The Promise of the Learning Health System

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Disclosure

This presentation reflects my previous and current work with the Learning Health Community.

I am not representing the University of Michigan in this presentation or in this meeting.
Inspiration

• I believe that people are naturally drawn to visionary ideas that stimulate imagination

• LHS = a "Big Idea" that attracts people and opens doors
This Presentation

• Description of the LHS

• A Quick Comment About Infrastructure

• Achieving an LHS
The Learning Health System

Health systems--at any level of scale--become learning systems when they can, continuously and routinely, study and improve themselves...

The NEW ENGLAND JOURNAL of MEDICINE

Perspective: Jan 3, 2013
“Code Red and Blue — Safely Limiting Health Care’s GDP Footprint”
Arnold Milstein, M.D., M.P.H.

...U.S. health care needs to adopt new work methods, outlined in the Institute of Medicine’s vision for a learning health system...
A Few Reasons Why We Need an LHS

- Highest GDP per capita spent on health (~18%)
- Mediocre population health indicators
- 100,000+ deaths per year from medical errors
- 25% of $3 Trillion expenditure has been characterized as “waste”
- A culture of blame rather than safety (<10% of “misadventures” reported)
- 17 year latency between knowledge discovery and application to practice
LHS “Anthems”

• Learn from every patient!
• A **system** problem needs a **system** solution!
• 17 years to 17 months
  – to 17 weeks to 17 days (to 17 hours)!

Musicians needed!
What is an LHS?

Three Views:

- Checklist
- Macro view from earth orbit
- Micro view from the ground
Checklist View: Properties of a Health System That Can Learn

☑ Every patient’s characteristics and experiences are available to learn from

☑ Best practice knowledge is immediately available to support decisions

☑ Improvement is continuous through ongoing study

☑ An infrastructure enables this to happen routinely and with economy of scale

☑ All of this is part of the culture
View from Earth Orbit: An Ultra-Large Scale System

All-Inclusive

Trusted

Decentralized

Reciprocal

Governance

Engagement

Data Aggregation

Analysis

Dissemination

Insurers

Pharma

Patient Groups

Tech Industry

Universities

Government/Public Health

Research Institutes

Healthcare Delivery Networks
Learning Systems Can Exist at Any Level of Scale

- Single Organization
- Network of Organizations
- State/Territory/Region
- Nation
- Planet
View from the Ground
How Learning Happens: “Virtuous Cycles” of Study and Change

A Problem of Interest

- Assemble Experience Data
- Analyze Data
- Interpret Results
- Take Action
- Tailored Messages to Decision-Makers
- Formation of Learning Community
Example of A Virtuous Learning Cycle

Reducing Falls in Nursing Homes

Assemble Data:
How do we prevent falls?
What is the fall rate?

Analyze Data:
What practices associate with lower fall rates?

Interpret Results:
Are the results credible?
What advice should be given?

Tailored Messages:
Based on your current practice, you might want to consider...

Take Action:
Change Current Practice:
In whole or part...

Community Formation
Precision Medicine as a Learning Cycle

Analyze Data:
What predicts better health status?

Assemble Data:
Patient genotypes, clinical history, environment and health status

Interpret Results:
Are the results credible?
What advice should be given?

Tailored Messages:
For this patient, the best therapy is...

Tailoring Intervention to the Individual Patient

Take Action:
Administer recommended or other therapy

Community Formation
The LHS Links Discovery to Better Health

Better Health = D2K + K2P

**D2K:**
Data to Knowledge

**K2P:**
Knowledge to Practice

A Problem of Interest
Better Health Requires This

A Problem of Interest

- Assemble Relevant Data
- Analyze Data
- Interpret Results
- Take Action to Change Practice
- Deliver Tailored Message
- Community Formation
Not This

A Problem of Interest

Assemble Relevant Data
Analyze Data
Interpret Results
Take Action to Change Practice
Deliver Tailored Message
Community Formation

Journals?
This Presentation

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Infrastructure!

Virtuous cycles enable learning but do not create a Learning Health System

• If you want to get 350,000 people per day across a river, do you build 350,000 rowboats?

• No, you build a:
Infrastructure: A Cyber-Social Platform Supporting Multiple Simultaneous Learning Cycles

- Different Problems
- Rapid Cycle
- Slower Cycle

People
Technology
Policy
Process

SUPPORTING PLATFORM
Why Infrastructure?

• Without it:
  – Every cycle requires its own agreements, technology, staffing, analytics, dissemination mechanisms
  – No economy of scale
  Cost of 100 cycles = 100 x (Cost of one)

• With it:
  – All cycles are supported by the infrastructure
  – Big economy of scale
  Cost of 100 cycles << 100 x (Cost of one)
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Thinking the "Right Way" About the LHS

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The LHS is an Ultra-Large-Scale System

- Including people and technology
- Decentralization
- Innovation around minimal (but essential) standards
- Diverse requirements
- Continuous evolution and deployment
- Diverse and changing elements
Propositions

• The LHS cannot be engineered top-down or built from a blueprint
• It will evolve as a complex multi-stakeholder, ultra-large scale ecosystem
• This requires a multi-stakeholder community
• That’s why we’re here
Genesis of a Community: The First LHS Summit: May 17-18, 2012

• ~ 70 organizations represented at the National Press Club
• Resulted in 10 consensus Core Values
Since the Summit...

• The LHS has captured the national and international imagination
• The Learning Health Community, has evolved
• ~ 105 organizations have formally endorsed the Core Values
• The Community has:
  – Catalyzed interest
  – Spawned two initiatives
  – Developed a >2000 person mailing list
It’s Time for the Community to Take the Next Big Step!
Thanks and Write to Me

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