Meeting the Data Needs of the Learning Health System

Today’s Panel:

- **Erin Dietrich**, Senior Director for Research Applications & Advanced Computing
- **Myron Hepner**, Director of the Michigan Data Collaborative
- **Erin Kaleba**, Director, Data Office for Clinical and Translational Research
- **Tim Pletcher**, Executive Director, Michigan Health Information Network Shared Services
Research Data Services

LHS Collaboratory Meeting
October 2019
AGENDA

1. My Background

1. HITS Overview

1. Data, Reporting, and Analytics

1. Research Data Services

1. How to Get Help!
• Proudly serving at U-M since 1997
• Career began as an application developer in ITS for enterprise systems
• MSI Graduate from U-M School of Information
• Jumped into supporting research at LSA in 2012
• Joined Michigan Medicine in 2018
**Data Foundations**

**DATA WAREHOUSING**
- Toad DataPoint, Data Robot
- Health System Data Warehouse (HSDW)
- CDR (OTIS)

**DATA INTEGRATION & DELIVERY**
- MiChart Reporting Infrastructure: Epic, Radar, Reporting Workbench, Crystal Reports, Caboodle, Slicer Dicer, Informatics
- Clarity and Caboodle
- Tableau

**MEDICAL SCHOOL**
- Medical School Data Warehouse (MSDW)
- SCAP
- MSTAT
ENTERPRISE/DEPARTMENTAL INFORMATION DELIVERY

- Provide analytics expertise to groups across Michigan Medicine and develops reporting solutions used for planning and quality improvement.

DATAWORKS and HIE & INTEROPERABILITY

- Develop solutions to help faculty and staff at Michigan Medicine easily locate and use the data they need.
- Focus and improve the work with HIE services that can transfer the most useful health information in the most efficient manner.
- Work with providers to integrate patient care data in the clinical workflow context, aligning with Michigan Medicine clinical goals.
Research Data Services

HITS DEPARTMENT

- Research Applications and Advance Computing Division
  - Research Data Services (RDS) Team

FOCUS

- We focus on the delivery and integration of data for researchers across the Michigan Medicine enterprise so that they can focus on analysis

RECENT ACTIVITIES

- Enabling data flow through clinical trial networks
- Assisting individual researchers access their study data using a variety of tools
- Query Automation
- Special data queries from departmental systems
Service Offerings

- Provide researcher-level tools to aggregate and access study data, assist with integration between internal and external data sources, and create custom data services that enable basic and clinical research
- Help set up research patient registries
- In conjunction with DOCTR, perform custom data pulls for researchers from the vast data sources across MM
- Provide assistance with institutional reporting through targeted data pulls from administrative sources
- Enable external clinical research network participation
- Help leverage tools for patient reported outcomes through collaboration with MICH/REDCap
How Can We Help?

Health Information Technology & Services (HITS) offers three convenient ways to get the IT-related help, information, and resources you need:

1. CLICK
   Click our online service portal: help.medicine.umich.edu

2. CALL
   Call the HITS Service Desk: 734-936-8000

3. VISIT
   Visit one of three “Help Me Now” walk-up service locations:
   - North Campus Research Complex Building 18 (G018)
   - Taubman Health Sciences Library Floor 4 (4020)
   - Towsley Center for Continuing Medical Education (G2413)

Health Information Technology & Services
hits.medicine.umich.edu
How Can We Help?

Find out by clicking help.medicine.umich.edu and use your Level-2 password + Duo to access.
THANK YOU

Erin Dietrich
Senior Director
Research Applications & Advanced Computing
Erin O. Kaleba
Director, Data Office for Clinical and Translational Research

DATA RESOURCES FOR YOUR RESEARCH

- **BACKGROUND**: 17yrs trying to use data collected for one purpose for another purpose

- **KEEPING HUMBLE**: “Is this what you wanted to be when you grew up?” *at family holidays*…

- **VISION**: Enable access to data about all contributors of a patient’s wellness and illness *AND* do so in the most secure, innovative manner

DataOffice@umich.edu
From Discovery to Translation

Data Office + RDW

UofM Research Community
National Research Networks
Industry

Data about patients
From Discovery to Translation

The “FRONT DOOR”

