Michigan Health Information Network

Statewide Health Provider Directory Implementation Guide

Version 12

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Document History

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8/19/2014	2-5	Formatting changes, added section 4	Amrutha Diwakar / Bo Borgnakke
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Acronyms and Abbreviations Guide

API	Application Programming Interface
HPD	Health Provider Directory
HISP	Health Information Service Provider
ESI	Electronic Service Information
EHR	Electronic Health Record
IHE	Integrating the Healthcare Enterprise
HIN	Health Information Network
TOC	Transition Of Care
ADT	Admit-Discharge-Transfer
HIN	Health Information Network
MU	Meaningful Use legislation
DSO	Data Sharing Organization
UCA	Use Case Agreement

UCS	Use Case Summary

Table of Contents

1 Introduction

Michigan's statewide Health Provider Directory Service (HPD) was created by Michigan Health Information Network Shared Services (HIN) under contract to the State of Michigan to enable electronic information sharing among healthcare providers and eligible organizations statewide. The HPD is a secure store and source for Electronic Service Information (ESI) used for accurately and securely routing health information, and was specifically designed so that it could be used in other states or regions, not just Michigan.

The HPD provides the ability to look up healthcare providers (by name, i.e. white pages and by other criteria such as specialty, i.e. yellow pages) to obtain their electronic delivery addresses which are essential for secure communication of PHI. The HPD is built on a powerful data model that allows storage and traversal of the myriad relationships and affiliations that providers typically have with multiple healthcare entities. HIN's HPD data model is fully compliant with emerging industry standards for provider directories such as HPD+, IHE/EHR, and the Modular Specification (ModSpec). Additionally, the data model in HPD is built using the Salesforce Force.com platform allowing the HPD to render ubiquitously in any browser or on any tablet or PDA as a Salesforce.com application with a familiar look and feel and the benefits that are inherent with that platform.

Use Cases

1.1 Submit Data

1.1.1 Purpose of Use Case

The HIN seeks to populate the statewide Health Provider Directory (HPD) with as much current health care organization and health professional information as is available. The HIN will assist Data Sharing Organizations in leveraging existing or establishing new capabilities to provide information on their, or their participants' provider profile records, organization records and any related affiliations, electronic addresses and electronic service information (ESI). Authorized health care organizations and health professionals can use the Directory to submit, update and look up electronic addresses and electronic service information to facilitate secure exchange of health information.

1.1.2 Data Flow and Actors

For more information about this use case, refer to the documents linked below:

Use Case Summary:

[MiHIN - UCS - Submit Data to Health Provider Directory - v10 11-11-14](#)

Use Case Agreement:

http://mihin.org/about-mihin/resources/mihin-legal-document-templates/

1.2 Basic Query

1.2.1 Purpose of Use Case

The statewide Health Provider Directory (HPD) Use Case provides up-to-date information on health care organizations and health professionals to facilitate contact look-up and secure exchange of health information for the purposes of meeting operational, treatment or payment obligations as defined in the HIPAA Privacy and Security Rules. Such information will include electronic address and electronic service information, such as Direct addresses, and may also include name, address, specialty and credentialing information.

When a user queries the statewide HPD via the basic search functionality, the HPD returns a standard report, which contains contact information about the health care organization(s) and health professional(s) meeting the user's search criteria.

1.2.2 Data Flow and Actors

For more information about this use case, refer to the documents linked below:

Use Case Summary:

[MiHIN - UCS - Health Provider Directory Basic Query - v12 11-11-14](#)

Use Case Agreement:

http://mihin.org/about-mihin/resources/mihin-legal-document-templates/

1.3 Advanced Query

1.3.1 Purpose of Use Case

The goal of the statewide HPD Advanced Query and Data Extract service is for Michigan Health Information Network Shared Services (HIN) to offer, on a limited pre-approved basis, tools for Data Sharing Organizations (DSO) and their participants that permit query access to and storage of the HPD data. As such a user of this service will be have permissions to access and store data that is beyond the capabilities provided with the Basic Search service. These permissions include:

- Ability of a user to see additional data elements that are not part of the Basic Query service,
- Extensive query capability, data retrieval of multiple records from the statewide HPD, and
- Capability for DSOs to store the results for analysis internal to their organization.

