Predictive Analytics: A Foundation for Care Management

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Speaker Introduction

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Conflict of Interest

Jessica Taylor, RN
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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

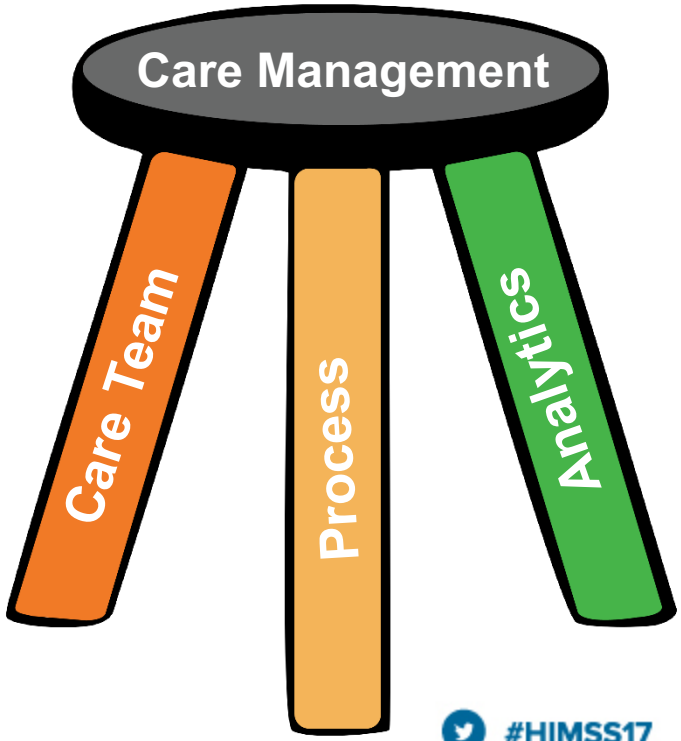
Manual	Machine Learning
Several hours of paperwork each day for identification and prioritization	Patient lists created in minutes and automatically prioritized
Some at risk patients missed due to incomplete data and lack of time	More patients identified and seen, more complete data and accurate scores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

Manual vs. Machine Learning Analytics

- Care mangers 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

Predictive Risk Score Use Cases	Benefits
Accurately identify those at risk	Eliminate manual efforts, intervene early
Manage 30-day readmits & ED revisits	Reduce unnecessary readmissions or revisits
Identify risk for high cost events	Reduce unnecessary cost and utilization
Identify risk of specific conditions	Prevent or better manage conditions like diabetes, COPD, AMI, or stroke.

1st Leg: Predictive Analytics

Predictive Risk Score Use Cases	Benefits
Identify patients for palliative care with mortality scores	Prepare patients and families for end of life
Manage provider panels by risk score	Level load provider work
Preadmission testing planning	Improve patient post-op outcomes and discharge planning

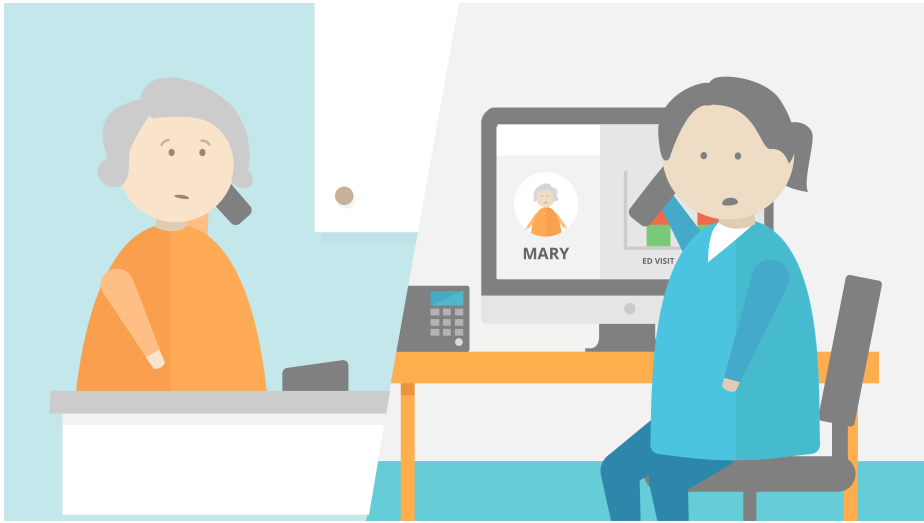
2nd Leg: The Care Team

- RN care mangers 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

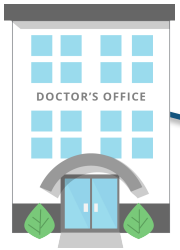
- Ambulatory care managers assess risk scores
- Practice sets thresholds for each risk category
- Care managers call high-risk patients to educate and manage care gaps



