



MIHIN
Michigan Health Information Network

Michigan Statewide Health Provider and Consumer Directory FHIR APIs

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Version Control

Version	Date	Changes	Author
0.0	11/04/15	Initial draft version	Jeff Eastman
1.0	11/05/15	Added language and references to FHIR standard for improved compatibility and interoperability	Jeff Eastman
2.0	11/10/15	Minor edits, move to MiHIN format	D. Livesay
3.0	11/10/15	Added id fields to relevant objects and defined HPD Identifier Systems	Jeff Eastman
4.0	11/10/15	Renamed to FHIR API and added practitionerRole field on Practitioner to encode specialty information.	Jeff Eastman
5.0	11/25/15	Added FHIR Patient resource to support transactional ACRS administration Added Electronic Service and Membership <i>extensions</i> to the FHIR Resource definitions.	Jeff Eastman
6.0	01/07/16	Updated Coding system values to correspond with URL formats Added a section for Datatypes to distinguish them from Resources Added Statewide Consumer Directory APIs needed to preserve backward compatibility while	Jeff Eastman



		<p>utilizing FHIR resources and data types wherever possible.</p> <p>Removed FHIR Patient resource in favor of FHIR Person resource and ActiveCareRelationship resource extension</p>	
7.0	12/07/15	<p>Reversed decision to switch from Person to Patient resources in order to eliminate the need for Personal Relationships in the SCD API definition. Patient.Contact fields already contain most of this functionality and the rest can be expressed with Extensions.</p>	Jeff Eastman
8.0	12/22/15	<p>Adjusted FHIR extension types to be compatible Basic resource types and added examples from operational HAPI-FHIR server incorporating them.</p>	Jeff Eastman
9.0	01/07/16	<p>Removed member and activeCareRelationship extensions to Organizations because they don't scale well in practice.</p> <p>Added administrator field to Active Care Relationships to support linking to submitting organization</p> <p>Removed careProvider and managingOrganization from SCD Patient to eliminate PHI from this record type.</p> <p>Added FHIR Contract to record Consent Directives in the SCD</p>	Jeff Eastman



10.0	01/25/16	<p>Removed practitionerRole for encoding NUCC Taxonomy specialty information</p> <p>Added taxonomy extensions to Organization and Practitioner to encode NUCC Taxonomy specialty information</p> <p>Added qualification extension to Organization to encode credential information for licenses & other credentials</p>	Jeff Eastman
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13.0	03/14/16	Removed the backwards compatibility API sections	Jeff Eastman



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Introduction

This document defines a RESTful API that can be used to Create and Update Providers and Organizations within the Statewide Health Provider Directory (HPD). This interface adopts the terminology and semantics of a subset of the HL7 Fast Healthcare Interoperability Resources ([FHIR](#)) standard. References to particular resources defined by the FHIR standard and adopted by this API are included in the paragraphs below.

This document also defines a RESTful API that can be used create and update information about Consumers within the Statewide Consumer Directory (SCD). The HPD and SCD reside in the same Salesforce instance and many of the resources are interdependent (esp. ActiveCareRelationship), thus these two APIs share the same document.

FHIR Resources

“Resources represent granular clinical concepts. The resources can be managed in isolation, or aggregated into complex documents. This flexibility offers coherent solutions for a range of interoperability problems. The simple direct definitions of the resources are based on thorough gathering of requirements, formal analysis and extensive cross-mapping to other relevant standards.

Each resource carries a master id. The id is never changed or reused, and it identifies the resource permanently. Resources may refer to other resources by id knowing that this is a stable reference. Each resource has a URL which is derived from the id, the type, and the local base URL. Given one resource address, the address of any other resource can be automatically determined.

Resources contain references to other resources. While each resource can be read and/or changed without explicit reference to these other resources, the presence of these references influences the behavior of the system: implementations are required to maintain system and data integrity at all times.

Each resource supports the same list of transactions - read, update, delete, etc. One particularly important transaction supported by every resource type is the



provision of a conformance statement which specifies what parts of the defined content model are supported by the system, and what other transactions or interactions are supported. If any of the other interactions are supported, the conformance interaction must be supported. (i.e. if the conformance interaction returns an error, no operations are supported).” - From [FHIR Resources](#).

This section defines the Resources supported by this API, their supported data fields and how these fields are mapped to the internal HPD data model.

Organization

“A formally or informally recognized grouping of people or organizations formed for the purpose of achieving some form of collective action. Includes companies, institutions, corporations, departments, community groups, healthcare practice groups, etc.” - from [FHIR Organization](#). The following fields are supported by this API:

- ⑥ **id** – [0..1] Inherited from Resource. The Organization.ID
- ⑥ **name** – [1..*] Organization Name related objects
- ⑥ **type** – [0..1] Organization.Type
- ⑥ **identifier** – [0..*] Organization Identifier related objects
- ⑥ **address** – [0..*] Organization Address related objects
- ⑥ **telecom** – [0..*] Organization Telephone, Email, Website

Practitioner

“A person who is directly or indirectly involved in the provisioning of healthcare.” - from [FHIR Practitioner](#). The following fields are supported by this API:

- ⑥ **id** – [0..1] The Contact ID (Providers are a record type of Contact)
- ⑥ **name** – [1..*] ProviderName related objects
- ⑥ **active** – [0..1] Provider.Status
- ⑥ **gender** – [0..1] Provider.Gender
- ⑥ **birthdate** - [0..1] Provider.Birthdate
- ⑥ **identifier** – [0..*] Provider Identifier related objects
- ⑥ **telecom** – [0..*] Provider.Telephone, Email
- ⑥ **address** – [0..*] Provider Address related objects



- ⑥ **qualification** – [0..*] Provider Credential related objects

Bundle

“A container for a collection of resources.” - from [FHIR Bundle](#). The following fields are supported by this API:

- ⑥ **type** – [1..1]
- ⑥ **entry** – [1..*]



FHIR Resource Extensions

This API supports the following classes that augment and extend the current set of FHIR Resources. They closely model the current HPD artifacts and are required to support the current production HPD use cases. These new resources will be submitted to the FHIR development process in the hopes they can be incorporated into that standard at some point in the future.

