Using Innovation to Advance Interoperability

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The Center for Medical Interoperability
Speaker Introduction

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Conflict of Interest

Kelly Aldrich, DNP, MS, RN-BC Informatics Nurse Specialist
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Has no real or apparent conflicts of interest to report.
Agenda

Using Innovation to Advance Interoperability

Interoperability remains one of the biggest challenges facing organizations today. This session will describe progress being made by The Center for Medical Interoperability to compel change and improve patient safety, care quality and outcomes, and reducing clinician burden and waste.
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*Using Interoperability to Advance Innovation*

Interoperability remains one of the biggest challenges facing organizations today. This session will describe progress being made by The Center for Medical Interoperability to compel change and **improve patient safety, care quality and outcomes, and reducing clinician burden and waste.**
Learning Objectives

• Discuss the importance of innovation for achieving the goal of interoperability
• Outline innovative approaches that are being applied for connecting health IT and devices
• Discuss how to improve real-time information flow and make technology seamless in the background so we can achieve the best possible outcomes for patients and care givers
IT just makes sense

Accelerating the seamless exchange of information to improve healthcare for all
Interoperability defined

The ability of information to be shared and used seamlessly across medical devices and systems to improve health and care coordination.

Interoperability describes the extent to which systems and devices can exchange data, and interpret that shared data. For two systems to be interoperable, they must be able to exchange data and subsequently present that data such that it can be understood by a user.

http://www.himss.org/library/interoperability-standards/what-is-interoperability
A typical ICU illustrates the challenge—a lack of interoperability can compromise patient safety, undermine care quality and outcomes, contribute to clinician fatigue, and waste billions of dollars each year.

Patients and care teams deserve better.
Do we even know...
How broken our care processes are
due to the **LACK of Interoperability**

To Err Is Human.. To Kill Is Not
Research estimates up to 440,000 Americans are dying annually from preventable hospital errors.

That is an unimaginable 1,205.5 people per day
Complexity in coordination of care and transitions of care continue to grow

Underlying infrastructure must support healthcare organizations’ clinical needs:

- Empower clinical care teams to define and lead technology requirements
- Improve patient outcomes, including safety and engagement
- Enhance usability, workflow and reduce clinician burden
- Evaluate care delivery in real-time
- Enable data innovation from precision medicine to public health – data liquidity
The IOM report on The Future of Nursing asserts the U.S. healthcare system has the opportunity to transform itself.

Nurses are active leaders in this transformation. Nurses have already taken a leadership role in embracing technology as a necessary tool to innovate the delivery of healthcare. Nurses must take on this leadership role to improve safety and efficiency, bring efficiency for decision making to the point of care, and empower patient to be involved partners.
Focus on Infrastructure, Innovation & Transformation

- 501(c)(3) R&D arm for health systems, guiding innovation and providing vendor-neutral focal point to work with solution providers.

- Established centralized lab to cooperatively solve members’ shared technical challenges, and test and certify devices and IT systems.

- Collaboratively assembling the technology coalitions to develop vendor-neutral architecture that enables interoperability within health systems.

We aim to improve real-time information flow and make technology function seamlessly in the background so clinicians can excel in their jobs and achieve the best possible outcomes for patients.
Unified board committed to solving shared technical challenges
CMI technical portfolio drives three imperatives

<table>
<thead>
<tr>
<th>Connected</th>
<th>Interoperable</th>
<th>Trusted</th>
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<tbody>
<tr>
<td>The ability to exchange information...</td>
<td>...and to use that information for the optimization of healthcare...</td>
<td>...with a high level of confidence</td>
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**Two-way, 1:Many, Standards based, Plug-and-Play and Secure**

*Plug-and-play interoperability is the ability of two or more systems to appropriately, seamlessly and interchangeably share and use information*
The cable industry transformed itself over 30 years ago... today we routinely take for granted: high speed broadband Internet, WiFi, high quality video (pay TV), and increasingly, the infrastructure for connected devices to communicate with each other — ‘the Internet of things.’

DOCSIS 3.1
Ecosystem must address this holistically

**Clinical**
- Improve patient outcomes, including safety and engagement
- Enhance workflow and reduce clinician burden
- Enable data innovation from precision medicine to public health

**Vendor Needs**
- Clear, consistent requirements
- Assurance market demand exists for proposed solutions
- Business and regulatory predictability

**Business**
- Support changing business and payment models
- Increase efficiency and lower costs
- Streamline contracting and operationalizing solutions

**Technical**
- Ensure secure, reliable infrastructure for data exchange
- Migrate to next generation platform in support of data innovation
- Address legacy integration issues

**Healthcare Organization Adoption**

**Government**

**HCO Ecosystem Goals**
- Reduce complexity
- Appropriately commoditize infrastructure
- Validate solutions through testing and certification
Interoperability Maturity Model (IMM)

Infrastructure
Transport level connectivity including security; technology independent of systems and applications

Contextual/Dynamic
Ability of devices and applications to share data based on the patient and clinical workflow

Syntactic
Use of recognized formats to communicate and exchange information

Conversational Complexity
Extent and sophistication of information exchange including orchestration

Terminology/Semantic
Use of recognized vocabularies, nomenclatures, and ontologies as well as information models
Current state is proprietary, high cost and unsustainable.
Desired state: Conceptual Architecture

