My bio? A HIMSS and ACCE Fellow, on a “road less traveled,”
Four+ Decades in Health Technology and Information Systems

15 years in non-profit research, development, & independent testing, standards, and forensic investigation of medical technologies
   At ECRI Institute, from “bench” to CIO and COO
   - Worked with FDA on medical device standards
     - Computerized arrhythmia detection disclosure and apnea monitors
   - Forensic investigations of patient injuries and deaths
   - Breakthrough computer systems for medical device nomenclatures, “Hazard Reports,” feature comparisons, product directories, medical device maintenance, and safety assurance

10 years in a publicly-traded corporation, medical device manufacturing, repairs, 24x7 rental/delivery, and medical device and drug manufacturing and distribution
   At MEDIQ Life Support Services, from COO through CTO and CRO
   Registered with FDA as device and drug manufacturer
   Owned and managed a fleet of 500,000 medical devices nationwide

15+ years as a professor, consultant, businessman, and HIMSS volunteer
   - focused on Medical Informatics, Health Systems Engineering, Medical Device Data Systems Research, Wireless Medical Devices, and Patient Safety
   - Serve on many HIMSS privacy, security, standards, and education committees

Ongoing Research Professor and graduate instructor at Villanova University and South University
Agenda

• Interoperability and the HIMSS STEPS Value Model
• Brief history & context
• Where we are today
• The critical success factors
• YOUR role
Overview

• The US is achieving interoperable medical record systems
  o Consistent US priority since President George W. Bush signed an Executive Order in 2004.
    ▪ Much progress has been made towards standardizing nomenclature, data structure, privacy and security, software testing, and product certification.

_There IS light at the end of the tunnel; NO, it is not the light of an oncoming locomotive!_
Learning Objectives

• Show how the HIMSS STEPS™ Health IT Value Model illustrates the value of interoperability
• Explain how and why we got to this point
• Describe the current state of interoperability
• List the critical success factors ahead
• Articulate an action plan and role
The HIMSS STEPS™ Value Model shows Ways Interoperability Improves The Value of Health IT

Interoperability impacts each of the STEPS™!

- **Satisfaction** (e.g., Consistent and automatic flow of data between clinical contexts and users)

- **Treatment/clinical** (e.g., Reduce errors and duplicate and wasteful treatment; Doing the Right things right!)

- **Electronic Secure Data** (e.g., Consistent application application of well-established security protocols leverages proven, testable eCommerce solutions.)

- **Patient Engagement and Population Management** (e.g., Like travel and banking, it becomes far easier for patients and families to locate complete medical and health data at a finite number of portals; Enables consistent public health data analysis.

- **Savings** (e.g., Standards-based interoperability lowers the cost for all parties, reduces the learning curve for users, improves patient safety and the costs of errors.)
Some history and context

- **President George W. Bush** Executive order, 2004
  - Goal: electronic health records for each citizen
    - Created HHS ‘Office of National Coordinator’
    - Tasked ONC with National Strategic Plan

- **President Barak Obama** ARRA-HITECH, 2009
  - Goal: Certified EHR software adoption incentives
    - Penalties for security and privacy lapses
Where we were in 2004...

Interoperability: Major Cause of Health IT project failures?

Base Standards

- OASIS
- IETF
- ISO
- W3C
- CEN
- DICOM
- IEEE
- CDISC
- LOINC
- ETSI
- IHTSDO
- ITU

We dread "standards" because there are SO many to choose from!

eHealth Projects

Health Interop. Standards: Ignore & Face Consequences
Where we finally are in 2016...
US Interoperability standards evolution

- Pre-2004, Tower of Babel, too many competing and incomplete standards

- ONC’s 2005-2010 AHIC and HITSP programs
  - Set national priorities in 1-year sprints
  - Identified and selected finite, cohesive framework of Standards
    - e.g., DICOM, HL7, IEEE, IHE, LOINC, & SNOMED
  - ONC supported, then funded consistent, NIST-developed test and certification tools
    - First, as pilot tools and demonstrations in 2006-2009
    - Launched new test and certification tool programs in 2009
The key? Financial CMS-based financial incentives for providers formalized in 2010