Organization

The following new fields extend the standard definition of Organization as noted above. These fields are implemented using the [FHIR Extensibility](#) mechanism:

- ⑥ **service** – [0..*] References to ElectronicServices are encoded as Extensions with the MIHIN_ELECTRONIC_SERVICE_URL = <http://org.mihin.fhir.extension.electronic-service>
- ⑥ **taxonomy** – [0..*] Organization Specialty related objects are encoded as Extensions with the NUCC_TAXONOMY_URL=http://org.nucc.taxonomy
- ⑥ **qualification** – [0..*] Organization Credential related objects are encoded as Extensions with the MININ_QUALIFICATION_URL=org.mihin.qualification

Practitioner

This API supports the [United States Realm FHIR Profile](#) extensions to encode optional *race*, *ethnicity* and *religion* attributes. If a Direct email is encoded in a **telecom** associated with the Practitioner, this will have the effect of adding/updating an appropriate ElectronicService in the **service** below. The following new fields also extend the standard definition of Practitioner as noted above: These fields are implemented using the [FHIR Extensibility](#) mechanism:

- ⑥ **service** – [0..*] References to ElectronicServices are encoded as Extensions with the MIHIN_ELECTRONIC_SERVICE_URL = <http://org.mihin.fhir.extension.electronic-service>
- ⑥ **taxonomy** – [0..*] Provider Specialty related objects are encoded as Extensions with the NUCC_TAXONOMY_URL=http://org.nucc.taxonomy



Membership

A Membership denotes a formal relationship between a Practitioner or Organization and another Organization in which the member participates or has participated. These fields are implemented using the [FHIR Extensibility](#) mechanism as instances of the [FHIR Basic](#) resource.

- ⑥ **id** – [0..1] Inherited from Resource. The ID of the Membership
- ⑥ **code** – [1..1] A CodeableConcept that includes the MIHIN_ELECTRONIC_SERVICE_URL coding
- ⑥ **extensions** – This Basic resource is further extended with extensions having the MIHIN_ELECTRONIC_SERVICE_URL with the field name appended and separated by a period.
 - **type** – [1..1] A CodeableConcept that denotes the type of the membership. See Organization Membership Types and Practitioner Membership Types below.
 - **owner** – [1..1] A Reference to an Organization that has the members
 - **member** – [1..1] A Reference to a Practitioner or Organization
 - **identifier** – [0..1] An Identifier by which the member is known to the organization
 - **service** – [0..*] References to Electronic Services
 - **period** – [0..1] A Period that defines the effective dates of this membership

ElectronicService

ElectronicServices represent the information required to securely transmit protected health information from one system to another system electronically. These fields are implemented using the [FHIR Extensibility](#) mechanism as instances of the [FHIR Basic](#) resource.

- ⑥ **id** – [0..1] Inherited from Resource. The Electronic_Service_c.ID
- ⑥ **code** – [1..1] A CodeableConcept that includes the MIHIN_MEMBERSHIP_URL coding
- ⑥ **extensions** – This Basic resource is further extended with extensions having the MIHIN_MEMBERSHIP_URL with the field name appended and separated by a period.
 - **name** – [1..1] A plain text *string* name of the service



- **destination** – [0..*] A list of CodeableConcepts that denote the MiHIN Shared Services for which this Electronic Service is a destination. See Service Destination Types below.
- **content** – [1..*] A list of CodeableConcepts that denote the content data types consumed by this service (i.e. delivery preferences). See Content Profile Types below.
- **integration** – [1..1] A CodeableConcept that denotes the networking protocol expected by this service. See Integration Profile Types below.
- **address** – [1..1] A string denoting the service’s delivery address (Direct email, IP, logical address)

Datatypes

“The FHIR specification defines a set of data types that are used for the resource elements. There are two categories of data types: simple / primitive types, which are single elements, and complex types, which are re-usable clusters of elements.”
From [FHIR Datatypes](#).

Identifier

“A numeric or alphanumeric string that is associated with a single object or entity within a given system. Typically, identifiers are used to connect content in resources to external content available in other frameworks or protocols. Identifiers are associated with objects, and may be changed or retired due to human or system process and errors.” - from [FHIR Identifier](#). The following fields are supported by this API:

- ⑥ **id** – [0..1] Required for **update**, optional for **read**, not allowed for **create**
- ⑥ **type** – [1..1] See HPD Supported Codings, below
- ⑥ **system** – [1..1] See HPD Identifier Systems, below
- ⑥ **value** – [1..1]
- ⑥ **period** – [0..1]



Address

“A postal address. There are a variety of postal address formats defined around the world. Postal addresses are often also used to record a location that can be visited to find a patient or person.” - from [FHIR Address](#). This API also supports the [United States Realm FHIR Profile](#) extensions to encode *county* information in addresses.

The following fields are supported by this API:

- ⑥ **id** – [0..1] Required for **update**, optional for **read**, not allowed for **create**
- ⑥ **use** – [1..1] Organization|Provider_Address_c.Use_c
- ⑥ **type** – [1..1] Organization|Provider_Address_c.Type_c
- ⑥ **line** – [1..1] Organization|Provider_Address_c.StreetAddress_1_c
- ⑥ **city** – [1..1] Organization|Provider_Address_c.City_c
- ⑥ **district** – [0..1] Organization|Provider_Address_c.County_c
- ⑥ **state** – [1..1] Organization|Provider_Address_c.State_c
- ⑥ **postalCode** – [1..1] Organization|Provider_Address_c.Postal_Code_c
- ⑥ **country** – [0..1]
- ⑥ **period** – [0..1]

CodeableConcept

“A CodeableConcept represents a value that is usually supplied by providing a reference to one or more terminologies or ontologies, but may also be defined by the provision of text. This is a common pattern in healthcare data.” - from [FHIR CodeableConcept](#). This API restricts CodeableConcepts to a representation containing a single, required Coding. The following fields are supported by this API:

- ⑥ **coding** – [1..1] Code defined by a terminology system
- ⑥ **text** – [0..1] Plain text representation of the concept

Coding

‘A Coding is a representation of a defined concept using a symbol from a defined “code system” - see [Using Codes in Resources](#) for more details.’ - from [FHIR Coding](#). The following fields are supported by this API:



- ⑥ **system** – [1..1] Identity of the terminology system
- ⑥ **code** – [1..1] Symbol in syntax defined by the system
- ⑥ **display** – [0..1] Representation defined by the system

