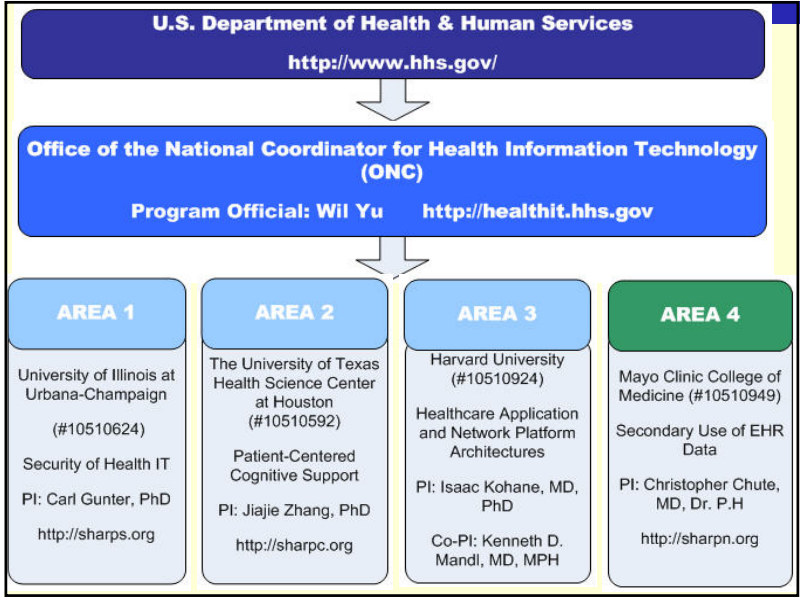


Strategic Health IT Advanced Research Projects (SHARP) and Beacon Communities for HIT standards and interoperable data exchange

Christopher G. Chute, MD DrPH
Mayo Clinic

Successfully Leveraging HITECH Resources
MN eHealth Summit
17 June 2010



SHARP: Area 4: Secondary Use of EHR Data A \$15M National Consortium

- 14 academic and industry partners
- Develop tools and resources that influence and extend secondary uses of clinical data
- Cross-integrated suite of project and products
 - Clinical Data Normalization
 - Natural Language Processing (NLP)
 - Phenotyping (cohorts and eligibility)
 - Common pipeline tooling (UIMA) and scaling
 - Data Quality (metrics, missing value management)
 - Evaluation Framework (population networks)

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Collaborations

- **Agilex Technologies**
- **CDISC** (Clinical Data Interchange Standards Consortium)
- **Centerphase Solutions**
- **Deloitte**
- **Group Health, Seattle**
- **IBM Watson Research Labs**
- **University of Utah**
- **Harvard Univ. & i2b2**
- **Intermountain Healthcare**
- **Mayo Clinic**
- **Minnesota HIE (MNHIE)**
- **MIT and i2b2**
- **SUNY and i2b2**
- **University of Pittsburgh**
- **University of Colorado**



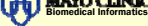
Project Advisory Committee

Suzanne Bakken, RN DNSc, Columbia University
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Tevfik Bedirhan Üstün, MD, Coordinator Classifications, WHO



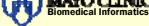
Vision

- To assemble a federated informatics research community committed to open-source resources that can industrially scale to address barriers to the broad-based, facile, and ethical use of EHR data for secondary purposes
- To create, evaluate, and refine informatics artifacts that advance the capacity to efficiently leverage EHR data to improve care, generate new knowledge, and address population needs
- To make these artifacts available to the community of secondary EHR data users, manifest as open-source tools, services, and scalable software
- To partner with industry developers who can make these resources available with commercial deployment and support.



Themes & Projects

Themes		Projects	Players	
Data Normalization	Phenotype Recognition	Clinical Data Normalization	IBM, Mayo, Utah, Agilex	
		Data Quality and Evaluation Frameworks	Natural Language Processing (NLP)	Harvard, Group Health, IBM, Utah ,Mayo, MIT, SUNY, i2b2, Pittsburgh, Colorado
			High-Throughput Phenotyping	CDISC, Centerphase, Mayo, Utah
			UIMA and Scaling Capacity	IBM, Mayo
			Data Quality	Mayo, Utah
			Evaluation Framework	Agilex, MN HIE, Mayo, Utah



Project 1 - Clinical Data Normalization CG Chute, MD DrPH

- Build generalizable data normalization pipeline
- Semantic normalization annotators involving LexEVS
- Establish a globally available resource for health terminologies and value sets
- Establish and expand modular library of normalization algorithms

Project 2: Clinical Natural Language Processing (cNLP); GK Savova, PhD

- Overarching goal
 - High-throughput phenotype extraction from clinical free text based on standards and the principle of interoperability
- Focus
 - Information extraction (IE): transformation of unstructured text into structured representations
 - Merging clinical data extracted from free text with structured data