- Physicians and hospitals are given financial incentives to offset EMR adoption expenses
  - Every 3-4 years, providers have new bonuses
    - Must use NIST-tool certified software ("ONC Certified")
- Early years biased towards implementers’ start-up
  - Many providers 1st exposure to EMRs
- NOW, the harder cultural changes for sharing data are being exposed!
Current state of interoperability

• “Majority” of primary care physicians and hospitals
  o ARE now using EMR software
    ▪ Advances in ePrescribing, structured and coded documents, exchanging problem lists and allergies to coordinate care, and replacing paper
  o BUT, many frustrating limitations, flaws
    ▪ Data are internally standardized, but loosely
    ▪ Very limited interoperability between parties
      • No national Health Information Exchange standards
    ▪ VERY substantial ongoing privacy breaches
    ▪ Financial incentives are unaligned
    ▪ WAY too little automation; hard work for all
How did we get here?

• ONC and CMS avoided a total industry bootstrap in 2010
  - **Meaningful Use Stage 1** standards: modest goals
    - Technical / operational benefits modest, too!
  - **Meaningful Use Stage 2** standards: more intrusive
    - Clinicians need to deal with data quality
      - Data quality is a new, tedious skill
      - Meager automation
        - LOTS of user typing, e.g. vital signs

**Fighting systems flaws, & complaints of usability**
MU 1 and 2 were scaffolds; MU 3 is an on-ramp to broader interoperability

Fortunately, a lot of MU 3 looks like an updated version of ANSI/HISTP Standards (2005-2010)
  - Available for free at www.hitsp.org

i.e., Industry knows a lot about those standards!

Selecting and using those software tools will take YOUR leadership, insight, and vision!
Meaningful Use is DEAD. Long live MACRA!

- YES, in early January CMS announced “Meaningful Use” is ending.
  - A week later, CMS and ONC explained “not really...”

From CMS’s December 18, 2015 publication, MACRA was explained:

The passage of the Medicare Access and Children’s Health Insurance Program (CHIP) Reauthorization Act of 2015 (MACRA)³ supports the ongoing transformation of healthcare delivery by furthering the development of new Medicare payment and delivery models for physicians and other clinicians. Section 102 of MACRA⁴ requires that the Secretary of Health and Human Services develop and post on the CMS.gov website “a draft plan for the development of quality measures” by January 1, 2016, for application under certain applicable provisions related to the new Medicare Merit-based Incentive Payment System (MIPS) and to certain Medicare alternative payment models (APMs).
Time keeps on slippin’, slippin’, slippin’ into the future!

*This is the new MACRA timeline:*

**Figure 1: Key Dates in the Measure Development Plan**

From CMS, 12/18/15
A Rose by any other name...

SO, in their December, 2015 document, CMS explained that MACRA will look like this:

**Merit-Based Incentive Payment System**

Beginning in 2019, CMS will apply a positive, negative, or neutral payment adjustment to each MIPS EP based on a composite performance score across four performance categories:

- Quality
- Resource use
- Clinical practice improvement activities
- Meaningful use of certified electronic health record (EHR) technology

**OK; MU is “dead!”** **BUT,** after 2019, CMS payments **STILL** will depend on

“**Meaningful use of certified health record (EHR) technology**”
Critical success factors: Making future evolution EASIER

• **Standardized data & structure** IS emerging
  o An auto hood is not a bonnet, an auto trunk is not a boot, and a windscreen is not optional...

• **Clinicians as better informed customers**
  o Usability is no longer optional, but essential
  o Automation must improve efficiency, not just safety

• **True “Adam Smith” open-market** product-features, cost transparency and competition should finally prevail!
  o i.e., buyers are not stupid!
Another critical success factor: *Industry collaboration, partnership, & transformation!*

Led by HIMSS: working with industry and standards groups that ONC knows and trusts.

Ultimately takes load off vendors, buyers, and regulators!
NOTE: Three Distinct Certification Programs for EHR, HIE, and HISP products

Certification Marks signify compliance and proof that a product has all of the requirements to be interoperable with other certified ConCert by HIMSS products.

