Seth Foldy, MD, MPH, FAAFP

Director, Public Health Informatics and Technology Program Office
Office of Surveillance, Epidemiology and Laboratory Services
Centers for Disease Control and Prevention
What is an Electronic Health Record (EHR)?

- A systematic collection of patient electronic health information organized to assist the care of patients and groups of patients (like a practice’s population)
- Digital formatting enables information to be used and shared over secure networks
  - Track care (e.g., prescriptions) and outcomes (e.g., blood pressure)
  - Trigger warnings and reminders
  - Send and receive orders, reports, and results
What is a Health Information Exchange (HIE)?

- Technical and social framework that enables information to move electronically between organizations
  - Reporting to public health
  - ePrescribing
  - Sharing laboratory results with providers
EHRs: Planned U.S. Adoption Rising Fast

- Non-federal acute care hospitals
- Office-based Physicians

EHR, Electronic health record
Office of the National Coordinator for Health Information Technology
http://healthit.hhs.gov/media/important-facts-about-ehr-adoption-ehr-incentive-program-011311.pdf
HITECH Act incentives and programs

- $20B in Medicare and Medicaid incentives for eligible acute-care hospitals and health care providers to
  - Adopt certified EHRs
  - Exchange information electronically with key partners via Health Information Exchange (HIE)
  - Achieve objectives of “Meaningful Use” of EHRs

Objectives escalate over time

Later start = lesser incentives

$2B programs from ONC to address workforce, technical standards, and other obstacles
Goals and Objectives of HITECH and EHRs
Stage 1: 2011–12

- Improve care quality, safety, efficiency, and reduce health disparities
  - Quality and safety measurement
  - Clinical decision support (automated advice) for providers
  - Patient registries (e.g., “a directory of patients with diabetes”)  
- Improve care coordination
- Engage patients and families in their care
- Improve population and public health
  - Electronic laboratory reporting for reportable conditions (hospitals)
  - Immunization reporting to immunization registries
  - Syndromic surveillance (health event awareness)
- Ensure adequate privacy and security protections

HITECH, Health Information Technology for Economic and Clinical Health – part of American Recovery & Renewal Act Of 2009
EHR, Electronic health record
Public Health Opportunities

- Improving public health surveillance and practice
  - More complete and faster reporting of existing data
  - New data will become available on population health and quality of care
  - Standardized data: Easier use, reuse, and analysis

- Improving and measuring prevention activities in clinical settings

- Improving communication between public health and health providers via EHR in the context of care
  - “This patient appears to lack measles immunization”
  - “3 year old with diarrhea? Note a *Shigella* outbreak in a local childcare”

EHR, Electronic health record
“We have lots of information technology. We just don’t have any information.”
Electronic Health Records
The View From the Trenches

Robert Lamberts, MD
Evans Medical Group, Evans, GA
Who Is This Guy??

Am I stupid?
My Physician Credentials

- Primary care physician: Internal medicine/pediatrics
- Full-time practitioner since 1994
- Private practice: Co-owner of Evans Medical Group
  - 99% of care is in office/outpatient setting
My Geek Credentials

- **Early adopter**
  - Adopted use of electronic health records in 1996

- **Early adoption = Pain**
  - Computers were slow back then
  - EHRs were made by engineers
  - No chance of interfaces

- **Early leader in use of EHR**
  - Obsessed with clinical workflow
  - Had to stay in business!
Why I Needed Electronic Records

- Thousands of patients
- Bombarded with information from hundreds of places
  - Most information received is not useful – it is fluff
- Attention deficit disorder
- 24-hour days
A Certified Geek

- In 2003 won HIMSS Nicholas E. Davies Award for Primary Care
  - Healthcare Information and Management Systems Society (HIMSS)
  - Recognizes excellence in the implementation and use of health information technology, specifically EHRs

- What this means to me
  - Validated my approach to EHR
  - Vindicated my zeal for EHR as more than a “geek interest”
  - Gave me opportunities to teach about EHR
  - Didn’t pay anything, though

http://www.himss.org/ASP/davies_ambcare_infosheet.asp
EHR, Electronic health record
Recently qualified for the 1st stage of “Meaningful Use”

