RESOURCE AND PATIENT MANAGEMENT SYSTEM

Electronic Health Record

FHIR® API Access
(4DH FHIR® APIs)

API Technical Manual

FHIR® R4, USCDI v1.0

Version 1.0
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Office of Information Technology

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Table of Contents

Revision History

Version	Date	Author	Section	Page Number	Summary of Change
0.1	7/31/2022	Kathleen Keats	All	All	Baseline document
0.2	8/9/2022	Chris Blair	All	All	Review for accuracy
0.3	8/10/2022	Cynthia Bolognese	All	All	edit, proof, update for 508 compliance
1.0		Cynthia Bolognese	All	All	Ready for publication

1.0   Introduction

This document describes the SMART on FHIR® Application Programming Interface (API) for patient data access from the Four Directions Hub (4DH) Health Information Exchange, a part of the Certified Electronic Health Record (EHR).

This document provides an overview of the FHIR® APIs available from the Indian Health Service (IHS) 4DH system. This guide is applicable for third-party developers creating applications.

2.0   Requirements and Attributes

The FHIR® R4 resources listed here align with the United States Core Data for Interoperability (USCDI) v1 data elements.

2.1   Software Components and Configurations

IHS does not specify required software components to implement the IHS 4DH FHIR® API's.

The following components are required to interact with the IHS 4DH FHIR® API's:

- The HL7 standards as defined by US Core 3.1.1 / USCDI v1, SMART App Launch 1.0.0, and/or Bulk Data 1.0.1.

- To test your application, include a REST client, such as Postman, or a high-level language that can make HTTP requests according to the specified standards.

2.2   Application Registration Requirements and Attributes

IHS uses SMART on FHIR® to provide secure access to patient data.

An application client can be dynamically registered with the SMART on FHIR® authorization system by providing the following attributes as defined in the OpenID Connect Dynamic Client Registration specifications 1.0 – draft 19.

- application_type

- redirect_uris

- client_name

- logo_uri

- subject_type_sector_identification_uri

- token_endpoint_auth_method

- jwks_uri

- userinfo_encrypted_response_alg

- user_encrypted_response_enc

- contacts

- and request_uris.

3.0   4DH API URLs

In order to use the 4DH APIs to retrieve valid data, the user must be a registered patient or provider. Developers wishing to develop or run their applications against demo data in the 4DH system, should contact ITsupport@ihs.gov. 4DH API endpoints are list in Table 1.

Table 1: 4DH API Endpoints

URL	Address
Single Patient EndPoint [Base_URL]	https://ihs4dhapim.ihs.gov/FHIR/r4
Multi-patient Bulk FHIR® EndPoint	https://ihs4dhapim.ihs.gov/bulkFHIR/r4

4.0   Terms and Conditions

Terms and Conditions Summary

The Indian Health Service (IHS) hosts a health information exchange for Indian health facilities. The health information exchange enables providers in IHS, Tribal and Urban sites to view data on shared patients within the Four Directions Hub (4DH) system. 4DH also provides the capability for bi-directional queries with external entities, such as the Veterans Administration, through the nationwide eHealth Exchange.

Most of the 4DH functionality supports matching of patient records and the treatment of patients by using the consolidated patient health information with external queries. The external query is not consolidated into the 4DH and is available for providers only during the session. 4DH provides a way for patients to obtain health information by using an application that can utilize an API (4DH FHIR®™ API), based on the HL7 FHIR®™ specifications.

Security of Information

The 4DH and its API is an IHS U.S. Government Information system that contains sensitive patient health information and is for use by authorized users only. All patient information viewed with the 4DH is strictly confidential and is subject to the protection of the Health Insurance Portability and Accountability Act of 1996 (HIPAA) (Pub. L. 104-191, Aug 21, 1996, 110 Stat. 1936); 45 CFR, Parts 160 and 164; and the Health Information Technology for Economic and Clinical Health (HITECH) Act (Pub. L. 111-5, Feb 17, 2009). The patient information is also subject to the Privacy Act of 1974, as amended (5 U.S.C. § 552a) and the security regulations pursuant to HIPAA and other government security regulations.

Agreement & Disclaimers

I. General Disclaimer

The IHS provides this suite of application subject to the following Terms and Conditions. You must agree to these Terms and Conditions to access 4DH.

IHS use and disclosure of patients' health information is limited as required by federal law. IHS reserves the right to perform statistical analyses of user behavior and characteristics to measure interest in and use of the various areas of the site. IHS may at times share aggregate information (i.e., anonymous, statistical data) about usage within the IHS for quality assurance audits and IHS program administrative needs.

II. Medical Disclaimer

The information provided by the IHS 4DH is based on the official health record at the time it was last updated from the facilities. Any incorrect information should be referred to the individual facilities.

III. Download

Downloading of the information obtained in an external query is possible. If you do download, you are advised to take actions to protect the patient's health information.

IV. Changes to HIE Terms and Conditions
The HIE Terms and Conditions may be revised according to the MPA.

5.0   FHIR® Mapping

The following sections describe FHIR® R4 resources available with the 4DH APIs. Access to data is only for authorized patients and providers.

IHS uses SMART on FHIR® to provide secure access to patient data.

For a full list of capabilities, see the FHIR CapabilityStatement at the [Base_url]/metadata.

5.1   USCDI: Patient Demographics

5.1.1   FHIR® Resource: Patient

The [Base_URL] is listed in Table 1.

Search Expression: SearchType

Parameters: _id [token], identifier [token], birthdate [date], gender [token], family [token], given [string], name [string], us-core-race [token], us-core-ethnicity [token]

Syntax:

- **GET** [Base_URL]/Patient/_search?patient=[id]
- **GET** [Base_URL]/Patient/[id]
- **GET** [Base_URL]/Patient?identifier=[id]
- **GET** [Base_URL]/Patient?name=[string]
- **GET** [Base_URL]/Patient?family=[string]
- **GET** [Base_URL]/Patient?given=[string]
- **GET** [Base_URL]/Patient?us-core-race=[string]
- **GET** [Base_URL]/Patient?us-core-ethnicity=[string]
- **GET** [Base_URL]/Patient?birthdate=[date]&name=[string]
- **GET** [Base_URL]/Patient?gender={system|}[code]&name=[string]
- **POST** [Base_URL]/Patient/_search (parameters are x-www-form-urlencoded)

Example Request: **GET** [Base_URL]/Patient?family=Newman

Example Response:
```
{
  "resourceType": "Bundle",
  "id": "1aa6482d-7495-4720-80eb-152a4539e7fa",
  "type": "searchset",
```

```
        "timestamp": "2022-07-26T19:15:59Z",
        "total": 1,
        "link": [
            {
                "relation": "self",
                "url": "https://ihs4dhapim.ihs.gov/fhir/r4/Patient?family=newman"
            }
        ],
        "entry": [
            {
                "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/Patient/100000026",
                "resource": {
                    "resourceType": "Patient",
                    "address": [
                        {
                            "city": "BEAVERTON",
                            "line": [
                                "1357 AMBER DR."
                            ],
                            "postalCode": "97006",
                            "state": "OR"
                        },
                        {
                            "city": "BEAVERTON",
                            "line": [
                                "1357 AMBER DR"
                            ],
                            "postalCode": "97006",
                            "state": "OR"
                        },
                        {
                            "city": "BEAVERTON",
                            "line": [
                                "1357 AMBER DRIVE"
                            ],
                            "postalCode": "97006",
                            "state": "OR"
                        },
                        {
                            "city": "BEAVERTON",
                            "line": [
                                "1357-E1 Amber Drive"
                            ],
                            "postalCode": "97006",
                            "state": "OR"
```

```
          }
        ],
        "birthDate": "1970-05-01",
        "communication": [
          {
            "language": {
              "coding": [
                {
                  "code": "en",
                  "display": "ENGLISH",
                  "system": "urn:oid:1.0.639.1"
                }
              ]
            },
            "preferred": true
          }
        ],
        "extension": [
          {
            "extension": [
              {
                "url": "ombCategory",
                "valueCoding": {
                  "code": "2106-3",
                  "display": "WHITE",
                  "system": "urn:oid:2.16.840.1.113883.6.238"
                }
              },
              {
                "url": "ombCategory",
                "valueCoding": {
                  "code": "2108-9",
                  "display": "EUROPEAN",
                  "system": "urn:oid:2.16.840.1.113883.6.238"
                }
              },
              {
                "url": "ombCategory",
                "valueCoding": {
                  "code": "1002-5",
                  "display": "AMERICAN INDIAN OR ALASKA NATIVE",
                  "system": "urn:oid:2.16.840.1.113883.6.238"
                }
              },
              {
```

```
                           "url": "text",
                           "valueString": "WHITE, EUROPEAN, AMERICAN INDIAN
OR ALASKA NATIVE"
                         }
                       ],
                       "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-race"
                     },
                     {

                       "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-birthsex",
                       "valueCode": "F"
                     },
                     {

                       "url": "http://intersystems.com/fhir/extn/sda3/lib/patient-entered-on",
                       "valueDateTime": "2022-07-22T11:27:59-06:00"
                     },
                     {

                       "extension": [
                         {
                           "url": "ombCategory",
                           "valueCoding": {
                              "code": "2186-5",
                              "display": "NOT HISPANIC OR LATINO",
                              "system": "urn:oid:2.16.840.1.113883.6.238"
                           }
                         },
                         {
                           "url": "text",
                           "valueString": "NOT HISPANIC OR LATINO"
                         }
                       ],
                       "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-
ethnicity"
                     }
                   ],
                   "gender": "female",
                   "identifier": [
                     {
                       "system": "urn:oid:2.16.840.1.113883.3.454.90411",
                       "type": {
                         "coding": [
                           {
                              "code": "PI",
                              "system": "http://terminology.hl7.org/CodeSystem/v2-0203"
                           }
                         ],
```

```
                    "text": "MPIID"
                  },
                  "value": "100000026"
                }
            ],
            "maritalStatus": {
              "coding": [
                {
                  "code": "M",
                  "system": "http://terminology.hl7.org/CodeSystem/v3-
MaritalStatus"
                }
              ]
            },
            "name": [
              {
                "family": "JONES",
                "given": [
                  "ALICIA"
                ],
                "text": "ALICIA JONES"
              },
              {
                "family": "NEWMAN",
                "given": [
                  "ALICIA"
                ],
                "text": "ALICIA NEWMAN"
              },
              {
                "family": "NEWMAN",
                "given": [
                  "ALICIA",
                  "JONES"
                ],
                "text": "ALICIA JONES NEWMAN"
              },
              {
                "family": "NEWMAN",
                "given": [
                  "ATHENA",
                  "JONES"
                ],
                "text": "ATHENA JONES NEWMAN"
              },
```

```json
    {
      "family": "ALICIA",
      "given": [
        "ALICE",
        "JONES"
      ],
      "text": "ALICE JONES ALICIA"
    },
    {
      "family": "NEWMAN",
      "given": [
        "ANNA",
        "JONES"
      ],
      "text": "ANNA JONES NEWMAN"
    },
    {
      "family": "NEWMAN",
      "given": [
        "ALICE",
        "JONES"
      ],
      "text": "ALICE JONES NEWMAN",
      "use": "official"
    }
  ],
  "telecom": [
    {
      "system": "phone",
      "use": "home",
      "value": "+1(555)-723-1544"
    },
    {
      "system": "phone",
      "use": "mobile",
      "value": "+1(555)-444-1234"
    }
  ],
  "id": "100000026",
  "meta": {
    "lastUpdated": "2022-07-22T17:28:09Z",
    "versionId": "24"
  }
},
"search": {
```

```
        "mode": "match"
      }
    }
  ]
}
```

5.2   USCDI: Problem List

5.2.1   FHIR® Resource: Condition

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: patient [reference], subject [reference], category [token], clinical-status [token], code [token], onset-date [date], abatement-date [date]

Syntax:

- **GET** [Base_URL]/Condition/[id]

- **GET** [Base_URL]/Condition?patient=[id]

- **GET** [Base_URL]/Condition?subject=[id]

- **GET** [Base_URL]/Condition?category=[code]

- **GET** [Base_URL]/Condition?clinical-status=[code]

- **GET** [Base_URL]/Condition?code=[code]

- **GET** [Base_URL]/Condition?onset-date=[date]&abatement-date=[date]

- **POST** [Base_URL]/Condition/_search (parameters are x-www-form-urlencoded)

Example Request: **GET** [Base_URL]/Condition?patient=100000026

Example Response:
```
{
  "resourceType": "Bundle",
  "id": "3837c759-9917-4fff-a93d-f48ee35d406e",
  "type": "searchset",
  "timestamp": "2022-07-26T19:18:07Z",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://ihs4dhapim.ihs.gov/fhir/r4/Condition?patient=100000026"
    }
  ],
```

```
        "entry": [
          {
            "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/Condition/196",
            "resource": {
              "resourceType": "Condition",
              "category": [
                {
                  "coding": [
                    {
                      "code": "55607006",
                      "display": "Problem",
                      "system": "http://snomed.info/sct"
                    }
                  ],
                  "extension": [
                    {
                      "url": "http://intersystems.com/fhir/extn/sda3/lib/code-table-
translated-prior-codes",
                      "valueCodeableConcept": {
                        "coding": [
                          {
                            "code": "75326-9",
                            "display": "Problem",
                            "system": "http://loinc.org"
                          }
                        ],
                        "text": "A"
                      }
                    }
                  ]
                }
              ],
              "clinicalStatus": {
                "coding": [
                  {
                    "code": "active",
                    "system": "http://terminology.hl7.org/CodeSystem/condition-
clinical"
                  }
                ]
              },
              "code": {
                "coding": [
                  {
                    "code": "386661006",
```

```
          "display": "Fever",
          "system": "http://snomed.info/sct"
        }
      ]
    },
    "extension": [
      {
        "url": "http://intersystems.com/fhir/extn/sda3/lib/problem-entered-at",
        "valueReference": {
          "reference": "Organization/57"
        }
      }
    ],
    "note": [
      {
        "text": "Fever"
      }
    ],
    "onsetDateTime": "2020-01-21T00:00:00-06:00",
    "subject": {
      "reference": "Patient/100000026"
    },
    "id": "196",
    "meta": {
      "lastUpdated": "2022-07-05T15:21:44Z",
      "versionId": "1"
    }
  },
  "search": {
    "mode": "match"
  }
}
]
}
```

