Leveraging Health Information Exchange for Care Coordination

Summer Institute of Nursing Informatics 2019
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Learning Objectives

1. Introduce current health care challenges
2. Discuss the key components for health information exchange
3. Describe potential technology tools for care coordination
4. Explore outcomes in using Health Information Exchange data for care coordination

Today's Health Care Landscape

Today's Health Care - Facts

Today's Healthcare Landscape and the Need for Interoperability
What’s Changing?

<table>
<thead>
<tr>
<th>TRADITIONAL VS VALUE-BASED CARE MODELS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VOLUME</strong></td>
</tr>
<tr>
<td>Fee for Service- Per Case</td>
</tr>
<tr>
<td>No Rewards for Quality</td>
</tr>
<tr>
<td>Collaboration/Partnerships &amp; Care Coordination Not Valued</td>
</tr>
<tr>
<td>No IT Investment Incentives</td>
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</tbody>
</table>

Movement from a model centered on care delivery, or treatment of illness → a model with inclusive of health management and wellness

The Transformation

Value base delivery model

• improve health of populations
• enhance patient experience
• lower cost across continuum of care
• elevating clinicians experience

Healthcare organizations & providers

• more accountability for care coordination
• need for interoperability to share health data (HCIN 2009)
• need for providers to use HIE & PDMP
  > 136 million ED visits annually
  > 13% to 27% ED visits are potentially avoidable
  > 28% patients have reoccurring encounters in multiple facilities

The Need for Interoperability

“Leveraged correctly, health information technology can help automate efforts, increase transparency, and reduce miscommunication between health plans, providers, and healthcare organizations.”
**Health Information Exchange (HIE)**

- **HIE** allows health care providers to securely and appropriately access, and share patient information electronically from multiple entities.
- Historically divided into 3 key forms:
  1. **Directed Exchange** – ability to send and receive secure information.
  2. **Query-Based Exchange** – ability for providers to find or request information.
  3. **Consumer Mediated Exchange** – ability for patients to control the use of their data.
- Different HIE models formed based on local characteristics:
  - **State-wide HIEs** closely affiliated with or run by state government.
  - **Private HIEs** specifically supporting hospital systems, payers, or other provider networks.
  - **Hybrid HIEs** with multiple local networks collaborating.
  - **Regional/Community HIEs** working across organizations and depending on a variety of funding sources.

**Current Status**

- Most geographies are covered by some form of HIE, either with a statewide or regional entity.
  - 70 HIE members ([https://strategichie.com/membership/member-list/](https://strategichie.com/membership/member-list/))
- Core competencies vary greatly between HIEs, although most operate at least a clinical portal and push notifications.
- Other services include reporting based on administrative data, results delivery, and research.
- Many HIEs have a patient consent model, either through regulation or HIE policy.
  - Opt-out is in most states, and requires adequate notice to patients of their right to be excluded from searches.
  - Opt-in requires patients to consent to a search before it occurs.

**Drivers of Health Information Exchange**

**Promoting Interoperability**

<table>
<thead>
<tr>
<th>National Exchange Initiatives</th>
<th>CMS Proposed Rules</th>
<th>ONC Proposed Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide-spread desire to share data across HIEs through standard use cases, agreements, and technology standards.</td>
<td>Enable notifications for patients who are admitted, transferred, or discharged.</td>
<td>Defines information blocking framework, outlines 7 Information blocking exceptions.</td>
</tr>
<tr>
<td>National Networks to exchange data through proprietary frameworks.</td>
<td>Certain patients must receive open APIs &amp; share all information that has been requested by the pt.</td>
<td>Outlines significant enhancements to the ONC Health IT Certification Program.</td>
</tr>
<tr>
<td>National Networks include: Carequality, Commonwell Health Alliance, Patient-Centered Data Home</td>
<td>Certain patients must join a trusted exchange network.</td>
<td>Defines APIs without special effort.</td>
</tr>
<tr>
<td>Comments</td>
<td>Comments</td>
<td>Comments</td>
</tr>
<tr>
<td>National Network includes:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| - Carequality | - Health-Medicine & Medical | - | Hospitals
| - Commonwell Health Alliance | - | |
| - Patient-Centered Data Home | - | |
| Comment | - | |
| | Access and use are generally governed by state law. | - Impact Health IT platforms of certified products, Health Information Networks, HIEs, Providers. |
| **Prescription Drug Monitoring Programs** (PDMP) | **State Initiatives** | **State Initiatives** |
| Programs collecting Controlled Dangerous Substances (CDS) dispenses | Maryland & CMS entered into a new initiative to improve care and reduce the growth in health care spending. | Maryland & CMS entered into a new initiative to improve care and reduce the growth in health care spending. |
| Mandated reporting in 49 states plus the District of Columbia, Puerto Rico, and Guam | Hospitals, physicians, and policymakers chose to enact its shared health technology strategy. | Hospitals, physicians, and policymakers chose to enact its shared health technology strategy. |
| Comment | Comments | Comments |
| | 2. All-Payer hospital rates | 2. All-Payer hospital rates |
| | 3. Total care cost accountability | 3. Total care cost accountability |
| | 4. Value-based provider incentives | 4. Value-based provider incentives |
| | 5. Population health goals | 5. Population health goals |

