

# Population Health Management



**Bharat Sutariya, MD**

*Vice President & Chief Medical Officer*



# Overview

- Advocate Healthcare Profile
- PHM Solutions at Advocate Health
- State of PHM IT Industry
- Cerner's PHM Platform & Solutions
- Innovation in Population Health Management



## ■ **\$4.7 Billion Annual Revenue**

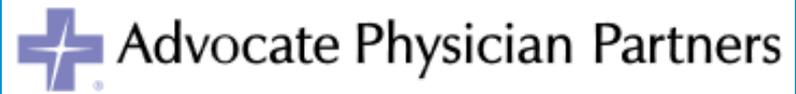
- ◇ AA Rated

## ■ **12 Acute Care Hospitals**

- ◇ 1 Children's Hospital
- ◇ 5 Level 1 Trauma Centers
- ◇ 4 Major Teaching Hospitals
- ◇ 4 Magnet Designations

## ■ **Over 250 Sites of Care**

- ◇ Primary Care
- ◇ Specialty Care
- ◇ Occupational Health
- ◇ Imaging Centers
- ◇ Immediate Care Centers
- ◇ Surgery Centers
- ◇ Home Health/Hospice



## ■ **Physician Membership**

- ◇ 1,200+ Primary Care Physicians
- ◇ 2,800+ Specialist Physicians
- ◇ Total membership includes 1000 + Advocate-employed Physicians

## ■ **9 Physician Hospital Organizations (PHO's)**

## ■ **230,000 Capitated Lives/ 700,000 PPO Lives/230,000 Attributable Lives**

## ■ **Two ACOs**

- ◇ MSSP
- ◇ Commercial

# Advocate Physician Partner Desires

- Alphabet soup of information solutions to support growing Clinical Integration Program – not scalable
- Next Generation of unified population health management solutions needed to evolve their Clinical Integration (ACOs and beyond)
- Information to flow seamlessly across continuum of care
- A longitudinal record across clinical, financial and pharmacy information – broader context and integrated intelligence

