Sitting position	
extension(levelOfExertion).url	Details of physical activity at the time of measurement	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-levelofexertionextension	
extension(levelOfExertion).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(levelOfExertion).valueCoding.code	Code defined by the http://snomed.info/sct system	251894003	
extension(levelOfExertion).valueCoding.display	Display value of level of exertion	Level of Extertion (attribute)	
extension(characterOfHeartRate).url	Textual description of the character of the pulse or heart rate	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-characterofheartrateextension	
extension(characterOfHeartRate).valueAnnotation.text	Text of character of heart rate	Character sample	
extension(clinicalDescription).url	Clinical description of pulse or heart rate	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-clinicaldescriptionextension	
extension(clinicalDescription).valueAnnotation.text	Text of clinical description	Clinical description sample	
extension(heartRhythmirregularity).url	Observed irregularity of pulse or heart rate	http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-heartrhythmIrregularityextension	
extension(heartRhythmirregularity).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(heartRhythmirregularity).valueCoding.code	Code defined by the http://snomed.info/sct system	271638000	
extension(heartRhythmirregularity).valueCoding.display	Display value of heart rhythm irregularity	Heart regularly irregular (finding)	

4.2.13.7. Optional properties of Oxygen Saturation

Property	Description	Example	Acceptable Values/Units
bodySite.text	Anatomical site where oxygen saturation is measured		
extension(levelOfExertion).url	Details of physical activity at the time of measurement	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-levelofexertionextension	
extension(levelOfExertion).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(levelOfExertion).valueCoding.code	Code defined by the http://snomed.info/sct system	154h	
extension(levelOfExertion).valueCoding.display	Display value of level of exertion	Hvile	
extension(prePostduktal).url	Sensor-point of measurement in relation to ductus arteriiosus in newborns	http://hl7.org/fhir/StructureDefinition/NoDomainVitalSignsObservationPrePostduktalExtension	
extension(prePostduktal).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(prePostduktal).valueCoding.code	Code defined by the http://snomed.info/sct system	154d	
extension(prePostduktal).valueCoding.display	Pre/postduktal	Post-ductal	
extension(inspiredOxygen).url	Amount of oxygen available to the individual at the time of measurement	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-inspiredoxygenextension	
extension(inspiredOxygen).extension(OxygenAdministrationMethod).url	Low flow oxygen delivery method	http://dips.no/fhir/StructureDefinition/OxygenAdministrationMethodExtension	
extension(inspiredOxygen).extension(OxygenAdministrationMethod).valueString	Value of the oxygen administration method	Oxygen administration method	
extension(inspiredOxygen).extension(Flow).url	Oxygen flow rate given to an individual	http://dips.no/fhir/StructureDefinition/FlowExtension	
extension(inspiredOxygen).extension(Flow).valueQuantity.value	Measured Flow rate value	6100	

Property	Description	Example	Acceptable Values/Units
extension(inspiredOxygen).extension(Flow).valueQuantity.unit	Unit of Flow rate measurement	ml/min	
extension(inspiredOxygen).extension(FiO2).url	FiO2 Fraction of oxygen in inspired air	http://dips.no/fhir/StructureDefinition/FiO2Extension	
extension(inspiredOxygen).extension(FiO2).valueRatio.numerator.value	Numerator of the value	21	
extension(inspiredOxygen).extension(FiO2).valueRatio.denominator.value	Denominator of the value	100	
extension.(inspiredOxygen).extension(ProsentO2).url	Prosent O2 fraction of oxygen in inspired air	http://dips.no/fhir/StructureDefinition/ProsentO2Extension	
extension.(inspiredOxygen).extension(ProsentO2).valueRatio.numerator.value	Numerator of the value	21	
extension.(inspiredOxygen).extension(ProsentO2).valueRatio.denominator.value	Denominator of the value	100	

4.2.13.8. Optional properties of Respiratory Rate

Property	Description	Example	Acceptable Values/Units
interpretation.text	Brief clinical description of respiratory rate	Demo interpretation	
extension(BodyPosition).url	Anatomical position of the body at the time of measurement	http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-respirationrate-bodypositionextension	
extension(BodyPosition).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(BodyPosition).valueCoding.code	Code defined by the http://snomed.info/sct system	10904000	
extension(BodyPosition).valueCoding.display	Display value of body position	Stående/Oppreist	
extension(levelOfExertion).url	Details of physical activity at the time of the measurement	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-levelofexertionextension	