5.3   USCDI: Procedures

5.3.1   FHIR® Resource: Procedure

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: identifier [token], patient [reference], subject [reference], performer [reference], status [token], code [token], date [date]

Syntax:

- **GET** [Base_URL]/Procedure/[id]

- **GET** [Base_URL]/Procedure?identifier=[id]

- **GET** [Base_URL]/Procedure?patient=[id]

- **GET** [Base_URL]/Procedure?subject=[id]

- **GET** [Base_URL]/Procedure?performer=[id]

- **GET** [Base_URL]/Procedure?status=[code]

- **GET** [Base_URL]/Procedure?code=[code]

- **GET** [Base_URL]/Procedure?date=[date]

- **POST** [Base_URL]/Procedure/_search (parameters are x-www-form-urlencoded)

Example Request: **GET** [Base_URL]/Procedure?patient=100000026

Example Response:

```
{
  "resourceType": "Bundle",
  "id": "b1f27cc0-cd60-4e69-8cdc-1846135c960e",
  "type": "searchset",
  "timestamp": "2022-07-26T19:18:41Z",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://ihs4dhapim.ihs.gov/fhir/r4/Procedure?patient=100000026"
    }
  ],
  "entry": [
    {
      "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/Procedure/204",
      "resource": {
        "resourceType": "Procedure",
        "code": {
          "coding": [
            {
              "code": "33224",
              "display": "Insertion Of Pacing Electrode, Cardiac Venous System,
For Left Ventricular Pacing, With Attachment To Previously Placed Pacemaker Or
Implantable Defibrillator P",
              "system": "urn:oid:2.16.840.1.113883.6.12"
            }
          ],
```

```json
                    "text": "Insertion Of Pacing Electrode, Cardiac Venous System, For Left
Ventricular Pacing, With Attachment To Previously Placed Pacemaker Or
Implantable Defibrillator P"
                  },
                  "extension": [
                    {
                        "url": "http://intersystems.com/fhir/extn/sda3/lib/procedure-entered-
at",
                        "valueReference": {
                          "reference": "Organization/57"
                        }
                    }
                  ],
                  "performedDateTime": "2020-01-17T11:11:08-07:00",
                  "status": "completed",
                  "subject": {
                    "reference": "Patient/100000026"
                  },
                  "id": "204",
                  "meta": {
                    "lastUpdated": "2022-07-05T15:21:44Z",
                    "versionId": "1"
                  }
              },
              "search": {
                "mode": "match"
              }
          },
          {
              "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/Procedure/2058",
              "resource": {
                "resourceType": "Procedure",
                "code": {
                  "coding": [
                      {
                        "code": "168731009",
                        "display": "Chest x-ray, PA and lateral",
                        "system": "http://snomed.info/sct"
                      }
                  ],
                  "text": "Chest x-ray, PA and lateral"
                },
                "extension": [
                  {
```

```
                    "url": "http://intersystems.com/fhir/extn/sda3/lib/procedure-entered-
           at",

                    "valueReference": {
                       "reference": "Organization/2055"
                    }
                 },
                 {
                    "url": "http://intersystems.com/fhir/extn/sda3/lib/procedure-entered-
           on",

                    "valueDateTime": "2022-07-21T12:00:00-06:00"
                 }
              ],
              "performedDateTime": "2022-07-15T13:10:24-06:00",
              "status": "completed",
              "subject": {
                 "reference": "Patient/100000026"
              },
              "id": "2058",
              "meta": {
                 "lastUpdated": "2022-07-21T20:06:20Z",
                 "versionId": "2"
              }
           },
           "search": {
              "mode": "match"
           }
        }
      ]
   }
```

5.4   USCDI: Smoking Status

5.4.1   FHIR® Resource: Observation

The [Base_URL] is listed in Table 1.

Search Expression: SearchType

Parameters: identifier [token], patient [reference], subject [reference], performer [reference], category [token], status [token], date [date]

Required parameter: code [token] with value "72166-2"

Syntax:

- **GET** [Base_URL]/Observation?patient=[id]&code=72166-2

- **POST** [Base_URL]/Observation/_search (parameters are x-www-form-urlencoded)

Example Request:
GET [Base_URL]/Observation?patient=100000026&code=72166-2

Example Response:
```
{
  "resourceType": "Bundle",
  "id": "63e88b4d-5a21-48be-94f1-924c9bf8b5e4",
  "type": "searchset",
  "timestamp": "2022-07-28T20:06:37Z",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://ihs4dhapim.ihs.gov/fhir/r4/Observation?code=72166-
2&patient=100000026"
    }
  ],
  "entry": [
    {
      "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/Observation/1300",
      "resource": {
        "resourceType": "Observation",
        "category": [
          {
            "coding": [
              {
                "code": "social-history",
                "display": "Social History",
                "system": "http://terminology.hl7.org/CodeSystem/observation-
category"
              }
            ],
            "text": "Social History"
          }
        ],
        "code": {
          "coding": [
            {
              "code": "72166-2",
              "display": "Tobacco smoking status NHIS",
              "system": "http://loinc.org"
            }
          ]
```

```
      },
      "effectivePeriod": {
         "end": "2022-07-22T00:00:00-05:00",
         "start": "2022-07-22T00:00:00-05:00"
      },
      "issued": "2022-07-22T12:00:00-06:00",
      "performer": [
         {
            "reference": "Organization/426"
         }
      ],
      "status": "final",
      "subject": {
         "reference": "Patient/100000026"
      },
      "id": "1300",
      "valueCodeableConcept": {
         "coding": [
            {
               "system": "http://terminology.hl7.org/CodeSystem/data-absent-
reason",
               "code": "unknown",
               "display": "Unknown"
            }
         ]
      },
      "meta": {
         "lastUpdated": "2022-07-28T17:49:51Z",
         "versionId": "1"
      }
   },
   "search": {
      "mode": "match"
   }
}
]
}
```

5.5   USCDI: Vital Signs

5.5.1   FHIR® Resource: Observation

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: identifier [token], patient [reference], subject [reference], performer [reference], category [token], status [token], date [date]

Required parameter: category [token] with value "vital-signs"

Syntax:

- **GET** [Base_URL]/Observation?patient=[id]&category=vital-signs&date=geYYYY-MM-DD&date=leYYYY-MM-DD

- **POST** [Base_URL]/Observation/_search (parameters are x-www-form-urlencoded)

Example Request:
GET [Base_URL]/Observation?patient=100000026&category=vital-signs&date=ge2015-06-01&date=le2015-06-22

Example Response:
```
{
  "resourceType": "Bundle",
  "id": "249eef52-2a98-46ef-abde-20c2aa1f6cd0",
  "type": "searchset",
  "timestamp": "2022-07-26T19:19:26Z",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://ihs4dhapim.ihs.gov/fhir/r4/Observation?category=vital-signs&date=ge2015-06-01&date=le2015-06-22&patient=100000026"
    }
  ],
  "entry": [
    {
      "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/Observation/192",
      "resource": {
        "resourceType": "Observation",
        "category": [
          {
            "coding": [
              {
                "code": "vital-signs",
                "display": "Vital Signs",
                "system": "http://terminology.hl7.org/CodeSystem/observation-category"
              }
            ],
            "text": "Vital Signs"
```

```
            }
          ],
          "code": {
            "coding": [
              {
                "code": "8867-4",
                "display": "Heart Rate",
                "system": "http://loinc.org"
              }
            ],
            "extension": [
              {
                "url": "http://intersystems.com/fhir/extn/sda3/lib/code-table-detail-
observation-observation-value-units",
                "valueCodeableConcept": {
                  "coding": [
                    {
                      "code": "/min",
                      "display": "/min"
                    }
                  ]
                }
              }
            ]
          },
          "effectiveDateTime": "2015-06-22T10:10:00-05:00",
          "extension": [
            {
              "url": "http://intersystems.com/fhir/extn/sda3/lib/observation-entered-
at",
              "valueReference": {
                "reference": "Organization/57"
              }
            }
          ],
          "status": "unknown",
          "subject": {
            "reference": "Patient/100000026"
          },
          "valueQuantity": {
            "code": "/min",
            "system": "http://unitsofmeasure.org",
            "unit": "/min",
            "value": 80
          },
```

```
            "id": "192",
            "meta": {
                "lastUpdated": "2022-07-05T15:21:43Z",
                "versionId": "1"
            }
        },
        "search": {
            "mode": "match"
        }
    }
  ]
}
```

5.6   USCDI: Laboratory Results

5.6.1   FHIR® Resource: Observation

The [Base_URL] is listed in Table 1.

Search Expression: SearchType

Parameters: identifier [token], patient [reference], subject [reference], performer [reference], status [token], code [token], date [date]

Required parameter: category [token] with value "laboratory"

Syntax:

- **GET** [Base_URL]/Observation/[id]

- **GET** [Base_URL]/Observation?category=laboratory

- **GET** [Base_URL]/Observation?patient=[id]&category=laboratory&code={system|}[code]

- **GET** [Base_URL]/Observation?patient=[id]&category=laboratory&date=geYYYY-MM-DD&date=leYYYY-MM-DD

- **POST** [Base_URL]/Observation/_search (parameters are x-www-form-urlencoded)

Example Request:
GET [Base_URL]/Observation?patient=100000026&category=laboratory&code=5778-6

Example Response:
```
{
    "resourceType": "Bundle",
    "id": "2c1b7208-0ce4-4720-b673-9070b524162e",
```

```
    "type": "searchset",
    "timestamp": "2022-07-28T20:19:13Z",
    "total": 1,
    "link": [
        {
            "relation": "self",
            "url":
"https://ihs4dhapim.ihs.gov/fhir/r4/Observation?category=laboratory&code=5778-
6&patient=100000026"
        }
    ],
    "entry": [
        {
            "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/Observation/1057",
            "resource": {
                "resourceType": "Observation",
                "category": [
                    {
                        "coding": [
                            {
                                "code": "laboratory",
                                "system": "http://terminology.hl7.org/CodeSystem/observation-
category"
                            }
                        ]
                    }
                ],
                "code": {
                    "coding": [
                        {
                            "code": "5778-6",
                            "display": "Color of Urine",
                            "system": "http://loinc.org"
                        }
                    ],
                    "extension": [
                        {
                            "url": "http://intersystems.com/fhir/extn/sda3/lib/code-table-detail-
lab-test-item-is-numeric",
                            "valueBoolean": true
                        },
                        {
                            "url": "http://intersystems.com/fhir/extn/sda3/lib/code-table-detail-
lab-test-item-original-text",
                            "valueString": "Color of Urine [5778-6]"
```

```
                    }
                ]
            },
            "effectiveDateTime": "2022-05-27T06:16:02-06:00",
            "performer": [
                {
                    "reference": "Organization/1056"
                }
            ],
            "referenceRange": [
                {
                    "text": "YELLOW"
                }
            ],
            "status": "final",
            "subject": {
                "reference": "Patient/100000026"
            },
            "valueString": "YELLOW",
            "id": "1057",
            "_issued": {
                "extension": [
                    {
                        "url": "http://hl7.org/fhir/StructureDefinition/data-absent-reason",
                        "valueCode": "unknown"
                    }
                ]
            },
            "meta": {
                "lastUpdated": "2022-07-28T17:49:48Z",
                "versionId": "1"
            }
        },
        "search": {
            "mode": "match"
        }
    }
  ]
}
```

5.7   USCDI: Laboratory Tests

5.7.1   FHIR® Resource: DiagnosticReport

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: patient [reference], status [token], code [token], date [date]

Required parameter: category [token] with value "lab"

Syntax:

- **GET** [Base_URL]/DiagnosticReport?category=lab

- **GET** [Base_URL]/DiagnosticReport?category=lab&patient=[id]

- **GET** [Base_URL]/DiagnosticReport?category=lab&patient=[id]&code={system|}[code]

- **GET** [Base_URL]/DiagnosticReport?category=laboratory&patient=[id]&date=ge YYYY-MM-DD&date=leYYYY-MM-DD

- **POST** [Base_URL]/DiagnosticReport/_search (parameters are x-www-form-urlencoded)