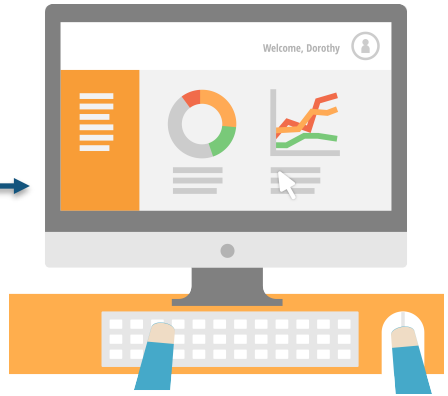
3rd Leg: Care Processes & Workflow

Ambulatory to Acute Care Risk Management

25,000 St. Joe's Patients



Community At Large

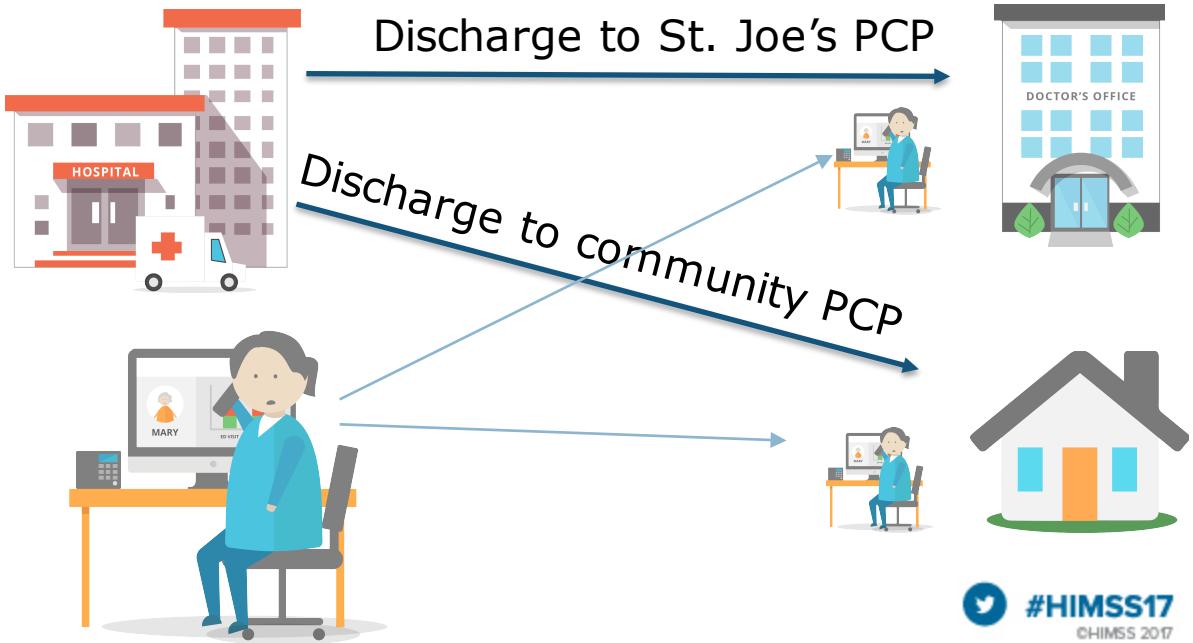


Hospital care managers use 30-day return visit risk scores for discharge planning