# Connecting the Nation's Largest ACO

## Electronic Health Records



eClinicalWorks



## Patient Satisfaction



## Master Person Indexes



## Labs



550K Lives across MSSP & Commercial

 Advocate  
Physician Partners

4,200 Physicians & 11,000 unique users

## Pharmacy Benefit Management



## Claims & Payers



## Directories



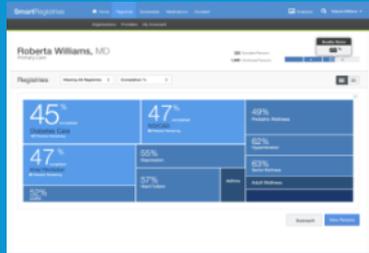
## Registration & Billing



# Smart Registries



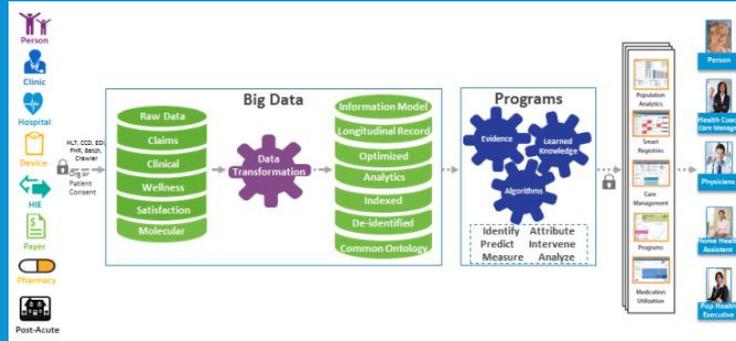
Smart Registries Home Page



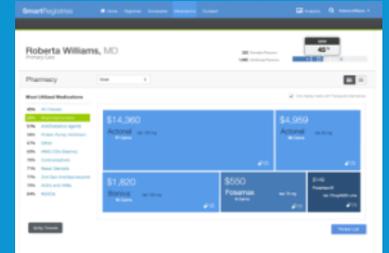
Registry Treemap



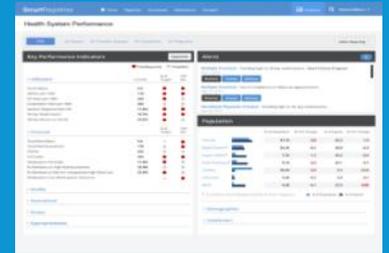
Registry Person View



## Health Intent Platform



Medication Utilization



Analytics Dashboard



Scorecard Treemap

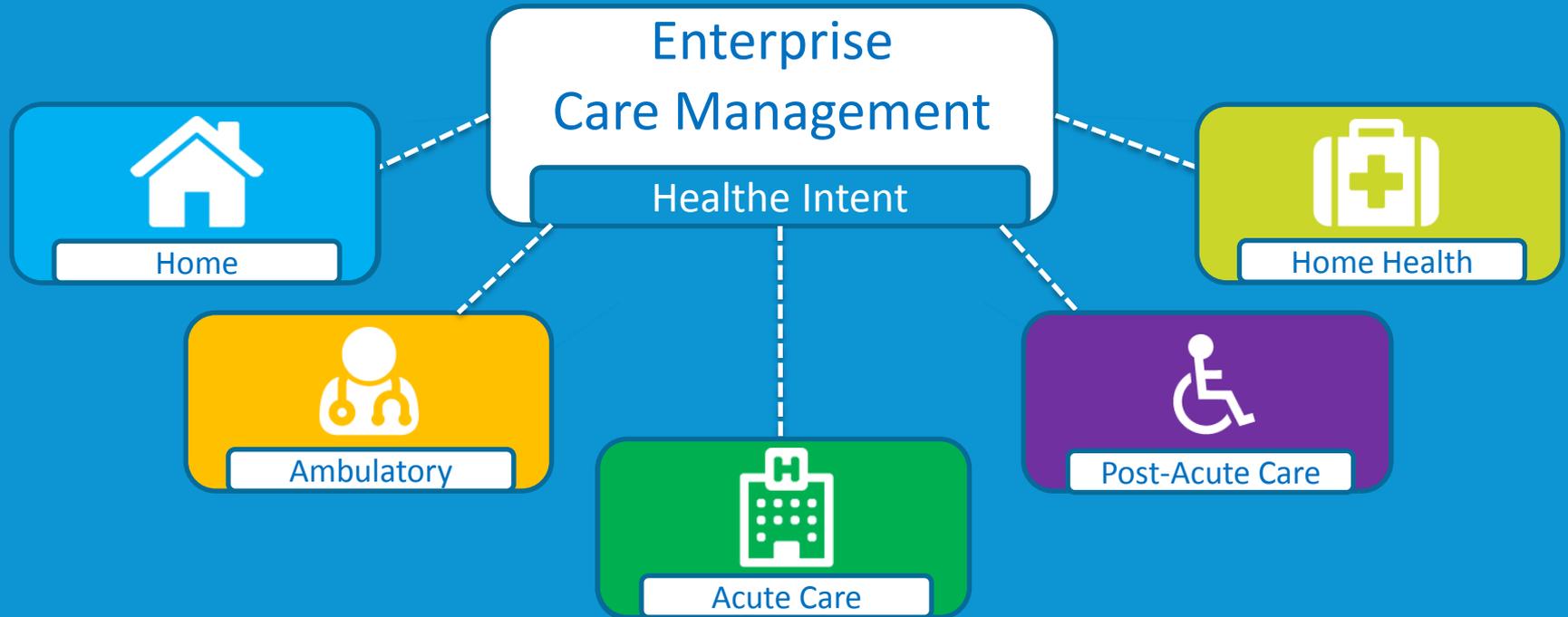


Scorecard

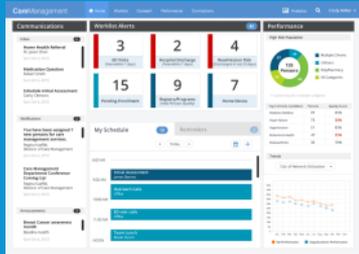


Builder/Editors

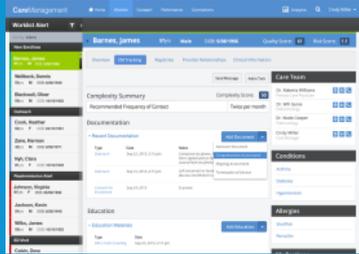
Care Management is a person-centric approach of proactive surveillance, coordination and facilitation of health services across the care continuum to achieve optimal health status, quality and cost.