Property	Description	Example	Acceptable Values/Units
extension(levelOfExertion).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(levelOfExertion).valueCoding.code	Code defined by the http://snomed.info/sct system	251894003	
extension(levelOfExertion).valueCoding.display	Display value of level of exertion	Level of Exertion (attribute)	
extension(respirationRegularity).url	Observed regularity of respiratory rate	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-respirationregularityextension	
extension(respirationRegularity).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(respirationRegularity).valueCoding.code	Code defined by the http://snomed.info/sct system	276888009	
extension(respirationRegularity).valueCoding.display	Display value of respiration regularity	Regelmessig	
extension(inspiredOxygen).url	Amount of oxygen available to the individual at the time of measurement	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-inspiredoxygenextension	
extension(inspiredOxygen).extension(OxygenAdministrationMethod).url	Low flow oxygen delivery method	http://dips.no/fhir/StructureDefinition/OxygenAdministrationMethodExtension	
extension(inspiredOxygen).extension(OxygenAdministrationMethod).valueString	Value of oxygen administration method	Oxygen administration method	
extension(inspiredOxygen).extension(Flow).url	Oxygen flow rate given to an individual	http://dips.no/fhir/StructureDefinition/FlowExtension	
extension(inspiredOxygen).extension(Flow).valueQuantity.value	Measured Flow rate value	6100	
extension(inspiredOxygen).extension(Flow).valueQuantity.unit	Unit of Flow rate measurement	ml/min	
extension(inspiredOxygen).extension(FiO2).url	Fraction of oxygen in inspired air	http://dips.no/fhir/StructureDefinition/FiO2Extension	
extension(inspiredOxygen).extension(FiO2).valueRatio.numerator.value	Numerator of the value	21	

Property	Description	Example	Acceptable Values/Units
extension(inspiredOxygen).extension(FiO2).valueRatio.denominator.value	Denominator of the value	100	
extension(inspiredOxygen).extension(ProsentO2).url	Percentage of oxygen in inspired air	http://dips.no/fhir/StructureDefinition/ProsentO2Extension	
extension(inspiredOxygen).extension(ProsentO2).valueRatio.numerator.value	Numerator of the value	21	
extension(inspiredOxygen).extension(ProsentO2).valueRatio.denominator.value	Denominator of the value	100	
extension(spontaneousBreathing).url	Observation of spontaneous respiration	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-spontaneousbreathingextension	
extension(spontaneousBreathing).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	
extension(spontaneousBreathing).valueCoding.code	Code defined by the http://snomed.info/sct system	241700002	
extension(spontaneousBreathing).valueCoding.display	Display value of spontaneous breathing	Tilstede	
extension(clinicalDescription).url	Narrative description about the respiratory rate of the individual	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-clinicaldescriptionextension	
extension(clinicalDescription).valueAnnotation.text	Text of clinical description	Description of Respiration	
extension(respirationDepth).url	The depth (volume) of the breath	http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation—respirationdepthextension	
extension(respirationDepth).valueCoding.system	Identity of the terminology system	http://snomed.info/sct	

Property	Description	Example	Acceptable Values/Units
extension(respirationDepth).valueCoding.code	Code defined by the http://snomed.info/sct system	301284009	
extension(respirationDepth).valueCoding.display	Display the value of respiration depth	Normal	

4.3. Update Operation

This section describes the properties of the Update method in DIPS FHIR Observation for the vital signs.

- Auth-Ticket = Valid ticket from the database
- Content-type = application/json
- Method = PUT
- URL = https://{SERVER}/DIPS-WebAPI/HL7/FHIR-R4/Observation/{externalfhirid}?_profile=DIPSVitalSignsObservation&_format=json

> externalfhirid property is mandatory for the Request body and URL of Update method

Update Operation supports DIPS FHIR Observation for the vital signs as same as the Create Operation.