What does this mean?
- Had to meet government criteria for use of EHR
- Had to prepare a submission to the government
- The check is in the mail

http://healthit.hhs.gov/portal/server.pt/community/healthit_hhs_gov__meaningful_use_announcement/2996
EHR, Electronic health record
The Credentials that Matter

Academic theory and public policy crash land in my exam rooms

I am the best case scenario: If EHR and data exchange doesn’t work for me, it won’t work for anyone

EHR, Electronic health record
The Promise of Information Technology

- **Information**
  - Available and organized

- **Communication: Instantaneous**

- **Patient care**
  - Not missed
  - Not duplicated
  - Bad care avoided

- **Money: Saved**
How I Use My Patient Record

- **Organize information for better patient care**
  - Reminder of important facts about the patient
  - Catalog of patient care (i.e., a health history timeline)
  - Developing a long-term care plan

- **Justify billing for the visit**
  - Information goes into the record for nonclinical purposes
  - Extra information far exceeds the useful information in volume
Here’s What We Have Done

- **Improved patient care**
  - Called patients who have missed care
    - Immunizations
    - Diabetes care
  - Improved immunization rates
    - Far above national average: Pneumovax >90%
  - Sent test results to patients
  - Conducted consults via e-mail

- **Improved patient satisfaction**
- **Maintained good income**
The Hard Road Ahead

- Poor acceptance by physicians
- “Ownership” of patient Information
- Concerns about confidentiality
- Legal concerns
Incentive: Non-negotiable for Success
## Incentive: Non-negotiable for Success

### What incentives would work?

- Improve the availability of data through good data exchanges
  - Better care while maintaining confidentiality
- Streamline the process of putting meaningful data into the record for all parties
  - Doctors and patients, not just data-gatherers and payors
  - Reduce the documentation to free clinicians up to give care
- Give financial incentives, if needed
  - Works well for primary care, not as much for specialists
- Raise the expectations of the consumers (i.e., patients)
- Get me home at a reasonable hour
Implementing Health Information Exchange and Electronic Health Records

Jac J. Davies, MS, MPH
Director, Beacon Community of the Inland Northwest
Spokane, Washington
Inland Northwest Health Services
Who We Are and What We Do

- Non-profit 501(c)(3) organization
- Provide unique, effective, and affordable services using collaborative and innovative approaches for the benefit of the entire health care continuum
  - Connect 34 hospitals on a common information system
  - Provide electronic health records to >750 providers in >100 clinics
  - Educate patients
  - Improve access to health care
  - Facilitate the sharing of information among providers
  - Develop new efficiencies through the smart use of technology
- Oversee a variety of health care companies and services

http://www.inhs.info
Physician Office EHRs Supported by INHS

- Launched in 2003 with focus on eastern Washington and northern Idaho
  - >60% of physician offices in this region are now using an EHR
- Currently supporting physician offices in 4 states
EHR System
Implementation Issues

- **Type of system being implemented**
  - Adequate capturing of data to support clinical care?
  - Support for population health within practice and broader?

- **How the system is implemented**
  - Level of customization at each site
  - Effect of customization on the ability to capture and use data

- **How the system is used**
  - As intended
  - Individuals creating variations
Transmission of health care related data among facilities, health information organizations, and government agencies according to national standards
Health Information Exchange

- **Very complex and fluid environment**
- **Organizational framework varies**
  - Enterprise: Within a corporation; support business operations
  - Community: Multi-organization; focus on immediate clinical care
  - State: All states implementing now with HITECH funding
- **Services and capabilities vary**
  - Clinical data
  - Administrative transactions
- **Available data vary**
  - Large data sources commonly available (hospitals, laboratories)
  - Growing availability of ambulatory care data

HITECH, Health Information Technology for Economic and Clinical Health – part of American Recovery & Renewal Act Of 2009
Operational HIE Initiatives in the United States

Operational HIEs, Health information exchanges that transmit data that is being used by healthcare stakeholders.

eHealth Initiative, the State of Health Information Exchange in 2010. www.ehealthinitiative.org
Providing de-identified emergency department and inpatient data since 2009
- Increasing situational awareness
- Providing early warning of possible disease outbreaks
  - Emergence of H1N1 influenza: Real-time population health data from eastern Washington had previously been unavailable to public health