# Enterprise Care Management



Care Manager Dashboard



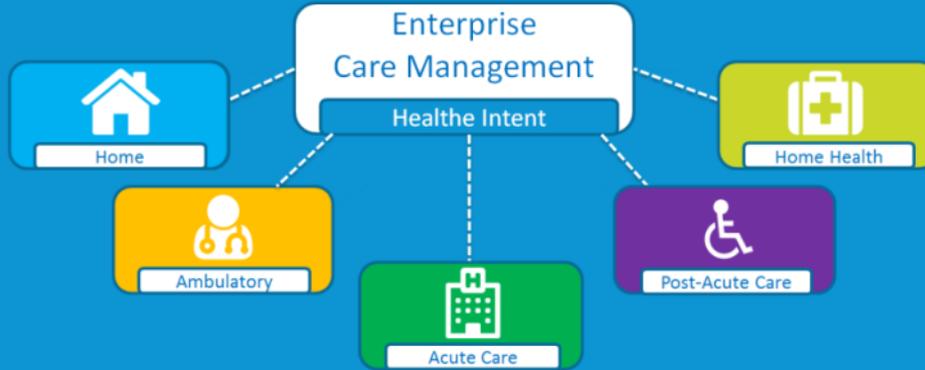
Care Manager Patient View



Quality & Outcomes



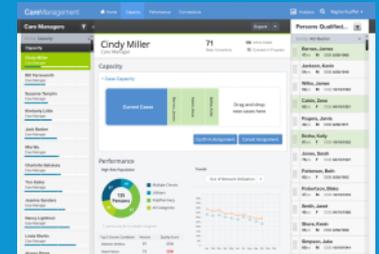
Registry & Performance



Management Dashboard



Analytics Dashboard



Workforce Management

# Care Management

- Knowledge Driven Approach to Managing Care
- Proactive Surveillance and Alerting
- Communication Capabilities to the Entire Care Team
- Outreach and Member Engagement Capabilities
- Performance Management at Assigned Population Level
- Workforce Assignment and Balancing

# State of PHM Solutions Industry

## *KLAS, Population Health Management 2013 Report*

“A crowded roster that keeps growing”

“No easy button for providers”

“PHM is far from commodity”

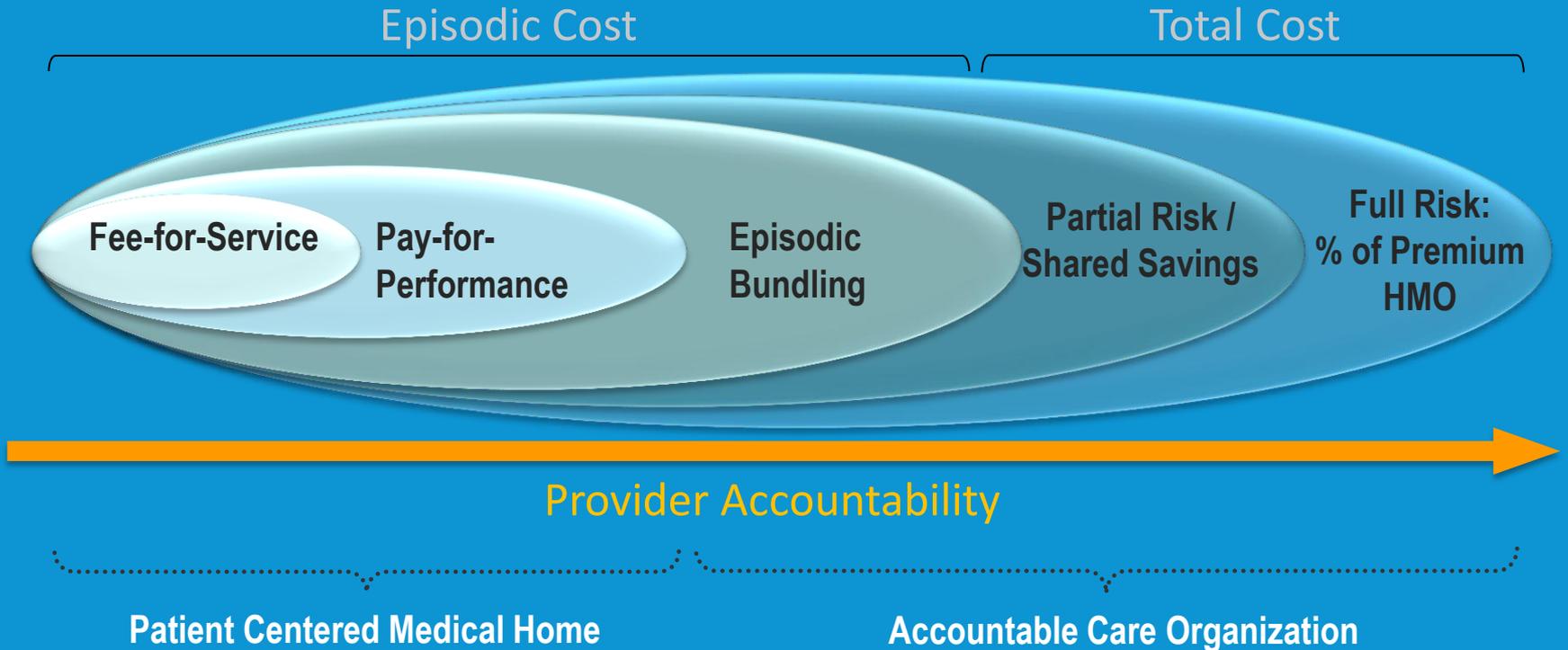
“EMR vendors are getting into the game”