**Chesapeake Regional Information System for our Patients (CRISP)**

- **Regional Health Information Exchange (HIE)** serving Maryland, West Virginia, and the District of Columbia.
- **Vision**: To advance health and wellness by deploying health information technology solutions adopted through cooperation and collaboration.

**CRISP Services**

- **Point of Care**: Clinical Query Portal & InContext Information
- **Care Coordination**: Encounter Notification Service (ENS)
- **Population Health**: CRISP Reporting Services (CRS)
- **Public Health Support**
- **Program Administration**

*Maryland is an opt-out state.*
Deep Interoperability

• Indications of one of two optimal responses in all four interoperability stages
  1. often or nearly always have access to needed data through any interoperable means
  2. able to easily locate specific patient records or have them automatically presented to clinicians
  3. able to retrieve patient data fully integrated into the EMR’s native data fields or in a separate tab or section within the EMR
  4. feel retrieved patient data often or nearly always benefits patient care

26% have achieved deep interoperability—up 2% from last year

Source: KLAS (2017). Interoperability 2017 First Look at Trending—Some Progress Toward a Distant Horizon

Informatics and Tools for Coordinated Care Delivery

CRISP Clinical Architecture

Patient demographics
• Patient Enterprise
  Master Patient Index
  Number
  Patient’s name (last, first, middle)
  Gender
  DOB
  Address
  Contact number
  Encounter visits
  Results—lab, radiology, transcriptions
  Notes

Promoting Interoperability

Data
• Data - Facts measured, collected, reported, or generated
  • Informatics role: define requirements, data validation, testing
  • HIE architecture models:
    1. Federated architecture allows patient data to remain at the source (e.g. hospitals or practices); exchanges data on-demand
    2. Centralized architecture maintains all patient data in a single database
    3. Hybrid architecture (majority)
  • Data source includes:
    • Providers: EHR (orders, notes, results)
    • Payers: Claims
    • Pharmacies, laboratory, imaging centers
    • Public Health Agencies
  • Transmission of data generally includes:
    • Admission/Discharge/Transfer feeds with patient demographics & visit information
    • CDAs/CCDs containing patient problems, medications, history, etc.
    • HLT CDA messages for lab results, radiology reports, transcriptions

Information
• Information—Organizing, Interpreting Data
  • Health Information Exchange Data allows health care professionals and patients to appropriately access and securely share a patient’s medical information electronically
  • To advance health and wellness by deploying health information technology solutions adopted through cooperation and collaboration
  • Informatics role—design, data validation, testing, training
**Information (Patient’s Health Information)**

- United States Core Data for Interoperability
- The USCDI establishes the minimum data set that must be consistently exchanged and replaces the existing Common Clinical Data Set (CCDS)
- Organizing and interpreting patient’s health data

**CRISP Clinical Architecture**

- Leveraging patient’s health information exchange in clinical workflow
- Embedded CRISP InContext Application

**Promoting Interoperability Knowledge**

- Knowledge: interpreting, integrating, and understanding patient data & information
- Health Information Exchange Data/Information acquired by a person through experience or education to make decisions
- Informatics role: design of workflow, usability testing, communication, support, and post implementation observation

**Knowledge**

- HIE - patient data per encounter in Maryland
Knowledge
Immunization information in HER
Bidirectional Interface with state immunization registry

Promoting Interoperability
Wisdom

- **Wisdom** - understanding, applying, integrating services
- Using data, information, and knowledge to make insightful clinical decisions on the right patient, right place, and the right time
- Incorporate important HIE information into native workflows within an EHR
- Create opportunities to spur innovation and improvement to advance health and wellness through the use of technology
- Promote and enable patient

Wisdom

- Emergency providers and staff can easily identify patients associated with Transitional Care program or who meet criteria for the program.

