Healthier Communities Through Interoperability

David Camitta, MD, MS
The Patient at the Center

Home Well
Where Are We?

- 1 in 3 patients

- Average Medicare patient sees 7 providers annually
Where Are We...PCPs and Specialists

- 229
- 117
Interoperability

• The ability of a system to exchange electronic health information with and use electronic health information from other systems without special effort on the part of the user.

• The ability for health systems to electronically send, receive, find, and use health information with other electronic systems outside their organization.
Key Types and Methods of HIE

- Directed – send and receive electronically between care providers. Generally push.
  - HISP

- Query Based – find and/or request. Pull.
  - Local/Regional HIO/National Network

- Consumer Mediated - patients aggregate and control use of information.
  - Portals, Apple Health Records
ONC Interoperability Roadmap

2015 - 2017
Send, receive, find and use priority data domains to improve health care quality and outcomes.

2018 - 2020
Expand data sources and users in the interoperable health IT ecosystem to improve health and lower costs.

2021-2024
Achieve nationwide interoperability to enable a learning health system, with the person at the center of a system that can continuously improve care, public health, and science through real-time data access.
Nationwide HIE

|------|------|------|------|------|------|------|------|------|------|------|------|------|------|

The Office of the National Coordinator for Health Information Technology

NHIN
Nationwide Health Information Network

HealtheWay

carequality

the sequoia project

eHealth Exchange

commonWell Health Alliance

Dignity Health
Current HIE Capability

% of Hospitals with Capability to Exchange Summary of Care Record with Any Outside Providers | National Avg = 76%

- 0 - 20%
- 21 - 40%
- 41 - 60%
- 61 - 80%
- 81 - 100%

2015 American Hospital Association Survey
Finding data

% of Hospitals that Electronically Find Patient Health Information from Outside Providers | National Avg = 52%

- 0 - 20%
- 21 - 40%
- 41 - 60%
- 61 - 80%
- 81 - 100%

2015 American Hospital Association Survey
% of Physicians that Share Patient Health Information with Any Other Providers | National Avg = 42%

- 0 - 25 %
- 26 - 50 %
- 51 - 75 %
- 76 - 100 %

Source: 2014 National Electronic Health Records Survey (NEHRS)
Progress - Send and Receive Multiple Methods

- 78% use more than one electronic method to send Summary of Care Records.
- 61% use more than one electronic method to receive Summary of Care Records.
Hospital Usage

- **SEND**: 2014: 78% | 2015: 85% | 2016: 88% | 2017: 88% (Significantly different from previous year)
- **RECEIVE**: 2014: 56% | 2015: 65% | 2016: 72% | 2017: 74% (Significantly different from previous year)
- **FIND**: 2014: 48% | 2015: 52% | 2016: 55% | 2017: 61% (Significantly different from previous year)
- **INTEGRATE**: 2014: 40% | 2015: 38% | 2016: 41% (Significantly different from previous year)
- **ALL 4 DOMAINS**: 2014: 23% | 2015: 26% | 2016: 29% | 2017: 41% (Significantly different from previous year)
Office Based Usage

<table>
<thead>
<tr>
<th>Activity</th>
<th>2015</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Send</td>
<td>38%</td>
<td>36%</td>
</tr>
<tr>
<td>Receive</td>
<td>38%</td>
<td>38%</td>
</tr>
<tr>
<td>Find</td>
<td>34%</td>
<td>53%*</td>
</tr>
<tr>
<td>Integrate</td>
<td>31%</td>
<td>28%</td>
</tr>
<tr>
<td>Conduct all 4</td>
<td>9%</td>
<td>10%</td>
</tr>
</tbody>
</table>
Office Based Exchange

- Ambulatory care providers outside your organization (reference): 29% send, 29% receive.
- Affiliated hospitals: 25% send, 29% receive.
- Unaffiliated hospitals: 18% send, 23% receive.
- Behavioral Health providers: 14% send, 12% receive.
- Long-term care providers: 14% send, 12% receive.

*Note: Data is marked with an asterisk.
How Often?

