Health Information Exchange in Minnesota & North Dakota

April 16, 2014

Objectives

• Learn basic HIE concepts
• Understand key success factors for HIE
• Gain an understanding of Minnesota and North Dakota’s approach to HIE
• Hear real-time field experience with HIE
Presenters

- Greg Linden, Chief Information Officer, Stratis Health
- Chad Peterson, ND Health Information Network Technology Manager
- Candy Hanson, Project Manager, Health Information Technology for Post Acute Care providers

Health Information Exchange (HIE) 101
HIE in Minnesota

Greg Linden, MBA CPHIT/CPEHR
CIO, Stratis Health

April, 2014
Objectives

• Learn the basic methods of transport that are currently available to support health information exchange.
• Learn about the data elements that are important to support transitions of care
• Understand Minnesota's HIE objectives and progress towards health information exchange

HIE Basics

• “Pull” – a.k.a. “Query-based exchange”
  – User wants to “pull” information about a patient
• “Push”
  – User needs to “push” information about a patient to a known user/organization
• “Transport” – the technical methods used to move patient data securely
Information “pull” (“CONNECT”)

- “CONNECT”: national standard that enables “pull” queries
- A primary care provider recommends a procedure for their patient, a resident at a long-term care facility
  - The hospital wants to pull patient record information at admission
  - The provider wants to pull results of the procedure
  - The LTC facility wants to pull updated med list upon return
Information “push” (“Direct”)

- “Direct”: a national standard for “push” transactions
- e-mail with a trust and security layer:
  - Trust: you may only correspond with addresses with whom you’ve established mutual trust
  - Security: Confidentiality, Integrity and Authenticity
- Direct is a standards-compliant, secure, directed clinical messaging standard
  - HIPAA-compliant
  - Meaningful Use-compliant
  - Simple
  - Low-cost
  - No added legal framework or consent management required

Direct: “push” example

Lab to clinic: Lab receives order from clinic and responds with lab report
Direct: Example Use Cases

- Exchange clinical information
- Structured lab data into EHR
- Electronic copy to patients
- Discharge instructions
- Clinical summaries to patient
- Send patient reminder

- Provide patient access
- Provide patient education
- Summary of care
- Immunization registry
- Report to public health
- Syndromic surveillance
- Report quality measures to CMS

Direct can be used in this scenario, too

- A primary care provider recommends a procedure for their patient, a resident at a long-term care facility
  - The hospital coordinates with the LTC to transfer the patient for the procedure, and may “push” information about the patient to the LTC
  - The LTC can “push” their information to the hospital to support admission
  - The hospital can “push” results of the procedure back to the PCP and the LTC
Data needed to support ToC

Transitions (Continuity) of Care benefits from data such as:

- Advance Directives
- Allergies
- Encounters
- Family History
- Functional Status
- Immunizations
- Medical Equipment
- Medications
- Payers
- Plan of Care
- Problem
- Procedures
- Results
- Social History
- Vital Signs

= CCD: the Continuity of Care Document!

HIE in Minnesota

By State Certified Health Information Organizations (HIO) and Health Data Intermediaries (HDI)

Foundation for Minnesota Approach:
- Consistent with national vision for exchange
- Builds on Minnesota e-Health vision and model for interoperable (HIOs)
- Patient centered approach
- Based on public good principles

Minnesota Model for HIE Includes:
- Granting certificates of authority to health information organizations (HIOs) and health data intermediaries (HIO)
- State oversight
National eHealth Exchange

Mobilizing Health Information Nationwide

The Internet

Standards, Specifications and Agreements for Secure Connections

Minnesota HIE Architecture

National eHealth Exchange

Statewide Health Information Exchange

Direct Exchange

Other settings
Bringing it Together!

