How Electronic Health Records Might Change Birth Defects Surveillance (and what to do about it!)

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Objectives

- What is the Electronic Health Record?
- Who, What, When and How of “Meaningful Use”
- What Will the Meaningful Use of EHRs change?
- How to prepare
- Where to find help
- Looking ahead
The Electronic Health Record (EHR): More than an electronic folder (EMR)

- A systematic collection of patient electronic health information organized to assist the care of a patient, and groups of patients

- Digital formatting enables information to be used longitudinally and shared over secure networks
  - Create/receive/reuse structured (computable) information
  - Track care (e.g., prescriptions) and outcomes (e.g., blood pressure)
  - Trigger alerts based on context of care (decision support)
  - Send and receive orders, results, care summaries, reports
  - Create registries of patients sharing a diagnosis or device
  - Measure quality, safety
  - Share information with patients (via personal health records)
EHRs: Implications

- Clinicians work at EHR, not phone, fax, email
- Monitor their own practice populations
- Automate many surveillance and reporting tasks
- Exchange or compile patient information using Health Information Exchange
- PH reporting increasingly from EHR using national standards
- Rules for EHRs start to define how public health exchanges information with providers
Figure 1. Percentage of office-based physicians with EMR/EHR systems: United States, 2001–2009, and preliminary 2010–2011

NOTES: EMR/EHR is electronic medical record/electronic health record. “Any EMR/EHR system” is a medical or health record system that is all or partially electronic (excluding systems solely for billing). Data for 2001–2007 are from the in-person National Ambulatory Medical Care Survey (NAMCS). Data for 2008–2009 are from combined files (in-person NAMCS and mail survey). Data for 2010–2011 are preliminary estimates (dashed lines) based on the mail survey only. Estimates through 2009 include additional physicians sampled from community health centers. Estimates of basic systems prior to 2006 could not be computed because some items were not collected in the survey. Data include nonfederal, office-based physicians and exclude radiologists, anesthesiologists, and pathologists.

SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey.
Meaningful Use

- **WHO sets EHR rules?**
  - Office of Nat’l Coordinator for Health Info Tech (ONC at HHS)

- **HOW are rules ‘enforced’?**
  - The Medicare and Medicaid *incentive* program; HIPPA

- **WHO qualifies for incentives?**
  - Most clinicians and hospitals paid by Medicare &/or Medicaid

- **WHAT qualifies?**
  - Implement a *certified* EHR
  - “Meaningfully use” for objectives to improve care and population health, including (in Stage 1) *one* of:
    - Submit Electronic Lab Reports for reportable conditions to PH
    - Submit Syndromic Surveillance reports to PH
    - Submit Immunization reports to Immunization Registries
    - ALSO: Quality measures, registries

- **WHEN? Today!**
More About WHEN… 3 Tsunamis

- 3 stages of Meaningful Use
- Escalating objectives
- Stage 1: Oct 2010-Dec 2013*
- Stage 2: Likely begins Oct. 2013*
- Stage 3: Likely begins Oct. 2015
- Medicare incentives favor early participation
- Penalties start ?2015

Original Stage 1 was 2 years, but ONC likely to extend by one year
Meaningful Use STAGE 1
Electronic Information Exchange

Births and fetal deaths
Birth defects & congenital disorders
Immunizations
Communicable diseases
Reportable test results
Outbreaks
Poisoning
Occupational injuries
Other injuries
Adverse events and effects
Cancer
Other chronic disease reports
Visits and hospitalizations
(Syndromic surveillance)
Quality reports
Deaths and associated data
Births and fetal deaths
Birth defects & congenital disorders
Immunizations
Communicable diseases
Reportable test results
Outbreaks
Poisoning
Occupational injuries
Other injuries
Adverse events and effects
Cancer
Other chronic disease reports
Visits and hospitalizations
(Syndromic surveillance)
Quality reports
Deaths and associated data

Likely Meaningful Use STAGE 2
Electronic Information Exchange

Public Health

HL7 2.5.1
Possible Meaningful Use STAGE 3 Electronic Information Exchange

- Immunizations & decision support
- Immunizations & decision support
- Public Health
- Healthcare

- Births and fetal deaths?
- Birth defects & congenital disorders?
- Immunizations
- Communicable diseases?
- Reportable test results
- Outbreaks
- Poisoning?
- Occupational injuries
- Other injuries
- Adverse events and effects?
- Cancer
- Other chronic disease reports?
- Visits and hospitalizations
  - Syndromic surveillance
- Quality reports
- Deaths and associated data?

Items in green are being considered by S&I Framework
PH Reporting Initiative – CDA?
What Does Meaningful Use Change?

