Interoperability 101: What Does it Mean, Why Does it Matter

FEBRUARY 11, 2015
• Health IT Policy & Legislative Updates
  • CPeH comments on Federal HIT Strategic Plan

• Interoperability 101
  • Lana Moriarty, Director, Office of Consumer eHealth, ONC
  • Gaj Sunthara, Presidential Innovation Fellow

• Interoperability Roadmap Discussion
  • Plans for CPeH Comment
  • Use Case Prioritization Exercise: https://www.surveymonkey.com/s/L2V82QX
Health IT Updates

Obama Administration
- President’s Precision Medicine Initiative
- 2015 Budget Proposal

Health & Human Services (HHS)
- Better, Smarter, Healthier: Medicare Reimbursement Goals
- Federal Health IT Strategic Plan
- Interoperability Roadmap
  - Funding Opportunity Announcements (FOAs)
- Meaningful Use
  - Stage 3
  - 2015 reporting period

Congress
- House Energy & Commerce: 21st Century Cures
- Senate HELP: Security of Electronic Health Data
Consumer Comments: Federal HIT Strategic Plan

• Thank You!
• CPeH Comments Submitted February 6 with 24 signatories

Alliance for a Just Society
American Association on Health and Disability
Asian & Pacific Islander American Health Forum
Association of Asian Pacific Community Health Organizations
California Center for Rural Policy
California Pan-Ethnic Health Network
Center for Medical Consumers
Connecticut Health Policy Project
Disability Rights Education and Defense Fund
Families USA
Family Caregiver Advocacy
GLMA: Health Professionals Advancing LGBT Equality

Healthwise
Informed Medical Decision Making Foundation
Lakeshore Foundation
Main Street Alliance
Morehouse School of Medicine
National Consumers League
National Health IT Collaborative for the Underserved
National Health Law Program
National Partnership for Women & Families
The Children’s Partnership
Universal Health Care Action Network of Ohio

MaryAnne Sterling, Family Caregiver Advocate
The path to the Interoperability Roadmap

- June 2014: ONC released a 10-year vision paper on how to achieve an interoperable health IT infrastructure

- September 2014: CPeH submitted comments reiterating the need to build equal interoperability with patients and families as well as providers

- Dr. DeSalvo sent back a letter thanking CPeH for its thoughtful comments

- January 2015: ONC released the Shared Nationwide Interoperability Roadmap—a 10 year plan to achieve interoperable health IT
  - Comments Due: Friday, April 3 at 5 pm ET
ONC is listening: **Disparities Action Plan**

"Standardized data elements support better **stratification of electronic health information** when aggregated to identify and address important issues such as **health disparities** and also support research and evidence-based personalized medicine."

(“Principle-Based Interoperability”, pg. 10)

"HIT developers and SDOs should advance systems in support of human-centered design for systems, including the **ability to provide information to individuals with varying levels of health literacy** so individuals can understand their electronic health information and **ability to provide information in their primary language.**"

(3-year goal, “Core Technical Standards”, pg. 85)
“Individuals and stakeholders across the care continuum are converging around a vision where a single care plan can be captured, dynamically updated and utilized in a secure and appropriate fashion by individuals, caregivers and any member of the individual’s virtual, interdisciplinary care team.”
(Appendix, Care Planning, pg. 122)
Guest Speakers:

- **Lana Moriarty**, Director, Office of Consumer eHealth, ONC
- **Gaj Sunthara**, Presidential Innovation Fellow,
Interoperability 101

Lana Moriarty, Director, Office of Consumer eHealth, ONC
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Defining Interoperability

• “the ability of two or more systems or compounds to exchange information and to use the information that has been exchanged”

• Interoperability
  – enables the exchange and use of key health information
  – breaks down information silos
  – facilitates communication across provider organizations, and positively affecting patient care

Interoperability vs Health Information Exchange

• Terms are used interchangeably, but **not the same thing**

• Health information exchange is different from health information interoperability – *exchange is necessary for interoperability, but it is not sufficient* by itself to achieve health information interoperability

• Need more than just transport standards

What does Interoperability mean for Consumers?

- **Information is available** WHEN and WHERE an individual needs it
- Allows individuals to manage their own health and work collaboratively within the health care system
- Eliminates barriers to the free flow of rich and complex types of information needed to determine the most appropriate health decision
- Honoring patient privacy preferences
- Going beyond the care delivery system
- Lower costs, improved care
Why does interoperability matter?