- Often: 18%
- Sometimes: 35%
- Rarely: 20%
- Never: 16%
- Do not know: 11%
Adoption

- Information not available to view in EHR as part of clinicians’ workflow: 53%
- Difficult to integrate information in EHR: 45%
- Information not always available when needed: 40%
- Information not presented in a useful format: 29%
- Do not trust accuracy of information: 11%
- Other reasons: 18%
**Interoperability Landscape at Dignity Health**

- **87,000** Active Users
- **40,000** Community View Users
- **320** Community EMR Connections
- **1 Million** Monthly External Queries
- **9 million** Enterprise HIE Patients
- **110** Contributing Systems
- **19** eHealth Exchange Connections
# Community View

## Information Cards

- **UC Davis Health System**
- **Hill Physicians**
- **Benioff Children's Hospital San Francisco**
- **Dignity Health Medical Foundation**
- **Sacramento Medshare**
- **Santa Cruz Health Information Exchange**
- **Providence Health & Services**
- **SimonMed**
- **ARIZONA DEPARTMENT OF HEALTH SERVICES**
- **Empire HIE**
- **CVS Pharmacy**
- **The Medical Clinic**
- **U.S. Department of Veterans Affairs**
- **Miniclinic**
- **Premise Health**
- **Intel Health**
- **Premise Health**
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- **Premise Health**

## Example Data Table

<table>
<thead>
<tr>
<th>Document</th>
<th>Title</th>
<th>Reference Date</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHR (E)</td>
<td>Document</td>
<td>02/12/1950</td>
<td>分かりやすい</td>
</tr>
<tr>
<td></td>
<td>Document</td>
<td>06/12/1950</td>
<td>分かりやすい</td>
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</tr>
</tbody>
</table>

## Example Diagram

[Diagram showing various medical information and charts related to patient data.]

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**Note:** The provided content includes a table with columns for document title, reference date, and source. The table is intended to represent the structured data typically found in electronic health records (EHRs). The diagram illustrates various medical information and charts, possibly relating to patient data and health records.
More continuum....
EMS HIE

EMS ePCR

ALERT
NEMSIS format CDA to ED dashboard

Emergency Department

FILE
NEMSIS 3 XML to HL7 Structured data, not PDF

Hospital EHR
PULSE

Statewide
Intended for use during disaster response

+DHV
Access to web portal with CCD information on patients being treated in an alternate care site, shelter or field hospital

+EHR-link
Access to EHRs on relocated patients from within existing hospital EHR system
Addressing opioid crisis
But Wait - How Do We Get to...

2021-2024

Achieve nationwide interoperability to enable a learning health system, with the person at the center of a system that can continuously improve care, public health, and science through real-time data access.
How do you get nationwide connectivity?

Data sharing networks increase connections exponentially.

If you connect six clinics, you might reach a few dozen physicians.

If you connect six networks, you can reach thousands of physicians.
California HIE Coverage

Mercy Medical Center Mt. Shasta
Mercy Medical Center Redding
St. Elizabeth Community Hospital
Sierra Nevada Memorial Hospital
Mercy Hospital of Redding
Mercy General Hospital
Woodland Healthcare

St. Joseph’s Behavioral Health Center
St. Joseph’s Medical Center
Mark Twain Medical Center
Mercy Medical Center
Bakersfield Memorial Hospital
Mercy Hospital Downtown
Mercy Hospital Southwest
St. Francis Memorial Hospital
St. Mary’s Memorial Hospital

Sequoia Hospital
Dominican Hospital
French Hospital Medical Center
Arroyo Grande Community Hospital
Marin Regional Medical Center
St. John’s Pleasant Valley Hospital
St. John’s Regional Medical Center
Northridge Hospital Medical Center
Glendale Memorial Hospital

California Hospital Medical Center
St. Mary’s Medical Center
Community Hospital of San Bernardino
St. Bernadine Medical Center

External Federated Sources:
Cedars-Sinai
CVS Minute Clinic
daVita Kidney Care
Department of Defense
Hill Physicians Medical Group
California Immunization Registry
Kaiser Permanente

Manifest MedEx
MemorialCare
Premise Health
Providence (SoCal)
SacValley MedShare
SCHIE DCPRHIID
Stanford

Sutter
UC Davis
UCSF Benioff Children’s
UCSF
Veterans Affairs

Carequality
Commonwell
WHO Community Health

• “Environmental, social, and economic resources to sustain emotional and physical well being among people in ways that advance their aspirations and satisfy their needs in their unique environment.”