1.3.2 Data Flow and Actors

For more information about this use case, refer to the documents linked below:

Use Case Summary:

MiHIN - UCS - Health Provider Directory Advance Query - v9 11-11-14

Use Case Agreement:

http://mihin.org/about-mihin/resources/mihin-legal-document-templates/

2 HPD API for HISP Integration

A set of REST APIs have been developed to run on top of the native Force.com APIs. They are designed to make access to the HPD from a DIRECT HISP more straightforward from a programming perspective.
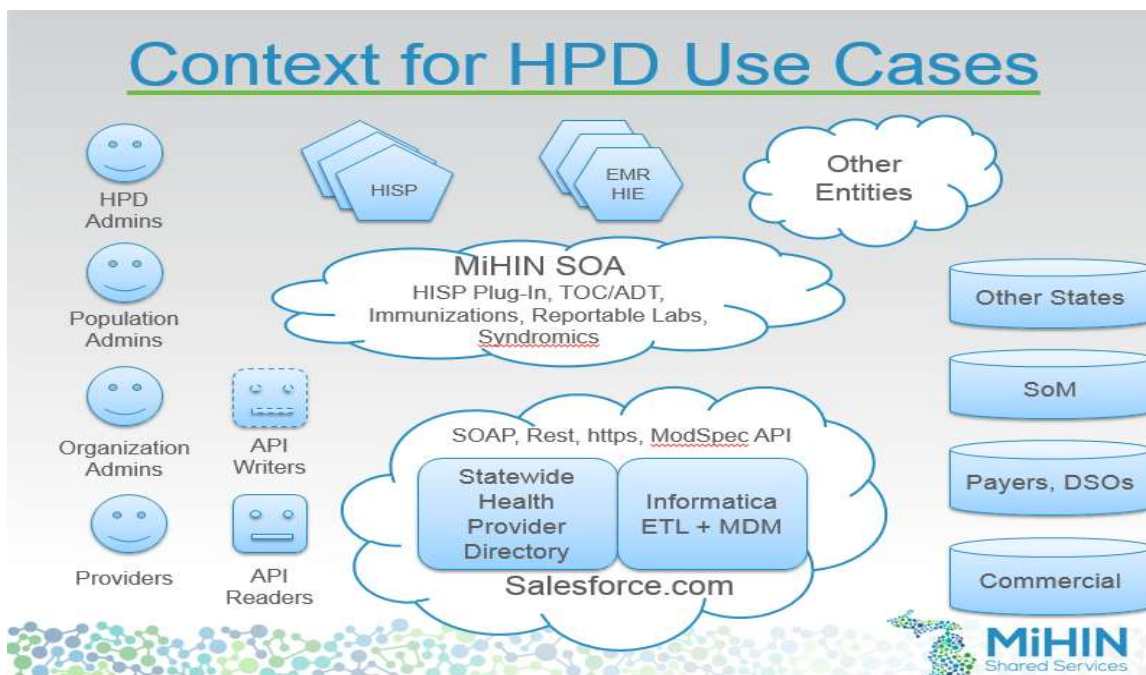
To obtain a detailed documentation of the API please contact MiHIN Help Desk at:

Email: help@mihin.org
Phone: (517) 336-1430

3 Architecture

The architectural overview of the HPD is depicted in the figure below.

The HPD receives data from multiple data sources, including the State of Michigan, Michigan's Data Sharing Organizations (DSO) which include the largest HIEs and Health Plans and has also used commercial data sources from time to time. Other states' provider information can also easily be imported. Provider data from these many sources is extracted, transformed, normalized and loaded into the HPD in the Salesforce Cloud using Informatica Cloud, a Salesforce-hosted Extract-Transform-Load (ETL) tool. Provider data is also de-duplicated using the Informatica's MDM tool.

