Analyze the Remaining Gaps as Data Exchange is Expanded to Broader Stakeholder Groups in Support of Innovation

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Steven Lane, MD, MPH, FAAFP
Clinical Informatics Director - Privacy, Information Security & Interoperability, Sutter Health
Conflict of Interest

Steven Lane, MD, MPH, FAAFP has no conflicts of interest to report
The push for advancing interoperability and increased demand for health information exchange has given rise to expanding stakeholder groups.

This has exposed a variety of gaps in data exchange.

In this session, we will identify and explore what gaps exist and discuss innovative ways in which data is being exchanged to help diminish these gaps.
Learning Objectives

1. Identify **barriers** in data reciprocity and data exchange when it comes to expanding stakeholder groups

2. Recognize the **impact** of stakeholder gaps in regards to **patient and value-based care**

3. Describe **innovative ways** in which some stakeholders are addressing disparities in data exchange
Outline

• Background
• Current State
• Stakeholders
• Gaps
• Federal support
• Innovations
• Conclusions
Background

• Definitions
• Degrees of Interoperability
• Benefits
“The term ‘interoperability’, with respect to health information technology, means health information technology that –

a. enables the secure exchange of electronic health information with, and use of electronic health information from, other health information technology without special effort on the part of the user

b. allows for complete access, exchange, and use of all electronically accessible health information for authorized use under applicable State or Federal law

c. does not constitute information blocking as defined in section 3022(a) of the Public Health Service Act as amended
• Interoperability is the ability of different information systems, devices or applications to connect, in a coordinated manner, within and across organizational boundaries to access, exchange and cooperatively use data amongst stakeholders, with the goal of optimizing the health of individuals and populations.

HIMSS, *Defining Interoperability in the Health Ecosystem*

– Available for public comment until March 23, 2019
Degrees of Interoperability

• Technical
  – Foundational connectivity

• Syntactic – *Data Liquidity*
  – Common data formatting
  – Maintain field level interpretation

• Semantic – *Data Portability*
  – Codified data mapped to standard vocabularies
  – Maintain meaning

• Functional – *Data Utility*
  – Integration into local workflows, clinical, and analytical processes
Benefits of Interoperability

• Triple Aim
  – ↑ Value – Quality / Cost
  – ↑ Health – individual, population
  – ↑ Satisfaction / experience – patient, provider, care team
• Impact on care
  – Direct patient care
  – Population health management
• Value based care: Alignment of incentives > ↑ exchange
• Patient safety
  – 250,000 deaths / year due to preventable medical errors
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Current State

- Interoperability Methodologies
- Connectivity Landscape
- Evolving Capabilities
- Metrics
Interoperability Methodologies

- Telephone, postal mail, FAX
- Secure file transfer
- HL7 Version 2 interfaces – **PUSH**
  - Within and between institutions
  - Focused use cases: Orders/results, ADT, registry reporting
- Document Exchange – **PUSH & PULL**
  - Clinical Document Architecture (CDA) – HL7 Version 3
  - Consolidated CDA (C-CDA) – 12 document types, 70 sections
- Fast Healthcare Interoperability Resources (FHIR®) – **PULL > PUSH**
  - Modular data element exchange
  - Supports Application Programming Interfaces (APIs)
Connectivity Landscape

• Health Information Exchanges (HIEs)
  – Centralized data stores +/- value added services
  – Regional and use-specific (e.g., payers, research)
• Direct Interoperability
  – DirectTrust
  – Health Information Service Providers (HISPs)
• National networks
  – eHealth Exchange
  – Single and multi-vendor networks
• Exchange frameworks – Connect networks
  – Carequality
  – Trusted Exchange Framework & Common Agreement (TEFCA)
Evolving Capabilities

**Traditional**
- Point-to-point connections
- HL7 V2 interfaces
- Individual and community trust agreements
- ADT feeds to central repositories (HIEs)
- Ad hoc CDA document query, push
- **Individual** access: portal, PDF

**Transitional**
- HIPAA/HITAC, MU/PI
- Transitions of Care
- Treatment use cases
- Federated architecture and trust
- Automated queries at point of care
- Patient summary CCD
- Discrete PAMI data
- Minimum necessary challenges
- **Individual** access: VDT capability, CCD

**Innovative**
- More:
  - Participants
  - Use cases
  - Discrete data
  - C-CDA templates
- Automation
  - Pop health bulk query
  - Patient Centered Data Home
- FHIR: Read > write
- **Individual** access: apps / APIs
While there are, as yet, no accepted standards by which to measure interoperability, there have been dramatic and progressive increases in the volume of transactions and the types and utility of data exchanged.