3 possible icons populate the TCC column:
- = meets criteria based upon automated screening
- = patient has a care coordination note but is not actively tracked by TCC
- = patient is tracked by TCC

Overdose Notification in the EHR

Design displaying of right data/information to clinicians at the right place, right time in the right workflow

Addressing Today’s Healthcare Challenges requires Leveraging HIE in Care Coordination

Sources: M. Battle, Population Health and Population Health Management: “What it is and What it is isn’t” November 2018

- Fragmented & Varied Patient Care
- Aging & Sicker Population
- Opioid Crisis
- High Costs
- Provider Burnout & Dissatisfaction
- Health Care Disparities
- Upped Claims
Informatics Leveraging HIE Care Coordination

Problem: Fragmented & Varied Patient Care

- Providers, Care Coordinators, Case Managers, Social Workers, High Risk Coordinators

What HIE data:
- Encounter visits
- Clinical notes
- Problems
- Results, lab, images, other tests
- Medications
- Immunization
- Medication information
- Care teams
- Social determinants
- Preferred pharmacy
- Advance directives, power of attorney

HIE Care Coordination Tools

Example- State HIE (CRISP) Unified Landing Page (ULP)

Patient Snapshot Tab
- All CRISP applications in a single, secure site with one username and password
- PDMP (authorized users only per State mandate)
- Snapshot: View of critical patient data including care alerts, care teams, and prior visits with customizable widgets
- Query Portal: Labs, radiology, images, and other clinical documents

HIE Care Coordination Tools

Example- State HIE (CRISP) Encounter Notification Service (ENS)

- Real-time or batch alerts to organizations and providers based on known treatment and care management relationships
- Solves a basic problem for organizations responsible for a patient’s health – where is my patient? When did my patient access care?
- Notifications can be delivered via a secure folder, the ULP, EHRs, or databases
- ENS subscription information is displayed at the point of care through ULP or In-Context

Informatics Leveraging HIE Care Coordination

Problem: Aging & Sicker Population

Who:
- Providers, Care Coordinators, Case Managers, Social Workers, High Risk Coordinators

Where:
- Ambulatory → ED → Acute Care → Skilled Nursing Facility; Post Acute Care → Population Health Program; Payers

What HIE data:
- Encounter visits
- Clinical notes
- Problems
- Results, lab, images, other tests
- Medications
- Immunization
- Medication information
- Care teams
- Social determinants
- Preferred pharmacy
- Advance directives, power of attorney

HIE Care Coordination Tools

Example- State HIE (CRISP) Unified Landing Page (ULP)

Goal:
- Identification of the Right Patient with the Right Information at the Right Time

Example- State HIE (CRISP) Reports

- Case Mix data and Medicare claims data
- Identify high needs patients
- Measure performance of initiatives for QI and program reporting
- Coordinate care
- Different levels of patient data available for hospitals based on HSCRC payment requirements & Total Cost of Care Model participation
**HIE Care Coordination Tools**

**Example - State HIE (CRISP) Encounter Notification Service (ENS)**

- Notifies when your patient is hospitalized in any regional hospital
- Receive special notification about ED visits that are potential readmissions

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**Informatics Leveraging HIE Care Coordination**

**Problem: Health Care Disparities**

**Goal: Access to Care**

1. Who
   - Heads, Care Coordinators, Case Managers, Social Workers, High Risk Coordinators

2. Where
   - Inpatient, ED, Acute Care, Skilled Nursing Facility, Post Acute Care, Population Health, Payers

3. What HIE data
   - Encounter visits
   - Clinical notes
   - Problems
   - Results, labs, images, other tests
   - Allergies
   - Immunization
   - Medication information
   - Care teams
   - Social determinants of health
   - Preferred pharmacy
   - Advance directives, power of attorney

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**Example: Care Alerts**

**HIE Care Coordination Tools**

**Care Alerts in CRISP**

- Care Alert: a short description of critical information for patient care generated by CRISP participants within their EHR.