Apart from the HPD which HIN operates in the Salesforce Cloud, HIN also operates its own cloud-based Service Oriented Architecture (SOA) where it offers other services including the transport of Public Health Reporting information such as Immunizations, Syndromics, and Reportable Labs, a Common CCD Gateway which includes a CONNECT on-ramp to the eHealth Exchange operated by HealtheWay, and a special gateway for Direct Secure Messaging called the Medical Information Direct Gateway, or MIDIGATE®.

4 Data Model

The HPD is deployed using the Salesforce.com platform and the HPD data model, built using the powerful data abstraction capabilities of the Salesforce Force.com platform, is depicted in the entity-relationship diagram below.
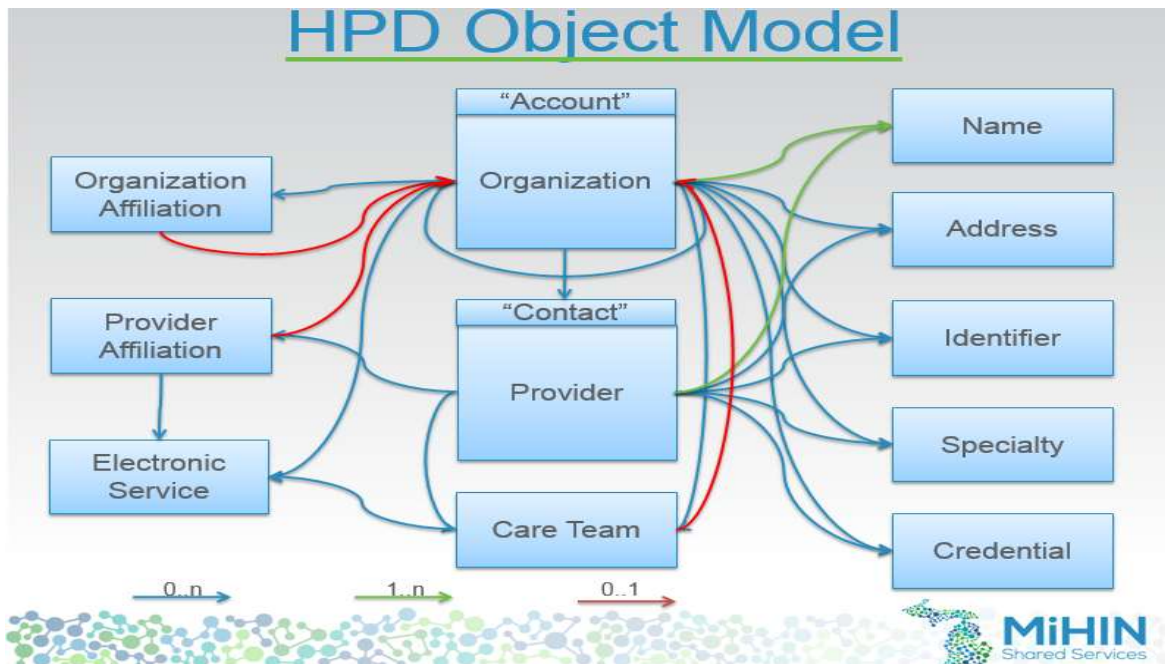
In the HPD data model, "Organizations "are built on top of Salesforce "Accounts" and "Providers" are built on top of Salesforce "Contacts." Organizations and providers can both store multiple names, addresses, identifiers, specialties and credentials.

The HPD data model supports multiple Provider-to-Organization affiliations which reflect the reality that many providers usually practice in more than one care setting. The directory supports multiple types of affiliations, such as "practices in," "member-of," "employed-by," "has-admitting-privileges-in" and others. New types of affiliations can be easily added to the model. Each provider affiliation can have multiple electronic service end points and unique contact information for that care setting.

The HPD data model also supports multiple Organization-to-Organization affiliations. This allows the data model to reflect the reality that organizations in the medical sector are highly interrelated. The types of organization affiliations are "member-of," "part-of," "service-provider-to" and others. New organization affiliations can also be added to the model.

