

# Population Health and Cerner's Approach

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Senior Director, Analytics at Cerner



# Talking Points

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- Industry Shift to Population Health
- Cerner's Approach

Cerner Today

# Cerner today

over **22,000**  
ASSOCIATES

hospitals  
**5,431**

OVER  
**450,000**  
PHYSICIAN USERS

physician practices **5,594**  
**3,888** EXTENDED CARE FACILITIES

**98** clients named  
Health Care's  
2015 Most Wired

**52** client hospitals named  
US News and World Report  
Most Connected

**345+** PATENTS  
WORLDWIDE

over **20,000**  
CLIENT  
FACILITIES  
**30+** COUNTRIES

OVER  
**\$4.9B**  
CUMULATIVE R&D INVESTMENT

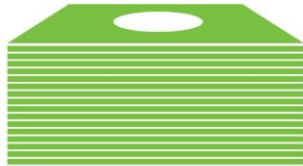
**\$4.4** ✓  
BILLION  
2015 REVENUE ⌚

HIMSS **6** **414** ACUTE CLIENTS **43** HIMSS  
**184** AMBULATORY CLIENTS **303**

Updated 4/2016

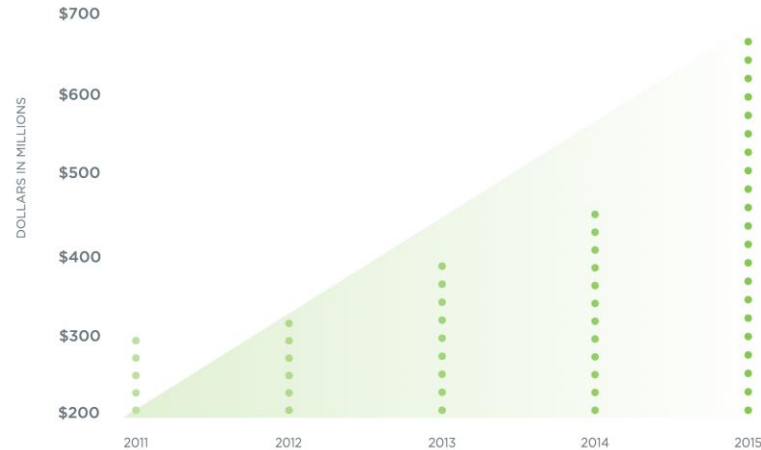
# Investing in innovation

Cumulative R&D  
**\$4.9B+**



\$685M R&D investment in 2015

## Cerner R&D investment

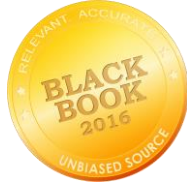


**47%**  
growth  
YOY  
2014 to 2015

\* Includes additive spending from Siemens H.S. R&D-Values reflect Gross R&D (before capitalization and amortization)

# World-class technology

## 2016 top inpatient EHR vendor



#1 Hospital chains, system and IDNS  
 #1 Community Hospitals (101-250 beds)

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## Great product & market overall grades



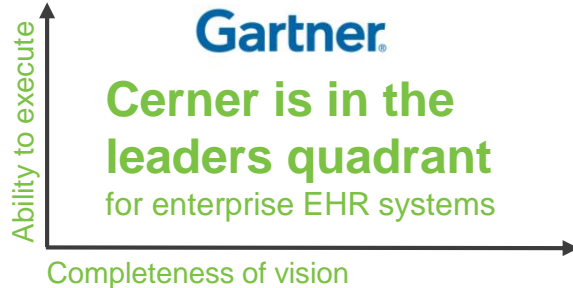
### Cerner

Optum  
 Aetna/Active Health  
 McKesson  
 Epic  
 IBM



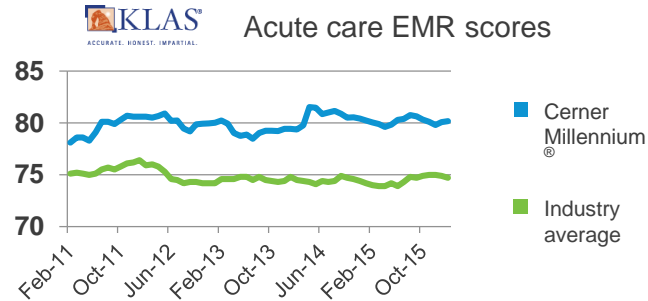
2014 Analytics for Population Health Management © 2015 Chilmark Research. All rights reserved.