• Focus on a defined geographical community.

• The health characteristics of a community are often examined using geographic information system (GIS) software and public health datasets.
The Real Continuum....
## EVOLUTION OF PUBLIC HEALTH DATA AND INFORMATICS NEEDS IN THE PUBLIC 1.0, 2.0, AND 3.0 ERAS

<table>
<thead>
<tr>
<th>Public Health 1.0</th>
<th>Public Health 2.0</th>
<th>Public Health 3.0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Characteristics of Essential Data and Informatics Infrastructure</strong></td>
<td><strong>Characteristics of Essential Data and Informatics Infrastructure</strong></td>
<td><strong>Characteristics of Essential Data and Informatics Infrastructure</strong></td>
</tr>
<tr>
<td>* Counts and trends</td>
<td>* Exposure-outcome cohort studies and causal inferences</td>
<td>* Geospatial inferences and trend</td>
</tr>
<tr>
<td>* Vital statistics and registration</td>
<td>* Relative risks and attributable risk estimates</td>
<td>* Layering of data and multilevel-systems thinking</td>
</tr>
<tr>
<td>* Registry systems of tracking mortality and diseases</td>
<td>* Methods to control for confounding and sampling bias</td>
<td>* Nontraditional data sources</td>
</tr>
<tr>
<td>* Identify pathogens and mode of transmission</td>
<td>* Continuous outcomes and exposure</td>
<td>* Digital bridges that interface with other sources</td>
</tr>
<tr>
<td>* Binary exposure and binary outcomes</td>
<td>* Longer time frame</td>
<td>* Community-level indicators</td>
</tr>
<tr>
<td>* Population statistics based on sum of individuals</td>
<td>* Measures of disparities, quality of life, and well-being</td>
<td>* Capacity to leverage big data</td>
</tr>
<tr>
<td>* Health services research</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Public Health Actions Driven by Data Insight**

<table>
<thead>
<tr>
<th>Public Health 1.0</th>
<th>Public Health 2.0</th>
<th>Public Health 3.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Developing diagnostic and therapeutic means to identify and remove pathogens*</td>
<td>* Managing chronic disease risks through screening and behavioural change*</td>
<td>* Coordinated multisectoral monitoring and action plan*</td>
</tr>
<tr>
<td>* Coordinating actions to disrupt disease transmission such as quarantine, vaccination, and treatment*</td>
<td>* Consistent surveillance and survey infrastructure*</td>
<td>* Prediction modeling based on complex set of risk drivers*</td>
</tr>
<tr>
<td></td>
<td>* Professionalized functions and performance standards of governmental public health agencies*</td>
<td>* Data and evidence as communication and policy tools rather than as the endpoint*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* Wellness promotion through changing the environmental, social, and economical contexts*</td>
</tr>
</tbody>
</table>

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It’s All About Information…

Dignity Health.
Whole Person Care Overview

Overarching goal for Whole Person Care (WPC)

- Coordination of health, behavioral health, and social services
- Comprehensive coordinated care for the beneficiary resulting in better health outcomes

WPC Pilot entities collaboratively to:

- Identify target populations
- Share data between systems
- Coordinate care real time
- Evaluate individual and population progress

Goals and Strategies

Increase, improve, and achieve:

- Integration among county agencies, health plans, providers, and other participating entities
- Coordination and appropriate access to care
- Access to housing and supportive services
- Health outcomes for the WPC population
- Data collection and sharing among local entities
- Targeted quality and administrative improvement benchmarks
- Infrastructure that will ensure local collaboration over the long term

Reduce:

- Inappropriate emergency department and inpatient utilization
Bloomberg Healthy Cities

PREVENTING NCDs AND INJURIES FOR A HEALTHIER SAN FRANCISCO

In USA, 94% of deaths are caused by noncommunicable diseases (NCDs) and injuries. Most of these are preventable.