Sources:

- Office of the National Coordinator for Health Information Technology (ONC) reports
- American Hospital Association (AHA) surveys
- Carequality document exchange metrics
- DirectTrust transaction volume
ONC Measurement Framework

Concepts to Measure Movement of Interoperable Electronic Health Information

- Send
- Receive
- Find
- Use

Barriers to Interoperability

Availability
Electronic Health Information from outside sources routinely available
Gaps in information exchange experienced by individuals

Use
Electronic Health Information from outside sources routinely used for decision-making and managing care
2017 Data:
- 70% of hospitals **participated** in nationwide HIE networks
- 51% of hospitals **had necessary patient data available** from outside of their systems at point of care
  - 53% of those organizations able to **integrate** received health data into their EHR

**Small, rural, and critical access hospitals** had lower rates of using electronic methods to exchange summary of care records compared to their counterparts
AHA Survey

Hospital Interoperability

Patient Access & Exchange

- **72%** of hospitals have the capability for patients to electronically view, download and transmit their health information.

NOTES: *Significantly different from previous two years (p<0.05).*
Carequality – Document Exchange

December 2016 - December 2018

Cumulative total = 114 M

~14M documents exchanged / mo.
DirectTrust – Transactions

Number of Send and Receive Direct Transactions between Trusted Endpoints by Quarter

~37M Transactions / month

Cumulative total = 607 M
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Stakeholders Identified in TEFCA-1

**HEALTH INFORMATION NETWORKS**

**FEDERAL AGENCIES**
Federal, state, tribal, and local governments

**INDIVIDUALS**
Patients, caregivers, authorized representatives, and family members serving in a non-professional role

**PROVIDERS**
Professional care providers who deliver care across the continuum, not limited to but including ambulatory, inpatient, long-term and post-acute care (LTPAC), emergency medical services (EMS), behavioral health, and home and community based services

**TECHNOLOGY DEVELOPERS**
Organizations that provide health IT capabilities, including but not limited to electronic health records, health information exchange (HIE) technology, analytics products, laboratory information systems, personal health records, Qualified Clinical Data Registries (QCDRs), registries, pharmacy systems, mobile technology, and other technology that provides health IT capabilities and services

**PUBLIC HEALTH**
Public and private organizations and agencies working collectively to prevent, promote and protect the health of communities by supporting efforts around essential public health services

**PAYERS**
Private payers, employers, and public payers that pay for programs like Medicare, Medicaid, and TRICARE
More than meets the eye

• Public Health
  – Surveillance and reporting
  – Clinical services: health centers, dental, nursing, EMS, disaster services, shelters, outreach, environmental
  – Coroners

• Federal / Government Agencies
  – Clinical services: Corrections, DoD/DHA, Indian Health Serv., Schools, VA
  – Research / administration: AHRQ, CDC, DoC, HHS, HRSA, NIH, NLM, ONC
  – Law enforcement
Providers with limited connectivity

- Small, rural and critical access hospitals and clinics
- Pediatrics – Excluded from Meaningful Use incentive program
- Telehealth
- Non-physicians – Dentistry, Optometry, Audiology, Podiatry
- Therapies – Physical, Occupational, Speech, etc.*
- Behavioral Health *
- Substance abuse treatment
- DME
- EMS
- LTPAC
- Home health
- Complementary care – Naturopaths, chiropractors, acupuncturists, homeopaths, etc.