Example Request:
GET [Base_URL]/DiagnosticReport?category=lab&patient=100000026

Example Response:
```
{
 "resourceType": "Bundle",
 "id": "3680527a-0665-463e-9ad5-abaef0a20bdc",
 "type": "searchset",
 "timestamp": "2022-07-27T14:58:21Z",
 "total": 2,
 "link": [
   {
     "relation": "self",
     "url":
"https://ihs4dhapim.ihs.gov/fhir/r4/DiagnosticReport?category=LAB&patient=100000139"
   }
 ],
 "entry": [
   {
     "fullUrl":
"https://ihs4dhapim.ihs.gov/fhir/r4/DiagnosticReport/EDWAVWEEED2CEQAXS7ZSGEUUF6YLQ5P4",
     "resource": {
       "resourceType": "DiagnosticReport",
       "basedOn": [
         {
```

```
      "reference":
"ServiceRequest/EDWAVWEEED2CEQAXS7ZSGEUUF6YLQ5P4"
        }
      ],
      "category": [
        {
          "coding": [
            {
              "code": "LAB",
              "display": "Laboratory",
              "system": "http://terminology.hl7.org/CodeSystem/v2-0074"
            }
          ],
          "text": "Laboratory"
        }
      ],
      "code": {
        "coding": [
          {
            "code": "_PATHOLOGY REPORT",
            "display": "_PATHOLOGY REPORT"
          }
        ]
      },
      "effectivePeriod": {
        "start": "2022-05-23T15:15:41-05:00"
      },
      "extension": [
        {
          "url": "http://intersystems.com/fhir/extn/sda3/lib/lab-order-result-resultstatus",
          "valueString": "F"
        }
      ],
      "identifier": [
        {
          "extension": [
            {
              "url": "http://intersystems.com/fhir/extn/sda3/lib/external-id-system",
              "valueString": "2.16.840.1.113883.3.454.90310.99999.18"
            }
          ],
          "system": "urn:oid:2.16.840.1.113883.3.454.90310.99999.18",
          "type": {
            "text": "ExternalId"
          },
```

```
      "use": "official",
      "value": "L4295237"
    },
    {
      "type": {
       "coding": [
         {
          "code": "FILL",
          "display": "Filler Identifier",
          "system": "http://terminology.hl7.org/CodeSystem/v2-0203"
         }
       ],
       "text": "FillerId"
      },
      "use": "official",
      "value": "E7F0488E-86E0-4955-8351-548751CC839C"
    },
    {
      "type": {
       "coding": [
         {
          "code": "PLAC",
          "display": "Placer Identifier",
          "system": "http://terminology.hl7.org/CodeSystem/v2-0203"
         }
       ],
       "text": "PlacerId"
      },
      "use": "official",
      "value": "15EFC510-6CF4-4DB0-AE42-FC85F2A13549"
    }
  ],
  "issued": "2022-05-23T15:15:41-05:00",
  "performer": [
    {
      "reference": "Practitioner/54"
    }
  ],
  "result": [
    {
      "reference": "Observation/91"
    }
  ],
  "status": "unknown",
  "subject": {
```

```
          "reference": "Patient/100000139"
         },
         "id": "EDWAVWEEED2CEQAXS7ZSGEUUF6YLQ5P4",
         "meta": {
          "lastUpdated": "2022-07-05T13:01:06Z",
          "versionId": "1"
         }
        },
        "search": {
         "mode": "match"
        }
       },
       {
        "fullUrl":
"https://ihs4dhapim.ihs.gov/fhir/r4/DiagnosticReport/LYSRO5UYJXWNZ2TYBLW
V7GH4WZZJ67JT",
        "resource": {
         "resourceType": "DiagnosticReport",
         "basedOn": [
           {
            "reference":
"ServiceRequest/LYSRO5UYJXWNZ2TYBLWV7GH4WZZJ67JT"
           }
         ],
         "category": [
           {
            "coding": [
              {
               "code": "LAB",
               "display": "Laboratory",
               "system": "http://terminology.hl7.org/CodeSystem/v2-0074"
              }
            ],
            "text": "Laboratory"
           }
         ],
         "code": {
          "coding": [
            {
             "code": "57698",
             "display": "LIPID PANEL (R)",
             "system": "http://loinc.org"
            }
          ]
         },
```

```
    "effectivePeriod": {
     "start": "2022-04-29T14:06:28-05:00"
    },
    "extension": [
     {
      "url": "http://intersystems.com/fhir/extn/sda3/lib/lab-order-result-resultstatus",
      "valueString": "F"
     }
    ],
    "identifier": [
     {
      "extension": [
        {
         "url": "http://intersystems.com/fhir/extn/sda3/lib/external-id-system",
         "valueString": "2.16.840.1.113883.3.454.90310.99999.18"
        }
      ],
      "system": "urn:oid:2.16.840.1.113883.3.454.90310.99999.18",
      "type": {
       "text": "ExternalId"
      },
      "use": "official",
      "value": "L4294758"
     },
     {
      "type": {
       "coding": [
         {
          "code": "FILL",
          "display": "Filler Identifier",
          "system": "http://terminology.hl7.org/CodeSystem/v2-0203"
         }
       ],
       "text": "FillerId"
      },
      "use": "official",
      "value": "C3F897B4-97BE-456B-826F-4299844C31F9"
     },
     {
      "type": {
       "coding": [
         {
          "code": "PLAC",
          "display": "Placer Identifier",
          "system": "http://terminology.hl7.org/CodeSystem/v2-0203"
```

```
        }
      ],
      "text": "PlacerId"
    },
    "use": "official",
    "value": "4626D2BB-6713-40E5-849A-B06758952AFC"
  }
],
"issued": "2022-04-29T14:06:28-05:00",
"performer": [
  {
    "reference": "Practitioner/54"
  }
],
"result": [
  {
    "reference": "Observation/104"
  },
  {
    "reference": "Observation/105"
  },
  {
    "reference": "Observation/106"
  },
  {
    "reference": "Observation/107"
  },
  {
    "reference": "Observation/108"
  },
  {
    "reference": "Observation/109"
  }
],
"status": "unknown",
"subject": {
  "reference": "Patient/100000139"
},
"id": "LYSRO5UYJXWNZ2TYBLWV7GH4WZZJ67JT",
"meta": {
  "lastUpdated": "2022-07-05T13:01:06Z",
  "versionId": "1"
}
},
"search": {
```

```
      "mode": "match"
    }
  }
 ]
}
```

5.8   USCDI: Radiology Report

5.8.1   FHIR® Resource: DiagnosticReport

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: patient [reference], status [token], code [token], date [date]

Required parameter: category [token] with value "rad"

Syntax:

- **GET** [Base_URL]/DiagnosticReport?category=rad

- **GET** [Base_URL]/DiagnosticReport?category=rad&patient=[id]

- **GET** [Base_URL]/DiagnosticReport?category=rad&patient=[id]&code={system| }[code]

- **GET** [Base_URL]/DiagnosticReport?category=rad&patient=[id]&date=geYYYY -MM-DD&date=leYYYY-MM-DD

- **POST** [Base_URL]/DiagnosticReport/_search (parameters are x-www-form-urlencoded)

Example Request:
GET [Base_URL]/DiagnosticReport?category=rad&patient=100000026

Example Response:
```
{
  "resourceType": "Bundle",
  "id": "283a37dd-e41a-44b9-befa-e0bfc6eca14a",
  "type": "searchset",
  "timestamp": "2022-07-29T17:47:08Z",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url":
"https://ihs4dhapim.ihs.gov/fhir/r4/DiagnosticReport?category=rad&patient=1000000
26"
```

```
        }
      ],
      "entry": [
        {
          "fullUrl":
"https://ihs4dhapim.ihs.gov/fhir/r4/DiagnosticReport/2ZDBX3HLL6KZUGF5OMU
YQ2PVJSZ7Z5CK",
          "resource": {
            "resourceType": "DiagnosticReport",
            "basedOn": [
              {
                "reference":
"ServiceRequest/2ZDBX3HLL6KZUGF5OMUYQ2PVJSZ7Z5CK"
              }
            ],
            "category": [
              {
                "coding": [
                  {
                    "code": "RAD",
                    "display": "Radiology",
                    "system": "http://terminology.hl7.org/CodeSystem/v2-0074"
                  }
                ],
                "text": "Radiology"
              }
            ],
            "code": {
              "coding": [
                {
                  "code": "36643-5",
                  "display": "Chest XR 2V",
                  "system": "http://loinc.org"
                }
              ]
            },
            "effectivePeriod": {
              "start": "2022-07-21T00:00:00-05:00"
            },
            "extension": [
              {
                "url": "http://intersystems.com/fhir/extn/sda3/lib/rad-order-result-
resultstatus",
                "valueString": "F"
              }
```

```json
        ],
        "identifier": [
          {
            "extension": [
              {
                "url": "http://intersystems.com/fhir/extn/sda3/lib/external-id-
system",

                "valueString": "2.16.840.1.113883.3.454.90310.99999.18"
              }
            ],
            "system": "urn:oid:2.16.840.1.113883.3.454.90310.99999.18",
            "type": {
              "text": "ExternalId"
            },
            "use": "official",
            "value": "R47822"
          },

          {
            "type": {
              "coding": [
                {
                  "code": "FILL",
                  "display": "Filler Identifier",
                  "system": "http://terminology.hl7.org/CodeSystem/v2-0203"
                }
              ],
              "text": "FillerId"
            },
            "use": "official",
            "value": "93B5CD6A-5C0B-4A36-9B54-10FF4ACA6900"
          },
          {
            "type": {
              "coding": [
                {
                  "code": "PLAC",
                  "display": "Placer Identifier",
                  "system": "http://terminology.hl7.org/CodeSystem/v2-0203"
                }
              ],
              "text": "PlacerId"
            },
            "use": "official",
            "value": "F2860D12-655F-4C77-A3A7-F867CC63D057"
          }
```

```
                          ],
                          "issued": "2022-07-21T00:00:00-05:00",
                          "presentedForm": [
                              {
                                  "contentType": "text/plain",
                                  "data":
"THVuZ3MgYXJlIGNsb3VkeS4gQ29uc2lzdGVudCB3aXRoIHBuZXVtb25pYS4="
,
                                  "extension": [
                                      {
                                          "url": "http://intersystems.com/fhir/extn/sda3/lib/result-entered-
at",
                                          "valueReference": {
                                              "reference": "Organization/426"
                                          }
                                      },
                                      {
                                          "url": "http://intersystems.com/fhir/extn/sda3/lib/result-
performed-at",
                                          "valueReference": {
                                              "reference": "Organization/1161"
                                          }
                                      },
                                      {
                                          "url": "http://intersystems.com/fhir/extn/sda3/lib/result-result-
status",
                                          "valueString": "F"
                                      },
                                      {
                                          "url": "http://intersystems.com/fhir/extn/sda3/lib/result-result-
type",
                                          "valueString": "IM"
                                      }
                                  ]
                              }
                          ],
                          "status": "unknown",
                          "subject": {
                              "reference": "Patient/100000026"
                          },
                          "id": "2ZDBX3HLL6KZUGF5OMUYQ2PVJSZ7Z5CK",
                          "meta": {
                              "lastUpdated": "2022-07-28T17:49:50Z",
                              "versionId": "1"
                          }
```

```
        },
        "search": {
            "mode": "match"


    }
  }
 ]
}
```

5.9　USCDI: Goals

5.9.1　FHIR® Resource: Goal

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: identifier [token], patient [reference], subject [reference], category [token], lifecycle-status [token], start-date [date], target-date [date]

Syntax:

- **GET** [Base_URL]/Goal/[id]

- **GET** [Base_URL]/Goal?patient=[id]

- **POST** [Base_URL]/Goal/_search (parameters are x-www-form-urlencoded)

Example Request: **GET** [Base_URL]/Goal?patient=100000026

Example Response:
```
{
  "resourceType": "Bundle",
  "id": "183af6e7-1230-498b-8deb-d0a68f476a6a",
  "type": "searchset",
  "timestamp": "2022-07-26T19:20:59Z",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://ihs4dhapim.ihs.gov/fhir/r4/Goal?patient=100000026"
    }
  ],
  "entry": [
    {
```

```
        "fullUrl":
"https://ihs4dhapim.ihs.gov/fhir/r4/Goal/WBOO56GBYMCE6MFPN4L23B4TJ36W
U7IQ",
        "resource": {
          "resourceType": "Goal",
          "description": {
            "text": "\r\n                Get rid of intermittent fever that is occurring
every few weeks.\r\n             "
          },
          "identifier": [
            {
              "extension": [
                {
                  "url": "http://intersystems.com/fhir/extn/sda3/lib/external-id-
system",
                  "valueString": "2.16.840.1.113883.3.454.90310.99999.32"
                }
              ],
              "system": "urn:oid:2.16.840.1.113883.3.454.90310.99999.32",
              "type": {
                "text": "ExternalId"
              },
              "use": "official",
              "value": "T"
            }
          ],
          "lifecycleStatus": "active",
          "subject": {
            "reference": "Patient/100000026"
          },
          "target": [
            {
              "detailCodeableConcept": {
                "text": "Get rid of intermittent fever that is occurring every few
weeks."
              },
              "measure": {
                "coding": [
                  {
                    "code": "52685-5",
                    "display": "Care goals documented",
                    "system": "http://loinc.org"
                  }
                ]
              }
```

```
            }
        ],
        "id": "WBOO56GBYMCE6MFPN4L23B4TJ36WU7IQ",
        "meta": {
            "lastUpdated": "2022-07-22T00:01:01Z",
            "versionId": "8"
        }
    },
    "search": {
        "mode": "match"
    }
  }
 ]
}
```

5.10   USCDI: Immunizations Information

5.10.1 FHIR® Resource: Immunization

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: identifier [token], patient [reference], performer [reference], status [token], date [date], vaccine-code [token]

Syntax:

- **GET** [Base_URL]/Immunization/[id]

- **GET** [Base_URL]/Immunization?patient=[id]&date=geYYYY-MM-DD&date=leYYYY-MM-DD

- **POST** [Base_URL]/Immunization/_search (parameters are x-www-form-urlencoded)