**Mrs. Franklin’s pain medications are managed entirely by Dr. Dolor. Securely text him prior to prescribing any controlled substances.**

**Mr. Stevens has CHF exacerbations that typically and rapidly respond to 40 mg IV furosemide in the ED with close follow-up the next day in the office. Call/text Dr. FIRST at 111-333-4444 if you are considering admission.**

**This patient has a MOLST. Please note: DNR, DNI, no feeding tube, no antibiotics.**

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**HIE Care Coordination Tools**

**Care Alert in EHR**

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**HIE Care Coordination Tools**

**Care Alert in EHR**
**Care Alerts (Pre/Post)**

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Total Number of Patients with a Visit</th>
<th>Total Number of Patients with a Visit %</th>
<th>Total Number of Patients with a Visit %</th>
<th>Total Number of Patients with a Visit %</th>
<th>Total Number of Patients with a Visit %</th>
<th>Total Number of Patients with a Visit %</th>
<th>Total Number of Patients with a Visit %</th>
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</thead>
<tbody>
<tr>
<td>1 Month</td>
<td>1000</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>3 Months</td>
<td>999</td>
<td>99.9%</td>
<td>99.9%</td>
<td>99.9%</td>
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<tr>
<td>6 Months</td>
<td>1137</td>
<td>98.4%</td>
<td>98.4%</td>
<td>98.4%</td>
<td>98.4%</td>
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<tr>
<td>12 Months</td>
<td>1222</td>
<td>93.8%</td>
<td>93.8%</td>
<td>93.8%</td>
<td>93.8%</td>
<td>93.8%</td>
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**Problem: Opioid Crisis**

- **Goal:** Reduce Opioid Use
- **Prescribers must query, review & document pt.’s PDMP prior to prescribing controlled drug substances**
- **Pharmacists must review patient PDMP prior to dispensing**

**What HIE data:**
- Encounter visits
- Clinical notes
- Problems
- Results, lab, images, other tests
- Allergies
- Immunization
- Medication information
- Care teams
- Social determinants
- Preferred pharmacy
- Advance directives, power of attorney

**Prescription Drug Monitoring Program (PDMP)**

- **Pharmacies**
- **Healthcare Providers**
- **State Insurance Programs**
- **Care Enforcement**
- **Healthcare Providers**

**Informatics Leveraging HIE**

**Care Coordination**

- **Who:** Providers, Care Coordinators, Case Managers, Social Workers, High Risk Coordinators
- **Where:** Ambulatory → ED → Acute Care → Skilled Nursing Facility; Post Acute Care → Population Health Program; Payers

**Problem: Opioid Crisis**

- **Design group:** Maryland Epic Users
- **Meetings:** Worked with all Maryland Epic facilities to explore workflow options, share interface and provider workflows, and define data utilization agreement

**Requirements:**
- Nonintrusive to workflow
- Interface and trigger query workflows
- Integrate using NCPCP outgoing medication dispense history interface
- Documentation required in EHR (audit history) and with CRISP
- Documentation for repeatable implementation

**Maryland Statistics**

*Figure 2. Number of Opioid-Related Deaths Occurring in Maryland from January through June of Each Year.*

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>288</td>
</tr>
<tr>
<td>2003</td>
<td>319</td>
</tr>
<tr>
<td>2004</td>
<td>368</td>
</tr>
<tr>
<td>2005</td>
<td>418</td>
</tr>
<tr>
<td>2006</td>
<td>492</td>
</tr>
<tr>
<td>2007</td>
<td>539</td>
</tr>
<tr>
<td>2008</td>
<td>359</td>
</tr>
<tr>
<td>2009</td>
<td>315</td>
</tr>
<tr>
<td>2010</td>
<td>265</td>
</tr>
<tr>
<td>2011</td>
<td>238</td>
</tr>
<tr>
<td>2012</td>
<td>234</td>
</tr>
<tr>
<td>2013</td>
<td>266</td>
</tr>
<tr>
<td>2014</td>
<td>300</td>
</tr>
</tbody>
</table>

**Participating Organization**

- **University of Maryland Medical System**
  - Johns Hopkins Health System
  - Anne Arundel Medical Center
  - Peninsula Regional Medical Center
- **Mercy Medical Center**
  - Bon Secours Hospital
- **Greater Baltimore Medical Center**
  - Kaiser Permanente
- **CRISP Epic**
  - Mera Medical Center
  - Mirus Medical Center
PDMP information presents during the prescribing workflow when a analgesic-narcotic or benzodiazepine outpatient order is entered or signed.

Documentation of provider reviewing PDMP.