## *George Hill, Citi Research, Population Health Management*

“The next big thing in health IT”

# Shift to Accountability

## Continuum of Payment Models



# Population Health Management



## Know

identify what is happening and predict what will happen



## Engage

your patients and providers to take action

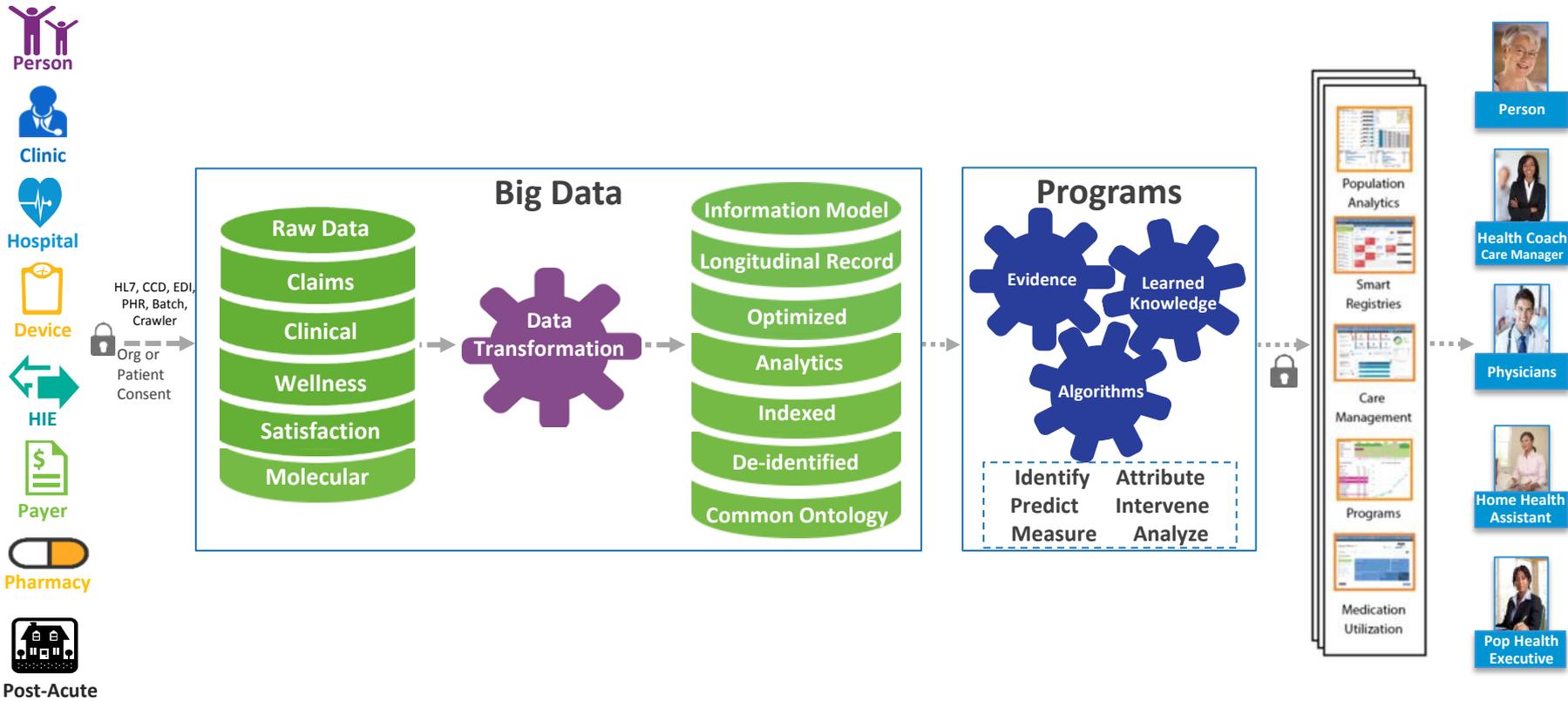


## Manage

cost, quality and health of your population



# Population Health Platform – Healthe Intent



# Population Health Registries & Programs

## Population Health Programs

### High Cost / Complex Conditions

Top Spend, Multi-condition, Polypharmacy

### Chronic Conditions

DM, Heart Failure, HTN, MI/CAD, etc.