- Providers/hospitals urgently seek to e-report
- Electronic reporters rise from dozens to thousands per state
- EHRs will use ONC-prescribed standards
- Rising report volumes
- Timeliness and completeness
- Electronically reusable information
- Public health: from ruler to participant
The Early Days…
Today!
Four ideas about electronic standards

- **Format** (message or document standard): defines WHAT information goes WHERE
  - E.g. HL7 message version 2.3.1 versus 2.5.1

- **Vocabulary set**: defines what codes or words are used to populate fields in a message or document
  - E.g. SNOMED, LOINC

- **Implementation Guide**: defines which vocabularies to use, whether fields are mandatory
  - E.g. HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health, Release 1 (US Realm)

- **Transport**: defines how messages are addressed, encrypted, receipt reply, etc.
Pathways of Information Flow

Public (surveys, PHRs) Environment

Clinicians
  Labs
    PH Labs

Provide Standard Vocabularies

Design Standard Formats

Secure Private Transport

Health Depts.
  Local
    State

Public Health Information Network (PHIN):
Shared Standards & Policies
www.cdc.gov/phin

- Governance (with ONC, S&L, CDC)
- Establish standards, certify applications
- Training, technical development, communication

- Prototypes and evaluations
- Open source development
- Research partnerships
Example: Electronic Laboratory Reporting (ELR)

- State “reportable condition” mandates include labs
- ELR improves speed, completeness of reporting
- ONC rules specify *new* implementation guide (HL7 v.2.5.1)

MU: Electronic Lab Reporting in Stage 1

- Hospitals pick one: ELR, SS, Immunization reporting
- Hospitals obtain “certified” EHR/modules
  - Meet NIST testing requirements
- Send test message to PH – may PASS OR FAIL
  - Tools like PHIN Message Quality Framework or Message Subscription Service) help validate messages
- If PASS, must begin ongoing submission of ELR
- CDC/ONC/CMS agreed that PH may “queue” hospitals to manage on-boarding
- “Queued” hospital may attest “+” so long as it on-boards when requested
- 31 ELC jurisdictions “testing” and 11 in production Jan 2012
How CDC Helps: ELR

- Advocate public health perspectives
- Maintenance of HL7 ELR implementation guide
- Aligned several Cooperative Agreements
- Vocabulary mapping tables using PHIN-VADS
- HL7 message validation (PHIN-MQF, MSS)
- HL7 translator modules (Rhapsody, MIRTH)
- Equip CDC-supplied applications for ONC-compliant ELR (e.g., NEDSS Base System)
- Technical assistance
  - Public Health: CDC and Assoc. of PH Laboratories
Meeting Tomorrow’s Challenges

• Stage 1
  – From “testing” to real data exchange
  – New industry TRANSPORT standards
    • DIRECT (like secure email)
    • NwHIN web services
  – PH transparency regarding options

• Stage 2
  – Switching to HL7 2.5.1 for Stage 2
  – Cancer reporting?

• Stage 3
  – Multi-functional public health report?
Meeting Tomorrow’s Challenges 1

• Simplifying PH reporting in Stage 3
  – Harmonized use case and value sets from several user stories
    • Communicable disease reports
    • Child health reports
    • Adverse event reports
    • Chronic disease reports
    • Administrative/quality reports

• Possible implementation guide by Stage 3
Meeting Tomorrow’s Challenges 2:
Reducing the complexity of exchange
Business 2 Business (B2B)

Healthcare Provider

Public Health Program
Three Layers for Exchange

Healthcare Provider

Public Health Program

Secure transport
(PHIN-MS, DIRECT, WebServices)

Format
(HL7 message, document)

Vocabulary
(LOINC, SNOMED)
• PHIX: Open source tool suite for information exchange
  http://phix.phiresearchlab.org/index.jsf
Four information sources for Population Health

- Mandated PH Reporting
- Quality Reporting
- Queries
- Registries
Querying EHRs

- Querying EHRs for Adverse Events (FDA Sentinel)
  - Structured queries sent to multiple large providers
  - Run behind their firewalls
  - Aggregated results

- Leveraging HIEs to track prevention:
  - Identified 13 Stage 1 Meaningful Use Quality Measures related to Million Hearts
  - Smoking - Aspirin - Cholesterol - Blood pressure (and diabetes)
  - Maine’s HealthInfoNet collects state-wide estimates
    - Calculated across all HIE practices
    - Covers 77% of Maine’s population
    - Collaboration with Maine Center for Disease Control and Prevention
  - Other pilots in discussion with Rhode Island and Wisconsin
Focus today: Inputs
Focus ASAP: Outcomes

Health event

Information-Driven Practice

Meaningful Use
EHR information
To Public Health

Saved Lives
Saved Disability-Adjusted Years
Saved Costs
The Clinical Workflow - Augmented

- Clinical context
- EHR
- Testing
- Diagnosis
- Management
- Job Aids (charts, forms, pocket cards, websites, apps)
- Public Health
Other Technology Changing the Rules

- Point of service information
- Mobile computing
- Personal health records
- Crowd sourcing/social networking
- Cloud computing
  - From systems to “apps”
  - Scalability, sharability
- Natural and spoken language
- Challenge: new approaches while maintaining traditional PH access to private information

Photo credit: City of Milwaukee Health Department
QUESTIONS, INSIGHTS, DISCUSSION

More info:
www.cdc.gov/ehrmeaningfuluse
www.cdc.gov/phin

Or drop a line to: meaningfuluse@cdc.gov
Public Health Surveillance and Informatics Program Office (Proposed)

www.cdc.gov/osels
www.cdc.gov/ehrmeaningfuluse

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