Electronic Service Information (ESI) consists of the electronic delivery addresses and message types that are essential for electronic routing of health information. The data model allows the HPD to store any type of ESI, whether Direct Secure Messaging

addresses, IHE/EHR routing information, Object Identifiers (OIDs), notification and delivery preferences, message types accepted, or any other form of ESI.

Care Teams are groups of providers with different specialties who come together to provide Treatment, Payment and Operations (TPO) services to a patient. Each care team can be associated with multiple ESI endpoints in the data model.

5 Standards Overview

The Michigan statewide Health Provider Directory evolved from a comprehensive assessment of the State's provider directory requirements in an environment where existing industry directory standards are still evolving. Given these moving targets, the HPD has continued to evolve, with periodic enhancements needed to track these emerging industry standards:

- ☉ **IHE Healthcare Provider Directory** – This effort completed in 2013 and produced a set of profiles for storing provider data in an LDAP Active Directory implementation in *IHE IT Infrastructure Technical Framework Supplement – Healthcare Provider Directory (HPD)*. This definition did not initially address the storage of Electronic Service Information. More information can be found at the IHE Healthcare Provider Directory Wiki.
- ☉ **Healthcare Provider Directory Plus (HPD+)** – This profile outlines how the IHE HPD profile can be expanded for use with the S&I Provider Directory data model. It expected that the HPD Data model as implemented in LDAP will eventually be upgraded to S&I compliance and it introduced Electronic Service Information definitions. It also showed how the HPD could be adapted to use a Relational Database (RDB) persistence model and not rely on an LDAP server. Subsequent working harmonization efforts between the two teams led to the HPD Plus 1.1 definition. See the HPD Plus Working Group Wiki for more details.
- ☉ **S&I Framework Provider Directory** – This effort defined a standard that has been adopted by the ONC's Office of Standards & Interoperability. It defines the high-level query semantics required for ESI discovery by conformant Provider Directories and is in its final consensus version. This query semantics is shown below and it has formed the basis of the semantics of the RESTful *HPD API For HISP Integration* that the HPD supports. See the S&I Framework Wiki for more details.

Find Individual	Request a list of individuals by specifying one or more individual attributes.
Find Unique Individual	Request a specific individual by specifying the individual unique reference ID.
Find Organization	Request a list of organizations and relationships to other organizations by specifying one or more organization attributes.

Find Unique Organization	Request a specific organization and relationships to other organizations by specifying the organization unique reference ID.
Find Organizations for Unique Individual	Request a specific individual and related organizations by specifying an individual unique reference ID and one or more attributes of organizations. Organizations and relationships to the specified individual are returned when the organization matches the organization attributes and has a relationship to the individual specified. Attributes on the relationship between the individual and organization can also be specified in this query and further constrain which organizations and relationships are returned.
Find Individuals for Unique Organization	Request a specific organization and related individuals by specifying an organization unique reference ID and one or more attributes of individuals. Individuals and relationships to the specified organization are returned when the individual matches the individual attributes and has a relationship to the organization specified. Attributes on the relationship between the individual and organization can also be specified in this query and further constrain which individuals and relationships are returned.
Find Individuals and Organizations	Request a list of individuals, organizations and relationships between (individuals/organizations or organization/organization) based on attributes of individuals, organizations, and individuals/organization relationships. Response includes all objects (whether individual, organization or relationship) where the individuals match all of the individual attributes specified, the organizations match all of the organization attributes and where a relationship exists between each individual and one or more organizations returned. In the event the query includes one or more attributes regarding the relationship, then each relationship returned must match all the attributes specified. For each organization returned, all its relationships, as parent or child, with other organizations are returned.

6 Onboarding Process

6.1 Initial Onboarding

For organizations to share data with HIN under this use case, the organization will undergo two onboarding processes simultaneously. The two onboarding processes are legal onboarding and technical connectivity onboarding. These may occur in parallel – i.e. the organization can review and complete legal agreements with HIN while simultaneously establishing and testing technical connectivity. To initiate these two parallel onboarding processes, notify HIN via email at help@mihin.org.