### Process Failure / Transitions or Care

Readmissions, Sepsis, Process Oriented Solutions

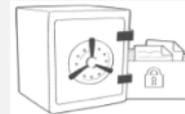
### Wellness & Preventions

Wellness Plan, Musculoskeletal, "Competitions"

### Quality & Performance Improvement

IQR, MU, PQRS, PCMH, ACO, CIN, etc.

A program is a systematic approach to identification, prediction, and management of an objective or condition at population, provider and person level



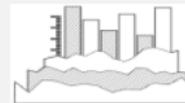
Knowledge  
and evidence



ID & prediction  
models



**Personalized  
Health Plan**

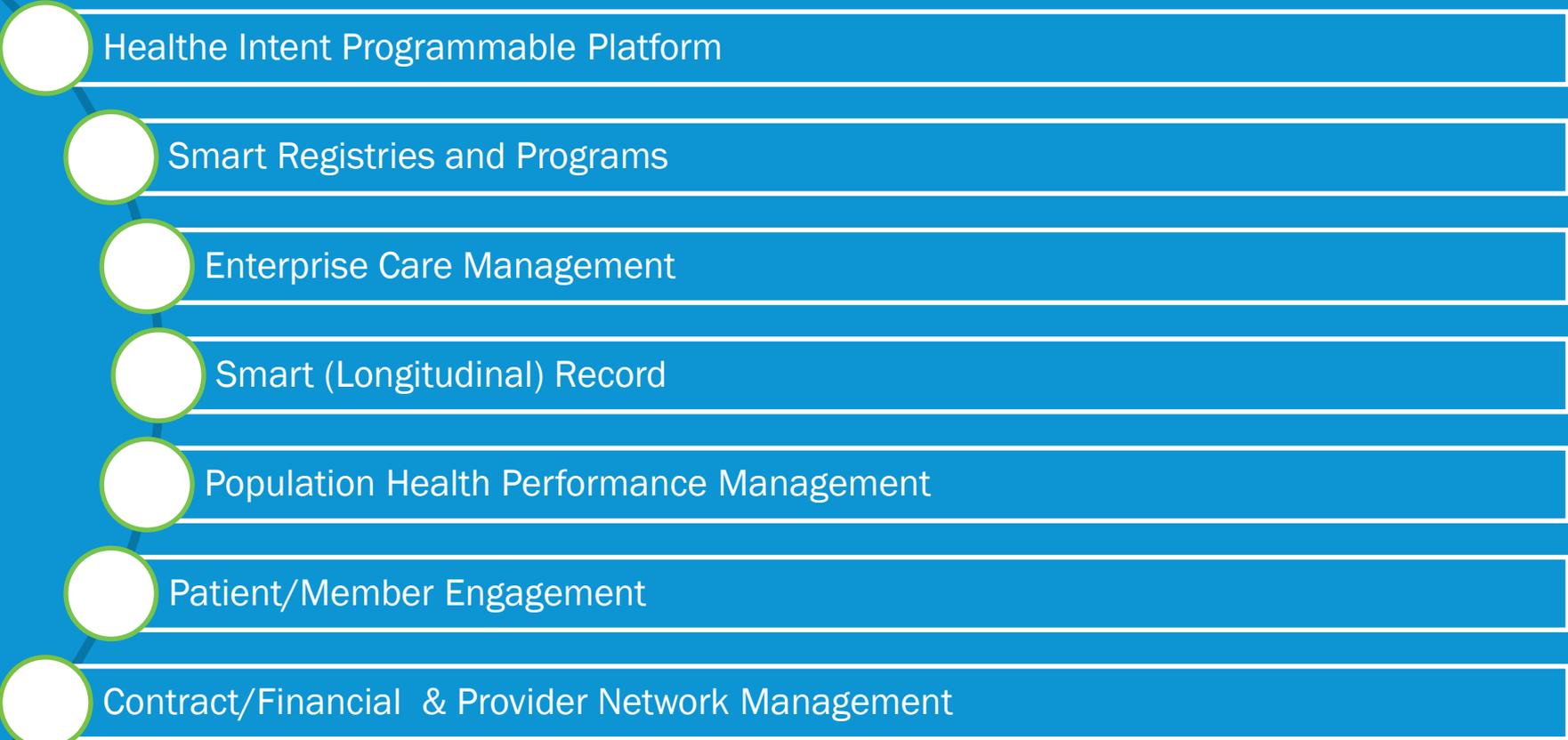


Analytics, measures  
and reports



Actions

# Population Health Management



Healthe Intent Programmable Platform

Smart Registries and Programs

Enterprise Care Management

Smart (Longitudinal) Record

Population Health Performance Management

Patient/Member Engagement

Contract/Financial & Provider Network Management

# People want to be engaged in their health wherever they are



**At Home**



**At the Doctor's**



**In the Hospital**



**At Work**



**On the Go**

**Inform**

Understand my health

Understand what's happening & what's next

Understand what's happening & what's next

Understand my benefits & health expenses

Get updates on my health

**Engage**

Help me stay on track

Make my visit as easy as possible

Make my stay as easy as possible

Determine my status & recommend changes

Help me stay on track

**Empower**

Help me make healthy decisions

Give me options and let me decide

Give me control of my experience

Help me create a plan that works for me

Give me apps to help me control my health

**Partner**

Adjust my plan together as needed

Work with me to create a realistic plan