- for EHR systems providing a simplified way for providers to send secure health information directly to trusted recipients
- for HIE systems that enable clinicians to share health information within and across care delivery communities
- for Health Information Services Provider systems to send secure health information directly to trusted recipients, including patients
Critical success factor: Consistent, Industry-Led eHealth product Certification, eases selection and deployment of healthcare delivery transformation solutions!

- Peace of mind when purchasing EHRs and HIEs
  - Vendors get peace of mind, too!
- Backed by names you trust (Led by HIMSS)
- Transparent & collaborative
- Ensures interoperable solutions so that patients receive the care they deserve

**IHE-based ConCert makes product integration EASIER for all!**
Another related critical success factor:

*Contract negotiation MUST NOT be overlooked!*  

ONC just released a Guide that clarifies many important EHR issues that can be fatal if ignored:

Free for download at


*Highlights many important topics, including assuring patient access to data, preventing expensive and potentially paralyzing “data blocking”, and, importantly, clear termination clauses by provider if/when needed.*
Critical success factor: 
**Device data automation is in sight!**

- HIMSS, RSNA, IHE, HL7, DICOM, IEEE collaborations
  - Since 1977
  - Large number and variety of products, brands
    - Vendor neutral, IHE Rosetta Terminology mapping, coordinated by NIST
  - Many product’s EHR interfaces are tested, some even certified, worldwide

**REDUCE** clinician workload and stress, **INCREASE** productivity and performance!
IHE Interoperability Domains

Look carefully: MOST Domains capture device AND workflow data; data transfer is accurate and near-immediate!

Automated, secure data capture and exchange IS enabled in all IHE Profiles!

User driven & vendor neutral; based on HL7, ICD, LOINC, IEEE and similar global standards.

THIS is where most patient data comes from, whether in hospital, clinic, or home!
Medical and Personal device data MUST be compatible to allow automated, standards-based patient data integration!

Parallel arrows show where Continua Guidelines and IHE Profiles are aligned

IHE, Continua, and HL7 are working on a “Devices on FHIR” demo in 2017.

Data paths for IHE Profiles for medical devices and PCHA’s Continua Guidelines for personal care
BUT, is all of this part of MU 3 (and MACRA: son of MU)?

- Yes!
  - In the ONC 2016 Standards Advisory
    - All necessary compatible EHR standards are identified
  - ONC likes industry ownership!
    - ConCert and the eHealth Initiative product testing and certification
      - Consistent w/ONC, IHE, and HL7
And beyond MU 3?
A brighter, easier future for all!

Healthcare is going through an eCommerce transformation, 15 years after most other industries!

Tomorrow’s eHealth components?
• HL7 is still improving FHIR™
  o FHIR = Fast Health Information Retrieval
• IHE and HL7 working together to deploy FHIR

Tomorrow’s solutions will be HL7 v2, v3, and FHIR-friendly, paving the way...
**Precision medicine is unfolding**

- **Consumer-centric**: individual control and use of personal data, with care coordinated as expected
  - Correct, timely facts => safer, error free care

- **Population health**: closing the loop, and aggregating community health and wellness data
  - Timely and actionable analysis, visualization, and response

- **mHealth**: IHE and Continua work with mobile and personal health and wellness technologies at the POINT and TIME for better decisions
YOUR role?

- **Mine** ALL of the available HIMSS resources!
- If you are a provider, specify *certified, interoperable products* that are consistent with ONC testing and certification to save time, effort, and money.

and

- Include *usability specifications* and testing.
- Be active in State and National HIMSS *Policy* events
  - Legislators respect YOUR expertise
    - NOBODY knows what you know; legislators WANT to get legislation *right*, and they ask HIMSS’ opinion frequently!
Caveats?
Be vigilant about the TCO (Total Cost of Ownership)!

The "TRUTH" about Purchase Cost?
Though it is most visible, it is usually only the TIP of the proverbial iceberg!
BEWARE, too: Culture eats Strategy for breakfast, lunch, and dinner!