4.3.1. Sample PUT Request body for updating a vital sign - Blood Pressure


```
{
  "resourceType":"Observation",
  "id":"externalfhirid1234",
  "meta":{
    "lastUpdated":"2014-01-30T22:35:23+11:00",
    "versionId":"0",
    "source":"meta vision"
  },
  "identifier":[
    {
      "system":"http://dips.no/fhir/namingsystem/externalId",
      "value":"External Id: testexternal98"
    },
    {
      "system":"http://dips.no/fhir/namingsystem/external-fhirid",
      "value":"externalfhirid1234"
    }
```

```
  ],
  "extension":[
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bloodpressure-bodypositionextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"4801000202104",
        "display":"Liggende"
      }
    },
    {
      "url":"http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-cuffsizeextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"720738005",
        "display":"Store voksne"
      }
    },
    {
      "url":"http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-diastolicendpointextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"1081881000202106",
        "display":"Fase V"
      }
    },
    {
      "url":"http://hl7.org/fhir/StructureDefinition/no-domain-vitalsignsobservation-sleepstatusextension",
      "valueCoding":{
        "system":"http://snomed.info/sct",
        "code":"248220008",
        "display":"Sovende"
      }
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-headtiltextension",
      "valueQuantity":{
        "value":"20",
        "unit":"deg"
      }
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bloodpressure-systolicformulaextension",
```

```
      "valueString":"sample text a"
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bloodpressure-diastolicformulaextension",
      "valueString":"sample text b"
    },
    {
      "url":"http://hl7.no/fhir/StructureDefinition/no-domain-vitalsignsobservation-bloodpressure-meanarterialformulaextension",
      "valueString":"sample text c"
    }
  ],
  "status":"final",
  "code":{
    "coding":[
      {
        "system":"http://loinc.org",
        "code":"85354-9",
        "display":"Blood pressure (observable entity)"
      }
    ]
  },
  "category":[
    {
      "coding":[
        {
          "system":"http://terminology.hl7.org/CodeSystem/observation-category",
          "code":"vital-signs",
          "display":"vital-signs"
        }
      ]
    }
  ],
  "subject":{
    "identifier":[
      {
        "system":"http://dips.no/fhir/namingsystem/dips-patientid",
        "value":"1000807"
      }
    ]
  },
  "encounter":{
    "reference":"Encounter/agy1002679",
    "identifier":[
      {
        "system":"http://dips.no/fhir/namingsystem/dips-omsorgsepisodeid",
```

```
        "value":"1002679"
      }
    ]
  },
  "effectiveDateTime":"2021-05-30",
  "performer":[
    {
      "reference":"PractitionerRole/agb103",
      "identifier":[
        {
          "system":"urn:oid:1.3.6.1.4.1.9038.51.1",
          "value":"103"
        }
      ]
    },
    {
      "reference":"Organization/afa22",
      "identifier":[
        {
          "system":"urn:oid:1.3.6.1.4.1.9038.70.3",
          "value":"22"
        }
      ]
    }
  ],
  "note":{
    "text":"Demo Blood Pressure 1"
  },
  "bodySite":{
    "coding":[
      {
        "system":"http://snomed.info/sct",
        "code":"51636004",
        "display":"Ankel, venstre "
      }
    ]
  },
  "method":{
    "coding":[
      {
        "system":"http://snomed.info/sct",
        "code":"129434008",
        "display":"Palpasjon"
      }
    ]
  },
  "component":[
```

```
    {
      "code":{
        "fhir_comments":[
          " \n        Observations are often coded in multiple code systems.\n        - LOINC provides a very specific code (though not more specific in this particular case)\n        - snomed provides a clinically relevant code that is usually less granular than LOINC\n        - the source system provides its own code, which may be less or more granular than LOINC\n        ",
          "   that shows the concept. The next two codes only have a LOINC code   "
        ],
        "coding":[
          {
            "fhir_comments":[
              "loinc Codes   "
            ],
            "system":"http://loinc.org",
            "code":"8480-6",
            "display":"Systolic blood pressure"
          },
          {
            "fhir_comments":[
              "   Also, a local code specific to the source system   "
            ],
            "system":"http://acme.org/devices/clinical-codes",
            "code":"bp-s",
            "display":"Systolic Blood pressure"
          }
        ]
      },
      "valueQuantity":{
        "fhir_comments":[
          "   no standard units used in this example   "
        ],
        "value":120,
        "unit":"mm[Hg]",
        "system":"http://unitsofmeasure.org",
        "code":"mm[Hg]"
      }
    },
    {
      "code":{
        "coding":[
          {
            "system":"http://loinc.org",
            "code":"8462-4",
            "display":"Diastolic blood pressure"
          }
        ]
```

```
    },
    "valueQuantity":{
      "fhir_comments":[
        "   no formal units in this example   "
      ],
      "value":75,
      "unit":"mm[Hg]",
      "system":"http://unitsofmeasure.org",
      "code":"mm[Hg]"
    }
  },
  {
    "code":{
      "coding":[
        {
          "system":"http://loinc.org",
          "code":"8478-0",
          "display":"Mean arterial pressure (observable entity)"
        }
      ]
    },
    "valueQuantity":{
      "fhir_comments":[
        "   no formal units in this example   "
      ],
      "value":90,
      "unit":"mm[Hg]",
      "system":"http://unitsofmeasure.org",
      "code":"mm[Hg]"
    }
  },
  {
    "code":{
      "coding":[
        {
          "system":"http://snomed.info/sct",
          "code":"4461000202102",
          "display":"The difference between the systolic and diastolic pressure."
        }
      ]
    },
    "valueQuantity":{
      "fhir_comments":[
        "   no formal units in this example   "
      ],
      "value":45,
      "unit":"mm[Hg]",
```

```
        "system":"http://unitsofmeasure.org",
        "code":"mm[Hg]"
      }
    }
  ]
}
```

4.3.2. Sample PUT Response after updating a vital sign

Output

- A complete Observation object is received from the json response and it can be viewed from a Read Operation request.