6.1.1 Initial Legal Process

The first time an organization undergoes the legal onboarding process with HIN, the organization negotiates and enters into a master Participating Organization agreement which then allows the Participating Organization to enter into one or more use cases via Use Case Agreements. There are numerous different kinds of master Participating Organization agreements, available here:

http://mihin.org/about-mihin/resources/mihin-legal-document-templates/

Once an organization has entered into a master Participating Organization agreement, the organization can enter into an unlimited number of use cases with HIN. All of HIN's use cases are listed here:

 http://mihin.org/about-mihin/resources/

6.1.2 Initial Technical Connectivity Process

The standard technical process after initial onboarding involves the steps below:

1. A technical meeting to discuss the project requirements and planning.

2. Conduct HPD train the trainer sessions – Provision licenses and train your users on HPD

3. Conduct HPD On-boarding data submission technical working sessions - Under the business rules, data format and specifications to submit data

4. Formulate your organization's "HPD Go Live Plan"- Discuss plans and dates to go-live

5. Import and validate your data in a sandbox –Validate the sample data submitted in sandbox

6. Import and validate your data in production- Proceed to load real data in production instance if the sample data passes validation in the previous step

7. Go live and launch HPD operations and support processes – Begin receiving periodic updates of the data.

7 Specifications

Entities of the Health Provider Directory Data Model

7.1 Provider

A Provider is the central entity in the HPD data model and each Provider has several links to other data model entities, as illustrated by the colored arcs above:

- Each provider may have zero or more Addresses
- Each provider may have zero or more Credentials
- Each provider may have zero or more Affiliations
- Each provider may have zero or more Specialties
- Each provider may participate in zero or more Care Teams

Each Provider has several fields that contain identifying information:

- Prefix – this optional field contains a prefix to the provider's name, such as Dr, Mr, Ms, etc.
- First Name – this required field contains the provider's given name.
- Last Name – this required field contains the provider's family name.
- Gender– this optional field represents the gender of the provider.
- NPI (National Provider Identifier) – this required l field contains the provider's NPI number.
- Email Address – this optional field contains the provider's normal email address.
- Direct Email Address – this optional field contains the provider's secure, Direct email address for health information exchange.
- Office Phone – this optional field contains the provider's office telephone number.
- Office Fax – this optional field contains the provider's office fax number.
- Mobile Phone – this optional field contains the provider's mobile phone number.
- Comment – this optional field may be used to store human-readable comments

7.2 Organization

Organizations may be linked to other HPD entities as follows:

- Parent Organization – organizations may be hierarchically linked to one other organization and may have multiple child organizations.
- Organization Affiliation – organizations may have zero or more links to other organizations.
- Names – an organization may have multiple Names.
- Addresses – an organization may have multiple Addresses.
- Specialties – an organization may have multiple Specialties
- Identifiers – an organization may have multiple Identifiers
- Credentials – an organization may have multiple Credentials.
- Care Teams – an organization may have multiple Care Teams.
- Admin Contact – an organization may have a single Provider entity as an administrative contact.
- Technical Contact – an organization may have a single Provider entity as a technical contact.

Each organization record contains the following fields:

- Organization Name – the required name of the organization.
- Organization NPI – the optional National Provider Identifier for the Organization
- Office Phone – the optional office telephone number.
- Office Fax – the optional office fax number.
- Comment – this optional field may be used to store human-readable comments

7.3 Specialty

Providers and organizations may have multiple specialties. Specialties are based upon the NUCC standard coding. Each specialty record has the following fields:

- Specialty – Specialty of the provider or organization

- Certifying Board - The organization that certified the specialty

- As- of date- The date of the initial certification

- Certification date - The date of the last recertification (if applicable)

- Re-certification date - The date upon which the specialty expires (if applicable)

7.4 Credential

Providers and organizations may have multiple credentials. There are three subtypes of credential:

1. Education – Providers can have education credentials

   - Provider – a required link to a Provider.
   - Credential name – the name of the particular educational credential (e.g. BS, MS, Ph.D., MD)

   - Granting Organization – a required link to the organization granting the degree.

   - Start Date – the date upon which the credentialing activity began

   - Grant Date – the date when the credential was granted.