APPLICATION LAYER
- Electronic Health Records
- Clinical Applications
- Research, Analytics & Innovation

PLATFORM LAYER
- Plug-and-Play Interoperability Platform
  - Departmental/Enterprise
  - Gateways and IT Systems
  - Point-of-Care

DEVICE LAYER
- Medical Devices

Leading the collaboration: Platform Medical Devices & Applications

Leveraging Standards (as appropriate)
Cybersecurity – threats are real, ever-present, and continuously changing

FDA final guidance, medical device cybersecurity released Dec 28th, 2016

- Consider throughout the total product lifecycle
  - Assure proper device performance in the face of cyber threats
  - Continuously monitor and address cybersecurity concerns once on the market
Foundational Trusted Wireless

Wi-Fi networks must perform with a known reliable level of assurance to ensure safe, high quality care for patients.

Geometric design

- Layered network design segregating guest from enterprise & clinical
- Sparse RF coverage to minimums is a thing of the past
- Designed by architect, based on math and physics
- Leverages AP density with low power and high data rates
- Privacy & Security at every level
  - Identified & Authorized Users

Known that guests consume between 75-95% of wireless resources
Using cryptography to keep exchanges secure, blockchain provides a decentralized database, or “digital ledger”, of transactions that everyone on the network can see.

Many people know it as the technology behind Bitcoin, but blockchain’s potential uses extend far beyond digital currencies.
“No problem can be solved within the same consciousness which caused it.”

*Albert Einstein*
Interoperability for Better Care

We can’t transform without the technology, yet solving the technical problem alone is not enough.
Coordinated path to transformation defined by high-value use cases
CMI Transformation Learning Center

The TLC is the part of the Center responsible for ensuring that technically interoperable solutions also meet **Useful**, **Safe** and **Satisfaction** requirements of patients and clinicians.
System Adoption Modeling (SAM) Process

3 Focus Areas

- Technical Informatics Underpinning
- Use Case Requirements
- Enablers, Go/No Go Milestones, Scalability

Analysis to evaluate next steps

Aldrich, 2016
System Adoption Modeling (SAM) Process ©

3 Focus Areas

- Use Case Requirements
  - Current state workflow
  - Ideal future state workflow
  - Gap analysis
  - Requirements for technical build
  - Metrics, goals, outcomes establishment

- Technical & Informatics Underpinning
  - Technical build
  - Usability testing
  - Scorecard
  - Workflow validation

- Enablers & Scalability
  - Reliable wireless – roadmap
  - Outcomes measure
  - Support scalable project plans
  - Business case modeling
    - Implementation Plan
    - Education Plan
    - Business Adoption
      ▪ Incentives alignment

Analysis to evaluate next steps

CMI Portfolio
Aldrich, 2016
Clinical & Tech relationship

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<th>Safe</th>
<th>Satisfying</th>
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<td>• Improve efficiency (throughput, utilization)</td>
<td>• Increased Standardization</td>
<td>• Useful</td>
</tr>
<tr>
<td>• Matches Thoughtflow &amp; workflow needs in solving or automating differently</td>
<td>• Decreased variability</td>
<td>• Supports user specific role needs</td>
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<td></td>
<td>• Reduce cognitive burden for clinician and person</td>
<td>• Outcomes measurement</td>
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<td>• Empowering</td>
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SAM is the strategy that supports a learning HIT system

Technical Build
Usability testing
Scorecard
Workflow validation
Aldrich, 2016
Focus on patient safety and interoperability

ECRI Top 10 Health Technology Hazards 2017
- 6 of the 10 are effected by Interoperability

The Joint Commission
Hospital National Patient Safety Goals
(NPSGs) Jan 2017

Leapfroggroup.org The Leapfrog Group is a national nonprofit organization driving a movement for giant leaps forward in the quality and safety of American health care.
The Pledge, Patient Safety Movement

The following (and more) companies have pledged to make the physiological parameters displayed on their medical devices, subject to all applicable privacy laws, available to anyone or any entity that wants to use them to improve patient care and help reverse the tide of preventable patient deaths.

http://patientsafetymovement.org/challenges-solutions/commitments-pledges/healthcare-technology-pledges/
Interoperability roadmap

ONC Interoperability Shared Commitment & Pledge

Advancing Interoperability; enabling free movement of data

1. Consumer access
2. No blocking/Transparency
3. Standards

Prioritizing interoperability by implementing federally recognized, national interoperability standards and focusing on real-world uses of technology, like ensuring continuity of care during referrals or finding ways for patients to engage in their own care. Stated they will not tolerate business models that prevent or inhibit the data from flowing around the needs of the patient.

Mr. Slavitt and Karen DeSalvo, MD January 19th, 2016

blog post
Five critical building blocks for a nationwide interoperable health information infrastructure:

1. Core technical standards and functions
2. Certification to support adoption and optimization of health IT products and services
3. Privacy and security protections for health information
4. Supportive business, clinical, cultural, and regulatory environments
5. Rules of engagement and governance

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What Nurses Want

Aldrich, Innovation Challenge July, 2013
IT does just make sense
#RN4HIT @informaticsdnp

Center for Medical Interoperability

Accelerating the seamless exchange of information to improve healthcare for all
Questions & Comments

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Please complete online session evaluation
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