Key Considerations

- Organizational support and needs
  - Vision, leadership
  - Workforce
- Workflow issues
  - Understand both clinical and non-clinical workflow inefficiencies and improvements through HIE
- Privacy and security issues
  - HIPAA privacy and security requirements (administrative safeguards, physical safeguards, and technical safeguards)
  - Minnesota privacy laws
- Technical infrastructure
  - EHR certification
  - EHR capability for sending, receiving, and querying information
  - EHR vendor support
  - Standards
  - HIE vendor support
- Estimating costs and benefits

Provider and entity directory solutions
Consumer preference management
Statewide Record Locator Services
State-Certified HIE Service Providers
Protocols & Specifications
Protocols & Specifications

Minnesota Implementation Plan & Companion Guides

Minnesota Statewide Implementation Plan and Guide 1: Addressing Common Barriers to the Adoption of EHRs
Released 2008

Guide 2: Standards Recommended to Achieve Interoperability in MN
Released 2008, Updated Sept. 2011

Guide 3: A Practical Guide to e-Prescribing
Released June 2009

Guide 4: A Practical Guide to Effective Use of EHR Systems
Released June 2009

Guide 5: A Practical Guide to Understanding HIE, Assessing Your Readiness and Selecting HIE Options in MN
Released June 2012

All are available on the MN e-Health website http://www.health.state.mn.us/e-health
Contact Information:

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www.stratishealth.org

NDHIN Overview
Chad Peterson, North Dakota Health Information Network Technology Manager

Stratis Health HIE Webinar - April 16, 2014
Current Stats

- 140+ Organizations have signed Participation Agreements and Business Associate Agreements with NDHIN
- 700+ users set up for NDHIN Direct (Direct Secure Messaging)
- Onboarding over 35 organizations right now (data providers)
- We’re **LIVE! 206,000+ Unique Patients**

Direct Secure Messaging

- **Orion Health Trust Network**
- **Basic Direct Secure Messaging**
  - Web-based access
  - Email client access
- **Managed Direct Secure Messaging**
  - Client-deployed hardware device
  - Monitored by OH Managed Services
- **Direct Secure Messaging with EHR System Integration**
  - Encrypted S/MIME access
  - Encrypted XDR access

**DSM Web**

**DSM Connect**

**DSM Direct**

**HPD**

**CERT**

**MSG**
Direct Secure Messaging 2.0

• DSM Web/DSM Direct (XDR)

• Phases
  • Organizational-level Security Certificates for each Participating Org
    • Sub-domain under NDHIN domain, or…
    • Sub-domain under Organization’s domain (i.e. direct.sanfordhealth.org)
    • Requires some additional paperwork to be completed
  • Creating User Accounts
    • Organization Administrator Role
  • Provider Directory
  • HISP-to-HISP
    • How do we send messages to Direct Users that use other HISPs?
    • Direct Trust/NATE

XDR Interfaces Progress

<table>
<thead>
<tr>
<th>Organization</th>
<th>Vendor</th>
<th>DOI</th>
<th>XDR Request Form</th>
<th>Onboarding Started</th>
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<td>Sanford</td>
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</table>
The NDHIN Model

Data Feeds to HIE

- Admission, Discharge, Transfer (ADT)
  - Patient Demographics
  - Encounter History
  - Allergies
  - Diagnosis
  - Procedures
- Observation Results (ORU)
  - Lab Results
  - Imaging Studies
  - Radiology Reports/Documents
- Medical Document Management (MDM) (Clinical Documents)
  - Work Types
    - Discharge Summaries
    - H&P’s
    - ED Visit Notes
    - Consult Reports
    - Operative Notes
- Immunizations (VXU)
- CCD/C-CDA Exchange
NDHIN – Production Statistics
(As of March 29)

<table>
<thead>
<tr>
<th>Participant Name</th>
<th>Admissions, Discharges, Transfers</th>
<th>Lab Results</th>
<th>Radiology Results</th>
<th>Immunizations w/ DoH</th>
<th>Clinical Docs</th>
<th>CCD's</th>
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<tr>
<td>Trinity Health</td>
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<td>Local Public HU's using CHAMP Software (13 cites)</td>
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</tbody>
</table>