Example Request: **GET** [Base_URL]Immunization?patient=100000026

Example Response:
```
{
  "resourceType": "Bundle",
  "id": "820fb36a-dc5d-4f78-a5f7-c8c7011be7da",
  "type": "searchset",
  "timestamp": "2022-07-26T19:22:12Z",
  "total": 1,
  "link": [
```

```
                 {
                    "relation": "self",
                    "url": "https://ihs4dhapim.ihs.gov/fhir/r4/Immunization?patient=100000026"
                 }
              ],
              "entry": [
                 {
                    "resource": {
                       "resourceType": "OperationOutcome",
                       "issue": [
                          {
                             "severity": "warning",
                             "code": "incomplete",
                             "diagnostics": "<HSODSErr>MissingData",
                             "details": {
                                "text": "At least one Immunization resource for this patient could
not be created due to a schema validation failure, therefore this result set may be
incomplete."
                             }
                          }
                       ]
                    },
                    "search": {
                       "mode": "outcome"
                    }
                 },
                 {
                    "fullUrl":
"https://ihs4dhapim.ihs.gov/fhir/r4/Immunization/2TP6IHQ75UXE5W6T6ADQ7X3
QQDQZO6CI",
                    "resource": {
                       "resourceType": "Immunization",
                       "extension": [
                          {
                             "url": "http://intersystems.com/fhir/extn/sda3/lib/vaccination-
duration",
                             "valueCodeableConcept": {
                                "coding": [
                                   {
                                      "code": "1d",
                                      "display": "1 day"
                                   }
                                ]
                             }
                          },
```

```
                  {
                    "url": "http://intersystems.com/fhir/extn/sda3/lib/vaccination-entered-
          at",
                    "valueReference": {
                      "reference": "Organization/57"
                    }
                  },
                  {
                    "url": "http://intersystems.com/fhir/extn/sda3/lib/vaccination-priority",
                    "valueCodeableConcept": {
                      "coding": [
                        {
                          "code": "N",
                          "display": "Normal"
                        }
                      ]
                    }
                  }
                ],
                "identifier": [
                  {
                    "extension": [
                      {
                        "url": "http://intersystems.com/fhir/extn/sda3/lib/external-id-
          system",
                        "valueString": "2.16.840.1.113883.3.454.90310.99999.20"
                      }
                    ],
                    "system": "urn:oid:2.16.840.1.113883.3.454.90310.99999.20",
                    "type": {
                      "text": "ExternalId"
                    },
                    "use": "official",
                    "value": "R15642"
                  },
                  {
                    "type": {
                      "coding": [
                        {
                          "code": "FILL",
                          "display": "Filler Identifier",
                          "system": "http://terminology.hl7.org/CodeSystem/v2-0203"
                        }
                      ],
                      "text": "FillerId"
```

```
        },
        "use": "official",
        "value": "F1561894-1C10-406E-B867-116E811446D3"
      },
      {
        "type": {
          "coding": [
            {
              "code": "PLAC",
              "display": "Placer Identifier",
              "system": "http://terminology.hl7.org/CodeSystem/v2-0203"
            }
          ],
          "text": "PlacerId"
        },
        "use": "official",
        "value": "628DDBC0-D903-47D3-8DC5-CC1EE8B334E8"
      }
    ],
    "occurrenceDateTime": "2022-07-22T00:00:00-05:00",
    "patient": {
      "reference": "Patient/100000026"
    },
    "status": "entered-in-error",
    "statusReason": {
      "coding": [
        {
          "code": "PATOBJ",
          "display": "patient objection"
        }
      ]
    },
    "vaccineCode": {
      "coding": [
        {
          "code": "166",
          "display": "influenza, intradermal, quadrivalent, preservative free,
injectable",
          "system": "http://hl7.org/fhir/sid/cvx"
        }
      ],
      "text": "INFLUENZA, intradermal, quadrivalent, preservative free"
    },
    "id": "2TP6IHQ75UXE5W6T6ADQ7X3QQDQZO6CI",
    "meta": {
```

```
                        "lastUpdated": "2022-07-22T17:28:10Z",
                        "versionId": "1"
                   }
               },
               "search": {
                   "mode": "match"


                   }
           }
       ]
   }
```

5.11   USCDI: Assessment and Plan of Treatment

5.11.1   FHIR® Resource: CarePlan

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: patient [reference], category [token], status [token], date [date]

Syntax:

- **GET** [Base_URL]/CarePlan/[id]

- **GET** [Base_URL]/CarePlan/[id]&category=assess-plan

- **GET** [Base_URL]/CarePlan?patient=[id]&category=assess-plan&status={system|}[code]&date=geYYYY-MM-DD&date=leYYYY-MM-DD

- **POST** [Base_URL]/CarePlan/_search (parameters are x-www-form-urlencoded)

Example Request: **GET**
[Base_URL]/CarePlan/patient=100000026&category=assess-plan

Example Response:
```
{
 "resourceType": "Bundle",
 "id": "b4510dc2-a257-433e-8eb4-d1346961e7de",
 "type": "searchset",
 "timestamp": "2022-07-27T14:57:46Z",
 "total": 1,
 "link": [
   {
     "relation": "self",
```

```
      "url": "https://ihs4dhapim.ihs.gov/fhir/r4/CarePlan?category=assess-
plan&patient=Patient/100000139"
    }
  ],
  "entry": [
    {
      "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/CarePlan/185",
      "resource": {
        "resourceType": "CarePlan",
        "category": [
          {
            "coding": [
              {
                "code": "assess-plan",
                "display": "AssessPlan",
                "system": "http://hl7.org/fhir/us/core/CodeSystem/careplan-category"
              }
            ]
          }
        ],
        "intent": "plan",
        "status": "active",
        "subject": {
          "reference": "Patient/100000139"
        },
        "text": {
          "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">This is a test care plan.
Normally these are going to be found in the text of the CCD.  We don't actually use
this container at IHS.</div>",
          "status": "additional"
        },
        "id": "185",
        "meta": {
          "lastUpdated": "2022-07-05T13:01:07Z",
          "versionId": "1"
        }
      },
      "search": {
        "mode": "match"
      }
    }
  ]
}
```

5.12   USCDI: Care Team Member(s)

5.12.1   FHIR® Resource: CareTeam

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: patient [reference], status [token]

Syntax:

- **GET** [Base_URL]/CareTeam/[id]

- **GET** [Base_URL]/CareTeam?patient=[id]&status={system|}[code]

- **POST** [Base_URL]/CareTeam/_search (parameters are x-www-form-urlencoded)

Example Request: **GET** [Base_URL]/CareTeam?patient=100000139&status=active

Example Response:
```
{
 "resourceType": "Bundle",
 "id": "7c9e4724-c514-4d6d-9039-2240924547b2",
 "type": "searchset",
 "timestamp": "2022-07-27T14:57:49Z",
 "total": 1,
 "link": [
   {
     "relation": "self",
     "url":
"https://ihs4dhapim.ihs.gov/fhir/r4/CareTeam?patient=100000139&status=active"
   }
 ],
 "entry": [
   {
     "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/CareTeam/24",
     "resource": {
       "resourceType": "CareTeam",
       "participant": [
         {
           "member": {
             "reference": "Practitioner/1807"
           },
           "role": [
             {
               "coding": [
                 {
```

```
            "code": "Primary",
            "display": "Primary Care Provider"
          }
        ]
      }
    ]
  }
],
"status": "active",
"subject": {
  "reference": "Patient/100000139"
},
"id": "24",
"meta": {
  "lastUpdated": "2022-07-15T17:12:44Z",
  "versionId": "2"
}
},
"search": {
  "mode": "match"
}
}
]
}
```

5.13   USCDI: Health Concerns

5.13.1   FHIR® Resource: Condition

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: patient [reference], subject [reference], clinical-status [token], onset-date [date], abatement-date [date], code [token]

Required parameter: category [token] with value "health-concern"

Syntax:

- **GET** [Base_URL]/Condition?patient=[id]&category=health-concern&date=geYYYY-MM-DD&date=leYYYY-MM-DD

Example Request: **GET**
[Base_URL]/Condition?patient=100000026&category=health-concern

Example Response:
```
{
  "resourceType": "Bundle",
  "id": "1450d6d8-317f-4e2e-968b-ad85b697989e",
  "type": "searchset",
  "timestamp": "2022-07-26T19:25:17Z",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://ihs4dhapim.ihs.gov/fhir/r4/Condition?category=health-concern&patient=100000026"
    }
  ],
  "entry": [
    {
      "fullUrl":
"https://ihs4dhapim.ihs.gov/fhir/r4/Condition/2KKRTSHASENNSGNK5G6WBL5O
ACF5VH2X",
      "resource": {
        "resourceType": "Condition",
        "category": [
          {
            "coding": [
              {
                "code": "health-concern",
                "display": "Health Concern",
                "system": "http://hl7.org/fhir/us/core/CodeSystem/condition-
category"
              }
            ],
            "text": "Health Concern"
          }
        ],
        "clinicalStatus": {
          "coding": [
            {
              "code": "active",
              "system": "http://terminology.hl7.org/CodeSystem/condition-
clinical"
            }
          ]
        },
        "identifier": [
          {
```

```
              "extension": [
                {
                  "url": "http://intersystems.com/fhir/extn/sda3/lib/external-id-
system",

                  "valueString": "2.16.840.1.113883.3.454.90310.99999.33"
                }
              ],
              "system": "urn:oid:2.16.840.1.113883.3.454.90310.99999.33",
              "type": {
                "text": "ExternalId"
              },
              "use": "official",
              "value": "P51417"
            }
          ],
          "note": [
            {
              "text": "Fever, 07/22/2022"
            }
          ],
          "subject": {
            "reference": "Patient/100000026"
          },
          "id": "2KKRTSHASENNSGNK5G6WBL5OACF5VH2X",
          "meta": {
            "lastUpdated": "2022-07-22T12:26:44Z",
            "versionId": "1"
          }
        },
        "search": {
          "mode": "match"
        }
      }
    }
  ]
}
```

5.14   USCDI: Medications

5.14.1   FHIR® Resource: MedicationRequest

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: status [token], intent [token], patient [reference], encounter [reference], authoredon [date]

Syntax:

- **GET** [Base_URL]/MedicationRequest?patient=[id]&intent={system|}[code]

- **GET** [Base_URL]/MedicationRequest?patient=[id]&intent=order&status={system|}[code]

- **POST** [Base_URL]/MedicationRequest/_search (parameters are x-www-form-urlencoded)

Example Request: **GET**
[Base_URL]/MedicationRequest?patient=100000139&intent=order

Example Response:
```
{
 "resourceType": "Bundle",
 "id": "9b8d25af-e771-43a9-823c-118d91401989",
 "type": "searchset",
 "timestamp": "2022-07-27T14:58:54Z",
 "total": 1,
 "link": [
   {
    "relation": "self",
    "url":
"https://ihs4dhapim.ihs.gov/fhir/r4/MedicationRequest?intent=order&patient=100000
139"
   }
 ],
 "entry": [
   {
    "fullUrl":
"https://ihs4dhapim.ihs.gov/fhir/r4/MedicationRequest/7FREUAN3EFHS5ZBMMNF
BUSN5XOWA5DBK",
    "resource": {
     "resourceType": "MedicationRequest",
     "authoredOn": "2022-05-24T12:00:00-05:00",
     "dosageInstruction": [
      {
       "asNeededBoolean": false,
       "doseAndRate": [
        {
         "doseQuantity": {
          "code": "mg",
          "system": "http://unitsofmeasure.org",
          "unit": "mg",
```

```
            "value": 250
          }
        }
      ],
      "text": "TAKE ONE (1) TABLET BY MOUTH EVERY 6 HOURS UNTIL
ALL TAKEN FOR INFECTION",
        "timing": {
         "code": {
          "coding": [
            {
             "code": "Q6H",
             "display": "every 6 hours",
             "system": "http://hl7.org/fhir/timing-abbreviation"
            }
          ],
          "text": "every 6 hours"
         },
         "repeat": {
          "frequency": 1,
          "period": 6,
          "periodUnit": "h"
         }
        }
      }
    ],
    "extension": [
      {
        "url": "http://intersystems.com/fhir/extn/sda3/lib/medication-context",
        "valueString": "request"
      },
      {
        "url": "http://intersystems.com/fhir/extn/sda3/lib/medication-drug-product",
        "valueReference": {
          "reference": "Medication/170"
        }
      },
      {
        "url": "http://intersystems.com/fhir/extn/sda3/lib/medication-duration",
        "valueCodeableConcept": {
         "coding": [
            {
             "code": "91d",
             "display": "91 days"
            }
         ]
```

```
          }
        },
        {
          "url": "http://intersystems.com/fhir/extn/sda3/lib/medication-entered-at",
          "valueReference": {
            "reference": "Organization/116"
          }
        },
        {
          "url": "http://intersystems.com/fhir/extn/sda3/lib/medication-from-time",
          "valueDateTime": "2022-05-23T00:00:00-05:00"
        },
        {
          "url": "http://intersystems.com/fhir/extn/sda3/lib/medication-prescription-
number",
          "valueString": "15176_F0"
        },
        {
          "url": "http://intersystems.com/fhir/extn/sda3/lib/medication-route",
          "valueCodeableConcept": {
            "coding": [
              {
                "code": "C38288",
                "display": "ORAL",
                "system": "http://ncimeta.nci.nih.gov"
              }
            ]
          }
        },
        {
          "url": "http://intersystems.com/fhir/extn/sda3/lib/medication-to-time",
          "valueDateTime": "2022-08-21T00:00:00-05:00"
        }
      ],
      "identifier": [
        {
          "extension": [
            {
              "url": "http://intersystems.com/fhir/extn/sda3/lib/external-id-system",
              "valueString": "2.16.840.1.113883.3.454.90310.99999.15"
            }
          ],
          "system": "urn:oid:2.16.840.1.113883.3.454.90310.99999.15",
          "type": {
            "text": "ExternalId"
```

```
        },
        "use": "official",
        "value": "15176"
      },
      {
        "type": {
          "coding": [
            {
              "code": "FILL",
              "display": "Filler Identifier",
              "system": "http://terminology.hl7.org/CodeSystem/v2-0203"
            }
          ],
          "text": "FillerId"
        },
        "use": "official",
        "value": "4884CAC1-65D3-43A9-AE45-6D690D8B0390"
      },
      {
        "type": {
          "coding": [
            {
              "code": "PLAC",
              "display": "Placer Identifier",
              "system": "http://terminology.hl7.org/CodeSystem/v2-0203"
            }
          ],
          "text": "PlacerId"
        },
        "use": "official",
        "value": "CA00452F-102F-46A2-8034-D1DECA078985"
      }
    ],
    "intent": "order",
    "medicationReference": {
      "reference": "Medication/7FREUAN3EFHS5ZBMMNFBUSN5XOWA5DBK"
    },
    "reportedBoolean": false,
    "requester": {
      "reference": "Practitioner/144"
    },
    "status": "completed",
    "subject": {
      "reference": "Patient/100000139"
    },
```

```
        "id": "7FREUAN3EFHS5ZBMMNFBUSN5XOWA5DBK",
        "meta": {
          "lastUpdated": "2022-07-14T16:08:47Z",
          "versionId": "3"
        }
      },
      "search": {
        "mode": "match"
      }
    }
  ]
}
```