* Included in 2019 Quality Payment Program
Additional Stakeholders

• Research
  – Public, private, academic, networks
• Pharmacy
  – Retail pharmacies
  – Pharmacy Benefit Management
  – Pharma companies – e.g., post marketing surveillance
• Insurance
  – Life
  – Disability
  – Casualty
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Gaps

• Evolving/competing standards
• Data Utility
• Other Barriers
Multitude of Standards

- Governance – Varies by technology, network, HIO
- Security and trust – Varies by technology, network, push vs. pull
- Format and transport
  - HL7 V2, C-CDA, FHIR – *Which to use?*
- Content
  - Data – SDOs, Information modeling initiatives
  - Common Clinical Data Set – Evolving 2014 > 2015 CEHRT standard
  - US Core Data for Interoperability (USCDI) glide path – 2019 and beyond
  - C-CDA templates
  - FHIR – Argonaut profiles, US Core
- Privacy
  - Varies by state, data type
  - Personal data beyond HIPAA covered entities??
Data Utility

- Access / view
- Ingest
- Interpret
- Integrate / reconcile
- Incorporate into standard workflows

#WithoutSpecialEffort
Other Barriers

- Economic barriers
  - Business models and practices
  - Information Blocking – *Pending final rulemaking*

- Inefficiency
  - System design
  - Procurement
  - Implementation
  - Integration
  - Support

- Procuring Interoperability: Achieving High-Quality, Connected and Person-Centered Care, Washington, DC: 2018
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HHS/ONC Support for Interoperability

- EHR certification program – 2015 Edition requiring patient API access
- Interoperability Standards Advisory
- Interoperability Proving Ground – Implementations
- Tech Lab Standards Coordination

- *DRAFT* US Core Data for Interoperability (USCDI)
- *DRAFT* Trusted Exchange Framework & Common Agreement
- *PENDING* proposed Information Blocking clarifications

- OCR RFI regarding potential changes to HIPAA to improve information sharing for treatment and care coordination
CMS Support for Interoperability

- Meaningful Use > “Promoting Interoperability”
- MyHealthEData
  - Blue Button 2.0
    - Beneficiary access to CMS claims data via FHIR APIs
    - Required use of 2015 Certified EHR Technology (CEHRT)
    - Includes patient data access via APIs, exchange of the Common Clinical Data Set, Patient-directed exchange
  - Performance Measures
    - Include electronic referral loops, clinical information reconciliation, real time drug formulary and PDMP queries
- Proposals
  - Require interoperability as Medicare Condition of Participation
  - Require Medicare Advantage plans to provide Blue Button 2.0 capabilities
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Innovations to close the gaps

- Direct
- Consolidated Clinical Document Architecture (C-CDA)
- Fast Healthcare Interoperability Resources (FHIR®)
- Provider-Payer data exchange
- Consumer-mediated exchange

...PLUS MANY MORE!
Direct - Beyond ToC

• Broadly implemented to support Transitions of Care (ToC) as required by Meaningful Use Stage 2

• Successfully implemented innovative use cases:
  – Query and push based on ADT events
    • Current CCD requested by & sent to ED upon patient arrival
    • Care team notifications at time of hospital/ED discharge – To PCP, care manager, home care team
  – Results delivery – without point-to-point interfaces
  – Care coordination messaging between care team members
  – Closed loop referrals – Now required by CMS
    • Cross-organization, cross-vendor
  – Fax > Direct conversion – improved security, integration

• Leverages established technical interoperability standards to facilitate closed loop ambulatory referrals via Direct
  – Supports the exchange of clinical and scheduling information between providers
• Successfully tested across multiple EHR vendors
  – Being demoed in the HIMSS Interoperability Showcase
• Future focus:
  – Acute to LTPAC transfers
  – Insurance pre-authorization
• Clinicians identified challenges related CCD quality and usability:
  – Unacceptably large documents
  – Lack of clinical notes
  – Desire for encounter-specific documents in addition to patient summary documents
  – Need for document version management

• Carequality-CommonWell Joint Document Content Workgroup
Improving C-CDA Exchange