• Individuals and providers need access to the right information at the right time in a manner they can use to make decisions that impact their health regardless of geographic or organizational boundaries

• Typical Medicare beneficiary receives care from 2 primary care providers and 5 specialists each year

• Only 10-20% of health outcomes are attributable to health care

• Information needs to flow inside and outside the care delivery system to support health
About one in three individuals experience gaps in information exchange

Proportion of individuals who experienced one or more gaps in health information when seeking care for a medical problem within the last year, 2013.

Experienced one or more gaps listed below

- Had to tell a health care provider about your medical history because they had not gotten your records from another health care provider: 18%
- Had to bring an X-ray, MRI, or other type of test result with you to the appointment: 18%
- Had to wait for test results longer than you thought reasonable: 11%
- Had to provide your medical history again because your chart could not be found: 7%
- Had to redo a test or procedure because the earlier test results were not available: 6%

37%

Patel V., Barker W. & Siminerio E. (September 2014). Individuals’ Access and Use of their Online Medical Record Nationwide. ONC Data Brief, no.20.
Individuals’ ability to address those gaps and delays is limited today: Only 3 in 10 individuals were given access to an online medical record.

Proportion of individuals offered access to their online access and whether a healthcare provider or health insurer provided access, 2013.

Patel V., Barker W. & Siminerio E. (September 2014). Individuals’ Access and Use of their Online Medical Record Nationwide. ONC Data Brief, no.20.
End Goal

• Providers, patients, policymakers, public health community and innovators work collectively to achieve an **interoperable learning health system**

• Health information can be collected, shared, and used to:
  1. Improve public and population health
  2. Facilitate important research
  3. Inform clinical quality measures and care outcomes
  4. Keep communities healthy
To Achieve Interoperability

• Must first adopt and optimize use of electronic health records (EHRs) and health information exchange (HIE) services

• Increased adoption of health IT among all health care providers, especially those who care for at-risk populations, will improve care coordination, increasing outcomes and reducing costs

• Increased use of health IT among consumers will demand interoperable systems
**Interoperability Roadmap**

- **Interoperability (Roadmap Definition)**
  - The ability of a system to exchange information with and use information from, other systems without special effort on the part of the customer.

- **Interoperability 10-year Goal**
  - Majority of providers and individuals securely send, receive, find, and use essential health information.

- **Differing Legal Requirements**
  - Though legal requirements differ across the states, nationwide interoperability requires a consistent way to represent an individual's permission to collect, share, and use their individually identifiable health information, including with whom and for what purpose(s).
States philosophically aligned
State privacy and consent laws are diverse in content
Diversity in organizational policies within states
See roadmap appendix A and B for ONC Consent
Biblography
Laws, regulations, and policies for patient consent

Laws, regulations, and policies for sensitive information

Consent models (opt-in, opt-out, with restrictions, etc.)

HIO Architecture

EHR system interoperability

Consent directive (paper or electronic)

Patient provides consent to share sensitive health information and HIPAA Permitted Uses and Disclosures
What is Computational Privacy?

- Is capturing a patient’s consent choice on a piece of paper interoperable?
- To achieve health, an individual’s electronic health data need to be digitally connected to their consent choices.
- Health care providers, and their Health IT systems need to know what to do when the individual does not document a choice.
- Telemedicine, community health supports, and other innovative delivery processes will be stunted if we cannot make privacy computable.

Granular Choice

Basic Choice

Permitted Uses=
Background Rules
Where We Are Today

Consumer Demand

Compelling Apps

Data Flowing

2010
- Blue Button Appears on the VA Portal

2011
- Blue Button Pledge Program
- App Challenges

2012
- 1st Round of White House Presidential Innovation Fellowships

2013
- Meaningful Use Stg 2 Patient “VDT” Requirements
- Standards Guidelines

2014
- Blue Button Connector Website
- Blue Button Campaign
- CLIA Rule
- Where We Are Today

Blue Button Pledge Program
- App Challenges
- ONC Charge: Take Blue Button Nationwide

ONC Charge: Take Blue Button Nationwide

CLIA Rule
The Blue Button Campaign

Target Audience: Adults with Chronic Conditions, Cancer Patients, and Caregivers
Blue Button Connector

A Way to Help You Find Your Health Data

Get Started

http://bluebuttonconnector.healthIT.gov
Path Forward

Today
- Paper records
- PDF Files
- Bi-directional exchanges

Tomorrow
- Build upon existing health IT infrastructure
- Empower individuals
- Simplify
- One size does not fit all
- Focus on value
- Protect privacy and security in all aspects of interoperability

Future health information exchange supports national health IT ecosystem
Emphasis for 2015