3rd Leg: Care Processes & Workflow

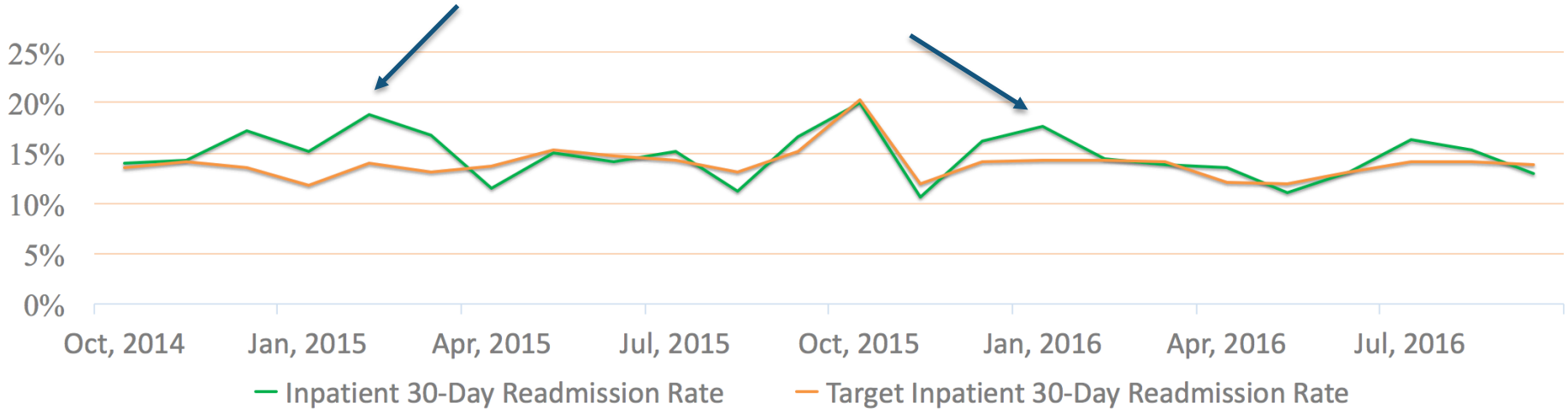
Acute to Ambulatory Patient Risk Management

- 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*

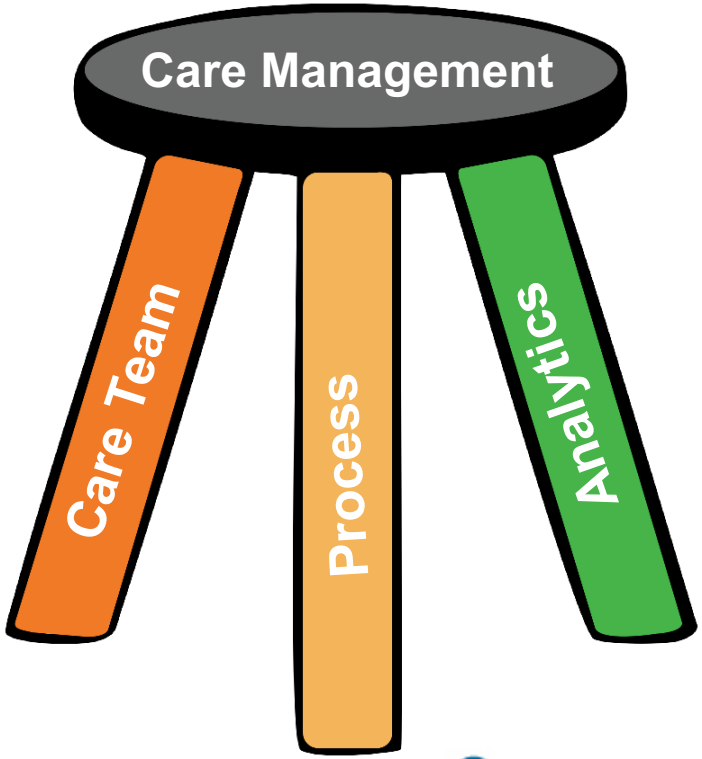
- 15.0% reduction in emergency room visits
- 9.5% reduction in 30-day ED return rate
- 4.2% reduction in admissions
- 13.0% reduction in 30-day readmissions
- 12.1% reduction in inpatient days
- 5.0% reduction in cost per person
- 37.3% reduction in hospital mortality

*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