4.4. Read Operation

This section describes the properties of the Read method in DIPS FHIR Observation for the vital signs.

- Auth-Ticket = Valid ticket from the database
- Content-type = application/json
- Method = GET
- URL = https://{SERVER}/DIPS-WebAPI/HL7/FHIR-R4/Observation/{FhirId}?_profile=DIPSVitalSignsObservation

Fhirid can be used to read back the Observation.

4.5. Search Operation

This section describes the properties of the Search method in DIPS FHIR Observation for the vital signs.

- Auth-Ticket = Valid ticket from the database
- Content-type = application/json
- Method = GET
- URL = https://{SERVER}/DIPS-WebAPI/HL7/FHIR-R4/Observation?{SearchParameters}&_profile=DIPSVitalSignsObservation

Table 5. Search Parameters

Parameter	Description	Example
patient	Search by Patient Id	cdp1000807
Fhirid	Search by DIPS Fhir Id	751fcbb9-ba36-1045-acd5-efc7f0c422e1
code	Search by code	8302-2
externalFhirid	Search by External Fhir Id	testid_BMI

Parameter	Description	Example
patient.identifier	Search by DIPS Patient id, National id or a system value followed by National id	cdp<PID>, <NationalId>, urn:oid:2.16.578.1.12.4.1.4.1|<NationalId> , urn:oid:2.16.578.1.12.4.1.4.2|<NationalId>, urn:oid:2.16.578.1.12.4.1.4.3|<NationalId>
effectiveDateTime	Search by Effective Date Time	lt2021-05-31, gt2021-05-10

4.6. Example Requests

4.6.1. Read Observation by FHIR ID

```
GET .../Observation/<FHIRID>?_profile=DIPSVitalSignsObservation
```

4.6.2. Get Observation by patient

```
GET .../Observation?patient=cdp<PatientId>&_profile=DIPSVitalSignsObservation
```

4.6.3. Get Observation by the patient with paging

```
GET
.../Observation?patient=cdp<PatientId>&_profile=DIPSVitalSignsObservation&page=1&_count=100
```

Paging works independently of search parameters, where if not specified explicitly, default paging parameter values are taken from the web.config file.

- _count : No of records Per single page (DEFAULT = 100)
- page : Required page number

4.6.4. Get Observation by patient.identifier

```
GET .../Observation?patient.identifier=cdp<PatientId>&_profile=DIPSVitalSignsObservation
```

```
GET .../Observation?patient.identifier=<NationalId>&_profile=DIPSVitalSignsObservation
```

```
GET
.../Observation?patient.identifier=urn:oid:2.16.578.1.12.4.1.4.1|<NationalId>&_profile=DIPSVitalSigns
Observation
```

4.6.5. Get Observation by FHIR ID

GET .../Observation?_profile=DIPSVitalSignsObservation&Fhirid=<Fhirid>

4.6.6. Get Observation by code

GET .../Observation?_profile=DIPSVitalSignsObservation&code=85354-9

GET .../Observation?_profile=DIPSVitalSignsObservation&code=29463-7

4.6.7. Get Observation by code and patient

GET .../Observation?_profile=DIPSVitalSignsObservation&patient=cdp<PatientId>&code=85354-9

GET .../Observation?_profile=DIPSVitalSignsObservation&patient=cdp<PatientId>&code=29463-7

4.6.8. Get Observation by the patient, code, and effectiveDateTime

GET .../Observation?_profile=DIPSVitalSignsObservation&patient=cdp<PatientId>&code=85354-9&effectiveDateTime=lt2021-05-31

GET .../Observation?_profile=DIPSVitalSignsObservation&patient=cdp<PatientId>&code=85354-9&effectiveDateTime=gt2021-05-10

GET .../Observation?_profile=DIPSVitalSignsObservation&patient=cdp<PatientId>&code=85354-9&effectiveDateTime=gt2020-12-10&effectiveDateTime=lt2021-06-01

4.6.9. Get Observation by external FHIR ID

GET .../Observation?_profile=DIPSVitalSignsObservation&externalFhirid=<ExternalFhirid>

DIPS AS
Postboks 1435
8037 Bodø
Norway
https://www.dips.no
+47 75 59 20 00