2. License – Both organizations and providers can have license credentials. Licenses contain the following fields:

   - Provider – a required link to a Provider.

   - Credential Name – the name of the particular license.

   - Credential Number – the license number.

   - Granting Organization – a required link to the organization granting the license.

   - Grant Date – the date the license was granted.

   - Expiration Date – the date the license will expire, if it expires.

   - Current Status – the current status of the license.

   - PHI Suspended? – this field indicates if the status of the license restricts the receipt of Protected Health Information (PHI).

   - Suspended Date – the date of suspension, if applicable.

   - Limitations – any limitations to the license.

   - Provider – a required link to a Provider.

   - Credential Name – the name of the particular certificate.

   - Credential Number – the identification number of the certificate provided by the granting organization, if applicable.

   - Granting Organization – a required link to the organization granting the certificate.

- Grant Date – the date the license was granted.

- Current Status – the current status of the certificate.

- Expiration Date – the date the certificate will expire, if applicable.

7.5 Address

Each Provider and organization may have multiple, optional addresses recorded in the HPD. Each address record contains the following fields:

- Type – the required type of the address (e.g. Home, Office, etc.).
- Street Address 1 – the first line of the street address.
- Street Address 2 – the optional second line of the street address.
- City – the city name.
- County – the county name.
- State – the state abbreviation (e.g. MI).
- Zip Code – the zip code.
- Location – the geocoded latitude and longitude of the address, used for map display.
- Phone – a phone number associated with the address.
- Fax – a fax number associated with the address.
- Comment – this field may be used to store human-readable comments.

7.6 Provider Affiliation

Each Provider and organization may have multiple, optional addresses recorded in the HPD. Each address record contains the following fields:

- Type – the required type of the address (e.g. Home, Office, etc.).
- Street Address 1 – the first line of the street address.
- Street Address 2 – the optional second line of the street address.
- City – the city name.
- County – the county name.
- State – the state abbreviation (e.g. MI).
- Zip Code – the zip code.
- Location – the geocoded latitude and longitude of the address, used for map display.
- Phone – a phone number associated with the address.
- Fax – a fax number associated with the address.
- Comment – this field may be used to store human-readable comments.

7.7 Organization Affiliation

Organizations may be affiliated with other organizations in the directory. Each Organization Affiliation has the following links:

- Affiliated Organization – a required link to the organization that is in the parent role to the member organization.

- Member Organization – a required link to the organization that is the member of the affiliated organization.

Each organization affiliation has one field:

- Affiliation Type – the type of affiliation (e.g. Member of, Part of, Service Provider To).

7.8 Care Team

Providers may participate in multiple care teams with other providers within an organization (e.g. a doctor may have several staff members in her care team within a hospital). Each Care Team has the following links:

- Organization – a required organization that is the owner of the care team.
- Providers – a list of Care Team Memberships that denotes the providers that are members of the care team.
- Electronic Services – a list of electronic service endpoints (ESI) for the care team.

Each Care Team has the following fields:

- Name – the required name of the care team.
- Electronic Service URL – an optional web link to information about the care team.

7.8.1 Care Team Membership

A Care Team Membership object manages each provider's participation in each care team separately. This allows providers to configure their own participation attributes in the care team. Each Care Team Membership has the following links:

- Care Team – a required link to the care team.

- Provider – a required link to the provider.

Each Care Team Membership has the following fields:

- Role – Either Treatment, Payment or Operations may be selected.

- TOC Destination? – this field indicates if the provider wishes to receive transition of care notifications that are sent to this care team

- Preferred Types – a selection of zero or more ADT message types that the provider wishes to receive.

- Direct Email – the providers Direct email address where the ADT messages are to be sent

7.9 Electronic Services

- ESI Name- Name of the ESI endpoint in the HPD. Used to identify the service in human-readable terms.