Project 3: High-Throughput Phenotyping
Jyoti Pathak, PhD

- Develop portable phenotype algorithms
 - Administrative Data; Labs; Medications
 - Build on NHGRI eMERGE experience
- Phenotyping logic specification
- Applications of phenotype characterization
- Expansion of Cohort Amplification methods

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Project 4 - UIMA exploitation
Marshall Schor – IBM Research

- Use UIMA as a unifying framework, leveraging ecosystem
 - Work with team leads to identify “fit” (or not) of UIMA into subprojects
 - Phenotyping and Data Quality, especially
- Support UIMA and UIMA-AS use
 - Consult on pipe line design / architectures / configuration
- Support scaling, capacity flexibility
 - Develop and deploy virtual machine images that can dynamically scale in cloud computing environments
 - Develop integration / deployment tooling with goal of simplicity
 - Enabling widespread adoption of POC

Project 5 - Data Quality
Kent Bailey, PhD

- Refine metrics for data consistency
- Deploy methods for missing or conflicting data resolution
- Integrate methods into UIMA pipelines
- Refine and enhance methods

Project 6 - Real-world evaluation framework
Dr. Huff

- Iteratively test normalization pipelines, including NLP where appropriate, against normalized forms, and tabulate discordance.
 - Normalize retrospective data from the EMRs and compare it to normalized data that already exists in our data warehouses (Mayo Enterprise Data Trust, Intermountain).
- Use cohort identification algorithms in both EMR data and EDW data.
 - Normalize the data against CEMs.

SHARP Area 4: More information...

Strategic Health IT Advanced Research Projects (SHARP)
 Research Focus Area: 4. Secondary Use of EHR Data

<http://informatics.mayo.edu/sharp>
<http://sharpn.org>

Proposal

We propose research that will generate a framework of open-source services that can be dynamically configured to transform EHR data into standards-conforming, comparable information suitable for large-scale analyses, inferring, and integration of disparate health data. We will read more.

SHARP Program Organization

Contacts

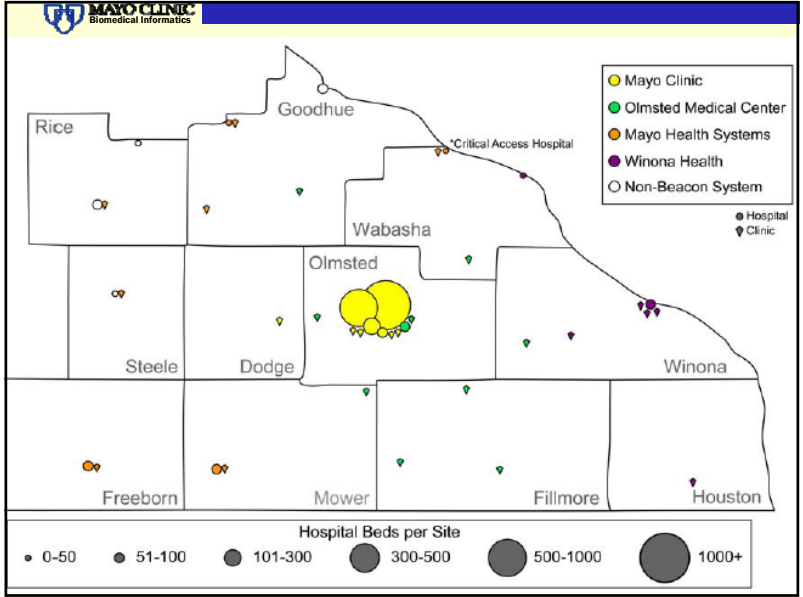
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- ONC Program Official: Wl Yu, 202-690-7151, Wl.Yu@hhs.gov
- Program Advisory Committee

Collaborators

Beacon: \$12.3M Healthcare improvement through standards-based health information exchange

- 11 SE MN counties; all public health depts, Mayo, Winona Health System, Olmsted Medical Center, MN Health Information Exchange, Indian Health Service, VA, Federal Med Center
- Demonstrate efficacy in childhood asthma & DM
 - Implement standards-based data exchange
 - National data exchange methods and monitoring
 - Comparative effectiveness research
 - Invoke 6-sigma and LEAN quality improvement
 - Disease metrics, utilization of ER and hospital

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Beacon Grant for SE MN Vision

SE MN community will embrace standards based HIE to improve access, quality and efficiency of health care delivery

- County Public Health Departments
- Mayo Clinic Rochester
- Mayo Health System
- Olmsted Medical Center
 - Public school systems
- Winona Health System
- MN HIE
- Stratis – REACH (HIT Ext.)
 - Key Health Alliance
- Agilex
- Veterans Administration
- Indian Health Service
- US DOJ – Bur. Prisons