ContactPoint

“Details for all kinds of technology-mediated contact points for a person or organization, including telephone, email, etc.” - from [FHIR ContactPoint](#). This API also supports the [United States Realm FHIR Profile](#) extensions to encode the *direct* flag indicating that a particular email address can be used with the Direct protocol. The following fields are supported by this API:

- ⑥ **system** - required
- ⑥ **value** - required
- ⑥ **use** - required
- ⑥ **rank** - optional
- ⑥ **period** - optional

HumanName

“A name of a human with text, parts and usage information.” - from [FHIR HumanName](#). The following fields are supported by this API:

- ⑥ **prefix** - optional
- ⑥ **given** - required
- ⑥ **family** - required
- ⑥ **suffix** - optional

Period

“A time period defined by a start and end date/time.” - from [FHIR Period](#). The following fields are supported by this API:

- ⑥ **start** – optional. If not present Period has been ongoing
- ⑥ **end** – optional. If not present Period is ongoing



HPD Supported Codings

The following Codings represent the vocabulary used for CodeableConcepts used in this API:

Organization Types

These codings are used to denote the types of Organizations supported by this API.

- ⑥ **system** = "http://org.mihin.fhir.organization.type"
- ⑥ **code** = {ACO, Association, Clinic, Department, HIE, Hospital, Lab, Long Term Care Facility, Medical School, Payer, Pharmacy, PO, Practice, University, Other}
- ⑥ **display** = (type if code = Other)

Practitioner Types

These codings are used to denote the types of Practitioners supported by this API.

- ⑥ **system** = "http://org.mihin.fhir.practitioner.type"
- ⑥ **code** = {Care Coordinator, Certified Nurse Midwife, Chiropractor, Doctor of Osteopathy, Licensed Practical Nurse, Medical Doctor, Medical Technologist, Non-clinical Staff, Nurse, Nurse Practitioner, Optometrist, Pharmacist, Physical Therapist, Physician Assistant, Podiatrist, Registered Nurse, Other}
- ⑥ **display** = (type if code = Other)

Organization Identifier Types

These codings are used to denote the types of Organization Identifiers supported by this API.

- ⑥ **system** = "http://org.mihin.fhir.organization.identifier.type"
- ⑥ **code** = {NPI, Medicare, Medicaid, OID, StarLIMS, BloodSpot, Other}
- ⑥ **display** = (type if code = Other)



Practitioner Identifier Types

These codings are used to denote the types of Practitioner Identifiers supported by this API.

- ⑥ **system** = "http://org.mihin.fhir.practitioner.identifier.type"
- ⑥ **code** = {NPI, Medicare, Medicaid, StarLIMS, BloodSpot, SSN-4, Other}
- ⑥ **display** = (type if code = Other)

Organization Membership Types

These codings are used to denote the types of Organization Memberships supported by this API.

- ⑥ **system** = "http://org.mihin.fhir.organization.membership.type"
- ⑥ **code** = {Part Of, Member Of, Service Provider To, Other}
- ⑥ **display** = (type if code = Other)

Practitioner Membership Types

These codings are used to denote the types of Practitioner Memberships supported by this API.

- ⑥ **system** = "http://org.mihin.fhir.practitioner.membership.type"
- ⑥ **code** = {Employed By, Member Of, Practices In, Has Admitting Privileges In, Accepts Benefit Plan Of, Other}
- ⑥ **display** = (type if code = Other)

Service Destination Types

These codings are used to denote the types of Service Destinations supported by this API.

- ⑥ **system** = "http://org.mihin.fhir.service.destination.type"
- ⑥ **code** = {Immunizations, Laboratory Results, Quality Measures, Transitions of Care, Medication Reconciliation, Other}
- ⑥ **display** = (type if code = Other)



Content Profile Types

These codings are used to denote the types of Content Profiles supported by this API: HL-7 ADT message types and LOINC codes. See [Known Code Systems](#) for additional details

⑥ **system** = <http://hl7.org.adt>

⑥ **code** =

- A01
- A02
- A03
- A04
- A06
- A07
- A13
- A14
- A21
- A22
- A23
- A25
- A26
- A27
- A28
- A29
- A31
- A32

⑥ **system** = <http://loinc.org>

⑥ **code** =

- 34133-9

Integration Profile Types

These codings are used to denote the types of Integration Profiles supported by this API.

⑥ **system** = "http://org.mihin.fhir.integration.profile.type"

⑥ **code** = {Direct SMTP, LLP, Other}

⑥ **display** = (type if code = Other)



HPD Identifier Systems

This is a list of the Identifier systems that have been defined for this API:

- ⑥ **NPI** - <http://hl7.org/fhir/sid/us-npi>
- ⑥ **SSN-4** - <http://hl7.org/fhir/sid/us-ssn>
- ⑥ **Medicare** - <to be defined>
- ⑥ **Medicaid** - <to be defined>
- ⑥ **OID** - urn:oid
- ⑥ **StarLIMS** - <to be defined>
- ⑥ **BloodSpot** - <to be defined>
- ⑥ **CommonKeyService** - <to be defined>



Statewide Consumer Directory FHIR API

The following API is supported in order to support the current SCD functionality.

SCD Resources

The following FHIR Resources are supported by the SCD FHIR API:

Patient

“Demographics and other administrative information about an individual or animal receiving care or other health-related services.” - from [FHIR Patient](#). The following fields are supported by this API:

- ⑥ **id** – [0..1] The Patient ID field (Patients are record types of Contact)
- name** – [1..*] Patient Name & Patient Name related objects
- ⑥ **active** – [0..1] Patient Status
- ⑥ **identifier** – [0..*] Patient Identifier related objects
- ⑥ **telecom** – [0..*] Patient Telephone, fax, email, ...
- ⑥ **address** – [0..*] Patient Address related objects
- ⑥ **gender** – [0..1] Patient Gender
- ⑥ **birthdate** – [0..1] Patient Birthdate
- ⑥ **contact** – [0..*] Patient Relationship related object

There are 3 main methods that a Patient can be identified in this API:

- ⑥ By **id**. This is the most efficient way to uniquely identify a Patient in the directory, as Salesforce indexes all Objects by this value.
- ⑥ By **identifier**. This is the second most efficient way to identify a Patient in the directory. A search will be done on the Patient_Identifier_c related objects, indexed by **system** and **value**.
- ⑥ By demographic matching. The supplied fields will be passed to the MiHIN Common Key Service to retrieve a common key Identifier for the Patient. If such an Identifier is returned, a search will be done using this value.