Work with me to create a realistic plan

Help motivate me to optimise my health & care

Work together no matter where I am

**Community**

Engage others in my health

Involve my supporters & care team

Involve my supporters & care team

Support a culture of health

Know where I am & how to connect

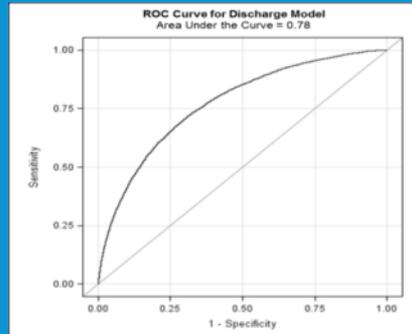
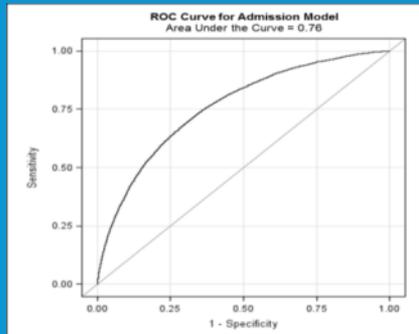
Partially adapted from the National eHealth Collaborative on Patient Engagement

# Population Health Innovation

# Readmission Prediction Model

Variables	Admission Model	Discharge Model
Demographics	✓	✓
Utilization	✓	✓
Lab Tests	✓	✓
Experimental	✓	✓
H&P	✓	✓
Medications	✓	✓
Conditions		✓
Procedures		✓
Length of Stay		✓
Discharge Disposition		✓

- ✓ High predictive ability
- ✓ Utilized reliable & clinically-related data
- ✓ Internal validation
- ✓ Scalable in large populations



Dataset	Performance Measures	Admission Model	Discharge Model
Development	Discrimination Ability C-Statistic	0.76	0.78
	Calibration (Model Fit) Hosmer-Lemeshow goodness-of-fit test (P-value)	36.0 (P<0.001)	31.1 (P<0.001)
	Overall Performance Brier Score (% improvement over random prediction)	0.062 (7.6%)	0.060 (9.1%)
Internal Validation	Discrimination Ability C-Statistic	0.75	0.77
	Calibration (Model Fit) Hosmer-Lemeshow goodness-of-fit test (P-value)	23.5 (P=0.003)	19.9 (P=0.01)
	Overall Performance Brier Score (% improvement over random prediction)	0.063 (6.6%)	0.061 (9.1%)
External Validation (With Recalibration)	Discrimination Ability C-Statistic	0.76	0.78
	Calibration (Model Fit) Hosmer-Lemeshow goodness-of-fit test (P-value)	6.1 (P=0.641)	14.3 (P=0.074)
	Overall Performance Brier Score (% improvement over random prediction)	0.061 (8.9%)	0.060 (9.1%)