• Evolve the Blue Button Connector website

• Ensure that the right policy & technical levers are in place to support consumer access to their information (especially MU2 and MU3)

• Support healthcare providers in consumer engagement

• Disseminate the PSA campaign

• Shape pilots (by others) to learn & demo success

• Support the technology developer community – HIPAA guidance and clarification

• Leverage our coordinator role among federal agencies to bake consumer engagement into everything we do

• Support efforts to capture and use Patient Generated Health Data.
How You Can Help

• Tell us challenges/successes enabling consumer access & other patient engagement efforts (bluebutton@hhs.gov)

• Support ONC standards work via S&I Initiative

• Comment on Interoperability Roadmap
Comment on Interoperability Roadmap

- Proposes critical actions that need to be taken by both private and public stakeholders to advance the nation towards a more connected, interoperable health IT infrastructure
- Draft Roadmap outlines the critical actions for different stakeholder groups necessary to help achieve an interoperable health IT ecosystem
- Comment period ends at 5pm on April 3, 2015
Interoperability 101

Fast Health Interoperable Resources (FHIR)
Feb 11th 2015

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Agenda

- Background
- Why
- What is Direct?
- Direct Pain Points
- FHA
- FHIR 101
- FHIR Querying via RESTful API
- FHIR Architecture
- Who is onboard?
- FHIR on FIRE
Background

“Public API as basic conduit of interoperability:
The “Public API" should enable data- and
document-level access to clinical and financial
systems in accordance with Internet-style
interoperability design principles and patterns.”

- Joint Health IT Policy & Standards JASON Task Force
Why FHIR

- Consolidated *(CDA)* - complex & big documents instead the discrete elements we want
- Direct ad-hoc based emails (push only)
- No seamless transactions
- Healthcare is not special
  - Google, Facebook & Amazon
    - Seamless Transmission
    - RESTful API
    - Authentication & Authorization
What is Direct?

- Simple email exchange
- Secure SMTP
  - using S/MIME (X.509) certs
- Exchange Service Provider
  - STA / HISP
- Any documents
  - CCDA, PDF, TIFF, ASCII, FHIR etc...
Direct Pain Points

- Only Push
- No confirmation back
- Direct address
  - One organizational cert by STA/HISP
  - 1:M
    - Organization can multiple emails for its providers and patients
    - Patients can have multiple direct address for each health providers
- STA/HISP Certs Maintenance Nightmare
  - Expiration and renewal processes & installations
Federal Health Architecture

- Direct exchange within federal agencies and partners:
  - CMS
  - DoD
  - VA
  - IHS
  - SSA
FHIR 101

- FHIR is an open specification standard from HL7
- FHIR is not an implementation or technology
- FHIR transformation can be exchanged via
  - SMTP
  - HTTP(S) - RESTful API
  - Bi-directional: GET, POST
  - Search, History, Read, Update, Validate, Batch

- Well-suited for Mobile, IoT, PHR & Web
- Supports with request & response (confirmations)
  - Documents: FHIR Doc, CDA, PDF etc...
  - Asynchronous (Event-driven) Messages
- SOA within the 20%
  - 80% - Keep the simple stuff simple
  - 20% - Custom extensions/needs
FHIR Querying via RESTful API

- Not complex SQL and human readable query
- Base Query against a resource type / identifier
  - GET [base-endpoint]/Patient/23
  - GET [base-endpoint]/Patient?name=john
  - FHIR Profile Example
    - GET[base-endpoint]/Patient?gender: text=male
- Easier for startups and enterprises
- Key Terms:
  - FHIR Resource Type = Data Models
  - FHIR Identifier
  - FHIR Profile
FHIR Query via RESTful API - JSON

JSON Format
- Human Readable
- Less Bytes
- Faster
- Native to
  - IoT
  - Mobile Devices
  - Web
FHIR Query via RESTful API - XML

XML Format

- Human Readable
- Still far better than V2.x/V3.x/C-CDA
FHIR Server Architecture

- JSON/XML
- RESTful API Over HTTP(S)
- SMTP Direct FHIR Doc. Attachments
- FHIR Service
- EHR / Providers
- RDBMS
SMART on FHIR - Architecture

- EHR Pluggable Apps uses FHIR
- Regardless of any EHR
  - Same app in Cerner & EPIC (for now)
- Uses OAuth 2.0 and OpenID Connect
  - Authentication & Authorization
  - MITREid Connect
  - MITRE Corporation and MIT Kerberos and Internet Trust (KIT)
The Argonaut Project