Unique Patient ID's
NDHIN Clinical Portal

- Comprehensive View of Patient Information
- Customizable User Interface
- Notifications/Subscriptions
- Timeline View
- Normalization of Data
  - Lab Results
  - Problems
  - Allergies and Medications

Integrated Health Data Architecture
Data Feeds to HIE

- Admission, Discharge, Transfer (ADT)
  - Patient Demographics
  - Encounter History
  - Allergies
  - Diagnosis
  - Procedures
- Observation Results (ORU)
  - Lab Results
  - Imaging Studies
  - Radiology Reports/Documents
- Medical Document Management (MDM) (Clinical Documents)
  - Work Types
    - Discharge Summaries
    - H&P's
    - ED Visit Notes
    - Consult Reports
    - Operative Notes
- Immunizations (VXU)
- CCD/C-CDA Exchange

Interfaces

<table>
<thead>
<tr>
<th>Type of Data</th>
<th>Interface Approach</th>
<th>User Interface (Front end View)</th>
</tr>
</thead>
</table>
| Patient Demographics  | HL7 - ADT Demographics to EMPI                         | Homepage
|                       |                                                          | Patient Search
|                       |                                                          | Patient Summary - Demographics & Emergency Contacts |
| Encounter History     | HL7 – ADT (PV1 segment) Inbound                        | Patient Summary – Encounter History Windowlet        |
| Laboratory Results    | HL7 - ORU Inbound - Numerical and Textual (e.g. Pathology and Microbiology) | Document Tree/Results Viewer Normalized to LOINC    |
| Radiology Reports     | HL7 - ORU Inbound - Textual                            | Document Tree/Results Viewer                         |
| Transcribed Reports   | HL7 Or MDM – Inbound or PDFs/Scanned documents         | Document Tree/Results Viewer                         |
### Interfaces Continued

<table>
<thead>
<tr>
<th>Type of Data</th>
<th>Interface Approach</th>
<th>User Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allergies</strong></td>
<td>HL7 - ADT (AL1 segment) Inbound</td>
<td>Patient Summary - Allergies Windowlet Normalized to SNOMED</td>
</tr>
<tr>
<td><strong>Diagnosis</strong></td>
<td>HL7 – ADT (DG1 segment) Inbound</td>
<td>Patient Summary– Encounter History Windowlet</td>
</tr>
<tr>
<td><strong>Problems</strong></td>
<td>HL7-PPR</td>
<td>Patient Summary – Problems Windowlet Normalized to ICD/9/10 or SNOMED</td>
</tr>
<tr>
<td><strong>Procedures</strong></td>
<td>CCD – can be parsed from the CCD into the CDR</td>
<td>Patient Summary – Procedures Windowlet Normalized to ICD/9/10 or CPT4</td>
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Encounter History

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<tr>
<th>Admission Date</th>
<th>Discharge Date</th>
<th>Diagnoses</th>
<th>Specialty</th>
<th>Facility</th>
<th>Provider</th>
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<td>31-Mar-15</td>
<td>16-Jul-15</td>
<td>Diabetes</td>
<td>ENT</td>
<td>Hospital</td>
<td>Dr. Martin</td>
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<tr>
<td>24-Jul-15</td>
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<td>Diabetes</td>
<td>ENT</td>
<td>Hospital</td>
<td>Dr. Martin</td>
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</table>

Medication History

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<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Start Date</th>
<th>Stop Date</th>
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<td>Glimepiride</td>
<td>13mg</td>
<td>Oral</td>
<td>31-May-15</td>
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<td>Tenofovir</td>
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<td>Oral</td>
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Cumulative Parameters