# Manage Readmission Prevention Worklist

Target patients

Algorithm driven

Multi-role applicable

Post-30 day tracking

Multiple patient, cross encounter capability

The screenshot displays the 'ThePreventionist' interface for a 'Readmission Worklist'. The top navigation bar includes 'DASHBOARD' and 'WORKLIST' tabs, along with a search icon and a search input field. The main header shows 'Readmission Work...' and an 'Add Patient' button. Below this, a patient list is shown, sorted by 'Length of Stay with pending...'. The selected patient, Jane Smith, is highlighted in blue. Her details include: 58yrs, Female, DOB: 12/15/1955, Length of Stay (Days): 2.11, and Risk: 46%. A hand cursor is pointing at the patient name. To the right of the patient name are tabs for 'Overview', 'Location Encounter' (2), 'Documentation' (2), 'Transition Readiness' (4), and 'Scheduling'. A 'Collapse All' button is also present. The main content area is divided into sections: 'Additional Encounter Information', 'Problem List', and 'Specialty Services'. The 'Additional Encounter Information' section lists: Primary Care Physician: Strehlow, Mark; PCP#: 555-555-5412; Caregiver: Spouse; Caregiver#: N/A; Attending: Campbell, Bruce; Attending#: 555-555-8798; Admit Date: 08/26/13; Est. D/C: --; Length of Stay: 2.11 days. The 'Problem List' section lists: Problem: Pulmonitis, unknown etiology; Diagnosed: Jul 31, 2013; At risk for injury; --; Fracture of Lower End of Radius and Ulna, Closed; Mar 01, 2013. The 'Specialty Services' section lists: Service: Consult to Case Management; Assigned: Aug 26, 2013; Consult to Speech Therapy; Assigned: Aug 23, 2013; Consult to Home Health; Assigned: Jan 05, 2012.

# Appropriate Transition of Care

## Actual Sorting

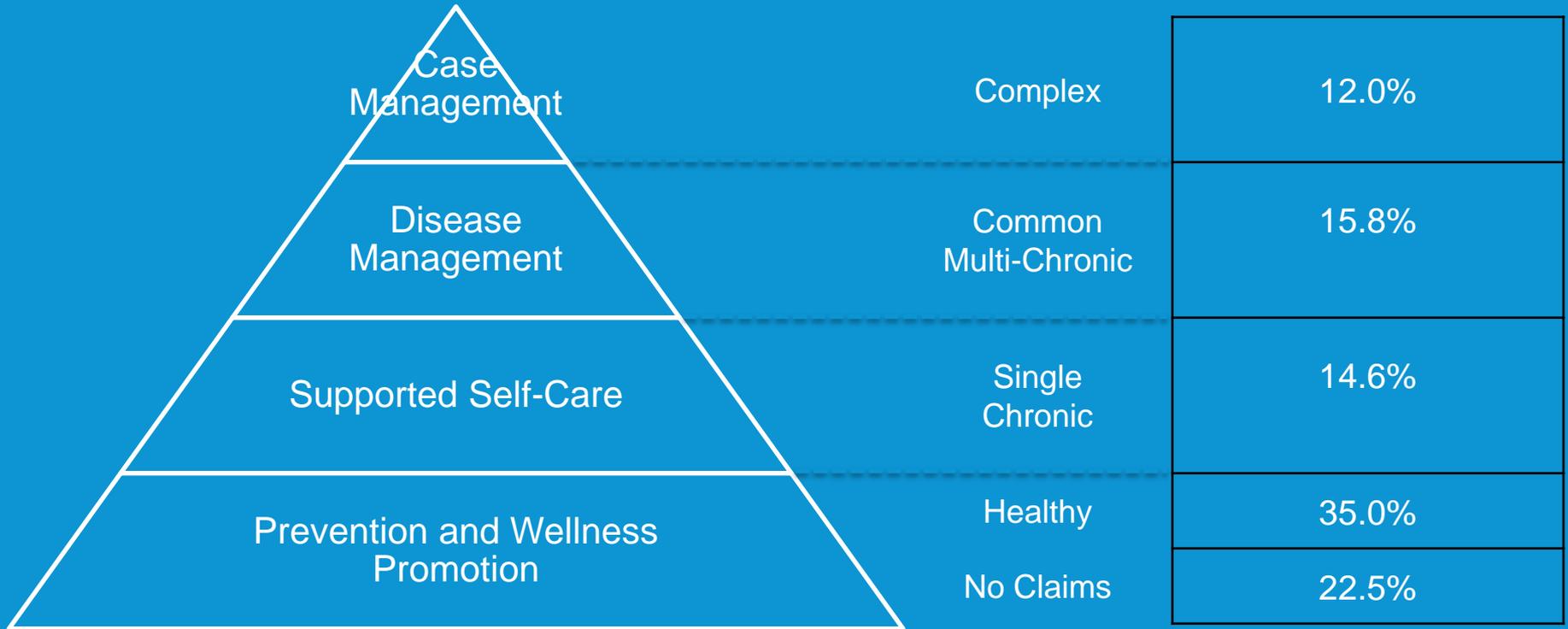
- Discharge locations
  - Home = 67%
  - Home Health = 13%
  - SNF = 15%
  - LTAC = 5%