*Note: In the event that more than one of these methods is provided in a single service endpoint request, only one will be evaluated in the order of **id**, **identifier**, and demographics.*



*Note: In the event that more than one **identifier** is supplied, all identifiers will be used to query the SCD and all must uniquely identify the same Patient in the directory. Otherwise an error will be returned.*

*Note: The MiHIN Common Key Service currently requires values for the following fields in order to be able to return a common key Identifier: **name, gender, birthDate, and one address.***

Contract

“A formal agreement between parties regarding the conduct of business, exchange of information or other matters.” From [FHIR Contract](#). Contracts are used in the SCD to record *Consent Directives* as in the [FHIR Consent Directive Profile](#). The following fields are supported in this API:

- ⑥ **id** – [0..1] inherited from Resource
- ⑥ **identifier** – [0..1] an Identifier for the contract
- ⑥ **issued** – [1..1] the DateTime the contract was issued
- ⑥ **applies** – [0..1] the Period during which this contract applies
- ⑥ **subject** – [1..1] a Reference to the Patient whose information is being shared
- ⑥ **type** – [1..*] a CodeableConcept that describes the type(s) of information to be shared
- ⑥ **subtype** – [0..*] a CodeableConcept that describes the subtype(s) of information
- ⑥ **actor** – [1..*] one or more ActorComponents that identify the actors (senders & recipients) in the sharing of information.
- ⑥ **signer** – [1..*] one or more SignatureComponents that identify the person(s) executing the Contract
- ⑥ **legal** – [1..1] a Reference to the actual legal document that was executed. This will typically be the external URL of that document as stored in an external eCMS system but it may also be an internal reference if the document is hosted in the SCD.
- ⑥ **service** – [0..1] (FHIR Extension) a Reference to the Electronic Service of the hosting eCMS provider

Note: The Michigan eCMS definitions are still fluid, thus this part of the SCD API may be expected to change as we track the Michigan standards in this area. Also, the Codings to be used for Michigan Consent Directives need to be defined. The example shown below has illustrative values only.



SCD Resource Extensions

This API supports the following classes that augment and extend the current set of FHIR Resources. They closely model the current SCD artifacts and are required to support the current production SCD use cases. These new resources will be submitted to the FHIR development process in the hopes they can be incorporated into that standard at some point in the future.

Organization

The following new fields extend the standard definition of Organization as noted above:

- ⑥ **serviceDescription** – [0..*] References to ServiceDescriptions are encoded as Extensions with the MIHIN_SERVICE_DESCRIPTION_URL = <http://org.mihin.fhir.extension.service-description>

Patient

This API supports the [United States Realm FHIR Profile](#) extensions to encode optional *race*, *ethnicity* and *religion* attributes.

Membership

The HPD Resource Extension Membership is further extended to allow the following additional field values:

- ⑥ **type** – (1..1) The type may also be selected from the Patient Membership Type codings, defined below.
- ⑥ **member** (1..1) The member may also be a Reference to a Patient

ServiceDescription

A ServiceDescription wraps an ElectronicService and its hosting Organization into an object that contains adequate information for an end user to select a particular Membership in which to participate as a member. These fields are implemented using the [FHIR Extensibility](#) mechanism as instances of the [FHIR Basic](#) resource.

- ⑥ **id** – [0..1] Inherited from Resource. The Service_Description_c.ID.
- ⑥ **code** – [1..1] A CodeableConcept that includes the MIHIN_SERVICE_DESCRIPTION_URL coding



- ⑥ **extensions** – This Basic resource is further extended with extensions having the MIHIN_SERVICE_DESCRIPTION_URL with the field name appended and separated by a period.
 - **type** – [1..1] A CodeableConcept that identifies the type of the Membership to be created to subscribe to this service. See Service Description Types below.
 - **name** – [1..1] A *string* that denotes the name of the service
 - **icon** - [0..1] An *image* that can be used to represent the service
 - **description** - [0..1] A *string* that provides a longer description of the service
 - **organization** – [1..1] A Reference to the Organization that is offering the service
 - **service** - [1..1] A Reference to an ElectronicService that supports this ServiceDescription

ActiveCareRelationship

ActiveCareRelationships are used to record the members of a Patient's Care Team, as reported to the MiHIN Active Care Relationship Service (ACRS) by Qualified Organizations (QO). These fields are implemented using the [FHIR Extensibility](#) mechanism as instances of the [FHIR Basic](#) resource.

- ⑥ **id** – [0..1] Inherited from Resource. The Active_Care_Relationship_c.ID
- ⑥ **code** – [1..1] A CodeableConcept that includes the MIHIN_ACTIVE_CARE_RELATIONSHIP_URL coding
- ⑥ **extensions** – This Basic resource is further extended with extensions having the MIHIN_ACTIVE_CARE_RELATIONSHIP_URL with the field name appended and separated by a period.
 - **patient** – [1..1] A Reference to the Active_Care_Relationship_c.Patient
 - **provider** – [1..1] A Reference to the Active_Care_Relationship_c.Provider
 - **practice** – [1..1] A Reference to the Active_Care_Relationship_c.Practice
 - **manager** – [1..1] A Reference to the Active_Care_Relationship_c.Manager
 - **attribution** – [0..*] Zero or more CodeableConcepts denoting the attribution mechanism(s) employed to produce this relationship



- **period** – [0..1] The period of time during which this active care relationship exists



SCD Supported Codings

The following Codings represent the vocabulary used for CodeableConcepts used in this API:

Patient Identifier Types

These codings are used to denote the types of Patient Identifiers supported by this API.

- ⑥ **system** = "http://org.mihin.fhir.patient.identifier.type"
- ⑥ **code** = {CKS, SSN-4, Medicaid, Other}
- ⑥ **display** = (type if code = Other)

Patient Membership Types

These codings are used to denote the types of Patient Memberships supported by this API.

- ⑥ **system** = "http://org.mihin.fhir.patient.membership.type"
- ⑥ **code** = {Preferred Portal, Preferred PHR, Advance Directive Location, Other}
- ⑥ **display** = (type if code = Other)

Service Description Types

These codings are used to denote the types of Service Destinations supported by this API.