5.15   USCDI: Allergies and Intolerances

5.15.1   FHIR® Resource: AllergyIntolerance

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: clinical-status [token], patient [reference]

Syntax:

- **GET** [Base_URL]/AllergyIntolerance?patient=[id]

- **POST** [Base_URL]/AllergyIntolerance/_search (parameters are x-www-form-urlencoded)

Example Request: **GET** [Base_URL]/AllergyIntolerance?patient=100000026

Example Response:
```
{
  "resourceType": "Bundle",
  "id": "c08708ea-a2ac-4a0f-81e8-d733a5a4a9fd",
  "type": "searchset",
  "timestamp": "2022-07-26T19:26:01Z",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url":
"https://ihs4dhapim.ihs.gov/fhir/r4/AllergyIntolerance?patient=100000026"
    }
  ],
  "entry": [
```

```
                        {
                          "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/AllergyIntolerance/2064",
                          "resource": {
                            "resourceType": "AllergyIntolerance",
                            "clinicalStatus": {
                              "coding": [
                                {
                                  "code": "active",
                                  "system":
"http://terminology.hl7.org/CodeSystem/allergyintolerance-clinical"
                                }
                              ]
                            },
                            "code": {
                              "coding": [
                                {
                                  "code": "7980",
                                  "display": "PENICILLIN G",
                                  "system": "http://www.nlm.nih.gov/research/umls/rxnorm"
                                }
                              ],
                              "text": "PENICILLIN G"
                            },
                            "extension": [
                              {
                                "url": "http://intersystems.com/fhir/extn/sda3/lib/allergy-allergy-
category",
                                "valueCodeableConcept": {
                                  "coding": [
                                    {
                                      "code": "416098002",
                                      "display": "Drug allergy (disorder)",
                                      "system": "http://snomed.info/sct"
                                    }
                                  ]
                                }
                              },
                              {
                                "url": "http://intersystems.com/fhir/extn/sda3/lib/allergy-entered-at",
                                "valueReference": {
                                  "reference": "Organization/57"
                                }
                              }
                            ],
                            "onsetDateTime": "2022-07-21T00:00:00-05:00",
```

```
                    "patient": {
                       "reference": "Patient/100000026"
                    },
                    "reaction": [
                       {
                          "manifestation": [
                             {
                                "coding": [
                                   {
                                      "code": "126485001",
                                      "display": "URTICARIA",
                                      "system": "http://snomed.info/sct"
                                   }
                                ]
                             }
                          ]
                       }
                    ],
                    "id": "2064",
                    "meta": {
                       "lastUpdated": "2022-07-21T19:43:39Z",
                       "versionId": "1"
                    }
                 },
                 "search": {
                    "mode": "match"

                 }
              }
           ]
        }
```

5.16   USCDI: Unique Device Identifier(s) for a Patient's Implantable Device(s)

5.16.1   FHIR® Resource: Device

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: patient [reference], type [token]

Syntax:

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

- **POST** [Base_URL]/Device/_search (parameters are x-www-form-urlencoded)

Example Request: **GET** [Base_URL]/Device?patient=100000026

Example Response:

```
{
  "resourceType": "Bundle",
  "id": "c75dfcf3-561c-45ae-9459-d84ec56fcd88",
  "type": "searchset",
  "timestamp": "2022-07-26T19:27:09Z",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url": "https://ihs4dhapim.ihs.gov/fhir/r4/Device?patient=100000026"
    }
  ],
  "entry": [
    {
      "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/Device/2066",
      "resource": {
        "resourceType": "Device",
        "extension": [
          {
            "url": "http://intersystems.com/fhir/extn/sda3/lib/device-u-d-i-
extension",
            "valueString": "(01)00643169007222(17)160128(21)BLC200461H"
          }
        ],
        "patient": {
          "reference": "Patient/100000026"
        },
        "type": {
          "coding": [
            {
              "code": "704707009",
              "display": "Cardiac resynchronization therapy implantable
defibrillator",
              "system": "http://snomed.info/sct"
            }
          ]
        },
        "udiCarrier": [
          {
            "deviceIdentifier": "2.16.840.1.113883.3.3719",
```

```
            "extension": [
              {
                "url": "http://intersystems.com/fhir/extn/sda3/lib/device-u-d-i-
assigning-authority",
                "valueString": "FDA"
              }
            ]
          }
        ],
        "id": "2066",
        "meta": {
          "lastUpdated": "2022-07-21T19:43:39Z",
          "versionId": "1"
        }
      },
      "search": {
        "mode": "match"
      }
    }
  ]
}
```

5.17   USCDI: Clinical Summary Document as C-CDA

5.17.1   FHIR® Resource: DocumentReference

The [Base_URL] is listed in Table 1.

Search Expression: SearchType

Parameters: _id [token], patient [reference], status [token], category [token], type [token], date [date], period [date]

Syntax:

- **GET** [Base_URL]/DocumentReference?_id=[id]

- **GET** [Base_URL]/DocumentReference?patient=[id]

- **GET** [Base_URL]/DocumentReference?patient=[id]&category=clinical-note

- **GET** [Base_URL]/DocumentReference?patient=[id]&category=clinical-note&date=geYYYY-MM-DD&date=leYYYY-MM-DD

- **POST** [Base_URL]/DocumentReference/_search (parameters are x-www-form-urlencoded)

Returns the Document Reference representation of all the data.

Example Request: **GET** [Base_URL]/DocumentReference?patient=100000139

Example Response:

```
{
  "resourceType": "Bundle",
  "id": "c135fef2-67af-4641-b052-5aeb3ca0cbef",
  "type": "searchset",
  "timestamp": "2022-07-29T18:52:29Z",
  "total": 3,
  "link": [
    {
      "relation": "self",
      "url":
"https://ihs4dhapim.ihs.gov/fhir/r4/DocumentReference?patient=100000139"
    }
  ],
  "entry": [
    {
      "fullUrl":
"https://ihs4dhapim.ihs.gov/fhir/r4/DocumentReference/5RVQAPM7O6NGWRBOV
AHLKASPVVRVSXZM",
      "resource": {
        "resourceType": "DocumentReference",
        "author": [
          {
            "reference": "Organization/176"
          }
        ],
        "category": [
          {
            "coding": [
              {
                "code": "clinical-note",
                "system": "http://hl7.org/fhir/us/core/CodeSystem/us-core-
documentreference-category"
              }
            ]
          }
        ],
        "content": [
          {
            "attachment": {
              "contentType": "text/plain",
              "creation": "2022-07-01T13:37:22-05:00",
              "extension": [
                {
```

```
                              "url": "http://intersystems.com/fhir/extn/sda3/lib/document-
document-number",

                              "valueString": "A2065E9B-8A76-4145-B897-
D43E9BB903B6"
                          },
                          {
                              "url": "http://intersystems.com/fhir/extn/sda3/lib/document-
file-type",

                              "valueString": "TEXT/HTML"
                          }
                      ],
                      "title": "Continuity of Care Document from 2019 DEMO
HOSPITAL (INST)",
                      "url":
"HS.UI.IHE.DocumentViewer.cls?FAC=DEMO&UUID=E3173FA9-795A-4EC9-
B354-D646D88CEBD9",
                      "_data": {
                          "extension": [
                              {
                                  "url": "http://hl7.org/fhir/StructureDefinition/data-absent-
reason",

                                  "valueCode": "unknown"
                              }
                          ]
                      }
                  },
                  "format": {
                      "code": "urn:hl7-org:sdwg:ccda-structuredBody:2.1",
                      "display": "Consolidated CDA R2.1 Structured Body Document",
                      "system": "urn:oid:1.3.6.1.4.1.19376.1.2.3"
                  }
              }
          ],
          "context": {
              "encounter": [
                  {
                      "reference": "Encounter/308"
                  }
              ],
              "period": {
                  "start": "2022-07-01T13:37:22-05:00"
              }
          },
          "custodian": {
              "reference": "Organization/176"
```

```
            },
            "date": "2022-07-01T13:37:22-05:00",
            "description": "Continuity of Care Document from 2019 DEMO
HOSPITAL (INST)",
            "extension": [
                {
                    "url": "http://intersystems.com/fhir/extn/sda3/lib/document-encounter-
number",
                    "valueString": "2096092"
                },
                {
                    "url": "http://intersystems.com/fhir/extn/sda3/lib/document-
transcription-time",
                    "valueDateTime": "2022-07-01T13:37:22-05:00"
                }
            ],
            "identifier": [
                {
                    "type": {
                        "text": "ExternalId"
                    },
                    "use": "official",
                    "value": "A2065E9B-8A76-4145-B897-D43E9BB903B6"
                }
            ],
            "status": "current",
            "subject": {
                "reference": "Patient/100000139"
            },
            "type": {
                "coding": [
                    {
                        "code": "34133-9",
                        "display": "Summarization of Episode Note",
                        "system": "http://loinc.org"
                    }
                ]
            },
            "id": "5RVQAPM7O6NGWRBOVAHLKASPVVRVSXZM",
            "meta": {
                "lastUpdated": "2022-07-28T17:06:07Z",
                "versionId": "1"
            }
        },
        "search": {
```

```
            "mode": "match"
          }
        },
        {
          "fullUrl":
"https://ihs4dhapim.ihs.gov/fhir/r4/DocumentReference/AICCHYLMKVZ6YGN2O2
PTAQ7UEFZZVQZE",
          "resource": {
            "resourceType": "DocumentReference",
            "author": [
              {
                "reference": "Organization/2"
              }
            ],
            "category": [
              {
                "coding": [
                  {
                    "code": "clinical-note",
                    "display": "Clinical Note",
                    "system": "http://hl7.org/fhir/us/core/CodeSystem/us-core-
documentreference-category"
                  }
                ]
              }
            ],
            "content": [
              {
                "attachment": {
                  "contentType": "text/plain",
                  "creation": "2022-07-05T12:24:25-05:00",
                  "data": "SGlzdG9yeSBhbmQgUHJvZ3Jlc3MgVGV4dA==",
                  "extension": [
                    {
                      "url": "http://intersystems.com/fhir/extn/sda3/lib/document-
document-number",
                      "valueString":
"http://compliancehospital.org/taxonomy/DocumentIds|20960923"
                    }
                  ]
                },
                "format": {
                  "code": "urn:ihe:pcc:cm:2008",
                  "display": "Care Management",
```

```
                  "system":
"http://ihe.net/fhir/ValueSet/IHE.FormatCode.codesystem"
                  }
                }
            ],
            "context": {
              "encounter": [
                {
                    "reference": "Encounter/308"
                }
              ],
              "period": {
                "end": "2022-03-27T12:24:25-05:00",
                "start": "2021-09-08T12:24:25-05:00"
              }
            },
            "custodian": {
              "reference": "Organization/2"
            },
            "date": "2022-07-05T12:24:25-05:00",
            "extension": [
              {
                "url": "http://intersystems.com/fhir/extn/sda3/lib/document-encounter-
number",
                "valueString": "2096092"
              },
              {
                "url": "http://intersystems.com/fhir/extn/sda3/lib/document-status",
                "valueCodeableConcept": {
                  "coding": [
                    {
                        "code": "current",
                        "display": "current"
                    }
                  ]
                }
              }
            ],
            "identifier": [
              {
                "extension": [
                  {
                      "url": "http://intersystems.com/fhir/extn/sda3/lib/external-id-
system",
```

```
                    "valueString":
"http://compliancehospital.org/taxonomy/DocumentIds"
                    }
                 ],
                 "system": "http://compliancehospital.org/taxonomy/DocumentIds",
                 "type": {
                    "text": "ExternalId"
                 },
                 "use": "official",
                 "value": "20960923"
              }
           ],
           "status": "current",
           "subject": {
              "reference": "Patient/100000139"
           },
           "type": {
              "coding": [
                 {
                    "code": "34117-2",
                    "display": "History and Progress Note",
                    "system": "http://loinc.org"
                 }
              ]
           },
           "id": "AICCHYLMKVZ6YGN2O2PTAQ7UEFZZVQZE",
           "meta": {
              "lastUpdated": "2022-07-28T17:06:07Z",
              "versionId": "1"
           }
        },
        "search": {
           "mode": "match"
        }
     },
     {
        "fullUrl":
"https://ihs4dhapim.ihs.gov/fhir/r4/DocumentReference/BTVW5XSFP7FXHWJGM
VBFVNDVKMWZ5W3T",
        "resource": {
           "resourceType": "DocumentReference",
           "author": [
              {
                 "reference": "Organization/2"
              }
```

```
        ],
        "category": [
          {
            "coding": [
              {
                "code": "clinical-note",
                "display": "Clinical Note",
                "system": "http://hl7.org/fhir/us/core/CodeSystem/us-core-
documentreference-category"
              }
            ]
          }
        ],
        "content": [
          {
            "attachment": {
              "contentType": "text/plain",
              "creation": "2022-07-05T12:24:25-05:00",
              "data": "UHJvY2VkdXJlIE5vdGUgVGV4dA==",
              "extension": [
                {
                  "url": "http://intersystems.com/fhir/extn/sda3/lib/document-
document-number",
                  "valueString":
"http://compliancehospital.org/taxonomy/DocumentIds|20960924"
                }
              ]
            },
            "format": {
              "code": "urn:ihe:pcc:cm:2008",
              "display": "Care Management",
              "system":
"http://ihe.net/fhir/ValueSet/IHE.FormatCode.codesystem"
            }
          }
        ],
        "context": {
          "encounter": [
            {
              "reference": "Encounter/308"
            }
          ],
          "period": {
            "end": "2022-03-27T12:24:25-05:00",
            "start": "2021-09-08T12:24:25-05:00"
```

```
              }
           },
           "custodian": {
              "reference": "Organization/2"
           },
           "date": "2022-07-05T12:24:25-05:00",
           "extension": [
              {
                 "url": "http://intersystems.com/fhir/extn/sda3/lib/document-encounter-
number",
                 "valueString": "2096092"
              },
              {
                 "url": "http://intersystems.com/fhir/extn/sda3/lib/document-status",
                 "valueCodeableConcept": {
                    "coding": [
                       {
                          "code": "current",
                          "display": "current"
                       }
                    ]
                 }
              }
           ],
           "identifier": [
              {
                 "extension": [
                    {
                       "url": "http://intersystems.com/fhir/extn/sda3/lib/external-id-
system",
                       "valueString":
"http://compliancehospital.org/taxonomy/DocumentIds"
                    }
                 ],
                 "system": "http://compliancehospital.org/taxonomy/DocumentIds",
                 "type": {
                    "text": "ExternalId"
                 },
                 "use": "official",
                 "value": "20960924"
              }
           ],
           "status": "current",
           "subject": {
              "reference": "Patient/100000139"
```

```
        },
        "type": {
          "coding": [
            {
              "code": "28570-0",
              "display": "Procedure Note",
              "system": "http://loinc.org"
            }
          ]
        },
        "id": "BTVW5XSFP7FXHWJGMVBFVNDVKMWZ5W3T",
        "meta": {
          "lastUpdated": "2022-07-28T17:06:07Z",
          "versionId": "1"
        }
      },
      "search": {
        "mode": "match"
      }
    }
  ]
}
```