Change does not come easily or quickly. Take your time, and be persistent, share your vision, demonstrate leadership, and build teamwork!
Nothing stays the same, except change itself!

Heraclitus of Ephesus c. 535 BC – 475 BC

Take a careful look in the mirror.
You, ACCE, HIMSS, engineers, scientists, physicians, and inventors have been all about INNOVATION since the beginning of medicine!

So, be careful what you wish for, but be relentless in pursuing it...
RECAP

- Interoperability and the HIMSS STEPS Value Model
- Brief history & context
- Where we are today
- The critical success factors
- YOUR role
The Challenges of implementing standards to move beyond Meaningful Use

The following observations were shared at HIMSS ’16 by Terrence A. O’Malley, MD, a physician at Partners Health Care System, Boston MA

Discussed today with his thoughtful permission!
Brief Bio: Informatics Through Clinical Care

- 40 years Internist-Geriatrician
- 20 years Network development, quality improvement. Medical Director of Non-Acute Services Partners HealthCare System Boston
- 5 Years:
  - Co-investigator ONC Challenge Grant: Improving Massachusetts Transfers (IMPACT)
  - Co-chair/Co-Lead: ONC S&I Framework Work groups
    - LTPAC Transitions of Care
    - Longitudinal Coordination of Care
    - eLTSS Care Plan
  - Collaborator: C-CDA 2013 R2 Update for LTPAC Transitions
  - HL7 CDA Implementation Guide for Personal Advance Care Plan Document
  - Consultant to: CMS, RTI, Mitre, Rand
Dr. O’Malley’s Perspectives

- New Payment Model for Health Care
- Who are the high cost, high risk individuals
- How will their care be organized
- Accountable Care Community: who’s in it, how is it connected
- Examples of where standards are stretched
  - Exchanging Clinical and Non-clinical data
  - Hearing the voice of the Individual
  - Dealing with the CCJR Bundle
  - Exchanging a dynamic care plan
Learning Objectives

- Understand the rapid and profound changes affecting health care beyond Meaningful Use
- Learn about the Accountable Care Community, the complex care teams needed to manage individuals with extensive medical, behavioral, functional and environmental problems
- Recognize the challenges of developing interoperable data for use by different levels of clinical sophistication
- Understand the limits of current standards for integrating the voice of the individual, sharing data between clinical and non-clinical sites and teams, integrating the care team under the CCJR Bundled Payment, and sharing a dynamic care plan.
Building from the Current Foundation

- Four challenges
  - Knit together the Accountable Care Community
  - Develop shared vocabularies that include clinical and non-clinical data
  - Exchange a dynamic care plan
  - Create data to measure the performance of the system to enable it to learn and improve
New payment model

• Old: Fee for Service (FFS)
  o More services generate more payments
  o Payment can expand, just add more services
  o Information exchange driven by MU not FFS

• New: Value Based Payment (VBP)
  o Responsible for the outcomes of an entire population
  o Outcomes = Quality and Cost
  o Payment based on meeting outcomes, not services
  o Information exchange critical to cross enterprise efficiency
Houston, We Have a Few Problems…

- We have a new payment model: Value Based Purchasing
  
  1. Pays for outcomes and not for volume of services
     - One outcome is Total Cost of Care
  
  2. Population based
     - Population is “attributed” not “elective”
     - Focuses us on the most complex individuals who drive most of the costs
  
  3. Multiplies the number of sites and team members required as part of a care plan
     - Compels attention to transitions of care among an enlarging care team
     - Requires coordination of care across all sites and not just within sites
     - Challenges us to develop a dynamic care plan with which to align an expanding care team
     - Exposes the absence of shared vocabularies among team members
Focus on the 5% (or Die)

Health Spending Is Very Highly Concentrated Among the Highest Spenders

Top 1% Median Cost $97,859
Top 1% of spenders account for 23% of spending

Top 5% Median Cost $43,038
Top 5% of spenders account for 50% of spending

Lowest 50% consume 2.7% of spending
Median Cost $234

NIHCM Foundation analysis of data from the 2012 Medical Expenditure Panel Survey.

