Analytics, Big Data, and Partnerships

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Big Data and the National Landscape

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Disclaimer

I have no relevant financial interest to disclose nor am I endorsing any of the commercial products identified in this presentation.

Objectives

- Discuss national health care and informatics driven initiatives and partnerships supporting big data.

- Provide exemplars on how big data is driving our capacity for new discoveries and knowledge supported quadruple aim.
Quadruple Aim

- **Triple Aim**
  - better care
  - better health
  - lower costs

- **Quadruple Aim**: that emphasizes the original three goals plus the goal of improving caregivers’ experiences

Consideration

"It is amazing that people who think we cannot afford to pay for doctors, hospitals, and medication, somehow think that we can afford to pay for doctors, hospitals, medication, and a government bureaucracy to administer it." - Thomasowell
Provider Hierarchy of Needs

Patient's Hierarchy of Needs

- Time
- Empowerment
- Personal Development
- Support
- Safety
- Physiologic

Quadruple Aim

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VALUE = ACCESS + QUALITY + SECURITY + COST

+ Improved Provider Satisfaction
A system that is designed to generate and apply the best evidence for the collaborative health care choices of each patient and provider; to drive the process of new discovery as a natural outgrowth of patient care; and to ensure innovation, quality, safety, and value in health care.

(Charter of the Institute of Medicine Roundtable on Value & Science-Driven Health Care)
7 Characteristics of Continuously Learning Healthcare System

- **Science and informatics**
  
  **Real-time access to knowledge.** The system continuously and reliably captures, curates and delivers the best available evidence to guide and improve clinical decision-making and healthcare safety and quality.

  **Digital capture of the care experience.** The system captures the care experience on digital platforms for real-time generation and application of knowledge for care improvement.

- **Patient-clinician relationships**
  
  **Engaged, empowered patients.** The system focuses on patient needs and perspectives and promotes the inclusion of patients, families and other caregivers as vital members of the continuously learning care team.
7 Characteristics of Continuously Learning Healthcare System

- **Incentives**
  - **Incentives aligned for value.** The system actively aligns incentives to encourage continuous improvement, identify and reduce waste and reward high value care.
  - **Full transparency.** The system systematically monitors the safety, quality, processes, prices, costs and outcomes of care, and makes information available for care improvement and informed choices and decision-making by clinicians, patients and their families.

- **Culture**
  - **Leadership-instilled culture of learning.** The system has leadership committed to a culture of teamwork, collaboration and adaptability in support of continuous learning as a core aim.
  - **Supportive system competencies.** The system constantly refines complex care operations and processes through ongoing team training and skill building; systems analysis and information development; and creation of the feedback loops for continuous learning and system improvement.

Learning Health System  IOM Report (2007)  Follow up Reports

- **Leadership Commitments to Improve Value in Health Care: Finding Common Ground**
- **Evidence-Based Medicine and the Changing Nature of Health Care**
- **Redesigning the Clinical Effectiveness Research Paradigm: Innovation and Practice-Based Approaches**
- **Clinical Data as the Basic Staple of Healthcare Learning: Creating and Protecting a Public Good**
- **Engineering a Learning Healthcare System: A Look at the Future**
- **Learning What Works: Infrastructure Required for Comparative Effectiveness Research**
- **Value in Health Care: Accounting for Cost, Quality, Safety, Outcomes, and Innovation**
- **The Healthcare Imperative: Lowering Costs and Improving Outcomes**
- **Patients Charting the Course: Citizen Engagement and the Learning Health System**
Digital Infrastructure for the Learning Health System: The Foundation for Continuous Improvement in Health and Health Care

A Learning Health System for the Nation

Precision medicine/health

Precision medicine initiative would help develop better treatments for diseases like cancer by:

- Accelerating the design and testing of effective treatments tailored to individual patients
- Expanding genetically based clinical cancer trials
- Establishing a national "cancer knowledge network" to guide treatment decisions
Are we prepared to capture and use social determinants of health?

Epigenome

What makes the epigenome change?

Lifestyle
Environmental factors (such as smoking, diet and infectious disease)

*Ability of the epigenome to adjust to the pressures of life appears to be required for normal human health.*
Utilize technology

Access to information

Data utilized to improve delivery and outcomes
Patient self management
Care coordination
Patient informed
Structured data utilized
Privacy & security protections

Transforming EVIDENCE - research/scholarship
Clinical and Translational Science Awards (CTSAs)

- Program creates a definable academic home for clinical and translational research.
- CTSA institutions work to transform the local, regional, and national environment to increase the efficiency and speed of clinical and translational research across the country

PCORnet: The National Patient-Centered Clinical Research Network
http://www.pcori.org/about-us

- **Clinical Data Research Networks (CDRNs)** (N=11)
  System-based networks that originate in healthcare systems, such as hospitals, health plans, or practice-based networks, and securely collect health information during the routine course of patient care.

- **Patient-Powered Research Networks (PPRNs)** (N=18)
  Networks operated and governed by groups of patients and their partners and are focused on a particular condition or population and whose members are interested in sharing health information and participating in research.

  **Coordinating Center** - Harvard Pilgrim Health Care Institute and Duke Clinical Research Institute - Provides technical and logistical support to the individual partner networks.

  July 21, 2015, PCORI’s Board of Governors approved funding for 34 individual data networks that will comprise Phase II.

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Synergy - Collaboration

**CTSAs**

**PCORI**

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Future Work Skills 2020

1 Sense-making
2 Social intelligence
3 Novel & adaptive thinking
4 Cross - cultural competency
5 Computational thinking
   Definition: ability to translate vast amounts of data into abstract concepts and to understand data-based reasoning

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