5.18   USCDI: Consultation Note

5.18.1   FHIR® Resource: DocumentReference

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: _id [token], patient [reference], status [token], category [token], type [token], date [date], period [date]

Syntax:

- **GET** [Base_URL]/DocumentReference?patient=[id]&type=11488-4

- **POST** [Base_URL]/DocumentReference/_search (parameters are x-www-form-urlencoded)

Example Request:
GET [Base_URL]/DocumentReference?patient=100000139&type=11488-4

Example Response:

```
{
  "resourceType": "Bundle",
  "id": "0e1b85f9-1a2e-4dfd-926d-90bb44b4e221",
  "type": "searchset",
  "timestamp": "2022-07-29T19:06:21Z",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url":
"https://ihs4dhapim.ihs.gov/fhir/r4/DocumentReference?patient=100000139&type=1
1488-4"
    }
  ],
  "entry": [
    {
      "fullUrl":
"https://ihs4dhapim.ihs.gov/fhir/r4/DocumentReference/PX6X4FNJTEBHXIGS3EN
RYPLFMENQI5YU",
      "resource": {
        "resourceType": "DocumentReference",
        "author": [
          {
            "reference": "Organization/2"
          }
        ],
        "category": [
          {
            "coding": [
              {
                "code": "clinical-note",
                "display": "Clinical Note",
                "system": "http://hl7.org/fhir/us/core/CodeSystem/us-core-
documentreference-category"
              }
            ]
          }
        ],
        "content": [
          {
            "attachment": {
              "contentType": "text/plain",
              "creation": "2022-07-05T12:24:25-05:00",
              "data": "Q29uc3VsdCBOb3RlIFRleHQ=",
              "extension": [
```

```
                            {
                                "url": "http://intersystems.com/fhir/extn/sda3/lib/document-
document-number",
                                "valueString":
"http://compliancehospital.org/taxonomy/DocumentIds|20960921"
                            }
                        ]
                    },
                    "format": {
                        "code": "urn:ihe:pcc:cm:2008",
                        "display": "Care Management",
                        "system":
"http://ihe.net/fhir/ValueSet/IHE.FormatCode.codesystem"
                    }
                }
            ],
            "context": {
                "encounter": [
                    {
                        "reference": "Encounter/308"
                    }
                ],
                "period": {
                    "end": "2022-03-27T12:24:25-05:00",
                    "start": "2021-09-08T12:24:25-05:00"
                }
            },
            "custodian": {
                "reference": "Organization/2"
            },
            "date": "2022-07-05T12:24:25-05:00",
            "extension": [
                {
                    "url": "http://intersystems.com/fhir/extn/sda3/lib/document-encounter-
number",
                    "valueString": "2096092"
                },
                {
                    "url": "http://intersystems.com/fhir/extn/sda3/lib/document-status",
                    "valueCodeableConcept": {
                        "coding": [
                            {
                                "code": "current",
                                "display": "current"
                            }
```

```
                ]
              }
            }
          ],
          "identifier": [
            {
              "extension": [
                {
                  "url": "http://intersystems.com/fhir/extn/sda3/lib/external-id-
system",
                  "valueString":
"http://compliancehospital.org/taxonomy/DocumentIds"
                }
              ],
              "system": "http://compliancehospital.org/taxonomy/DocumentIds",
              "type": {
                "text": "ExternalId"
              },
              "use": "official",
              "value": "20960921"
            }
          ],
          "status": "current",
          "subject": {
            "reference": "Patient/100000139"
          },
          "type": {
            "coding": [
              {
                "code": "11488-4",
                "display": "Consult Note",
                "system": "http://loinc.org"
              }
            ]
          },
          "id": "PX6X4FNJTEBHXIGS3ENRYPLFMENQI5YU",
          "meta": {
            "lastUpdated": "2022-07-28T17:06:07Z",
            "versionId": "1"
          }
        },
        "search": {
          "mode": "match"
        }
      }
```

```
    ]
}
```

5.19   USCDI: Discharge Summary

5.19.1   FHIR® Resource: DocumentReference

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: _id [token], patient [reference], status [token], category [token], type [token], date [date], period [date]

Syntax:

- **GET** [Base_URL]/DocumentReference?patient=[id]&type=18842-5

- **POST** [Base_URL]/DocumentReference/_search (parameters are x-www-form-urlencoded)

Example Request:
GET [Base_URL]/DocumentReference?patient=100000139&type=18842-5

Example Response:

```
{
    "resourceType": "Bundle",
    "id": "e97aa0ab-341e-4cb2-a145-492abd8d4f40",
    "type": "searchset",
    "timestamp": "2022-07-28T18:17:55Z",
    "total": 1,
    "link": [
        {
            "relation": "self",
            "url":
"https://ihs4dhapim.ihs.gov/fhir/r4/DocumentReference?patient=100000139&type=18842-5"
        }
    ],
    "entry": [
        {
            "fullUrl":
"https://ihs4dhapim.ihs.gov/fhir/r4/DocumentReference/HGHDEB4PWRWSAYIYOQY2X555CACG26BW",
            "resource": {
                "resourceType": "DocumentReference",
                "author": [
```

```
                {
                  "reference": "Organization/2"
                }
              ],
              "category": [
                {
                  "coding": [
                    {
                      "code": "clinical-note",
                      "display": "Clinical Note",
                      "system": "http://hl7.org/fhir/us/core/CodeSystem/us-core-
documentreference-category"
                    }
                  ]
                }
              ],
              "content": [
                {
                  "attachment": {
                    "contentType": "text/plain",
                    "creation": "2022-07-05T12:24:25-05:00",
                    "data": "RGlzY2hhcmdlIFN1bW1hcnkgVGV4dA==",
                    "extension": [
                      {
                        "url": "http://intersystems.com/fhir/extn/sda3/lib/document-
document-number",
                        "valueString":
"http://compliancehospital.org/taxonomy/DocumentIds|20960922"
                      }
                    ]
                  },
                  "format": {
                    "code": "urn:ihe:pcc:cm:2008",
                    "display": "Care Management",
                    "system":
"http://ihe.net/fhir/ValueSet/IHE.FormatCode.codesystem"
                  }
                }
              ],
              "context": {
                "encounter": [
                  {
                    "reference": "Encounter/308"
                  }
                ],
```

```
                    "period": {
                        "end": "2022-03-27T12:24:25-05:00",
                        "start": "2021-09-08T12:24:25-05:00"
                    }
                },
                "custodian": {
                    "reference": "Organization/2"
                },
                "date": "2022-07-05T12:24:25-05:00",
                "extension": [
                    {
                        "url": "http://intersystems.com/fhir/extn/sda3/lib/document-encounter-
number",
                        "valueString": "2096092"
                    },
                    {
                        "url": "http://intersystems.com/fhir/extn/sda3/lib/document-status",
                        "valueCodeableConcept": {
                            "coding": [
                                {
                                    "code": "current",
                                    "display": "current"
                                }
                            ]
                        }
                    }
                ],
                "identifier": [
                    {
                        "extension": [
                            {
                                "url": "http://intersystems.com/fhir/extn/sda3/lib/external-id-
system",
                                "valueString":
"http://compliancehospital.org/taxonomy/DocumentIds"
                            }
                        ],
                        "system": "http://compliancehospital.org/taxonomy/DocumentIds",
                        "type": {
                            "text": "ExternalId"
                        },
                        "use": "official",
                        "value": "20960922"
                    }
                ],
```

```
            "status": "current",
            "subject": {
               "reference": "Patient/100000139"
            },
            "type": {
               "coding": [
                  {
                     "code": "18842-5",
                     "display": "Discharge Summary",
                     "system": "http://loinc.org"
                  }
               ]
            },
            "id": "HGHDEB4PWRWSAYIYOQY2X555CACG26BW",
            "meta": {
               "lastUpdated": "2022-07-28T17:06:07Z",
               "versionId": "1"
            }
         },
         "search": {
            "mode": "match"
         }
      }
   ]
}
```

5.20   USCDI: History and Physical Note

5.20.1   FHIR® Resource: DocumentReference

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: _id [token], patient [reference], status [token], category [token], type [token], date [date], period [date]

Syntax:

- **GET** [Base_URL]/DocumentReference?patient=[id]&type=34117-2

- **POST** [Base_URL]/DocumentReference/_search (parameters are x-www-form-urlencoded)

Example Request:
GET [Base_URL]/DocumentReference?patient=100000139&type=34117-2

Example Response:

```
{
  "resourceType": "Bundle",
  "id": "7e351842-77ee-4f7c-b2fa-6335f2d30aaa",
  "type": "searchset",
  "timestamp": "2022-07-28T18:19:30Z",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url":
"https://ihs4dhapim.ihs.gov/fhir/r4/DocumentReference?patient=100000139&type=34117-2"
    }
  ],
  "entry": [
    {
      "fullUrl":
"https://ihs4dhapim.ihs.gov/fhir/r4/DocumentReference/AICCHYLMKVZ6YGN2O2PTAQ7UEFZZVQZE",
      "resource": {
        "resourceType": "DocumentReference",
        "author": [
          {
            "reference": "Organization/2"
          }
        ],
        "category": [
          {
            "coding": [
              {
                "code": "clinical-note",
                "display": "Clinical Note",
                "system": "http://hl7.org/fhir/us/core/CodeSystem/us-core-documentreference-category"
              }
            ]
          }
        ],
        "content": [
          {
            "attachment": {
              "contentType": "text/plain",
              "creation": "2022-07-05T12:24:25-05:00",
              "data": "SGlzdG9yeSBhbmQgUHJvZ3Jlc3MgVGV4dA==",
```

```
                    "extension": [
                        {
                            "url": "http://intersystems.com/fhir/extn/sda3/lib/document-
document-number",
                            "valueString":
"http://compliancehospital.org/taxonomy/DocumentIds|20960923"
                        }
                    ]
                },
                "format": {
                    "code": "urn:ihe:pcc:cm:2008",
                    "display": "Care Management",
                    "system":
"http://ihe.net/fhir/ValueSet/IHE.FormatCode.codesystem"
                }
            }
        ],
        "context": {
            "encounter": [
                {
                    "reference": "Encounter/308"
                }
            ],
            "period": {
                "end": "2022-03-27T12:24:25-05:00",
                "start": "2021-09-08T12:24:25-05:00"
            }
        },
        "custodian": {
            "reference": "Organization/2"
        },
        "date": "2022-07-05T12:24:25-05:00",
        "extension": [
            {
                "url": "http://intersystems.com/fhir/extn/sda3/lib/document-encounter-
number",
                "valueString": "2096092"
            },
            {
                "url": "http://intersystems.com/fhir/extn/sda3/lib/document-status",
                "valueCodeableConcept": {
                    "coding": [
                        {
                            "code": "current",
                            "display": "current"
```

```
                    }
                ]
            }
        }
    ],
    "identifier": [
        {
            "extension": [
                {
                    "url": "http://intersystems.com/fhir/extn/sda3/lib/external-id-
system",
                    "valueString":
"http://compliancehospital.org/taxonomy/DocumentIds"
                }
            ],
            "system": "http://compliancehospital.org/taxonomy/DocumentIds",
            "type": {
                "text": "ExternalId"
            },
            "use": "official",
            "value": "20960923"
        }
    ],
    "status": "current",
    "subject": {
        "reference": "Patient/100000139"
    },
    "type": {
        "coding": [
            {
                "code": "34117-2",
                "display": "History and Progress Note",
                "system": "http://loinc.org"
            }
        ]
    },
    "id": "AICCHYLMKVZ6YGN2O2PTAQ7UEFZZVQZE",
    "meta": {
        "lastUpdated": "2022-07-28T17:06:07Z",
        "versionId": "1"
    }
},
"search": {
    "mode": "match"
}
```

```
      }
    ]
}
```