Similarities Among the Top 5%

- Complex medical, behavioral, functional and environmental issues including social determinants
- Care from multiple providers
- Care in multiple sites
- High utilization of emergency responders, emergency departments, hospitals, nursing facilities, home nursing and home based services
- Experience multiple transitions and need an overall care plan
Social Determinants

- Race, class, gender, education, employment, housing, community/family supports, contact with criminal justice system, chronic severe mental illness, substance abuse
- Social determinants drive a greater proportion of health care spending than do clinical conditions
- VBP requires new systems to address social determinants
- Those new systems are not hospitals and doctors’ offices, they are community based services
- The Accountable Care Community
The Accountable Care Community

- The voice of the individual
- The voices of those who observe the individual
- The voices of those that provide critical services or supports
- IHE’s “Circle of Progress” links the key providers of clinical services through standardized, interoperable health information.
- Not only an essential part of providing clinical care, an essential foundation for building the new systems of care
Automated, secure data capture and exchange

User driven & vendor neutral; based on HL7, ICD, and similar global standards.

Look carefully: MOST Domains capture device AND workflow data; data transfer is accurate and near-immediate.
Connecting the Community

The Individual and Caregivers

Criminal Justice System

Behavioral Health

Housing Vocational Edu

First Responders

HCBS: Home Services

Look carefully: MOST Domains capture device AND workflow data; data transfer is accurate and near-immediate.

User driven & vendor neutral; based on HITRUST, Healthcare IT Security standard; open source & free.
Are the Standards up to the Task?

• Supporting standardized exchange among users with a wide range of clinical sophistication
• Mixing clinical with non clinical data
• Supporting an overarching “Care Plan” capability that links all participants, directed by the individual
• Making sure the Plan is: Complete, latest version
• Privacy and Security
• Who pays to make this happen?
Example #1: Non-Clinical to Clinical Setting Challenges

- How does a “non-clinical” home-based service provider make and share observations with the PCP?
  - Function, Behavior, Activity
  - Fall risk, Medication management, Nutrition, Safety
- What language do they use that is mutually understood?
  - Medicine, Nursing, Therapy, Behavioral Health?
- What platform do they use?
- What standards can be leveraged? Transport, Semantic.
Example #2: Individual communicating to the Care Team

• A critical piece: how does the individual guide the care team?

• What matters most to me
  o How I prioritize the issues that I face
  o What is acceptable: interventions and outcomes
  o Who do I want helping me with decisions
  o Who do I want on my team
  o Who do I want off my team
  o What are my goals

• Where are the standards?
Example #3 Comprehensive Care for Joint Replacement Bundles

- Mandatory 90 day bundle for joint replacement
- Single payment for all care provided
- Care spans multiple sites: hospital, SNF, home
- Requires coordination across the episode
- Involves a much bigger team
- Reporting for: payment, quality, outcomes
- Are there standards to support this?
Example #4: Multi-site Care Planning

- Payment will drive process
- Process must evolve with the standards
  - Shared “problem list” across disciplines, sites and teams
  - Who needs to see what
  - Who is in charge of the plan
    - Content
    - Direction
    - Participants
- New vocabulary: Social Determinants
- Standards to support shared work
  - Plan reconciliation, versioning, content
HIMSS’ Value Proposition: Interoperability for the Exchange of Standardized Health Information

Building the Accountable Care Community

Satisfaction: better care through consistent and automatic flow of data between clinical sites and users

Treatment: reducing errors, greater efficiency and safety

Electronic Secure Data: trust and the application of well established protocols

Patient Engagement: sharing the voice of the individual, easy access to data for populations and individuals

Savings: manage the highest cost populations under VBP with fewer errors and better coordination

http://www.himss.org/ValueSuite
Questions?

