Speaker Introduction

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Speaker Introduction

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Conflict of Interest

Richard D. Lang, Ed.D and Tim Hediger have no real or apparent conflicts of interest to report.
Agenda

• Concept: Clinical and Financial Integration
• Data Access and Interoperability
• Design and Development
• Aim: Population Health
• Risk Stratification
• Community Risk Dashboard
• Use Cases
• Summary and Observations
Learning Objectives

• Recognize how to transform existing data systems and quality improvement professionals into a solid population analytics team by transforming skill sets and utilizing current technology
• Describe how to use existing integration tools and enterprise infrastructure to build a comprehensive population analytics platform that is agile, scalable, solves specific problems and increases opportunities
• Identify how to utilize clinical expertise to “develop the math” and metrics for risk tagging and stratification
• Assess data normalization methods that tie in disparate databases for valid interpretation and common meaning
An Introduction of How Benefits Were Realized for the Value of Health IT

- **Satisfaction**
  - Providers have factual, quick reference for patients and conditions

- **Treatment/Clinical**
  - Dashboard anticipates potential acute episode
  - Patients with complex conditions easily identified

- **Electronic Secure Data**
  - Relational databases secured behind multiple firewalls

- **Patient Engagement/Population Management**
  - Promotes proactive, patient-centered interaction for effective care management

- **Savings**
  - Reduces need for large monolithic systems; complex, expensive interfaces, and long unrealized implementation cycles
Concept

- Doylestown Healthcare Partnership
  - Network owned by health system and 275+ PCP and specialist physicians
  - Clinical *and* financial integration among 400+ providers
  - Contracts valued over $100 million
  - Regional ACO joint venture with another health system; 80K lives
- Shared-savings pilots and population health management
  - Information systems to support quality, cost and “management” of care.
  - Critical success factor: Clinical Integration in a regional market
  - Optimize performance
Evolving Concept

“When your only tool is a hammer, all problems start looking like nails.”

• Why did we think we could do it better?
• Long Summer…
• Bloated, Over Featured, Monolithic Market Solutions
• Priced at a level that would consume any/all savings
• Incontrovertible Truth – All vendors stumbled over the integration issue
First Version
Forming Concept

• Requirements – QP, QA, QC True to Quality
• We had the data!!!!
  – New data and technology capabilities transformed ambulatory care in our community.
  – Yet, little done to utilize and analyze the data collected on the DCN
• We were sitting on a gold mine!
• Getting consent – Off to the races
• Defining the Clinical Math – Our Own Formula vs. Popular Groupers
  – Ken Coburn, MD and Health Quality Partners
  – Veterans of 14-year CMS chronic care demonstration project

If this were a pill, you’d do anything to get it
http://files.parsintl.com/eprints/77000.pdf
Design and Build

“Letting the cat out of the bag is a whole lot easier than putting it back in.”

• Building the right team
• Normalizing - Challenges
• Driving Principal – Build what we needed
• Piloting
• Quick to market
• Allow users to set design agenda based on need
Aims: Population Health

• Improve the health of the communities served by DH / DHP
  – Identify those at increasing risk for poor outcomes
  – Intervene proactively to mitigate risks and prevent avoidable complications of chronic disease and other vulnerabilities

• Create an enterprise-wide system of population health management and care coordination
  – Serving all payer populations
  – Across the continuum of care
  – Design, test, and improve with physician input through DHP
  – A consistent system to improve ease of use, reliability, and effectiveness
Addressing Gaps in Care is Not Enough

Medicare Accountable Care Organization Results For 2015: The Journey To Better Quality And Lower Costs Continues; David Muhlestein, Robert Saunders, and Mark McClellan; September 9, 2016, Health Affairs Blog
Effective Complex Care Management

- Tailored to specific particular context
- Identify individuals who are at the highest risk for poor outcomes and can most benefit from care management
- Requires alignment between selected populations, interventions, and desired outcomes
- HIT can be a powerful enabler of effective care management, though there are significant gaps in functionality among existing tools

Data Sources

SQL Database

- Daily Updates of Available Data:
  - ADT
  - Labs
  - Vital Signs
  - Medications
  - Assessments
  - Diagnoses
  - Appointments
  - Claims
  - Encounters

Community Risk Dashboard

Green = Currently in use
Orange = In development

Payer Attribution Files

NextGen
Aprima EHR
Meditech IP/OP
Pine Run SNF
DH Home Health

HSX: Other Hospital & ER Encounters
Patient Risk and Care Coordination Status
Payer Claims Files
Community Risk Dashboard: Initial Goals