• Workgroup Recommendations:
  – Implementers shall support encounter-specific documents utilizing specific C-CDA document templates:
    • Progress Note Document – Outpatient encounters
    • Discharge Summary Document – Inpatient encounters
  – Limit data included in encounter documents to:
    • Information generated at the time of the encounter
    • Patient level data, e.g., Problems, Medications, Allergies, reviewed / validated during encounter
  – Respect time parameters for encounter document queries
• Supports a consolidated longitudinal view of patient records including encounters from multiple institutions and vendors
C-CDA Document Types

• Release 1
  1. Consultation Note
  2. Continuity of Care Document (CCD)
  3. Diagnostic Imaging Report
  4. Discharge Summary
  5. History and Physical
  6. Operative Note
  7. Procedure Note
  8. Progress Note
  9. Unstructured Document

• Release 2
  10. Care Plan
  11. Referral Note
  12. Transfer Summary

• eHealth Exchange®
  Content Testing Program
VA Innovations

- Implementing Direct messaging
- Improvements to CCD section contents
- C-CCD Data Quality Initiative
  - Analyze received documents for completeness, quality, adherence to standards
  - PAMI data, procedures, vitals
  - Focus on critical data access and patient safety
  - White Paper: *Interoperability Progress and Remaining Data Quality Barriers of Certified Health Information Technologies*

HL7® FHIR®

• Release 4 – Published January 2, 2019
  – Normative standard:
    • RESTful API, XML and JSON formats
    • Terminology layer, conformance framework
    • Basic data types
    • Key Patient and Observation Resources
  – Future changes will be backward compatible
Heat Wave: The U.S. is Poised to Catch FHIR in 2019

87% of hospitals, 57% of clinicians using EHRs certified to use FHIR Release 2

10/01/2018
Payer-Provider Data Exchange

• Use cases
  – Treatment
    • Case management – acute, chronic
    • Care coordination
  – Healthcare Operations
    • Prior authorization
    • Quality reporting – HEDIS, STARS
    • Formulary management
  – Payment
    • Utilization and appropriateness of care review
    • Risk adjustment – HCC coding
    • Claims adjudication
Payer-Provider Data Exchange

• Policy issues
  – Minimum necessary requirements – vary by use case
  – Self-pay restrictions
  – Release restrictions / confidential data
  – Re-purposing data
Payer-Provider Data Exchange

• Technology solutions
  – Central repositories
    • Manifest Medex (CA)
  – C-CDA exchange
    • Carequality
  – FHIR®
    • ONC-led FAST Initiative – Governance, policy
    • HL7 Da Vinci Project – IGs, reference implementations
  – Vendor network solutions
    • Moxe Health
    • Epic Payer Exchange
## Da Vinci Project

- Leveraging FHIR® for payer-provider data exchange
- High priority use cases to support value based care:

<table>
<thead>
<tr>
<th>In HL7 ballot reconciliation as draft standard</th>
<th>Under active development</th>
<th>Planned 2019 Use Cases</th>
<th>Future Use Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage Requirements Discovery</td>
<td>Gaps in Care &amp; Information</td>
<td>Risk Based Contract Member Identification</td>
<td>Alerts: Notification (ADT), Transitions in Care, ER admit/discharge, …</td>
</tr>
<tr>
<td>Documentation Templates and Coverage Rules</td>
<td>Performing Laboratory Reporting</td>
<td>Chronic Illness Documentation for Risk Adjustment</td>
<td>Patient Cost Transparency</td>
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- Quality Measure Collection
- Clinical Data Exchange
- Pre-order Burden Reduction

**Interoperability Showcase:**
9100-49
Consumer-Directed Exchange in an Evolving App Ecosystem
• NewWave Telecom & Technologies
  – MyCareAI app – “Standards-based, consumer-controlled health data convergence hub”
    • Participating providers enroll Medicare beneficiaries
    • App requests claims history via Blue Button (FHIR)
    • Query for clinical data from providers based on claims
    • Aggregate and assemble longitudinal patient record
    • Evaluate quality metrics, identify risks for patient and population
    • Feedback to patient and providers (via regional health information network)
  • Offer services
    • www.NewWave.io HIMSS Booth #509
Telehealth Integration