Now transmitting notifiable disease and condition reports electronically

HIE, Health information exchange
Data Flow: From INHS to WA DOH to CDC

WA DOH distributes the disease reports to the appropriate local health agencies

WA DOH, Washington Department of Health
Geographic Coverage for Hospital Reporting in 2009 Before and After Connecting to INHS HIE

Based on Patient Encounters per capita

Washington State Department of Health
Impact: Influenza

- **During the 2010/2011 flu season**
  - WA DOH determined in real time that only 20-30% of pregnant women had been properly vaccinated against the flu by the time of their delivery.

- **In January 2011**
  - The state health officer sent out a “Dear colleague” letter asking clinicians to emphasize vaccination for pregnant and post-partum women.

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**Image:**

```
January 31, 2011

Dear colleague:

As usual, your help to primary pregnant and postpartum women from the flu is essential. Despite recommendations from the American College of Obstetricians and Gynecologists, the American Academy of Family Physicians, the American College of Physicians, and the CDC to vaccinate high-risk populations, this is still very insufficient.

New data does this. In December 2010, pregnant women admitted to hospitals in Washington's counties. Of the nearly 40 percent of women that lacked information on influenza vaccination status, only 20 percent reported the patient was vaccinated at the time of delivery.

Even if the opportunity is missed to vaccinate a woman during pregnancy, all vaccinated, postpartum women, whose vaccinations for the flu vaccine, should be vaccinated:

- Protect them since they are still at increased risk for severe influenza delivery.
- Reduce the risk of getting influenza and then infecting the baby, who is too young to be vaccinated (e.g., nursing mothers).
- Protect the baby by having immunity that can be passed in breast milk.

Now is the time to increase efforts to vaccinate all pregnant women. Immunization is still far from the 90 percent goal set by the Northwest and other states in February or March. It needs quick and as many as half of the women report vaccination in regional hospitals insufficient.

As a health care provider, you play an important role in stopping the flu. Pregnant women are more likely to be vaccinated within 24 hours if the influenza vaccination facility volunteer and the surgeon's office are in the same building against the disease.

Thank you for your efforts to keep Washington families protected from influenza.

Sincerely,

[Signature]

MarianDickson, MD, MPH
State Health Officer

WA DOH, Washington Department of Health
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Summary
EHR and HIE Opportunities and Challenges

- Unprecedented access for public health organization to rich sources of population health data
- The availability of an EHR or an HIE does not (yet) guarantee availability of data for use by public health
- Extensive changes underway in the health care system
- Public health organizations
  - Engage at the community level
  - Take advantage of the health care system changes
  - Recognize tremendous pressures on health care organizations and providers to transform the entire health care delivery system
  - Recognize the need to meet health care providers half way

EHR, Electronic health record
HIE, Health information exchange
Electronic Health Records
A State Health Department Perspective

Amy Zimmerman, MPH
Rhode Island State Health Information Technology Coordinator Executive
Offices of Health and Human Services
State of Rhode Island

http://www.health.ri.gov
Overview
Electronic Health Records and States

- Public health goals
- Role of the Rhode Island Department of Health
- Rhode Island experience
- Challenges and opportunities
Goals

- **Effective use of EHR data**
  - Protect and improve the health of individuals
  - Inform health care policy and practice at the consumer, provider, and community level

- **Groom providers as public health ambassadors**
  - Provide both “individual sick care” and “practice-based preventive care”

EHR, Electronic health record
Role of the Department of Health in the Electronic Transformation

- **Leadership and governance**
- **Data sender and receiver**
  - Laboratory orders and results, immunizations, and syndromic surveillance
- **Legislative and regulatory oversight**
  - Privacy and security, certificate of need, compliance orders, etc
- **Policy development**
  - Standards of care, technical standards
- **Measurement and analytics**
  - Monitor adoption, alignment of metrics, analysis, and public reporting
- **Funding**
Adoption of EHR in Rhode Island