UofM Research Community

National Research Networks

Industry
Data Office Services

Data Access
- Custom Data Pulls
- Access: Self Serve Tools
- Linkage w/Genetic, environmental, pt-reported outcome data

Data Curation
- Phenotype Devp
- Mapped data models
- Re-usable code

Data Sharing
- Industry Sharing
- Network-based Research: PCRF, CTSA, i2b2, PTN
- Automated data delivery to VM, cloud

Data Privacy
- Regular Audits
- Regulatory permissions
- Honest Brokering Services
Various Data Needs

Cohort Discovery
- Number of asthma patients with ED visit in last 2 yrs?

Retrospective Observational Study
- Difference in outcomes based on 2 sickle cell disease therapies?

Prospective Cohort Design & Recruitment
- Next appt for eligible patients for an industry-funded trial?

Precision Health
- How many pts with nephrotic kidney disease have genetic and environmental data available that I can analyze?

Multi-Center Registry
- Can U-M data be mapped to a national standard for export?
Michigan Genomics Initiative: 85,000+ consented participants

Ratio of Disease Prevalences in Michigan Genomics Initiative and UK Biobank

10,000 Participants added a year
Help Us Build the Vision by Using Our Services

- Medical Phenotype
- Genetics
- Family History
- Behavioral/Lifestyle
- Environmental
- Social

“MIPACT”

DataOffice@umich.edu
Michigan Data Collaborative

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1. My Background

1. Michigan Data Collaborative Overview

1. Drivers for State-Wide Data Aggregations
• UM Graduate in Industrial Engineering
• Intern at IBM for the NSFNet project with IBM, MCI, UM (Merit), and SoM
• 25+ years in healthcare data management and data services for Providers, Payers, Purchasers, and Clinical Trials research
• Proudly serving at U-M since 2006
• Joined Michigan Medicine in 2011
The MICHIGAN DATA COLLABORATIVE is:
A data collection, enrichment, and provisioning group in Michigan Medicine. We support care delivery transformation initiatives across the state, with goals to achieve improvements in population health, enhancements to patient experience and care delivery, sustainability of practice improvements, and reductions in overall healthcare costs.

DATA
- Claims data - Commercial (BCBSM, BCN, others), Medicaid, and Medicare
- Medical Record - EMR, ADT, CCDA
- Social Determinants of Health

ANALYTICS
- Population - Chronic Conditions; Attribution
- Quality - Screening rates; Quality and Outcomes
- Utilization - ED rates; Admissions and Readmissions rates; Avoidable Visits
- Assessment - Gaps in Care; Risk Scoring; Cost Standardization
- Value-Based services reporting
Drivers for State-wide Data Aggregation

Providing data for care transformation across the state.

**DELIVERY MODELS**
- Patient-Centered Medical Homes
- Accountable Care Organizations
- Integrated Care Delivery Systems
- Clinically Integrated Networks

**PAYMENT METHODS**
- Value-Based Purchasing
- Pay for Performance Incentives
- Shared Savings Programs
- Bundled Payments
- Capitated Contracts

**Michigan**

**41** PHYSICIAN ORGANIZATIONS

**38** ORGANIZED SYSTEMS OF CARE

**5** COMMUNITY HEALTH INNOVATION REGIONS

**5** MULTI-SITE ORGANIZATIONS
THANK YOU

Myron Hepner
Director
Michigan Data Collaborative
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Dr. Tim Pletcher is the Executive Director of the Michigan Health Information Network Shared Services (MiHIN), a public and private nonprofit collaboration dedicated to improving the healthcare experience, improving quality and decreasing cost for Michigan’s people by making valuable data available at the point of care through statewide health information sharing. Dr. Pletcher is also an Adjunct Research Investigator of Learning Health Sciences at the University of Michigan Medical School.

- Received a Doctorate of Health Administration and a Master’s Degree from Central Michigan University, and received his Bachelors of Science from the University of Michigan

- Tim and the Medical Readiness Trainer Project team received a Smithsonian-Computer World Medal for utilizing virtual reality and computer based modeling and human patient simulation to reduce medical errors

- Frequently presents both regionally and nationally on topics such as Health Informatics and Data Science
MiHIN is a network for sharing health information statewide for Michigan.