• SAFE Health
  – Initial focus on sexual health, STD testing, and treatment
  – Integrate with Dating Apps to incentivize regular testing and sharing of sexual health status
  – Home-grown EHR + interoperability
    • Labs for testing > historical data access (FHIR)
    • Pharmacies for e-prescribing & delivery (HL7 V2)
    • EHRs via Carequality for bidirectional exchange (C-CDA)
    • Developing to the Apple Health API (FHIR)

• www.SafeHealth.me
Apple Health Records

- Beta launch - January 24, 2018
- 1/16/2019: 167 healthcare organizations offering FHIR API-based access to data from 3 EHR vendors – AthenaHealth, Cerner, Epic
- LabCorp and Quest lab data access / integration
- Recent user survey: 90% of users endorsed:
  
  “The smartphone solution improved their understanding of their own health, facilitated conversations with their clinicians, or improved sharing of personal health information with friends and family.”

Apps using Health Records data

• Patient-facing:
  - Apps That Work with Health Records
    - One Drop Diabetes Management
      Health & Fitness
    - Medisafe - Pill & Med Reminder
      Medication Tracker, Organizer
    - Glow Cycle & Fertility Tracker
      Log your period & get pregnant
    - Heal – House Calls On-Demand
      Licensed, qualified doctors

• Service Providers:
  - Telehealth
  - Care plans, patient monitoring
Apple Health Records Market Penetration

Number of hospitals by Zip Code live with Apple FHIR API access

- Source: https://support.apple.com/en-us/HT208647; as of 01/16/2019
Patient access to EHR data via APIs

Individuals with potential access to the common clinical data set information in their EHR(s) via API access

vs. ~80M US iPhone users

- Source: https://torchinsight.com/
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• Federal support
• Improvement / innovation efforts
• Conclusions
Interoperability is within our reach!

• WE HAVE:
  – Stakeholder engagement
  – Mature standards – must continue to evolve
  – Increasing Connectivity – varies across users, technologies
  – Trust frameworks
    • Federal DURSA – eHealth Exchange
    • DirectTrust
    • Carequality
    • SHIEC
    • NATE
  – Government support
  – HIT investment – $9.5B in 2018!
Interoperability is within our reach!

- **WE NEED:**
  - *Interoperability by design*
  - Vendor *development* and user *implementation* to:
    - Automate exchange
    - Integrate data in workflows
    - Extend APIs beyond patient access and use
  - Continued evolution of *standards*: C-CDA, FHIR, Argonaut profiles
  - Clarification and enforcement of *Information Blocking* rules
  - Finalize and implement a comprehensive *TEFCA*
  - Implement the proposed *USCDI glide path*
    - “Omics” data
    - Device data
    - PGHD
    - Device data
    - SDoH
  - To #KillTheFax
• With CommonWell and Carequality linked, the biggest technical obstacle to widespread patient-record sharing has been removed.

• The healthcare industry is rapidly approaching the point where an organization using any of the major acute care/ambulatory EMRs should be able to easily connect to other provider organizations with minimal cost and effort.

• Today, the biggest barriers preventing widespread participation are governance and the need for organizations to decide to participate.
Opportunities for Participation

• HHS / ONC Federal Advisory Committees – Work Groups and Task Forces
  – https://www.healthit.gov/topic/federal-advisory-committees/membership-application

• ONC FHIR at Scale Taskforce (FAST) – Tiger Teams
  – https://oncprojecttracking.healthit.gov/wiki/display/TechLabSC/Tiger+Teams

• The Sequoia Project – Interoperability Matters Workgroups
  – https://sequoiaproject.org/interoperability-matters/

• Carequality – Advisory Committee, Workgroups
  – https://carequality.org/get-involved/

• DirectTrust – Task forces
  – https://www.directttrust.org/
Questions

• Contact information:
  • LaneS@SutterHealth.org
  • @emrdoc1
  • www.linkedin.com/in/steven-lane-md/

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