- ⑥ **system** = "http://org.mihin.fhir.service.description.type"
- ⑥ **code** = {Advance Directive, Other}
- ⑥ **display** = (type if code = Other)

Service Description Types

These codings are used to denote the types of Active Care Relationship attributions supported by this API.

- ⑥ **system** = <http://org.mihin.fhir.active-care-relationship.attribution.type>
- ⑥ **code** = see Codes in table below
- ⑥ **display** = see Display in table below



Code	Display	Description
DP	Declared by patient	Declared: Stated as true by patient
DC	Declared by care giver	Declared: Stated as true by a care giver
RP	Reported by provider	Reported: By Provider in a claim or medical transaction about a given patient or beneficiary
RO	Reported by organization	Reported: By Organization in a claim or medical transaction about a given patient or beneficiary
AL	Algorithmically assigned	Assigned: Link made by an algorithm or model
CP	Confirmed by patient	Confirmed: By patient
CC	Confirmed by care giver	Confirmed: By care giver
XP	Contested by patient	Contested: By patient
XG	Contested by care giver	Contested: By care giver



RESTful API

'Each "resource type" has the same set of interactions defined that can be used to manage the resources in a highly granular fashion. Applications claiming conformance to this framework claim to be conformant to "RESTful FHIR" (see [Conformance](#)).

Note that in this RESTful framework, transactions are performed directly on the server resource using an HTTP request/response. See the sections below for more information on Authentication and Authorization.

The API describes the FHIR resources as a set of operations (known as "interactions") on resources where individual resource instances are managed in collections by their type. Servers can choose which of these interactions are made available and which resource types they support. Servers SHALL provide a [conformance statement](#) that specifies which interactions and resources are supported.' - text from [FHIR Restful API](#).

Instance Level Interactions

The following instance interactions are supported by this API:

- ⑥ **read** – an HTTP GET
- ⑥ **update** – an HTTP PUT
- ⑥ **delete** – an HTTP DELETE. Note that objects are not actually deleted by this operation and can be un-deleted by system administrators

Type Level Interactions

The following type level interactions are supported by this API:

- ⑥ **create** – an HTTP POST
- ⑥ **search** – an HTTP GET or POST

Whole System Interactions

The following whole system interactions are supported by this API:



⑥ **conformance** – An HTTP OPTIONS or GET

Authentication

See the Force.com REST Developers Guide for details on accessing this API (http://www.salesforce.com/us/developer/docs/api_rest/api_rest.pdf). The required login credentials, Connected Application Consumer Key and Consumer Secret may be obtained from MiHIN.

To find the endpoint needed to make API calls, authentication must be done using OAuth as per the [Web Service Authorization with OAuth](#) documentation. The response will include an “instance_url” parameter. Use the value of this parameter in place of “{instance_url}” when determining the endpoint for an API query based on the URL section.

Requesting an Access Token

End-user username and password credentials must be provided in order to request an access token, which can be used as a session ID. This access token can be used to perform additional operations on the directory. The user should make an out-of-band POST request to the token endpoint, with the following parameters:

- **grant_type** - Value must be password for this flow.
- **client_id** - Consumer key from the connected app definition.
- **client_secret** - Consumer secret from the connected app definition.
- **username** - End-user username.
- **password** - End-user password

Note: password = SF Password + SF Security Token

Security

All communication is to be done over port 443. The following list of Salesforce servers may require white listing:

- [96.43.144.0/20](#) _ subnet mask: 255.255.240.0
- [136.146.0.0/15](#) _ subnet mask: 255.254.0.0
- [182.50.76.0/22](#) _ subnet mask: 255.255.252.0
- [204.14.232.0/21](#) _ subnet mask: 255.255.248.0



Authorization

Authorization in Salesforce is accomplished by associating a Profile with each User Account. Each profile determines the fields and objects that can be viewed or updated within the Salesforce instance. Within the HPD and SCD, different record types of Salesforce Contact objects are used to represent the Practitioners and Patients (Providers and Consumers) described in this API. In order for an external user to access any of the information in these directories, they must have a User Account with a Profile that defines their authorized levels of access to the information in the directory.

HPD Profiles

All of the information in the HPD is visible (read only) to all users of both directories. We distinguish six levels of write authorization by defining the following Profiles:

- ⑥ HPD Provider – HPD Providers can create and update information about themselves within the HPD using web portal access only. No API access is supported for this profile.
- ⑥ HPD Organization Administrator – HPD Organization Administrators can create and update information about the organizations and practitioners in their *population* using web portal access only. No API access is supported for this profile. *Populations may be flexibly defined to suit a variety of accessing needs and system administrators perform this configuration.*
- ⑥ HPD Population Administrator – HPD Population Administrators have the same create and update permissions as Organization Administrators, but can also create User Accounts for their providers and organization administrators. Population administrators have additional permissions to create reports, modify their portal branding and they have full API access to the members of their population.
- ⑥ HPD Platform Read – HPD Platform Read users have limited web access to the HPD but have full, read-only access to the directory using the HPD API defined above.
- ⑥ HPD Platform Write – HPD Platform Write users have limited web access to the HPD but have full, read-write access to the directory using the HPD API defined above.
- ⑥ System Administrators – System Administrators have full access to all of the information in both directories and are the only HPD profiles that allow deletion of information in the directory.



SCD Profiles

The information in the SCD is considered to be HIPAA Protected Health Information (PHI) and so access to this information is much more closely controlled. We currently define only three profiles that can be used to access this information:

- ⑥ SCD Platform Read - SCD Platform Read users have limited, read-only access to a subset of the SCD information that is necessary to route health information to destinations specified by consumers (Patients in the API) in the directory. See Consumer Affiliations below for more details.
- ⑥ SCD Platform Write – SCD Platform Write users have full read-write access to the information about themselves and concerning other consumers (Patients in the API) who have specified them as **caretakers**. See the section on Consumer Relationships below for details on how this is specified.
- ⑥ System Administrators - System Administrators have full access to all of the information in both directories and are the only SCD profiles that allow deletion of information in the directory

NIST Levels of Assurance

The National Institute of Standards and Technology (NIST) defines four levels of assurance that are adopted by this API definition. A summary of these requirements is provided below. Please see [NIST SP 800-63-2](#) for the full details.