- Recommendations from JASON Task Force (JTF) & PCAST
- Develop a first-generation FHIR Specs and core data services by May 2015
- HL7 to advance the work on FHIR specs
- Perfect storm / heavy hitters collaboration:
  - Provider organizations (Cerner, EPIC, Mayo, Intermountain Health, Boston Children’s etc...)
  - Academic communities
  - Security Implementation Guide
    - SMART OAuth 2.0 & OpenID Connect Profiles
Who is onboard

EHR Vendors:
- Cerner, EPIC, McKesson

International Health Systems:
- Australia, New Zealand & Canada

Independent Projects:
- Open source developers & universities

US Government Federal Agencies:
- HHS/ONC
- [Not officially R&D]: CMS, VA & DoD
FHIR on FIRE = The Perfect Storm

- ONC’s DAF - S&I Initiative
- ONC’s Privacy on FHIR / HIMSS Demo
  - HEART Profile
  - OAuth 2.0, OpenID Connect & UMA
- The Project Argonaut
- Cerner’s Production Solution on FHIR (with SMART on FHIR) pluggable apps by later 2015.
- PIF/HHS/ONC
  - Inside the government R&D efforts:
    - CMS, VA & DoD and IHS
  - Private Sectors
FHIR train has left the station!
Questions?

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Questions?
Accelerated: CPeH Comment Timeline

- February 6: Federal HIT Strategic Plan comments filed
- Early March: Meaningful Use Stage 3 NPRMs expected
  - Policy rule from CMS
  - Technical rule from ONC
    - 2015 reporting period NPRM?
- April 3: Interoperability Comments Due
  - By February 20: Please indicate your top 3 priority use cases: https://www.surveymonkey.com/s/L2V82QX
  - EARLY MARCH: Internal goal CPeH comments
  - STAY TUNED for opportunities in the next 2 weeks to provide input, feedback on CPeH areas of comment
Your Feedback Requested: Priority Use Cases

• There were over 50 use cases submitted to ONC through public comment, listening sessions, and federal agency discussions.

• ONC requests that organizations submit 3 priority use cases from this list in their comments.
  • These uses cases should inform priorities for the development of technical standards, policies and implementation specifications.

• We have narrowed down the list of 56 use cases to those most relevant to individual consumers, patients, and families
  • Please indicate your top 3 choices by Friday, February 20: https://www.surveymonkey.com/s/L2V82QX
Proposed Use Cases: **Care Coordination and Telehealth**

- **Care Coordination:**
  - 4) Use of standardized and interoperable **patient assessment data**
  - 29) Query-based exchange
  - 17) **Alerts and reminders** (for preventative screenings, care and medication regimens)
  - 10) **Quality measures** based on complete patient data

- **Telehealth:**
  - 14) eVisits and telemedicine
  - 48) **Mental health risk assessments** through eVisits and telemedicine
  - 52) Monitoring programs for **life threatening situations** (through home monitoring devices, eVisits, and telemedicine)
Proposed Use Cases: **Access** and Patient Generated Health Info (PGHD)

- **Access:**
  - 35) Aggregated view of health info *(including immunization history)*
  - 18) Access to *longitudinal health record*
  - 28) Accessibility and support for users with *disabilities*
  - 21) Managing *consents* to access/use of data

- **PGHD:**
  - 37) *Contributing information* to EHRs
  - 19) Submitting *corrections and amendments*
  - 36.) / 7.) Setting and meeting individual health goals by integrating data into *apps and tools*; into *mobile apps and tools*
  - 20) Data from *personal devices* (e.g. smartphones, BP cuffs, glucometers, and scales)
Proposed Use Cases: **Research and Population Health**

**Research:**
- 13) *Personalization of care* through access to genomic testing and data
- 32.) / 16.) Individuals are identified to participate in *clinical trials*; are offered participation

**Population Health:**
- 50) Population health management of data on *smoking cessation programs, new patient visits, and trauma-related incidents*
- 51) Population health management on *births, deaths, and occupational hazards* accessible to providers and population health stakeholders
Examples: Consumer Interoperability

**FIND**
- Parents have access to their children’s clinical information (such as vaccinations and lab results)

**RECEIVE**
- A woman with cancer is able to receive secure messages (with communication of lab results or instructions for treatment) that she is able to use in consult for a second opinion
Examples: Consumer Interoperability

**SEND**
- An elderly man with diabetes is able to *send and contribute* patient-generated data to his providers (e.g. caregiver status, glucometer readings, previous conditions) in order to make the right data available to providers to ensure safe and appropriate care.

**USE**
- A Spanish speaker who receives her hospital discharge instructions electronically, but in English will not be able to *use* that information.
Get **Involved!**

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