<table>
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<tr>
<th>Parameter</th>
<th>Lower Limit</th>
<th>Upper Limit</th>
<th>Normal Range</th>
<th>Description</th>
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<tr>
<td>WBC</td>
<td>5.0</td>
<td>10.0</td>
<td>4.0-10.0</td>
<td>White Blood Cells</td>
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<tr>
<td>RBC</td>
<td>4.5</td>
<td>5.5</td>
<td>4.0-5.5</td>
<td>Red Blood Cells</td>
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<tr>
<td>Hgb</td>
<td>13.0</td>
<td>17.0</td>
<td>12.0-16.0</td>
<td>Hemoglobin</td>
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<tr>
<td>Hct</td>
<td>41.0</td>
<td>45.0</td>
<td>37.0-47.0</td>
<td>Hematocrit</td>
</tr>
<tr>
<td>MCH</td>
<td>27.0</td>
<td>31.0</td>
<td>26.0-30.0</td>
<td>Mean Corpuscular Hemoglobin</td>
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<tr>
<td>MCHC</td>
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<td>31.0-34.0</td>
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<tr>
<td>MCV</td>
<td>83.0</td>
<td>95.0</td>
<td>80.0-94.0</td>
<td>Mean Corpuscular Volume</td>
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<tr>
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<td>150,000-450,000</td>
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<tr>
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<td>Platelet Count</td>
</tr>
</tbody>
</table>
Viewing CCD's

**Document View**
- Showing: All
- Mark All As Read
- Group By: Category
- Sort By: Date

**Patient Summary**
- Clinical Content (5/5)
- Clinical Documents (8/8)
  - Dermatology (2/2)
  - Respiratory (2/2)
  - Ultrasound (1/1)
- History and Physical (1/1)
- Radiology (1/1)

**Results**
- Result Type
- Result Name
- Result

**Organism:** MRSA (NURS AERUROSISSA)

**Sensitivity:** (1/1/2011 14:33) Method: MIC
- Intersp. Based on Blood Levels Amikacin: 8
- Susceptible Gentamicin: 8
- Susceptible Cefazolin: 8
- Resistant Gentamicin: 8

**Immunizations**

<table>
<thead>
<tr>
<th>Date</th>
<th>Provider</th>
<th>Lot</th>
<th>Reaction</th>
<th>YFC</th>
<th>Vaccine</th>
<th>Value</th>
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**Immunization Forecast**

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Recommended Dose</th>
<th>Minimum Dose</th>
<th>Dose</th>
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<td>Influenza</td>
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Health Care Directive – Part 1 of 16

Introduction

John Cardinal

3434 Madison Drive, Alexandria LA 759

This document allows me to do one or all of the following:

PART 1: Name another person (called a health care agent) to make health care decisions for me if I am unable to make and communicate health care decisions for myself. My health care agent must make health care decisions in accordance with the choices I have specified in this document.

Notifications

Subscriptions for patients I have a relationship with
Subscriptions/Patient Consent

- **Subscriptions/Notifications**
  - Providers can “subscribe” to their patients and be notified when specific events/triggers happen – based on HL7 messages
    - Inpatient Admission
    - Inpatient Discharge
    - Abnormal Lab Result (includes all abnormal results)
    - Above High/Low Abnormal OR Panic Lab Result (subset of abnormal lab result)
    - New Final Radiology Result
    - Patient is admitted to the ER

- **Patient Consent**
  - Opt Out/Opt In of HIE managed manually, within HIE
HealtheWay

Example Integration (Epic)
Single Click access to Clinical Portal
Example Integration (Cerner)
Single Click access to Clinical Portal

Audit Log
NDHIN – Benefits to Providers

- Public Health Reporting
  - Electronic Lab Reporting
  - Syndromic Surveillance
- Bi-Directional Interface to ND Immunization Registry
- Clinical Portal
- Patient Portal
- Statewide Advance Directive Repository
- eHealth Exchange Connectivity
  - Connect to other HIE’s/Federal Agencies across country
- Image Exchange
  - View images from PACS networks across state
- PCMH?
- Disease Registries
- NDHIN Direct
- Simplifying Interface Work – and much more!!

Success Stories for Health Information Exchange

Candy Hanson, Project Manager, Health Information Technology for Post Acute Care providers (HITPAC)
Next Webinar
May 14, 2014
12:15 p.m.

Using Teach Back to Promote Clear Communication and Improve Health Literacy
Send Questions to:

- Judy Beck
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Thank You!

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