1. **Level 1** - Although there is no identity proofing requirement at this level, the authentication mechanism provides some assurance that the same Claimant who participated in previous transactions is accessing the protected transaction or data. It allows a wide range of available authentication technologies to be employed and permits the use of any of the token methods of Levels 2, 3, or 4. Successful authentication requires that the Claimant prove through a secure authentication protocol that he or she possesses and controls the token...

Level 2 – Level 2 provides single factor remote network authentication. At Level 2, identity proofing requirements are introduced, requiring presentation of identifying materials or information. A wide range of available authentication technologies can be employed at Level 2. For single factor authentication, Memorized Secret Tokens, Pre- Registered Knowledge Tokens, Look-up Secret Tokens, Out of Band Tokens, and Single Factor One-Time Password Devices are allowed at Level 2. Level 2 also permits any of the token methods of Levels 3 or 4. Successful authentication requires that the Claimant prove through a secure authentication protocol that he or she controls the token...



Level 3 – Level 3 provides multi-factor remote network authentication. At least two authentication factors are required. At this level, identity proofing procedures require verification of identifying materials and information. Level 3 authentication is based on proof of possession of the allowed types of tokens through a cryptographic protocol. Multi-factor Software Cryptographic Tokens are allowed at Level 3. Level 3 also permits any of the token methods of Level 4. Level 3 authentication requires cryptographic strength mechanisms that protect the primary authentication token against compromise by the protocol threats for all threats at Level 2 as well as verifier impersonation attacks. Various types of tokens may be used as described in Section 6...

Level 4 – Level 4 is intended to provide the highest practical remote network authentication assurance. Level 4 authentication is based on proof of possession of a key through a cryptographic protocol. At this level, in-person identity proofing is required. Level 4 is similar to Level 3 except that only “hard” cryptographic tokens are allowed...

Identity Proofing

In order to control the authorized access to the information that is contained within the directories, data sharing rules are configured within the Salesforce platform. These rules are attached to the Profile that is associated with each User Account. Since some of the information in the SCD is protected (PHI), we require a high level of assurance (LOA) that each user is whom they claim to be. The following table outlines the LOA required for each of the directory profiles.

Profile	Level of Assurance
HPD Provider	2
HPD Organization Admin	2
HPD Population Admin	3
HPD Platform Read	2
HPD Platform Write	3
SCD Platform Read	2
SCD Platform Write	3
System Administrator	4



Examples

Below are a couple of examples illustrating the FHIR Json encodings supported by this API. FHIR XML encodings are not supported:

An Example Organization

```
{
  "resourceType":"Organization",
  "id":"Organization-1059",
  "meta":{
    "versionId":"1",
    "lastUpdated":"2015-12-22T15:17:05.279-05:00"
  },
  "extension":[
    {
      "url":"http://org.mihin.fhir.extension.electronic-service",
      "valueReference":{
        "reference":"ElectronicService/ElectronicService-1199",
        "display":"Skilled.Nursing.Facility@direct.test.mihin.org"
      }
    }
  ],
  "identifier":[
    {
      "use":"official",
      "system":"http://www.hl7.org/oid/",
      "value":"1.2.3.4.5.9.99.9999.1059"
    },
    {
      "use":"official",
      "type":{
        "coding":[
          {
            "system":"http://hl7.org/fhir/v2/0203",
            "code":"NPI"
          }
        ]
      },
      "text":"US National Provider Identifier"
    }
  ],
}
```




```

        "system":"http://hl7.org/fhir/sid/us-npi",
        "value":"9999991059"
    }
],
"active":true,
"type":{
  "coding":[
    {
      "system":"NUCC",
      "code":"261Q00000X"
    }
  ],
  "text":"Clinic/Center"
},
"name":"Skilled Nursing Facility",
"telecom":[
  {
    "system":"phone",
    "value":"616.555.8199",
    "use":"work"
  }
],
"address":[
  {
    "line":[
      "221 N Missouri Circle"
    ],
    "city":"Rochester Hills",
    "state":"MI",
    "postalCode":"48307"
  }
]
}

```

An Example Organization “Peace of Mind”

```

{
  "resourceType":"Organization",
  "id":"Organization-1099",
  "meta":{

```



```

    "versionId":"2",
    "lastUpdated":"2015-12-23T06:32:33.178-05:00"
  },
  "extension":[
    {
      "url":"http://org.mihin.fhir.extension.electronic-service",
      "valueReference":{
        "reference":"ElectronicService/ElectronicService-1330",
        "display":"Peace.of.Mind@direct.test.mihin.org"
      }
    },
    {
      "url":"http://org.mihin.fhir.extension.electronic-service",
      "valueReference":{
        "reference":"ElectronicService/ElectronicService-1331",
        "display":"Peace of Mind"
      }
    },
    {
      "url":"http://org.mihin.fhir.extension.service-description",
      "valueReference":{
        "reference":"ServiceDescription/ServiceDescription-1",
        "display":"Advance Directive Repository"
      }
    }
  ],
  "identifier":[
    {
      "use":"official",
      "system":"http://www.hl7.org/oid/",
      "value":"1.2.3.4.5.9.99.999.9999.1099"
    },
    {
      "use":"official",
      "type":{
        "coding":[
          {
            "system":"http://hl7.org/fhir/v2/0203",
            "code":"NPI"
          }
        ]
      }
    }
  ]
}

```



```

    ],
    "text": "US National Provider Identifier"
  },
  "system": "http://hl7.org/fhir/sid/us-npi",
  "value": "9999991099"
}
],
"active": true,
"type": {
  "coding": [
    {
      "system": "NUCC",
      "code": "305S00000X"
    }
  ],
  "text": "Point of Service"
},
"name": "Peace of Mind",
"telecom": [
  {
    "system": "phone",
    "value": "734.555.8614",
    "use": "work"
  }
],
"address": [
  {
    "line": [
      "765 W Oak Avenue"
    ],
    "city": "Ann Arbor",
    "state": "MI",
    "postalCode": "48103"
  }
]
]
}