Michigan Health Information Network Shared Services (MiHIN)

MiHIN is Michigan’s state-designated entity to continuously improve healthcare quality, efficiency, and patient safety by promoting secure, electronic exchange of health information. MiHIN represents a growing network of public and private organizations working to overcome data sharing barriers, reduce costs, and ultimately advance the health of Michigan’s population.
Our Mission and Purpose

We are a public and private nonprofit collaboration dedicated to improving the healthcare experience, improving quality and decreasing cost for Michigan’s people by supporting the statewide exchange of health information and making valuable data available at the point of care.

- Safer & More Optimal Care
  - Help prevent diagnostic, medication, treatment, system or communication errors
  - Ensure appropriate treatment, follow up, and prophylactic actions

- Reduce Burdens & Waste
  - Failures of care delivery & coordination, overtreatment, administrative complexity, pricing failures, and even fraud & abuse

- Innovate & Learn Faster
  - Detect, monitor, & measure
  - Technology adoption
  - Quality improvement
  - Implementation & translational science and research
Brief History: Michigan Health Information Network Shared Services

2010 - Federal Office of National Coordinator establishes State Health Information Exchange Cooperative Agreement Program

Michigan forms Health Information Technology Commission, which establishes Michigan Health Information Network Shared Services (MiHIN)

Active Care Relationship Service and Admission, Discharge, Transfer Notifications go live in production

97% of admissions statewide sent through MiHIN

Common Key Service introduced for patient matching

149 trusted data sharing organizations connected to MiHIN

2010

MiHIN enters production in early 2012 with first immunization use case

2011

2012

2013

2014

2015

2016

2017

2018

Over one billion messages routed through statewide health information network

More than 100 million messages routed through statewide network

MiHIN establishes Use Case Factory® process

More than 100 million messages routed through statewide network

97% of admissions statewide sent through MiHIN

Common Key Service introduced for patient matching

149 trusted data sharing organizations connected to MiHIN
Hospital & SNF Statewide Coverage

159 Hospitals (includes CAH & VA)

Over 360 SNFs
Practice & Pharmacy Coverage

5000+ Practices

1771 Pharmacies
Use Case Level Value
Use Case Driven Data Lakes

- Statewide ADT
- Statewide CCDs
- Statewide Immunizations
- Statewide Labs
- Quality Measure Information

Copyright MIHIN 2018
MiHIN Use Case Factory: *Operational Governance*

- A modular, highly standardized legal framework
- Implementation guides and conformance
- Synthetic data, personas, interoperability testbed (FHIR-PIT) simulation tools
- A four-phase stage gate process to prioritize and incentivize use case adoption
- Cost recovery and sustainability linked to mature use cases & value
Active Care Relationship Service® (ACRS®)
Linking patients with the providers who care for them

Lets providers declare active care relationships with patients by submitting patient rosters to MiHIN.

Accurately routes information to alert providers in active care relationships with patients (e.g., Admission, Discharge, Transfer Notifications, medication reconciliation, etc.).

Updates entire care team in real time with any changes in a patient’s status.

Enables easy views of care team members by authorized participants:
• Health systems
• Provider organizations
• Care coordinators
• Health plans
• Patients
Active Care Relationship Foundational Role at MiHIN

- Consumer Access
- Query
- Care Coordination
- Quality Reporting
- Public Health
- Credentialing
- Consent
- Push & Alerts
- Provider Directory
- Identity
- Patient Matching (CKS)

Active Care Relationship Service
ACRS Improves Patient Matching

Active Care Relationship Service

Common Key Service

Patient Matching Accelerator (very high performance MPI)

Data clean up services

Patient Demographics + Common Key

Common key returned with cleaned demographics
Next Generation Record Locator Service

Intelligent Query Broker™

ACRS™

Provider Directory

MPI

ModularM MIS

Immunization Registry

Data Warehouse

HL7v2 / CCDA

IHE XCA, XDS

commonwell HEALTH ALLIANCE

Hospital & SNF

Specialist

Primary Care Physician

Hospital & SNF

Pharmacist

Health Plan

Pharmacist

Health Plan

IHE XCA, XDS

Hospital & SNF

Specialist

Primary Care Physician

Hospital & SNF
Discharge Medication Reconciliation

Helps healthcare providers share patient medication information at time of discharge with other care team members and organizations.