Goals Childhood Asthma and Diabetes

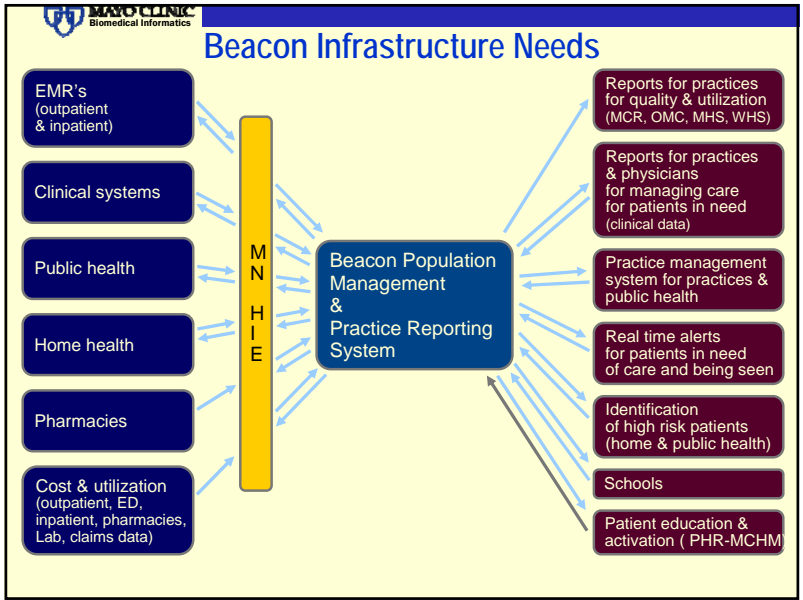
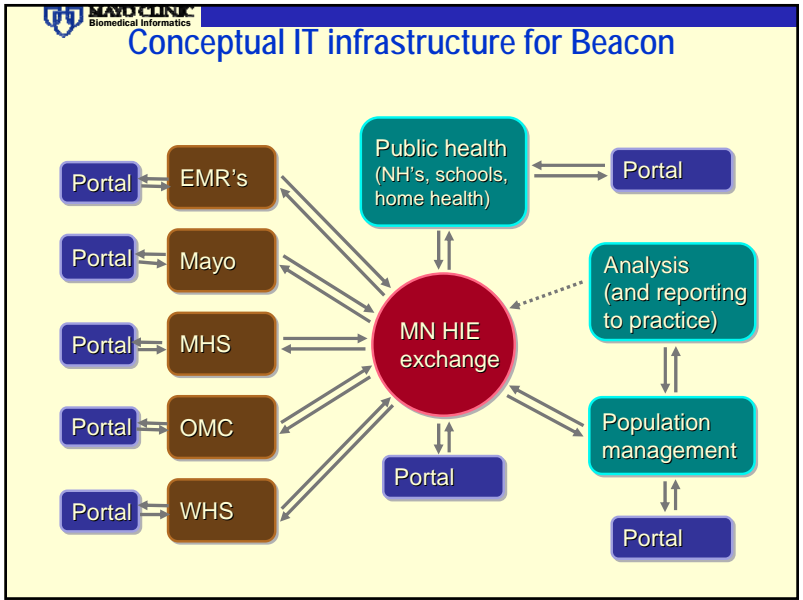
- Reduce Emergency room visits
- Reduce unscheduled MD visits
- Reduce hospitalization
- Improve self-reported functioning
- Improve compliance with the treatment of asthma
- Improve school attendance
- Reduce days out of work – self-reported for Diabetes
- Improve compliance with Diabetes

SE MN Beacon

EMRs	Care Provision	Counties
OMC	Public health	Dodge county
MCR	Nursing homes	Fillmore county
MHS	Hospitals	Freeborn county
WHS	Emergency rooms	Goodhue county
	Home health	Houston county
	Schools	Mower county
	Out-patient clinics	Olmsted county
		Rice county
		Steele county
		Wabasha county
		Winona county

Population Health Improvement Goals and Needs for Beacon

- Identify affected individuals currently without effective treatment
- Engage public health services for underserved populations
- Improve telemedicine connections in rural communities through Winona’s eSuite
- Report score card every month to practices on performance
- Provide platform for analysis of data for comparative effectiveness research



SE MN Beacon: More information...

Health IT Pilot Communities through Recovery Act Beacon Community Program

Beacon Community Awardee: Mayo Clinic Rochester, Mayo Clinic College of Medicine, Rochester, Minn.

<http://informatics.mayo.edu/beacon>

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SE MN Beacon Community Goal for Population Health in Service

- Enhance patient management and, reduce costs associated with hospitalization and emergency services for patients with diabetes and childhood asthma and address reduce health disparities for underserved populations and rural communities. [read more](#)

[SE MN BEACON Governance Board](#)

[SE MN BEACON Collaborators](#)

BEACON Map

[BEACON Facts-at-a-Glance](#)

[BEACON Communities](#)

For more information on the Beacon Community Program, e-mail BeaconCommunityGrants@hhs.gov