Predictive Analytics: A Foundation for Care Management

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Speaker Introduction
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Conflict of Interest

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Have no real or apparent conflicts of interest to report.
Agenda

- Learning Objectives and Introduction
- About St. Joseph Healthcare and HIE
- Manual vs. Machine Learning Analytics
- Legs of the Care Management Stool: Predictive Analytics, Care Team, Process and Workflow
- Results and Patient Stories
- Why Predictive Analytics Summary
Learning Objectives

- Identify essential elements of a successful care management program redesign
- Integrate predictive analytics tools into a health system’s care management program
- Assess and communicate results from use of care management processes and tools
- Compare machine learning predictive risk models to traditional measures used to identify high-risk patients
- Describe how existing real-time clinical data provides actionable and accurate predictions
HIMSS Value Steps

• Care Management supported by predictive analytics results in higher staff morale, more efficient workflows, more at risk patients receive care they need.

• Real-time predictive scores means care managers engage with patients earlier to prevent disease, adverse events, and unnecessary utilization.

• Real-time data available across the continuum, improved communication and coordination across care sites.

• Improved quality and cost indicators including reductions in readmissions, ER visits, cost per person and more.
St. Joseph Healthcare System

- 112-bed acute care community hospital
- Primary and specialty care practices
- Partner with FQHC
- 25,000 covered lives
- Participates in several ACOs
- Participant in statewide HIE
About Statewide HIE

- 1.4 million patients & 7 years of data included
- All 35 Maine hospitals & 450 ambulatory sites participate
- Real-time EHR data - orders, labs, meds, admissions, visit histories, imaging, diagnoses, procedures & clinical notes
- Data is standardized and aggregated
- Started offering predictive analytics in 2014
## Manual vs. Machine Learning Analytics

<table>
<thead>
<tr>
<th>Manual</th>
<th>Machine Learning</th>
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<tbody>
<tr>
<td>Several hours of paperwork each day for identification and prioritization</td>
<td>Patient lists created in minutes and automatically prioritized</td>
</tr>
<tr>
<td>Some at risk patients missed due to incomplete data and lack of time</td>
<td>More patients identified and seen, more complete data and accurate scores</td>
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<tr>
<td>Lacks care intervention recommendations</td>
<td>Recommended care interventions built in</td>
</tr>
<tr>
<td>Less coordination with community providers</td>
<td>Risk scores for community providers part of hospital discharge process</td>
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Manual vs. Machine Learning Analytics

- Care managers were at first skeptical of new risk scoring
- Conducted five month test using both approaches to follow hospital readmissions
- Of patients readmitted in that time frame
  - 45% identified as high risk using machine learning
  - 26% identified as high risk using manual process
Care Management Stool

- **Predictive Analytics:** Risk scores based on real-time clinical data

- **The Care Team:** Care Managers across care continuum

- **Established Processes:** Care Management workflows and processes
# 1st Leg: Predictive Analytics

<table>
<thead>
<tr>
<th>Predictive Risk Score Use Cases</th>
<th>Benefits</th>
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<tbody>
<tr>
<td>Accurately identify those at risk</td>
<td>Eliminate manual efforts, intervene early</td>
</tr>
<tr>
<td>Manage 30-day readmits &amp; ED revisits</td>
<td>Reduce unnecessary readmissions or revisits</td>
</tr>
<tr>
<td>Identify risk for high cost events</td>
<td>Reduce unnecessary cost and utilization</td>
</tr>
<tr>
<td>Identify risk of specific conditions</td>
<td>Prevent or better manage conditions like diabetes, COPD, AMI, or stroke.</td>
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# 1st Leg: Predictive Analytics

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<th>Predictive Risk Score Use Cases</th>
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<tr>
<td>Identify patients for palliative care with mortality scores</td>
<td>Prepare patients and families for end of life</td>
</tr>
<tr>
<td>Manage provider panels by risk score</td>
<td>Level load provider work</td>
</tr>
<tr>
<td>Preadmission testing planning</td>
<td>Improve patient post-op outcomes and discharge planning</td>
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2nd Leg: The Care Team

- RN care managers across the continuum
- 3 ambulatory (25,000 patients)
- 1 on each inpatient floor (4200 annual admissions)
- 2 in ER (27,000 annual visits)


3rd Leg: Care Processes & Workflow

Ambulatory Risk Management

- Ambulatory care managers assess risk scores
- Practice sets thresholds for each risk category
- Care managers call high-risk patients to educate and manage care gaps
3rd Leg: Care Processes & Workflow
Ambulatory to Acute Care Risk Management

Hospital care managers use 30-day return visit risk scores for discharge planning

25,000 St. Joe’s Patients

Community At Large
3rd Leg: Care Processes & Workflow
Acute to Ambulatory Patient Risk Management

• Post discharge, St Joe’s hospital patients handed off to ambulatory care manager for follow up

• Patient risk scores drive post-discharge care plan
But When 1 Leg Breaks the Stool Falls

All major spikes in readmission rate correspond with low staffing levels
Performance Against State Average*

- 15.0% reduction in emergency room visits
- 9.5% reduction in 30-day ED return rate
- 4.2% reduction in admissions
- 13.0% reduction in 30-day readmissions
- 12.1% reduction in inpatient days
- 5.0% reduction in cost per person
- 37.3% reduction in hospital mortality

*October 2015 – October 2016
Patient Stories
Why Predictive Analytics

- Encourages collaboration across the continuum
- Care management staff more efficient and productive
- Identifies at-risk patients likely missed
- Supports operational decision-making (resource allocation, facility planning, market analyses)
- Improves readiness for value-based payment
HIMSS Value Steps

Quality indicators well below state average

Real-time Risk scores across continuum

Engage with patients early

Reduced cost of care

Staff morale and patient satisfaction
Questions and Contact

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In the Spirit of Healing