## Model recommendations

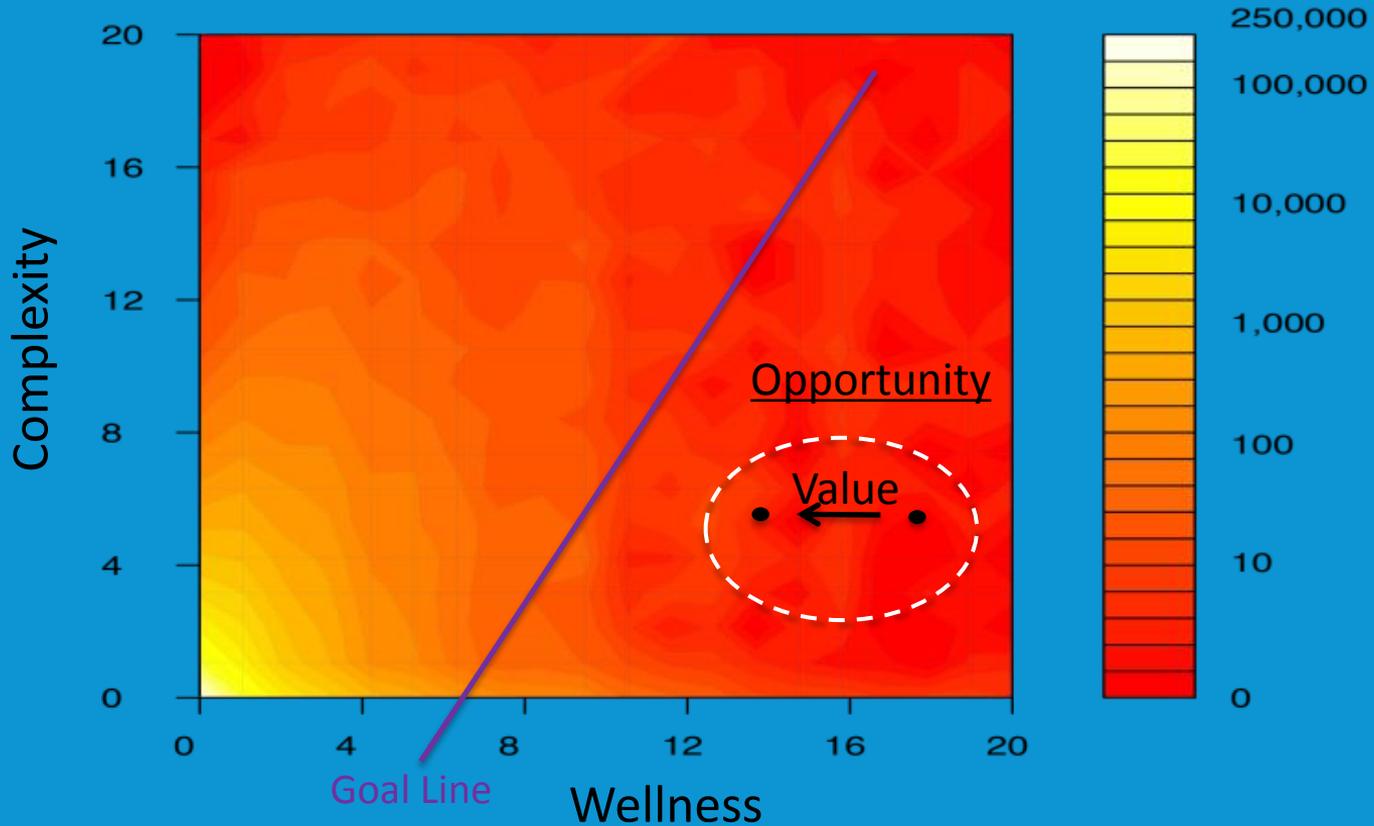
- Discharge locations
  - ↑ Home = 69%
  - ↑ Home Health = 16%
  - ↓ SNF = 14%
  - ↓ LTAC = 1%

The model recommendations have about 70% accordence vs. 30% discordance Above venue shift accounts for ~\$64 million in savings from total cost of care

# Population Health 101: Stratifying by Cost Only



# Population Clustering: Apps for Impact, Adherence and Intervention





Health care is too important to stay the same.

™