Elliot B. Sloane, PhD

ebsloane@gmail.com
Governing Health IT through Public Policy – A Roadmap for Interoperability

Liora Alschuler
Chief Executive Officer
Lantana Consulting Company
About Us

• Liora
  o Founder, CEO of Lantana
  o Co-author CDA, CCD, C-CDA
  o HL7 Board of Directors 2004-8; HL7 Fellow

• Lantana
  o Application of HIT Standards to drive value and improve quality and outcomes
  o Recent awards:
    ▪ ONC High Impact Pilot to connect pharmacy into HIE for continuity of care and quality assessment
    ▪ CDC for anti-microbial use/resistance reporting to states and National Healthcare Safety Network (NHSN)
  o Ongoing:
    ▪ CMS for quality measure definition and reporting
    ▪ Payers, HIEs, developers, providers implementing exchange, reporting standards
What Have We Learned?

• The Network Effect:
  o In **economics** and **business**, a network effect (also called network externality or demand-side economies of scale) is the effect that one user of a **good** or **service** has on the **value** of that product to other people. **When a network effect is present, the value of a product or service is dependent on the number of others using it.**

• Gall’s Law:
  o “**A complex system that works is invariably found to have evolved from a simple system that worked.** A complex system designed from scratch never works and cannot be patched up to make it work. You have to start over with a working simple system.” – John Gall (1975, p.71)

(see Wikipedia for more info on both laws)
How Can We Apply This?

• Get **everyone** connected with **simple** systems

• How do we lower the barriers?
  - Privacy/confidentiality
  - Identity management
  - Data capture and management

• What is the right balance between structured/unstructured data capture and exchange?

• Improve collaboration between regulators & standards developers
Governing Health IT through Public Policy – A Roadmap for Interoperability

Steven Cummings, BSN, MBA
Chief Implementation Officer
Brattleboro Memorial Hospital
Brattleboro Memorial Hospital

- 41 acute care beds
- Emergency Department
- Birthing Center
- Surgical Services
- Ambulatory Practices
  - Pediatrics / Family Medicine / Primary Care / Internal Medicine
  - Orthopedics
  - General Surgery
  - Opthamology
  - Gastroenterology
  - OB/GYN
  - Cardiology & Cardiac Rehab
  - Oncology & Infusion Center
  - Wound Clinic
  - Affiliations with Cheshire Medical Center for ENT and Podiatry (so far)

1200 Discharges
13,500 Visit
350 Births
4000 Cases
79,000 Visits and Rising
Why Change EHRs?

- BMH’s current systems are a mix of vendors and applications:
  - Inpatient – Cerner / Siemens Med Series 4
  - Emergency – TSystem
  - Ambulatory Practices – Greenway PrimeSuite
  - Birthing Center – GE Centricity
  - Surgical – ForeSite 2000
  - Patient Portals – Medfusion & Allscripts FollowMyHealth

- Challenges
  - Inpatient system being sunsetted by Cerner
  - Current systems share limited data within our own walls
  - Extremely challenging to look at data across the care continuum for population health, quality measures, etc.
  - Clinicians hampered by need to look in multiple places for PHI
  - Defining and sharing the “Medical Record” is nearly impossible
BMH EHR Selection Criteria

- Integrated suite of clinical applications for all care settings
- Go Forward platform for the vendor (no vaporware)
- Proven capability to send and receive records with other vendors and care providers outside a given health system
- Ability to interface as needed with our clinical service providers (i.e., Dartmouth Hitchcock Radiology and Telehealth Services)
- Ability to comply with state reporting requirements
  - VHIE
  - Syndromic Surveillance
  - Immunization Registry
- Potential to grow into a tool set targeted at the demands of population health goals and quality based outcomes measurement
Governing Health IT through Public Policy – A Roadmap for Interoperability

Richard Elmore
SVP, Corporate Development and Strategy
Allscripts
Largest, most rapid, industrial transformation ever
Managing Risk
Managing Quality

<-QUALITY/QUANTITY-> XRD
Tech Impact on Social Change
Putting the Patient in the Center

Industry Interop Challenges:

Multi-stakeholder engagement

Standards Refined / constrained

Community cooperation
Defragmenting the Health Care System

Requires More than Point-to-point Interop:

- Longitudinal View of Patient with Normalized Clinical Information
- Coordination of Care for Quality and Consumer Choice
- Personalization

Across Settings of Care
Soooooo....

What keeps us up at night??