21st Century Cures:

Leveraging Technology to Accelerate the #Path2Cures

Indiana University’s Response to House Energy and Commerce Committee Request for Suggestions

at: http://go.iu.edu/d6B

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Response to House Energy and Commerce Committee request for suggestions for “21st Century Cures”

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As House Energy and Commerce Committee Chairman Fred Upton has stated, “Advancements in technology and communications provide a gateway of opportunity as we work to accelerate the discovery, development, and delivery cycle for innovative cures and treatments.”

Healthcare institutions and academic information technology developers in Indiana have important problems to solve. Indiana University, IU Health, and their partners in the state of Indiana are at the forefront of using modern networks and information technology to accelerate discoveries in medicine and propel them into practice, thus improving the lives of Hoosiers. The approaches we are implementing in Indiana can serve as a model for the US generally.

Indiana: Challenges and opportunities in our history

For more than a century, Indiana’s economy has centered on agriculture-, coal- and heavy steel-based industries.

The economy of Indiana has struggled particularly following the decline of steel-based industries since the late 1990s. At one point or another since then, Indiana has led the nation in personal bankruptcies, unemployment, and mortgage defaults (all prior to the economic downturn in 2008). As the economy has lagged, many health problems in Indiana have worsened. Indiana now ranks amongst the lowest states in the US in health indicators such as obesity and smoking. In 2013, Indiana also led the nation in Methamphetamine-related drug arrests.

These factors and others have lowered Indiana’s health ranking among US states from about the median in the nation to its current ranking of 41st in health indicators overall (Figure 1).

Figure 1. Indiana ranking among states in the US in terms of overall health. Data retrieved from americashealthrankings.org.
For decades, Indiana University has led the nation in the creation of electronic health record systems.

The Regenstrief Institute – a medical research institute affiliated with IU – established the Regenstrief Medical Record System, which over time led to the creation of the HL7 medical records system that set international standards for transferring clinical and administrative data between hospital information systems. As a result of Regenstrief’s leadership, the medical records of most Indianapolis-area hospitals were housed on the Indiana University-Purdue University Indianapolis (IUPUI) campus.

In recent years, IU has emerged as a leader in information technology and networking.

Since the mid-1990s, IU has established itself as a leader in advanced computing and networking. In 2001, the Indiana Legislature approved funding for a university-owned research network connecting Indiana and Purdue Universities. In 2010, the legislature approved expanding that network to every college, university, and university-operated medical research clinic in the state of Indiana. Furthermore, in 2007, all of IU’s supercomputers and massive data storage systems were HIPAA aligned. IU was the first non-classified facility to achieve this status, which meant IU supercomputers could be used for analyzing protected, personal health information as part of clinical and translational research.

As a result of these factors, the state of Indiana constitutes a potential proving ground for new clinical and translational research and testing of new therapies in practice. Indiana has an unusual combination of a population with an abundance of people with health challenges (many lifestyle-induced), and excellent advanced networking and information technology systems supporting clinical and translational research and enabling new breakthroughs in healthcare.

Pursuing solutions that improve lives

In particular, within this challenging environment, the state of Indiana and IU have established a pipeline from basic laboratory research to clinical and translational research. Implementing scientific discoveries leads to better health in the community, as exemplified by the National Institutes of Health-funded Indiana Clinical and Translational Sciences Institute (CTSI).

Indiana University, IU Health, and partner research universities Purdue University and Notre Dame have distinguished themselves nationally through the use of advanced information networks and 21st century communications technology to promote and enable collaborative research. Figure 2 below briefly explains the concept of translational research – research that translates biomedical innovations into treatments that improve lives.
Two characteristics distinguish the approach Indiana University is leading within the state of Indiana (these partnerships are shown in Figure 3 below).

- The level of collaboration across academic, private, and governmental sectors
- The use of leading edge cyberinfrastructure and advanced networks to enable collaboration and accelerate the translation of innovations into practice and products improving health in the state and our nation
Establishing a model for others

Critical factors that have enabled the state of Indiana to effectively bridge public and private sectors to accelerate medical and health research include:

- **A shared commitment** to improving health across many organizations and many sectors of the Indiana economy

- **A statewide research network** (I-Light) that creates a secure and high-speed backbone for collaboration and exchanging data (Figure 4).

- **An advanced cyberinfrastructure** at Indiana University consisting of supercomputers, sophisticated databases, massive high-speed data storage systems, and archival tape storage systems, *all HIPAA-aligned and suitable for storage and analysis of protected health information*

- **A robust private-public partnership** in which the Regenstrief Institute, affiliated with IU, and the Indiana Health Information Exchange (IHIE) maintain a data warehouse with data from 103 of approximately 120 Indiana hospital systems, and almost all Indiana labs, X-ray facilities, and governmental databases (Figure 5).

- **An online collaboratory** – also secured and suitable for transmission and analysis of protected health information (Figure 6).

- **IU Health, an 18-hospital public/private partnership** led by IU providing excellent healthcare throughout the state of Indiana and also serving as a venue for clinical, translational, and population research

- **Two new accredited schools of public health** – the IU Fairbanks School of Public Health, located in Indianapolis, and the IU Bloomington School of Public Health – that...
focus on urban and rural health and are expanding the reach of medical research efforts focused on curing disease into community-based medical research to improve the quality of lives of Indiana's citizens.

Indiana University embraces and supports the goals set out in the House Energy and Commerce Committee white paper "21st Century Cures: A Call to Action."

We believe that the state of Indiana, through collaborative efforts led by Indiana University, provides a model that can be adopted throughout the US. The combination of willingness to collaborate across public/private boundaries, a high performance network, and a cyberinfrastructure suitable for research using private and protected health records, is enabling the state of Indiana to accelerate new discoveries and their rapid translation into everyday medical practice and improved quality of life. Similar collaborations in other states and between states across the country would accelerate the delivery of medical breakthroughs and improve healthcare delivery and lower costs across the country.