## A leader in vision and execution



Gartner Magic Quadrant for Global Enterprise EHR Systems; March 16, 2015  
 © 2015 Gartner, all rights reserved.

## Scores well above industry average



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Move to Population Health

## EXHIBIT ES-1. OVERALL RANKING

### COUNTRY RANKINGS

Top 2*
Middle
Bottom 2*



	AUS	CAN	FRA	GER	NETH	NZ	NOR	SWE	SWIZ	UK	US
<b>OVERALL RANKING (2013)</b>	4	10	9	5	5	7	7	3	2	1	11
<b>Quality Care</b>	2	9	8	7	5	4	11	10	3	1	5
Effective Care	4	7	9	6	5	2	11	10	8	1	3
Safe Care	3	10	2	6	7	9	11	5	4	1	7
Coordinated Care	4	8	9	10	5	2	7	11	3	1	6
Patient-Centered Care	5	8	10	7	3	6	11	9	2	1	4
<b>Access</b>	8	9	11	2	4	7	6	4	2	1	9
Cost-Related Problem	9	5	10	4	8	6	3	1	7	1	11
Timeliness of Care	6	11	10	4	2	7	8	9	1	3	5
<b>Efficiency</b>	4	10	8	9	7	3	4	2	6	1	11
<b>Equity</b>	5	9	7	4	8	10	6	1	2	2	11
<b>Healthy Lives</b>	4	8	1	7	5	9	6	2	3	10	11
<b>Health Expenditures/Capita, 2011**</b>	<b>\$3,800</b>	<b>\$4,522</b>	<b>\$4,118</b>	<b>\$4,495</b>	<b>\$5,099</b>	<b>\$3,182</b>	<b>\$5,669</b>	<b>\$3,925</b>	<b>\$5,643</b>	<b>\$3,405</b>	<b>\$8,508</b>

Notes: \* Includes ties. \*\* Expenditures shown in \$US PPP (purchasing power parity); Australian \$ data are from 2010.

Source: Calculated by The Commonwealth Fund based on 2011 International Health Policy Survey of Sicker Adults; 2012 International Health Policy Survey of Primary Care Physicians; 2013 International Health Policy Survey; Commonwealth Fund *National Scorecard 2011*; World Health Organization; and Organization for Economic Cooperation and Development, *OECD Health Data, 2013* (Paris: OECD, Nov. 2013).



# What Is Population Health?

As an approach, population health focuses on interrelated conditions and factors that influence the health of populations over the life course, identifies systematic variations in their patterns of occurrence, and applies the resulting knowledge to develop and implement policies and actions to improve the health and well being of those populations.<sup>[1]</sup>

## Determinants of Health

- Biology and Genetics
- Individual Behavior
- Health Services – Public Health
- Social Factors
- Policymaking

<sup>[1]</sup> Kindig, Stoddart. *What is Population Health?* Am J Public Health. 2003 March; 93(3): 380–383

# Aim for 21<sup>st</sup> Century Healthcare<sup>[2]</sup>



Safe

Effective

Patient-Centered

Timely

Efficient

Equitable

<sup>[2]</sup> Institute of Medicine (US) Committee on Quality of Health Care in America. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington (DC): National Academies Press (US); 2001.

# Health care quality and the IOM reports

- In recent times, driven by “triple aim” [3]
  - Better health
  - Better healthcare
  - Lower cost
- Quality measured in three categories at individual and organizational levels [4]
  - Structural – factors that make it easier or harder to deliver high-quality care
  - Process – factors describing healthcare content and activities,
  - Outcomes – changes attributable to care

[3] Berwick DM, Nolan TW, Whittington J. *The Triple Aim: Care, health, and cost*. Health Affairs. 2008 May/June;27(3):759-769.