5.21   USCDI: Procedure Note

5.21.1   FHIR® Resource: DocumentReference

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: _id [token], patient [reference], status [token], category [token], type [token], date [date], period [date]

Syntax:

- **GET** [Base_URL]/DocumentReference?patient=[id]

- **GET** [Base_URL]/DocumentReference?patient=[id]&category={system|}[code]

- **GET** [Base_URL]/DocumentReference?patient=[id]&type=[code]

- **GET** [Base_URL]/DocumentReference?patient=[id]&code={system|}[code]

- **GET** [Base_URL]/DocumentReference?patient=[id]&category={system|}[code] &code={system|}[code]&date=geYYYY-MM-DD&date=leYYYY-MM-DD

- **POST** [Base_URL]/DocumentReference/_search (parameters are x-www-form-urlencoded)

Example Request: **GET** [Base_URL]/DocumentReference?patient=100000139&type=28570-0

Example Response:
```
{
  "resourceType": "Bundle",
  "id": "070e579f-5bb7-4cbd-a796-dc9433b32e33",
  "type": "searchset",
  "timestamp": "2022-07-28T18:28:48Z",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url":
"https://ihs4dhapim.ihs.gov/fhir/r4/DocumentReference?patient=100000139&type=2
8570-0"
    }
  ],
```

```
    "entry": [
      {
        "fullUrl":
"https://ihs4dhapim.ihs.gov/fhir/r4/DocumentReference/BTVW5XSFP7FXHWJGM
VBFVNDVKMWZ5W3T",
        "resource": {
          "resourceType": "DocumentReference",
          "author": [
            {
              "reference": "Organization/2"
            }
          ],
          "category": [
            {
              "coding": [
                {
                  "code": "clinical-note",
                  "display": "Clinical Note",
                  "system": "http://hl7.org/fhir/us/core/CodeSystem/us-core-
documentreference-category"
                }
              ]
            }
          ],
          "content": [
            {
              "attachment": {
                "contentType": "text/plain",
                "creation": "2022-07-05T12:24:25-05:00",
                "data": "UHJvY2VkdXJlIE5vdGUgVGV4dA==",
                "extension": [
                  {
                    "url": "http://intersystems.com/fhir/extn/sda3/lib/document-
document-number",
                    "valueString":
"http://compliancehospital.org/taxonomy/DocumentIds|20960924"
                  }
                ]
              },
              "format": {
                "code": "urn:ihe:pcc:cm:2008",
                "display": "Care Management",
                "system":
"http://ihe.net/fhir/ValueSet/IHE.FormatCode.codesystem"
              }
```

```
            }
          ],
          "context": {
            "encounter": [
              {
                "reference": "Encounter/308"
              }
            ],
            "period": {
              "end": "2022-03-27T12:24:25-05:00",
              "start": "2021-09-08T12:24:25-05:00"
            }
          },
          "custodian": {
            "reference": "Organization/2"
          },
          "date": "2022-07-05T12:24:25-05:00",
          "extension": [
            {
              "url": "http://intersystems.com/fhir/extn/sda3/lib/document-encounter-
number",
              "valueString": "2096092"
            },
            {
              "url": "http://intersystems.com/fhir/extn/sda3/lib/document-status",
              "valueCodeableConcept": {
                "coding": [
                  {
                    "code": "current",
                    "display": "current"
                  }
                ]
              }
            }
          ],
          "identifier": [
            {
              "extension": [
                {
                  "url": "http://intersystems.com/fhir/extn/sda3/lib/external-id-
system",
                  "valueString":
"http://compliancehospital.org/taxonomy/DocumentIds"
                }
              ],
```

```
                "system": "http://compliancehospital.org/taxonomy/DocumentIds",
                "type": {
                    "text": "ExternalId"
                },
                "use": "official",
                "value": "20960924"
            }
        ],
        "status": "current",
        "subject": {
            "reference": "Patient/100000139"
        },
        "type": {
            "coding": [
                {
                    "code": "28570-0",
                    "display": "Procedure Note",
                    "system": "http://loinc.org"
                }
            ]
        },
        "id": "BTVW5XSFP7FXHWJGMVBFVNDVKMWZ5W3T",
        "meta": {
            "lastUpdated": "2022-07-28T17:06:07Z",
            "versionId": "1"
        }
    },
    "search": {
        "mode": "match"
    }
  }
 ]
}
```

5.22   USCDI: Progress Note

5.22.1   FHIR® Resource: Document Reference

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: _id [token], patient [reference], status [token], category [token], type [token], date [date], period [date]

Syntax:

- **GET** [Base_URL]/DocumentReference?patient=[id]&type=11506-3

- **POST** [Base_URL]/DocumentReference/_search (parameters are x-www-form-urlencoded)

Example Request:-**GET**
[Base_URL]/DocumentReference?patient=100000139&type= 11506-3

Example Response:

```
{
  "resourceType": "Bundle",
  "id": "38181074-523a-415b-85f7-6932f309b935",
  "type": "searchset",
  "timestamp": "2022-07-28T18:27:50Z",
  "total": 1,
  "link": [
    {
      "relation": "self",
      "url":
"https://ihs4dhapim.ihs.gov/fhir/r4/DocumentReference?patient=100000139&type=1
1506-3"
    }
  ],
  "entry": [
    {
      "fullUrl":
"https://ihs4dhapim.ihs.gov/fhir/r4/DocumentReference/CCCPXT5IX5OU3QG5Z6I5
XC33ETCB5TYM",
      "resource": {
        "resourceType": "DocumentReference",
        "author": [
          {
            "reference": "Organization/2"
          }
        ],
        "category": [
          {
            "coding": [
              {
                "code": "clinical-note",
                "display": "Clinical Note",
                "system": "http://hl7.org/fhir/us/core/CodeSystem/us-core-
documentreference-category"
```

```
                        }
                      ]
                    }
                  ],
                  "content": [
                    {
                      "attachment": {
                        "contentType": "text/plain",
                        "creation": "2022-07-05T12:24:25-05:00",
                        "data": "UHJvZ3Jlc3MgTm90ZSBUZXh0",
                        "extension": [
                          {
                            "url": "http://intersystems.com/fhir/extn/sda3/lib/document-
document-number",
                            "valueString":
"http://compliancehospital.org/taxonomy/DocumentIds|20960925"
                          }
                        ]
                      },
                      "format": {
                        "code": "urn:ihe:pcc:cm:2008",
                        "display": "Care Management",
                        "system":
"http://ihe.net/fhir/ValueSet/IHE.FormatCode.codesystem"
                      }
                    }
                  ],
                  "context": {
                    "encounter": [
                      {
                        "reference": "Encounter/308"
                      }
                    ],
                    "period": {
                      "end": "2022-03-27T12:24:25-05:00",
                      "start": "2021-09-08T12:24:25-05:00"
                    }
                  },
                  "custodian": {
                    "reference": "Organization/2"
                  },
                  "date": "2022-07-05T12:24:25-05:00",
                  "extension": [
                    {
```

```
                    "url": "http://intersystems.com/fhir/extn/sda3/lib/document-encounter-
number",
                    "valueString": "2096092"
                },
                {
                    "url": "http://intersystems.com/fhir/extn/sda3/lib/document-status",
                    "valueCodeableConcept": {
                        "coding": [
                            {
                                "code": "current",
                                "display": "current"
                            }
                        ]
                    }
                }
            ],
            "identifier": [
                {
                    "extension": [
                        {
                            "url": "http://intersystems.com/fhir/extn/sda3/lib/external-id-
system",
                            "valueString":
"http://compliancehospital.org/taxonomy/DocumentIds"
                        }
                    ],
                    "system": "http://compliancehospital.org/taxonomy/DocumentIds",
                    "type": {
                        "text": "ExternalId"
                    },
                    "use": "official",
                    "value": "20960925"
                }
            ],
            "status": "current",
            "subject": {
                "reference": "Patient/100000139"
            },
            "type": {
                "coding": [
                    {
                        "code": "11506-3",
                        "display": "Progress Note",
                        "system": "http://loinc.org"
                    }
```

```
          ]
        },
        "id": "CCCPXT5IX5OU3QG5Z6I5XC33ETCB5TYM",
        "meta": {
          "lastUpdated": "2022-07-28T17:06:07Z",
          "versionId": "1"
        }
      },
      "search": {
        "mode": "match"
      }
    }
  ]
}
```

5.23   USCDI: Practitioner

5.23.1   FHIR® Resource: Practitioner

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: identifier [token], name [string], family [string], given [string], address [string], address-city [string], address-state [string], address-postalcode [string], address-country [string]

Syntax:

- **GET** [Base_URL]/Practitioner/[id]

- **GET** [Base_URL]/Practitioner?name=[string]

- **GET** [Base_URL]/Practitioner?address=[string]

Example Request: **GET** [Base_URL]/Practitioner?name=flood

Example Response:
```
{
  "resourceType": "Bundle",
  "id": "b78c2750-a994-4386-b467-c6150ee379b3",
  "type": "searchset",
  "timestamp": "2022-07-29T19:30:53Z",
  "total": 1,
  "link": [
    {
```

```
                    "relation": "self",
                    "url": "https://ihs4dhapim.ihs.gov/fhir/r4/Practitioner?name=flood"
                }
            ],
        "entry": [
            {
                "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/Practitioner/16",
                "resource": {
                    "resourceType": "Practitioner",
                    "extension": [
                        {
                            "url": "http://intersystems.com/fhir/extn/sda3/lib/code-table-detail-
care-provider-description",
                            "valueString": "FLOOD, WILLIAM"
                        }
                    ],
                    "identifier": [
                        {
                            "system": "urn:oid:2.16.840.1.113883.3.454.90310.99999.3",
                            "value": "2970"
                        }
                    ],
                    "name": [
                        {
                            "family": "FLOOD",
                            "given": [
                                "WILLIAM"
                            ],
                            "text": "WILLIAM FLOOD"
                        }
                    ],
                    "id": "16",
                    "meta": {
                        "lastUpdated": "2022-07-27T19:40:18Z",
                        "versionId": "1"
                    }
                },
                "search": {
                    "mode": "match"
                }
            }
        ]
    }
```

5.24   USCDI: Encounter

5.24.1   FHIR® Resource: Encounter

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters: _id [token], identifier [token], patient [reference], class [token], type [token], status [token], date [date]

Syntax:

- **GET** [Base_URL]/Encounter/[id]

- **GET** [Base_URL]/Encounter?patient=[reference]

- **GET** [Base_URL]/Encounter?date={gt|lt|ge|le}[date]{&date={gt|lt|ge|le}[date]&...}&patient=[reference]

- **GET** [Base_URL]/Encounter?identifier={system|}[code]

- **GET** [Base_URL]/Encounter?class={system|}[code]&patient=[reference]

- **GET** [Base_URL]/Encounter?patient=[reference]&type={system|}[code]

- **GET** [Base_URL]/Encounter?patient=[reference]&status={system|}[code]

Example Request: **GET** [Base_URL]/Encounter/1104

Example Response:

```
{
  "resourceType": "Encounter",
  "class": {
    "code": "AMB",
    "system": "http://terminology.hl7.org/CodeSystem/v3-ActCode"
  },
  "extension": [
    {
      "url": "http://intersystems.com/fhir/extn/sda3/lib/encounter-encounter-m-r-n",
      "valueString": "27163"
    },
    {
      "url": "http://intersystems.com/fhir/extn/sda3/lib/encounter-encounter-m-r-n-a-a",
      "valueString": "DEMO"
    },
    {
      "url": "http://intersystems.com/fhir/extn/sda3/lib/encounter-encounter-type",
      "valueString": "O"
```

```
      },
      {
        "url": "http://intersystems.com/fhir/extn/sda3/lib/encounter-entered-on",
        "valueDateTime": "2022-07-15T12:00:00-06:00"
      },
      {
        "url": "http://intersystems.com/fhir/extn/sda3/lib/encounter-to-time",
        "valueDateTime": "2022-07-15T12:00:00-06:00"
      },
      {
        "url": "http://intersystems.com/fhir/extn/sda3/lib/encounter-visit-description",
        "valueString": "\r\n          ?No Reason Information for the extraction
criteria\r\n         "
      }
    ],
    "identifier": [
      {
        "type": {
          "text": "EncounterNumber"
        },
        "use": "official",
        "value": "2119158"
      }
    ],
    "period": {
      "end": "2022-07-15T12:00:00-06:00",
      "start": "2022-07-15T12:00:00-06:00"
    },
    "serviceProvider": {
      "reference": "Organization/1103"
    },
    "status": "finished",
    "subject": {
      "reference": "Patient/100000026"
    },
    "id": "1104",
    "type": [
      {
        "coding": [
          {
            "system": "http://terminology.hl7.org/CodeSystem/data-absent-reason",
            "code": "unknown",
            "display": "Unknown"
          }
        ]
```

```
      }
    ],
    "meta": {
      "lastUpdated": "2022-07-28T17:49:49Z",
      "versionId": "1"
    }
  }
}
        ]
}
```