Trends among All Rhode Island Physicians, 2009-2011

EHR, Electronic health record
E-prescribing Efforts Under Way in Rhode Island

Track the Growth of E-Prescribing in Your State

E-Prescribing Incentive Programs
Prescribers: Learn about incentive programs at the state and national level that can help you get started with e-prescribing.
Learn more

Benefits of E-Prescribing
Hear what patients, prescribers, nurses, and medical are saying about e-prescribing.
Learn more

E-Prescriptions routed today: 510,473

Top 10 E-Prescribing States
1. Massachusetts
2. Michigan
3. Rhode Island
4. Delaware
5. North Carolina
6. Connecticut
7. Pennsylvania
8. Hawaii*
9. Indiana*
10. Florida*

http://surescripts.com
Adoption of E-prescribing in Rhode Island

<table>
<thead>
<tr>
<th>% of Total Prescriptions Routed Electronically</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
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<td>10.9</td>
<td>23.3</td>
<td>33.5</td>
<td>36.3</td>
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</table>

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<thead>
<tr>
<th>% of Prescribers Using E-scripts for New or Renewal Prescriptions</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
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<tr>
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<td>39.0</td>
<td>51.4</td>
<td>67.5</td>
<td>78.1</td>
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</table>

<table>
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<tr>
<th>% of Pharmacies Capable of Accepting Electronic Scripts</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
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<td></td>
<td>88.6</td>
<td>99.4</td>
<td>100</td>
<td>100</td>
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</tbody>
</table>

http://www.riqi.org/matriarch/default.asp
Adoption of E-prescribing in Rhode Island

- % of e-prescribers using an electronic health record
- % of e-prescribers using a stand-alone e-prescribing software application

Prescribers

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
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<td>%</td>
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Rhode Island Department of Health
Early HIE Efforts Underway in Rhode Island

- In 1990s, the RI DOH created KIDSNET
  - Computerized child health information system
  - Integrates preventive health information from different public health programs
  - Used by providers to identify patients needing preventive services
  - Used for coordination of care, quality assurance activities, and to inform policy decisions

HIE, Health information exchange
RI DOH, Rhode Island Department of Health
http://www.kidsnet.com/
Current HIE Efforts Under Way in Rhode Island

- **State-wide HIE System**
  - Goal: Improve the quality, safety, and value of health care
  - Developed with AHRQ funding in 2004
  - Public-private partnership
  - Strong community governance through state designated Regional Health Information Organization (RHIO)
  - Confidentiality and security is a high priority
    - Resulted in stringent consent model (opt-in)
  - Regulatory oversight provided by RI DOH

AHRQ, Agency for Health Care Research and Quality
RI DOH, Rhode Island Department of Health
http://www.currentcareri.org/matriarch/default.asp
EHR and HIE Efforts Underway in Rhode Island

- Hospital data
- Laboratory data
- Pharmacy data
- Imaging data
- LTC data
- Behavioral health data
- Private HIE systems

Population Health Data

PATIENT

EHR

LTC data

via Direct

Private HIE systems

[Consented Data]

EHR

EHR

HIE, Health information exchange
LTC, Long-term care

EHR, Electronic health record
Uses of EHR Data
Prescription Data During H1N1 Outbreak, 2010

☐ Tracked use of dispensed antivirals
  ➢ Partnered with surescripts and pharmacies

☐ Discovered that 5% of all Tamiflu prescriptions were filled 5 days after being prescribed
  ➢ Educated patients and providers about need to close the gap

☐ Educated providers about detection of non-H1N1 influenza like illness
  ➢ Outcome: Drop in Tamiflu prescriptions
Challenges

- **Staffing and funding**
- **Changes in leadership and administration**
- **Technical issues**
  - Legacy and silo systems resulting in many point-to-point interfaces
  - Support for newest standards
- **Analytical issues**
  - Usability of EHR data due to quality and comparability
- **Inability of Rhode Island to use HIE data for population data due to consent model**

EHR, Electronic health record
HIE, Health information exchange
Opportunities

- Improve individual and population health
- Support for data-driven decision making
  - Harmonized metrics