- Type-Type of service that is described by this endpoint e.g. EHR Repository

- Integration Profile -The network protocol for message delivery e.g. LLP, Direct

- Content Profile - The content type of the messages being delivered e.g. HL-7, CCD

- Address - The symbolic address used for message delivery e.g. a Direct email address or a URL

- Certificate- The Digital certificate to be used for the service

MiHIN HPD Provider Template Data Dictionary

http://mihin.org/wp-content/uploads/2014/12/MiHIN-HPD-Provider-Template-Data-Dictionary-v17-10-1-14.docx

MiHIN Provider Template

http://mihin.org/wp-content/uploads/2014/12/Copy-of-MiHIN-Provider-Template-v14-3-26-14.xlsx

8 Support

Support tickets are a means for HPD users to report a problem and/or to ask a question regarding the HPD. Support ticket submissions are a streamlined way to address problems with the system or to suggest improvements so HPD developers can better serve HPD users. Once a ticket has been submitted, users will receive a confirmation email instantaneously. A Help Desk technician will then be assigned to respond to the user's concern. Support tickets can then be viewed and tracked online to monitor their progress. **Please refer the "User Guides" to learn more on how to submit support tickets.**

Statewide HPD User Guide
http://mihin.org/wp-content/uploads/2014/12/MiHIN-Health-Provider-Directory-User-Guide-v4-10-2-14.docx

If experiencing difficulties or have questions, please contact the MiHIN Help Desk:
Email: help@mihin.org
Phone: (517) 336-1430
Monday – Friday 8:00 AM – 5:00 PM (Eastern)

9 Legal Advisory Language

This reminder applies to all Use Cases covering the exchange of electronic health information:
The Data Sharing Agreement ("DSA") establishes the legal framework under which Participating Organizations can exchange messages through the HIN Platform, and sets forth the following approved reasons for which messages may be exchanged:

(a) By health care providers for Treatment, Payment and/or Health Care Operations consistent with the requirements set forth in HIPAA;
(b) Public health activities and reporting as permitted by HIPAA and other Applicable Laws and Standards;
(c) To facilitate the implementation of "meaningful use" criteria as specified in the American Recovery and Reinvestment Act of 2009 and as permitted by HIPAA;
(d) Uses and disclosures pursuant to an Authorization provided by the individual who is the subject of the Message or such individual's personal representative in accordance with HIPAA;
(e) By Data Sharing Organizations for any and all purposes, including but not limited to pilot programs and testing, provided that such purposes are consistent with Applicable Laws and Standards; and
(f) **For any additional purposes as specified in any Use Case, provided that such purposes are consistent with Applicable Laws and Standards**.

Under the DSA, "***Applicable Laws and Standards***" means all applicable federal, state, and local laws, statutes, acts, ordinances, rules, codes, standards, regulations and judicial or administrative decisions promulgated by any governmental or self-regulatory agency, including the State of Michigan, the Michigan Health Information Technology Commission, or the Michigan Health and Hospital Association, as any of the foregoing may be amended, modified, codified, reenacted, promulgated or published, in whole or in part, and in effect from time to time. "Applicable Laws and Standards" includes but is not limited to HIPAA; the federal Confidentiality of Alcohol and Drug Abuse Patient Records statute, section 543 of the Public Health Service Act, 42 U.S.C. 290dd-2, and its implementing regulation, 42 CFR Part 2; the Michigan Mental Health

Code, at MCLA §§ 333.1748 and 333.1748a; and the Michigan Public Health Code, at MCL § 333.5131, 5114a.

It is each DSO's obligation and responsibility to ensure that it is aware of Applicable Laws and Standards as they pertain to the content of each message sent, and that its delivery of each message complies with the Applicable Laws and Standards. This means, for example, that if a Use Case is directed to the exchange of physical health information that may be exchanged without patient authorization under HIPAA, the DSO must not deliver any message containing health information for which an express patient authorization or consent is required (e.g., mental or behavioral health information).

Disclaimer: The information contained in this implementation guide was current as of the date of the latest revision in the Document History in this guide. However they are subjected to changes. Therefore, links to any source documents have been provided within this guide for reference. HIN will apply its best efforts to keep all information in this guide up-to-date. It is ultimately the responsibility of the Participating Organization to be knowledgeable of changes outside of HIN's control.