```

An Example Practitioner

```

{
  "resourceType": "Practitioner",

```



```

"id":"Practitioner-10127",
"meta":{
  "versionId":"1",
  "lastUpdated":"2016-01-11T13:56:29.272-05:00"
},
"extension":[
  {
    "url":"http://hl7.org/fhir/StructureDefinition/us-core-race",
    "valueCodeableConcept":{
      "coding":[
        {
          "system":"http://hl7.org/fhir/v3/Race",
          "code":"1002-5",
          "display":"Native"
        }
      ]
    }
  },
  {
    "url":"http://hl7.org/fhir/StructureDefinition/us-core-ethnicity",
    "valueCodeableConcept":{
      "coding":[
        {
          "system":"http://hl7.org/fhir/v3/Ethnicity",
          "code":"2186-5",
          "display":"Native"
        }
      ]
    }
  },
  {
    "url":"http://gov.onc.fhir.extension.taxonomy",
    "valueCodeableConcept":{
      "coding":[
        {
          "system":"http://org.nucc.taxonomy",
          "code":"208D00000X",
          "display":"General Practice"
        }
      ]
    }
  }
]

```



```

    }
  },
  {
    "url":"http://org.mihin.fhir.extension.electronic-service",
    "valueReference":{
      "reference":"ElectronicService/ElectronicService-186",
      "display":"Willie.B.Park@direct.mihintest.org"
    }
  }
],
"identifier":[
  {
    "use":"official",
    "type":{
      "coding":[
        {
          "system":"http://hl7.org/fhir/v2/0203",
          "code":"TAX"
        }
      ],
      "text":"US Social Security Number"
    },
    "system":"http://hl7.org/fhir/sid/us-ssn",
    "value":"000010127"
  },
  {
    "use":"official",
    "type":{
      "coding":[
        {
          "system":"http://hl7.org/fhir/v2/0203",
          "code":"NPI"
        }
      ],
      "text":"US National Provider Identifier"
    },
    "system":"http://hl7.org/fhir/sid/us-npi",
    "value":"9999910127"
  }
],

```



```
"name":{
  "family":[
    "Park"
  ],
  "given":[
    "Willie",
    "Benjamin"
  ],
  "suffix":[
    "MD"
  ]
},
"telecom":[
  {
    "system":"phone",
    "value":"313.555.4016",
    "use":"home"
  },
  {
    "system":"phone",
    "value":"313.555.6261",
    "use":"work"
  }
],
"address":[
  {
    "line":[
      "550 N Mississippi Avenue"
    ],
    "city":"Taylor",
    "state":"MI",
    "postalCode":"48180"
  }
],
"gender":"male",
"birthDate":"1975-07-30",
"qualification":[
  {
    "identifier":[
```



```

        "use": "official",
        "type": {
          "coding": [
            {
              "system": "http://gov.michigan.fhir.medical-license-type",
              "code": "MD"
            }
          ],
          "text": "Michigan Medical License"
        },
        "system": "http://gov.michigan.fhir.medical-license",
        "value": "LARA-10127",
        "assigner": {
          "display": "State of Michigan"
        }
      },
      "issuer": {
        "reference": "Organization/Organization-1001",
        "display": "Michigan Department of Licensing and Regulatory Affairs"
      }
    }
  ]
}

```

An Example Patient

```

{
  "resourceType": "Patient",
  "id": "Patient-1126",
  "meta": {
    "versionId": "1",
    "lastUpdated": "2015-12-22T15:17:11.151-05:00"
  },
  "extension": [
    {
      "url": "http://hl7.org/fhir/StructureDefinition/us-core-race",
      "valueCodeableConcept": {
        "coding": [
          {
            "system": "http://hl7.org/fhir/v3/Race",
            "code": "2106-3"
          }
        ]
      }
    }
  ]
}

```



```

    }
  ]
}
},
{
  "url":"http://hl7.org/fhir/StructureDefinition/us-core-ethnicity",
  "valueCodeableConcept":{
    "coding":[
      {
        "system":"http://hl7.org/fhir/v3/Ethnicity",
        "code":"2186-5"
      }
    ]
  }
},
{
  "url":"http://hl7.org/fhir/StructureDefinition/us-core-religion",
  "valueCodeableConcept":{
    "coding":[
      {
        "system":"http://hl7.org/fhir/v3/ReligiousAffiliation",
        "code":"1041"
      }
    ]
  }
},
],
"text":{
  "status":"generated",
  "div":"<div><div class=\"hapiHeaderText\"> Cady Grace <b>PAULSON
</b></div><table class=\"hapiPropertyTable\"><tbody><tr><td>Identifier</td><td>000-
00-1126</td></tr><tr><td>Address</td><td><span>640 E Hudson Circle </span><br
/><span>St. Clair Shores </span><span>MI </span></td></tr><tr><td>Date of
birth</td><td><span>14 December 2011</span></td></tr></tbody></table></div>"
},
"identifier":[
  {
    "use":"official",
    "type":{
      "coding":[

```




```

        {
            "system":"http://hl7.org/fhir/v2/0203",
            "code":"TAX"
        }
    ],
    "text":"US Social Security Number"
},
"system":"http://hl7.org/fhir/sid/us-ssn",
"value":"000-00-1126"
},
{
    "use":"official",
    "type":{
        "coding":[
            {
                "system":"http://org.mihin.fhir.patient.identifier.type",
                "code":"CKS"
            }
        ],
        "text":"MiHIN Common Key Service Id"
    },
    "system":"http://org.mihinss/fhir/cks",
    "value":"ah7xjkynfl4bdznumnupokdyn67xm4x4qtuqpweb"
}
],
"name":[
    {
        "family":[
            "Paulson"
        ],
        "given":[
            "Cady",
            "Grace"
        ]
    }
],
"telecom":[
    {
        "system":"phone",
        "value":"586.555.5105",
    }
]

```



```

    "use":"home"
  },
  {
    "system":"phone",
    "value":"586.555.4955",
    "use":"work"
  },
  {
    "extension":[
      {
        "url":"http://hl7.org/fhir/StructureDefinition/us-core-direct",
        "valueBoolean":true
      }
    ],
    "system":"email",
    "value":"Cady.G.Paulson@direct.mihintest.org",
    "use":"home"
  }
],
"gender":"female",
"birthDate":"2011-12-14",
"address":[
  {
    "line":[
      "640 E Hudson Circle"
    ],
    "city":"St. Clair Shores",
    "state":"MI",
    "postalCode":"48082"
  }
]
}

```

An Example Electronic Service

```

{
  "resourceType":"Basic",
  "id":"ElectronicService-1",
  "meta":{
    "versionId":"1",