01
Better, faster coordination can minimize the possibility of adverse drug events for patients.

02
Maximize cost benefits for providers and health plans.

03
Regular confirmation of a patient’s medications can also help confirm the patient is correctly following a treatment plan.

When a patient’s medications change it’s critically important to check the medication list to be sure there are no problems with new, different or missing medicines.

“Medication reconciliation” is the process of checking the accuracy of a patient’s medications, particularly when those medications have changed.
The Electronic Consent Management Service (eCMS) allows patients to update their consent preferences electronically. eCMS also builds a statewide solution for managing consent preferences to ensure the appropriate consent is in place before specially protected information is routed to its destination.

**Electronic Consent Management Service Value:**
- Use of consumer portal to update consent preferences electronically
  - Ease of access allows for greater patient autonomy
  - Ability to save consent preferences in real time
  - Ability to store multiple consent forms in one location
- Provides a practical solution to sharing specially protected information
  - Create provider and state based functionality to manage consent preferences
  - Inclusion of privacy tags to ensure consent is checked for SPI
  - Increase in care coordination by sending previously withheld info
- Removes the burden of paper-based consent processes such as duplication and disorganization
Readmission Dashboard

Access real-time information on readmissions for your hospital's patients

**Recognizes and summarizes** readmissions in real time

Uses Admission, Discharge, and Transfer Notifications (ADTs) already flowing through MiHIN

Drill down to the patient level to see ADTs for your patients when they’re readmitted anywhere that sends ADTs through MiHIN

Provides a unique opportunity to gain insight into readmission drivers and inform interventions

Users will be able to see their organization’s 3, 7, 14, and 30-day readmission rates

Compare those rates to the overall health system average, the statewide average, or other health systems across the state

It can be accessed through MIDIGATE® (Medical Information Direct Gateway)
How MiHIN is Preparing for the Future

Non-profit LLC

Non-profit 501c#

Public Benefit Corporation

INTEROPERABILITY INSTITUTE

velatura
MiHIN’s wholly-owned subsidiary, Velatura LLC, has been renamed “Interoperability Institute LLC.”

**Mission**: The Interoperability Institute develops solutions and the next generation workforce required to enable organizations and communities to harness the benefits of interoperability at scale.

**Vision**: To serve as a focal point for creating communities and environments that accelerate the adoption of interoperability in ways that result in greater health and more impactful delivery of human services.
The healthcare interoperability solutions market is projected to reach $4.2 billion by the year 2024 compared to $2.3 billion in 2019. Growth in this market is driven by:
- The increasing focus on patient-centric care delivery
- Growing need to curtails healthcare costs
- Enhancing government initiatives for patient care
- Leveraging government funding for healthcare interoperability

**Initial Market Strategy**

**Interoperability Institute Pillars**

- Interoperability Land®
- Connectathons & Training
- Interoperability Workforce Program
Introducing Interoperability Land™

A collaboration platform designed to power the future of multi-organization development, integration, acceptance, and testing of innovative technologies and open standards.

- Build and test multi-organizational interoperable systems
- Create and share meaningful visualizations and models
- Create and host events to focus on a problem, service, API or topic
- Create highly realistic test scenarios with synthetic healthcare data
- Reduce the cost of creating and managing a developer API sandbox
- Harness the power of the community to solve interoperability problems
- Exercise full control over intellectual property and data
- Showcase applications, services and community contributions
- Gain insights into how standards are being implemented in the real world

Patient Gen | FHIR PIT | Ring of FHIR | PIT of Despair | Open API’s

Network of Trusted “Sandboxes”
Interoperability Hackathon Themes

- Open APIs
- eConsent
- Public Health
- Care Planning & Coordination
- NPRM's
- Value Based Care
- Patient Centered Care
- 3rd Party App Development
- Social Determinants of Health
Prior to Event

Environment configured prior to event. Environment can contain simulated, open and proprietary API’s and services.

During Event

Environment replicated for each participating team.