- Develop score for global risk (for hospital admission and death)
- Visualize vulnerabilities for which interventions can be more proactively delivered
- Support multiple use cases related to population health management
- For the entire DHP service population (optimized for the older, chronically ill)
- Shareable across multiple DHP and selected external partners
LACE Index

- A score to predict the risk of unplanned readmissions within 30 days of discharge
- DH data corroborates that LACE score correlates with unplanned readmission rate
Correlation of Readmissions with LACE

LACE index while a good start, has a limited ‘shelf life’ post-discharge and doesn’t score those not yet admitted. We needed more …
## Risk Score Calculation

<table>
<thead>
<tr>
<th>Factor</th>
<th>Calculation</th>
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<tbody>
<tr>
<td>Hospitalizations, SNF discharges in past 12 months</td>
<td>Count x 5</td>
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<tr>
<td>ER Visits in past 12 months</td>
<td>Count x 2</td>
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<tr>
<td>Last LACE score in last 90 Days</td>
<td>LACE score</td>
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<tr>
<td>Number of medications</td>
<td>&lt;5=0, 5-9=5, 10+=10</td>
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<tr>
<td>Age</td>
<td>&lt;75=0, 75-84=5, 85+=10</td>
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<tr>
<td>Diagnosis of dementia or cognitive decline (ever)</td>
<td>None=0, 1+=10</td>
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<tr>
<td>Diagnosis of injury due to falls (in past year)</td>
<td>None=0, 1+=10</td>
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<tr>
<td>Diagnosis of HF, CAD, COPD, DM (ever)</td>
<td>Count x 5 = score</td>
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A risk score model designed principally for older populations based on the HQP experience and synthesis of evidence by K Coburn, MD, MPH, FACP
Risk Score Distribution by Population

**All DHP**

**DHP Medicare**
Validation of Risk Score

• Patient risk score is dynamic (updated daily)
• History of risk scores are stored
• Use claims data to analyze:
  • Risk scores vs. future costs / utilization
  • Rising risk score vs. future cost / utilization
• Determine feasibility of predictive models
Patient Risk Score Over Time

[Graph showing patient risk score over time with dates from 7/28/2015 to 10/28/2016 and risk score range from 0 to 50.]
Risk Score Correlation with Future Utilization/Mortality
Design Principles for Dashboard Interface

- Patient-centered
- Visual
- Single page
- Simple interface
- Intuitively interactive
- Deep functionality
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<th>Risk Score</th>
<th>Age</th>
<th>Meds</th>
<th>Last Visit</th>
<th>ED Visits</th>
<th>Last POC Visit</th>
<th>Next POC Visit</th>
<th>HT</th>
<th>CAD</th>
<th>CVD</th>
<th>Asth</th>
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<th>DM</th>
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<td>0.56 (60)</td>
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Risk Score Distribution

- Risk Score: 0
- Age: 0
- Meds: 0
- Last Visit: 0
- ED Visits: 0
- Last POC Visit: 0
- Next POC Visit: 0
- HT: 0
- CAD: 0
- CVD: 0
- Asth: 0
- Dial: 0
- DM: 0
- Fall: 0
- NH (Conf): 0.56 (60)

Screen Shot
Dashboard Use Cases

• Clinical Integration Initiatives
  – Embedded pharmacy students in PCP practices
  – Fragility fractures
  – COPD: Pulmonary rehab; use of inhalers
  – Advance directives

• Quality measures; ‘gaps in care’
  – Cancer screening
  – Diabetes measures
A Summary of How Benefits Were Realized for the Value of Health IT

• Treatment/Clinical
  – Identified 2,000 patients with 30+ score (12% of population and 41% of ED visits and readmissions)

• Patient Engagement/Population Management
  – 850 patients are being placed in active care management
  – Observed significant decrease in readmission rate: 14% to 12.8%

• Savings
  – $4 million-$7 million less than most larger systems
  – Actual cost approximately $200,000/year vs. $1 million/year
Observations

“Bombs don't kill people, explosions kill people.”

- Select a target population
- Data integration is a significant challenge no matter how you do it.
- Data normalization is just as challenging
- Look everywhere for talent
- Get everyone involved
- Simplify views based on specific need
- The more data the better
- Partnering
Questions

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