```



```

    "lastUpdated": "2015-12-22T15:56:58.252-05:00"
  },
  "extension": [
    {
      "url": "http://org.mihin.fhir.extension.electronic-service.name",
      "valueString": "Windward.General.Hospital@direct.test.mihin.org"
    },
    {
      "url": "http://org.mihin.fhir.extension.electronic-service.destination",
      "valueCodeableConcept": {
        "coding": [
          {
            "system": "http://org.mihin.fhir.services",
            "code": "ADT"
          }
        ],
        "text": "Windward.General.Hospital@direct.test.mihin.org"
      }
    },
    {
      "url": "http://org.mihin.fhir.extension.electronic-service.content",
      "valueCodeableConcept": {
        "coding": [
          {
            "system": "http://org.mihin.fhir.esi.content",
            "code": "MIME"
          }
        ],
        "text": "MIME Content"
      }
    },
    {
      "url": "http://org.mihin.fhir.extension.electronic-service.integration",
      "valueCodeableConcept": {
        "coding": [
          {
            "system": "http://org.mihin.fhir.esi.integration",
            "code": "Direct"
          }
        ],
      }
    }
  ]
}

```



```

        "text": "Direct SMTP"
      },
      {
        "url": "http://org.mihin.fhir.extension.electronic-service.address",
        "valueString": "Windward.General.Hospital@direct.test.mihin.org"
      }
    ],
    "code": {
      "coding": [
        {
          "system": "http://org.mihin.fhir.extension.electronic-service"
        }
      ],
      "text": "Electronic Service"
    }
  }
}

```

An Example Membership

```

{
  "resourceType": "Basic",
  "id": "Membership-760",
  "meta": {
    "versionId": "1",
    "lastUpdated": "2015-12-22T16:04:38.016-05:00"
  },
  "extension": [
    {
      "url": "http://org.mihin.fhir.extension.membership.type",
      "valueCodeableConcept": {
        "coding": [
          {
            "system": "http://org.mihin.fhir.practitioner.membership.type",
            "code": "Member Of"
          }
        ]
      },
      "text": "Practitioner Membership"
    }
  ],
}

```



```

{
  "url":"http://org.mihin.fhir.extension.membership.organization",
  "valueReference":{
    "reference":"Organization/Organization-1025",
    "display":"Health Care Professionals"
  }
},
{
  "url":"http://org.mihin.fhir.extension.membership.member",
  "valueReference":{
    "reference":"Practitioner/Practitioner-10304",
    "display":"Nancy Delacruz Elliott MD"
  }
},
{
  "url":"http://org.mihin.fhir.extension.membership.period",
  "valuePeriod":{
    "start":"2015-12-22T15:59:06-05:00"
  }
}
],
"code":{
  "coding":[
    {
      "system":"http://org.mihin.fhir.extension.membership"
    }
  ],
  "text":"Membership"
}
}

```

An Example Active Care Relationship

```

{
  "resourceType":"Basic",
  "id":"ActiveCareRelationship-2000",
  "meta":{
    "versionId":"2",
    "lastUpdated":"2015-12-23T06:37:07.235-05:00"
  },
  "extension":[

```



```

{
  "url":"http://org.mihin.fhir.extension.active-care-relationship.administrator",
  "valueReference":{
    "reference":"Organization/Organization-1022",
    "display":"Sunnyside Physicians"
  }
},
{
  "url":"http://org.mihin.fhir.extension.active-care-relationship.patient",
  "valueReference":{
    "reference":"Patient/Patient-11327",
    "display":"Caroline Collins Werner"
  }
},
{
  "url":"http://org.mihin.fhir.extension.active-care-relationship.provider",
  "valueReference":{
    "reference":"Practitioner/Practitioner-10076",
    "display":"Gina Wilkins Long MD"
  }
},
{
  "url":"http://org.mihin.fhir.extension.active-care-relationship.practice",
  "valueReference":{
    "reference":"Organization/Organization-1043",
    "display":"Southwest Family Medicine"
  }
},
{
  "url":"http://org.mihin.fhir.extension.active-care-relationship.period",
  "valuePeriod":{
    "start":"2021-11-10T20:46:09-05:00"
  }
}
],
"code":{
  "coding":[
    {
      "system":"http://org.mihin.fhir.extension.active-care-relationship"
    }
  ]
}

```



```

    ],
    "text": "Active Care Relationship"
  }
}

```

An Example Contract for a Consent Directive

```

{
  "resourceType": "Contract",
  "id": "Contract-82",
  "issued": "2016-01-06T14:01:33-05:00",
  "subject": [
    {
      "reference": "Patient/Patient-1132",
      "display": "Alex Ramirez Gonzales"
    }
  ],
  "type": {
    "coding": [
      {
        "system": "http://org.mdch.fhir.consent-type",
        "code": "EX"
      }
    ]
  },
  "text": "All regulated health information except excluded subtypes"
},
"subType": [
  {
    "coding": [
      {
        "system": "http://org.mdch.fhir.consent-subtype",
        "code": "ASD"
      }
    ]
  },
  "text": "Referrals and treatment for alcohol and substance use disorder"
}
],
"actor": [
  {
    "entity": {
      "reference": "Organization/Organization-1101",

```



```

    "display": "West Lake Clinic"
  },
  "role": [
    {
      "coding": [
        {
          "system": "http://org.mdch.fhir.consent-actor-type",
          "code": "IR",
          "display": "Recipient"
        }
      ],
      "text": "Recipient of restricted health information"
    }
  ],
},
{
  "entity": {
    "reference": "Organization/Organization-1100",
    "display": "East Lansing General Hospital"
  },
  "role": [
    {
      "coding": [
        {
          "system": "http://org.mdch.fhir.consent-actor-type",
          "code": "IR",
          "display": "Recipient"
        }
      ],
      "text": "Recipient of restricted health information"
    }
  ]
},
],
"signer": [
  {
    "type": {
      "system": "http://org.mdch.fhir.consent-signer-type",
      "code": "SELF"
    }
  },

```




```
"party": {
  "reference": "Patient/Patient-1132",
  "display": "Alex Ramirez Gonzales"
},
"signature": "Alex Gonzales "
}
],
"legal": [
  {
    "contentAttachment": {
      "contentType": "application/pdf",
      "language": "en-US",
      "url": "http://org.mihin.ecms/ConsentDirective-82",
      "title": "MDCH Consent To Share Your Health Information"
    }
  }
]
}
```