- Better integration and coordination
  - Transition to more enterprise-wide approach
  - Improved internal coordination and communication
- Advance public health informatics and Health Care Reform efforts
Public Health and Meaningful Use of Electronic Health Records Opportunities, Realities, and a Proposed Approach

Farzad Mostashari, MD, ScM
National Coordinator for Health Information Technology
Health IT Landscape

- **2009 HITECH Act**
  - Foundation for transformation of health care delivery

- **2010 Affordable Care Act**
  - Business case for high-quality, safe, coordinated patient care

http://www.whitehouse.gov/healthreform/healthcare-overview
HITECH Framework
Meaningful Use at Its Core

Regional extension centers
Workforce training

Medicare and Medicaid incentives and penalties

State grants for Health Information Exchange
Standards and certification framework

ADOPTION

MEANINGFUL USE

EXCHANGE

Privacy and Security Framework

- Improved individual and population health outcomes
- Increased transparency and efficiency
- Improved ability to study and improve care delivery
Public Health Reporting

- Syndromic surveillance reporting
- Report to immunization registries
- Electronic laboratory reporting
Fewer Premature Deaths from Cardiovascular Disease

- Demographics
- Blood pressure
- Smoking
- Body mass index
- Problem list
- Medication list
- Laboratory data

- Quality measurement
- Clinical decision support
- Registry functions (make a list)

Patients get recommended care only about half of the time
Vaccination Against Pneumonia among >65 Years Old

Electronic Reminders Begin
Safer Care

- Computerized Provider Order Entry (CPOE)
- Drug-drug, drug-allergy interaction checks
- Electronic prescribing
- Medication reconciliation

There are 100,000–200,000 medical errors in the United States each year
Patient-centered Care
Patient-centered Care

- Patient reminders
Patient-centered Care

- Patient reminders
- **Patient education materials**
- *After visit summary*
Patient-centered Care

- Reminders
- Patient education
- After visit summary

- Online access
- Patient copy
More Coordinated Care

- **Shared care summary**
  - The typical primary care physician must coordinate care with 229 other physicians working in 117 different practices to manage care for her panel of Medicare patients.
A roadmap for how to transform health care to deliver care that is

- Higher quality
- Safer
- Patient-centered
- Coordinated
Public Health Opportunities

- **Addressing health disparities**
- **Improving chronic disease care**
  - Cardiovascular disease, asthma, diabetes
- **Improving public health surveillance**
  - Monitoring influenza morbidity, vaccine efficacy, genotyping
  - Reporting of notifiable diseases
  - Physician case reporting
  - Cancer and other registries
  - Communicating with clinical care (e.g., immunizations)
  - Public health alert/messaging
- **Reporting of births and deaths electronically**
- **Reducing prescription drug overdose deaths**
Budget cutbacks, silo’d funding, silo’d systems
Shortage of skilled IT workforce
Legacy systems, local codes, sunk costs
Variation in state requirements
High degree of variability in capabilities
New data exchange = new workflow demands
Overwhelmed and weary with competing priorities
Frustrated with stakeholders

“Health care providers only see the world through their narrow lens”
Clinical Realities

- Running faster just to stay in place financially
- Shortage of skilled IT workforce
- Legacy systems, local codes, sunk costs
- Variation in state requirements
- High degree of variability in capabilities
- New data exchange = new workflow demands
- Overwhelmed and weary with competing priorities
- Stakeholder frustration
  - “Public health departments only see the world through their narrow lens”
“The Future is Here, It’s Just Not Evenly Distributed”

- **Prove out and refine new interventions**
  - E.g., “public health alert”

- **Push state-wide action where there is readiness**
  - E.g., outpatient syndromic monitoring, prescription drug monitoring 2.0

- **Focus national efforts: Few key priorities that add greatest value and are most ready to scale**
  - E.g., electronic laboratory reporting
What I Ask of You

- Help all who would be Meaningful users
- Establish relationships and coordinate with state and local health IT resources
  - Beacons and Regional Extension Centers
  - State Health Information Technology Coordinators
  - Workforce and Medicaid
- Ask (data) sparingly, give (data) generously
- Engage with and leverage national standards
- Cherish the innovators and the skeptics within
- Expect more from us, and hold us accountable
Health

Meta Alonso
Jamie’s Mother

Putting the I in Health IT