Maryland CRISP PDMP Queries Monthly
From 200,000 to >3,000,000

Informatics Leveraging HIE
Care Coordination

Goal: Reduce costs of care

Problem: High Costs

Who
- Providers, Care Coordinators, Case Managers, Social Workers, High-Risk Coordinators, Payers, Population Health Programs

Where
- Ambulatory
  - ED
  - Acute Care
  - Skilled Nursing Facility; Post-Acute Care
- Population Health Programs; Payers

When/How data
- Encounter visits
- Clinical notes
- Problems
- Results, lab, images, other tests
- Allergies
- Immunization
- Medication information
- Care teams
- Social determinants
- Preferred pharmacy
- Advance directives, power of attorney
**Patient’s Results**

- Patients’ prior hospital records available (e.g., labs, radiology reports, etc.)
- Prevents duplicate tests ordering

**HIE Reports Pre/Post Enrollment**

- Upload patient panel with enrollment date in program
- Compare patient utilization and charges before and after

**Patient’s Results**

- Patients’ prior radiology results and now images available
- Prevents duplicate tests that are costly
- Less radiation exposure
- Alerts clinicians of important conditions or treatment information

**Informatics Leveraging HIE Care Coordination**

**Problem: Provider Burnout & Satisfaction**

<table>
<thead>
<tr>
<th>Who</th>
<th>Providers, Clinicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where</td>
<td>Ambulatory, ED, Acute Care, Skilled Nursing Facility, Post Acute Care</td>
</tr>
</tbody>
</table>

**Goal:** Having information to improve workflow efficiency, improve quality of care, provider satisfaction, reduce burnout

1. Encounter visits
2. Clinical notes
3. Problems
4. Results - lab, images, other tests
5. Allergies
6. Immunization
7. Medication information
8. Care teams
9. Social determinants
10. Preferred pharmacy
11. Advance directives, power of attorney

**HIE Reports Care Coordination Program Enrollment**

- Reports available to track how well hospitals assign patients with Care Plans, Care Alerts, Care Managers and PCPs
- Reports available to provide detail on current month of data

**HIE Reports Panels for Practices**

- Panel Utilization Dashboard for Practices
- Hospital utilization
- Panel size
- Panel size for practices
Summary

People
- It takes engagement!
- Organizations must promote interoperability between systems to develop a holistic care delivery model to deliver safe and quality care
- Alignment with hospital priorities involves: Leaders, Operations, IT, State HIE, i.e., CRISP
- Beyond the hospital → community

Process
- It takes knowledgeable resources!
- Understanding regulations, processes, and policies
- Registration & Training
- Opt out process for patients - state HIE, hospitals, ambulatory practices
- Licensure for residents are different than attendings
- Beyond the hospitals → community

Technology
- It takes time!
- Timeline - always takes longer than expected
- Patient’s health care model is complex with multiple data points coming from multiple entities
  - Definition of key terms are critical
  - Mapping of data requires investment of trading partners
- Promoting interoperability requires hospital IT investment
  - Infrastructure - HW, Network (i.e., Citrix), integration, interfaces
  - Technology ever changing - CCD, SSO, InContext, API
- Testing, Maintenance, Support
- Communication with changes, upgrades
- Beyond the hospitals → community

Today’s Health Care Landscape
- Fragmented and Varied Patient Care
- Provider Burnout & Dissatisfaction
- High Costs
- Aging and Sicker Population
- Opioid Crisis
- Health Care Disparities

Promoting Interoperability for Better Care Today & Tomorrow
Promoting Interoperability for Better Care Tomorrow

- Improve the Patient Experience
- Reduce Fragmentation & Variation in Care
- Eliminate Health Care Disparities
- Improve Care of the Population (Aging and Sick)
- Eliminate Opioid Crisis
- Reduce Care Costs across the Continuum
- Elevating Clinicians Experience

Sources: M. Battle, Population Health and Population Health Management: “What it is and What it is isn’t” November 2018

Better Care Today & Tomorrow

The Office of the National Coordinator for Health Information Technology, 2014

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Questions

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Appendix
Key Terms

- Application Programming Interface (API): an interface made available from an IT system that allows external developers access to that system
- Continuity of Care Document (CCD): a standard document standard for EHR systems to export patient information; a type of Clinical Document Architecture (CDA) found within the Consolidated CDA (C-CDA) implementation guide
- Electronic Health Record (EHR): the health care IT system used by clinicians to document patient information
- Health Information Exchange (HIE): the ability of two or more separate IT systems to share data back and forth
- Health Information Organization (HIO): an intermediary acting between separate IT systems to facilitate data exchange
- Interoperability: the ability for two or more separate IT systems to exchange data AND effectively use that data

References

- CRISP (2019). CRISP Services Presentation
- Solberg, A. (2016). Improving Health Information Exchange in an Emergency Department Presentation