Cities are the key to reversing this epidemic through progressive policies to change people’s behaviors, create healthy environments, and strengthen data for health.

Support cities to implement 1 of 10 proven interventions to prevent NCDs and injuries:

- **Create a smoke-free city**
  - Reduce smoking rates
  - Improve public health outcomes

- **Reduce air pollution**
  - Protect people from second-hand smoke
  - Reduce health risks
  - Improve air quality

- **Healthy food for all**
  - Promote healthy eating
  - Reduce obesity rates

- **Reduce sugary drink consumption**
  - Limit sugary drink consumption
  - Improve public health outcomes

- **Cleaner fuels for cleaner air**
  - Reduce pollution levels
  - Improve air quality
  - Reduce respiratory diseases

- **Increase seat belt and helmet use**
  - Reduce traffic fatalities
  - Improve road safety

- **Monitor NCD risk factors**
  - Collect data on NCD risk factors
  - Improve public health outcomes

How can we build health and opportunity?

**PEOPLE**

- Early behavior can drive disease and injury. City policies can make healthy choices the easy choice.

**PLACES**

- Smart planning and development shape cities into healthy streets.

**DATA**

- Quality data informs smart policies and spending.
Partnership in Our Communities

- **San Francisco Department of Public Health Partnership for Healthy Cities EHR Chronic Disease Initiative**: Bridging the Divide Between Clinical Health System Data and Public Health

- San Francisco Department of Public Health (SFDPH) initiative for all major health systems across San Francisco to share electronic health record (EHR) data to better characterize, monitor, and respond to chronic diseases in San Francisco.
Use Case - Diabetes

• **Diabetes**
  - Data to be collected: HbA1C, age, ethnicity, gender, zip code, address (if possible), etc.
  - Application of data: SFDPH currently funds healthy produce vouchers to encourage healthy eating.
  - Mechanisms can be devised to promote food voucher distribution to a specified registry of patients at health systems. In addition, SFDPH is advising a city-wide roll out of a MediCal benefit that provides medically tailored home delivered meals to patients with diet
Example Of Geographic Health Information Systems (GHIS) For Mapping The Terrain Of Diabetes In Durham County, North Carolina
California HIE Coverage

- Mercy Medical Center Mt. Shasta
- Mercy Medical Center Redding
- St. Elizabeth Community Hospital
- Sierra Nevada Memorial Hospital
- Mercy Hospital of Folsom
- Mercy San Juan Medical Center
- Methodist Hospital of Sacramento
- Mercy General Hospital
- Woodland Healthcare
- St. Joseph’s Behavioral Health Center
- St. Joseph’s Medical Center
- Mark Twain Medical Center
- Mercy Medical Center
- Bakersfield Memorial Hospital
- Mercy Hospital Downtown
- Mercy Hospital Southwest
- St. Francis Memorial Hospital
- St. Mary’s Memorial Hospital
- Sequoia Hospital
- Dominican Hospital
- French Hospital Medical Center
- Arroyo Grande Community Hospital
- Marian Regional Medical Center
- St. John’s Pleasant Valley Hospital
- St. John’s Regional Medical Center
- Northridge Hospital Medical Center
- Glendale Memorial Hospital

External Federated Sources:
- Cedars-Sinai
- CVS Minute Clinic
- DaVita Kidney Care
- Department of Defense
- Hill Physicians Medical Group
- California Immunization Registry
- Kaiser Permanente
- Manifest MedEx
- MemorialCare
- Premise Health
- Providence (SoCal)
- SacValley MedShare
- SCHIE OCPRHIO
- Stanford
- Sutter
- UC Davis
- UCSF Benioff Children’s
- UCSF
- Veterans Affairs

Carequality

Dignity Health

Commonwell Health Alliance
Driving Data Liquidity for Care Model Transformation

- 21st Century Cures
- TEFCA
- Information Blocking
Considerations for Health Plans

- Value based – quality/outcomes
- Interoperability foundational for data liquidity
- Coordination across continuum
- True population and community based
- Adopting and employing emerging standards
- Consumer/patient engagement
Putting it Together!
Thank You