5.25   USCDI: Location

5.25.1   FHIR® Resource: Location

The [Base_URL] is listed in Table 1**.**

Search Expression: SearchType

Parameters:_id [token], name [string], address [string], address-city [string], address-state [string], address-postalcode [string]

Syntax:

- **GET** [Base_URL]/Location/[id]

- **GET** [Base_URL]/Location?name=[string]

- **GET** [Base_URL]/Location?address=[string]

- **GET** [Base_URL]/Location?address-city=[string]

- **GET** [Base_URL]/Location?address-state=[string]

- **GET** [Base_URL]/Location?address-postalcode=[string]

Example Request: **GET** [Base_URL]/Location/4

Example Response:
```
{
  "resourceType": "Location",
  "identifier": [
    {
      "value": "DEMO-08"
    }
  ],
  "managingOrganization": {
    "reference": "Organization/2"
  },
  "name": "2019 DEMO HOSPITAL (INST)",
```

```
    "type": [
      {
        "text": "OTHER"
      }
    ],
    "id": "4",
    "meta": {
      "lastUpdated": "2022-07-27T19:40:18Z",
      "versionId": "1"
    }
  }
        ]
}
```

5.26   USCDI: Organization

5.26.1   FHIR® Resource: Organization

The [Base_URL] is listed in Table 1**The [Base_URL] is listed in** Table 1**..**

Search Expression: SearchType

Parameters: name [string], address [string]

Syntax:

- **GET** [Base_URL]/Organization?name=[string]

- **GET** [Base_URL]/Organization?address=[string]

Example Request: **GET** [Base_URL]/Organization?name=Neighborhood

Example Response:
```
{
  "resourceType": "Bundle",
  "id": "b0572ef0-9054-4bff-b074-61d382e00c6c",
  "type": "searchset",
  "timestamp": "2022-07-29T19:50:47Z",
  "total": 4,
  "link": [
    {
      "relation": "self",
      "url": "https://ihs4dhapim.ihs.gov/fhir/r4/Organization?name=Neighborhood"
    }
  ],
  "entry": [
    {
```

```
        "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/Organization/1012",
        "resource": {
          "resourceType": "Organization",
          "identifier": [
            {
              "value": "DEMO-09"
            }
          ],
          "name": "NEIGHBORHOOD PHYSICIANS PRACTICE",
          "id": "1012",
          "_active": {
            "extension": [
              {
                "url": "http://hl7.org/fhir/StructureDefinition/data-absent-reason",
                "valueCode": "unknown"
              }
            ]
          },
          "meta": {
            "lastUpdated": "2022-07-28T17:49:48Z",
            "versionId": "1"
          }
        },
        "search": {
          "mode": "match"
        }
      },
      {
        "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/Organization/1056",
        "resource": {
          "resourceType": "Organization",
          "address": [
            {
              "city": "Beaverton",
              "line": [
                "2472 Rocky Place"
              ],
              "postalCode": "97006",
              "state": "OR"
            }
          ],
          "identifier": [
            {
              "value": "NEIGHBORHOOD PHYSICIANS PRACTICE"
            }
```

```
        ],
        "name": "NEIGHBORHOOD PHYSICIANS PRACTICE",
        "telecom": [
          {
            "system": "phone",
            "use": "home",
            "value": "+1(555)-555-1002"
          }
        ],
        "id": "1056",
        "_active": {
          "extension": [
            {
              "url": "http://hl7.org/fhir/StructureDefinition/data-absent-reason",
              "valueCode": "unknown"
            }
          ]
        },
        "meta": {
          "lastUpdated": "2022-07-28T17:49:48Z",
          "versionId": "1"
        }
      },
      "search": {
        "mode": "match"
      }
    },
    {
      "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/Organization/553",
      "resource": {
        "resourceType": "Organization",
        "active": true,
        "identifier": [
          {
            "value": "DEMO-09"
          }
        ],
        "name": "NEIGHBORHOOD PHYSICIANS PRACTICE",
        "partOf": {
          "reference": "Organization/426"
        },
        "id": "553",
        "meta": {
          "lastUpdated": "2022-07-28T17:49:43Z",
          "versionId": "1"
```

```
        }
      },
      "search": {
        "mode": "match"
      }
    },
    {
      "fullUrl": "https://ihs4dhapim.ihs.gov/fhir/r4/Organization/564",
      "resource": {
        "resourceType": "Organization",
        "address": [
          {
            "city": "BEAVERTON",
            "line": [
              "2472 ROCKY PLACE"
            ],
            "postalCode": "97006",
            "state": "OR"
          }
        ],
        "identifier": [
          {
            "value": "NEIGHBORHOOD PHYSICIANS PRACTICE"
          }
        ],
        "name": "NEIGHBORHOOD PHYSICIANS PRACTICE",
        "telecom": [
          {
            "system": "phone",
            "use": "home",
            "value": "+1(555)-555-1002"
          }
        ],
        "id": "564",
        "_active": {
          "extension": [
            {
              "url": "http://hl7.org/fhir/StructureDefinition/data-absent-reason",
              "valueCode": "unknown"
            }
          ]
        },
        "meta": {
          "lastUpdated": "2022-07-28T17:49:43Z",
          "versionId": "1"
```

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

6.0   Supported Types and API Parameters

6.1   Supported and Unsupported Types

Supported request type

- HTTP GET
- HTTP POST

Unsupported request types

- HTTP DELETE
- HTTP PUT

7.0   Responses

As shown in each resource example in Table 2, the 4DH FHIR® API is capable of providing the responses in both JSON & XML formats.

Table 2: 4DH Response Format

Resource	Response Format
Application/JSON	https://ihs4dhapim.ihs.gov/FHIR/r4/Condition/_search?patient=tokenID**&_format=JSON**
Application/XML	https://ihs4dhapim.ihs.gov/FHIR/r4/Condition/_search?patient=tokenID**&_format=XML**

8.0   Error Codes/Handling

The 4DH FHIR® Server handles errors and has exceptions that provide an HTTP status code and a message in both JSON and XML formats and are listed in Table 3.

Table 3: HTTP Status Codes

Response	HTTP Status Code	Description
OK	200	valid request
OK	202	request is accepted
Bad Request	400	invalid or a bad URL request is made to the server
Forbidden Request	403	The request is not allowable with the current permissions. An example is a user trying to access data for which they do not have permissions.
Data Not Found	404	invalid or a bad URL request is made to the server

9.0   Bulk Export

The 4DH FHIR® API allows bulk data exports from the 4DH repository.

To gain access, the client creates a JSON Web Token (JWT) to authenticate with the authorization server. After authentication, an access token is provided to use in the API requests.

The 4DH Bulk Export FHIR® API supports:

- HTTP GET

- HTTP DELETE

The JWT authorization request requires the claims listed in Table 4 in addition to the client's signed private key.

Table 4: Required JWT Claims

JWT Claim	Description
iss	Client's client_id
sub	Service's client_id
aud	Authorization server's token URL
exp	Expiration time integer for the authentication JWT, expressed in seconds since the "Epoch" (1970-01-01T00:00:00Z UTC). This time SHALL be no more than five minutes in the future.
jti	A nonce string value that uniquely identifies this authentication JWT.

The authorization request response body contains required information encoded in JSON, as listed in Table 5.

Table 5: Required Information

Token Property	Description
access_token	Access token issued by authorization server
token_type	Fixed value: bearer
expires_in	The lifetime in seconds of the access token. Since the token is set at 5 minutes, the recommended value is 300.
scope	Scope of access authorized

9.1   Bulk FHIR® Dataset Query (with access token)

The bulk dataset query requires specific methods and resources, as shown in Table 6.

Table 6: Bulk FHIR® Dataset Query

Method	Description
GET [fhir base]/Patient/$export	Data on all patients
GET [fhir base]/Group/[id]/$export	Data on all patients within a group
GET [fhir base]/$export	All data in the system e.g. EHR migration

9.2   URL to Poll for Completion Status

With a valid and authorized query request, the 4DH system can begin to collect the data specified in the request. The final results will be made available in output files, which the client will likely need to download.

In the response to the data client, the 4DH system will provide a URL where the client can issue calls to check on the status of (or cancel) the Bulk FHIR Data query processing.

While the background job is in progress, requests for status should return a status of either a 202 (still in progress) or 200 (complete). The URL to poll for status, as well as the URL to cancel, is listed in Table 7.

Table 7: URLs for Status and Cancellation

Action	URL	Notes
Status Request	GET https://ihsdev4dhapim.ihs.gov/bulkfhir/r4/status/93c67743-540c-4783-b07c-05c460279f9e	The data client can begin checking whether or not the requested files are ready for download. May repeat request. Responses: X-Progress: "50% complete", Retry-After: 120, or a file list (see Section 8.3)
Cancel request	DELETE https://ihsdev4dhapim.ihs.gov/bulkfhir/r4/status/93c67743-540c-4783-b07c-05c460279f9e	At the data client's discretion, the client can call the status url. If the cancellation request is processed successfully, 4DH ODS will respond with a Status of 202

9.3   FHIR® Data File Download

A final status check will return the location of the generated data files. A 4DH sample response with the location of the files is shown below.

Sample 4DH Completion Response:
{

```
     "transactionTime": "2022-07-27T18:34:55Z",
    "request": "https://ihs4dhapim.ihs.gov/bulkfhir/r4/Group/1/$export",
    "requiresAccessToken": true,
    "output": [
      {
       "type": "AllergyIntolerance",
        "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_AllergyIntolerance_0001.ndjson"
      },
      {
       "type": "CarePlan",
        "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_CarePlan_0001.ndjson"
      },
      {
       "type": "CareTeam",
        "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_CareTeam_0001.ndjson"
      },
      {
       "type": "Condition",
        "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_Condition_0001.ndjson"
      },
      {
       "type": "ice",
        "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_ice_0001.ndjson"
      },
      {
       "type": "DiagnosticReport",
        "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_DiagnosticReport_0001.ndjson"
      },
      {
       "type": "DocumentReference",
        "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_DocumentReference_0001.ndjson"
      },
      {
       "type": "Encounter",
        "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_Encounter_0001.ndjson"
      },
      {
```

```
      "type": "Goal",
      "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_Goal_0001.ndjson"
    },
    {
      "type": "Immunization",
      "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_Immunization_0001.ndjson"
    },
    {
      "type": "Location",
      "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_Location_0001.ndjson"
    },
    {
      "type": "MedicationRequest",
      "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_MedicationRequest_0001.ndjson"
    },
    {
      "type": "MedicationStatement",
      "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_MedicationStatement_0001.ndjson"
    },
    {
      "type": "Medication",
      "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_Medication_0001.ndjson"
    },
    {
      "type": "Observation",
      "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_Observation_0001.ndjson"
    },
    {
      "type": "Organization",
      "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_Organization_0001.ndjson"
    },
    {
      "type": "Patient",
      "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_Patient_0001.ndjson"
    },
    {
```

```
    "type": "Practitioner",
    "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_Practitioner_0001.ndjson"
  },
  {
    "type": "Procedure",
    "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_Procedure_0001.ndjson"
  },
  {
    "type": "Provenance",
    "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_Provenance_0001.ndjson"
  },
  {
    "type": "ServiceRequest",
    "url": "https://ihs4dhapim.ihs.gov/file/93c67743-540c-4783-b07c-
05c460279f9e_ServiceRequest_0001.ndjson"
  }
 ],
 "error": [
  {
    "type": "",
    "url": ""
  }
 ]
}
```

9.4   FHIR® Data Format

The files at the locations listed in the Sample 4DH Completion Response are of type ndjson, which is a list of json objects separated by a newline character. Each file contains one FHIR® resource per line. Sample contents of a file are shown below.

Sample FHIR® data file:

Line 1: {"id":"5c41cecf-cf81-434f-9da7-e24e5a99dbc2","name":[{"given":["Brenda"],"family":["Jackson"]}],"gender":"female","birthDate":"1956-10-14T00:00:00.000Z","resourceType":"Patient"}

Line 2: {"id":"3fabcb98-0995-447d-a03f-314d202b32f4","name":[{"given":["Bram"],"family":["Sandeep"]}],"gender":"male", "birthDate":"1994-11-01T00:00:00.000Z","resourceType":"Patient"}

Line 3: {"id":"945e5c7f-504b-43bd-9562-
a2ef82c244b2","name":[{"given":["Sandy"],"family":["Hamlin"]}],"gender":"female
","birthDate":"1988-01-24T00:00:0

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Acronym List

Acronym	Meaning
4DH	Four Directions Hub (HIE service)
API	Application Programming Interface
CCDA	Consolidated Clinical Document Architecture
CIS	Centralized Interoperability Suite
EHR	Electronic Health Record
FHIR®	Fast Healthcare Interoperability Resources
HL7	Health Level Seven International
IHS	Indian Health Service
JSON	JavaScript Object Notation
JWT	JSON Web Token
RPMS	Resource and Patient Management System
XML	Extensible Markup Language

Contact Information

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