[4] Donabedian A. *An Introduction to Quality Assurance in Health Care*. New York, NY: Oxford University Press; 2002.

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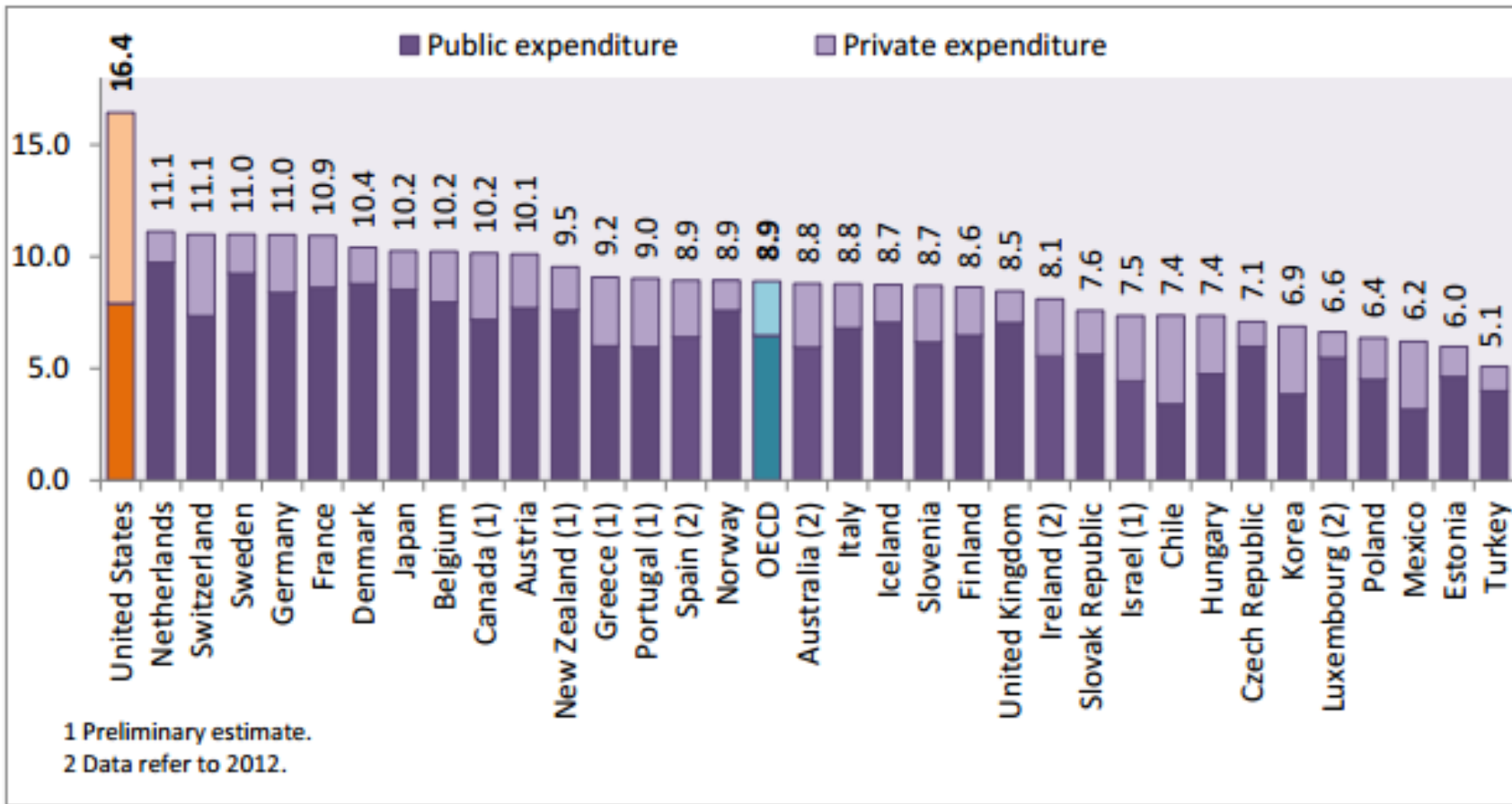
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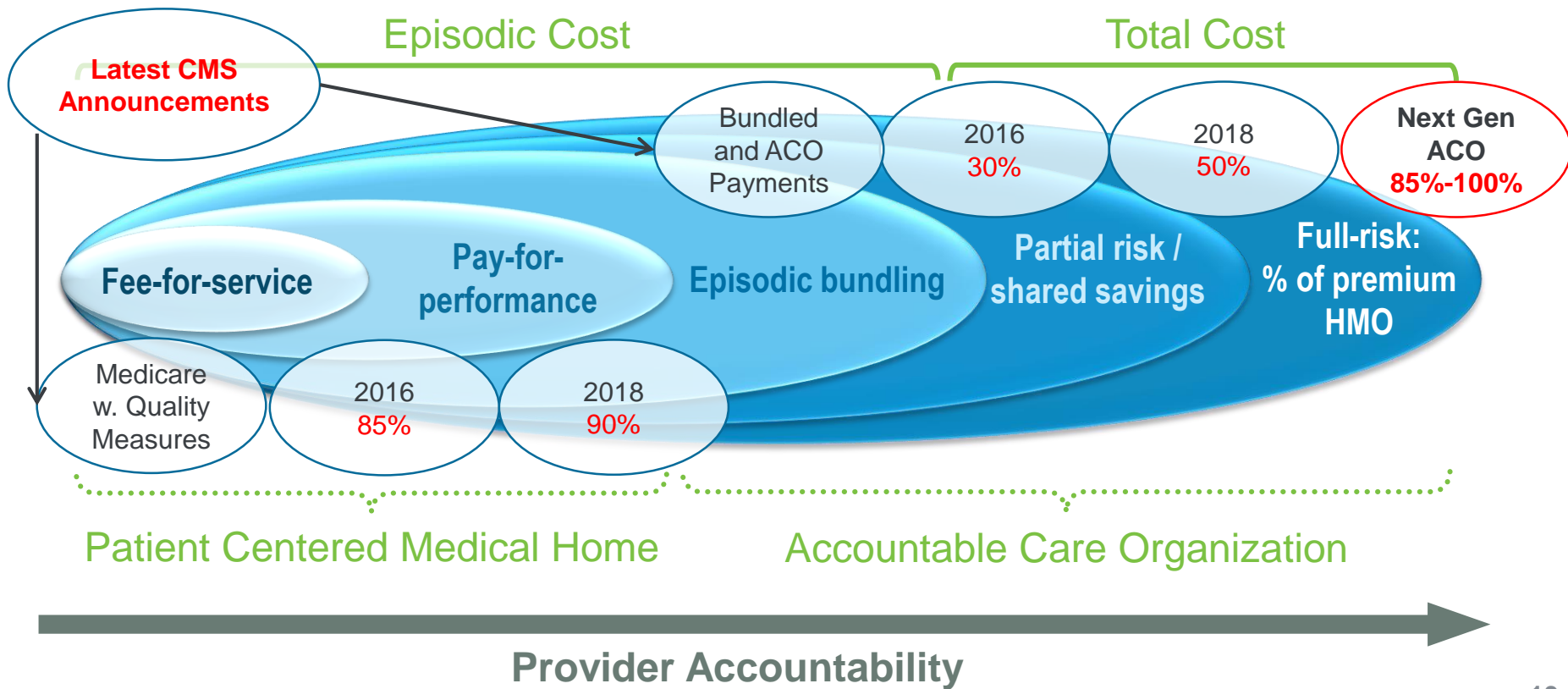
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Used from: <https://www.oecd.org/unitedstates/Country-Note-UNITED%20STATES-OECD-Health-Statistics-2015.pdf>

# Shift to accountability | continuum of payment models



# Definition of an ACO

Accountable Care Organizations (ACOs) are:

**groups** of doctors, hospitals, and other health care providers,

who **come together** voluntarily to give

**coordinated, high quality care** to the patients they serve

# ACO Patient Satisfaction – 8 measures

- CAHPS: Consumer Assessment of Healthcare Providers and Systems

ACO #	Measure title	NQF #	Measure steward	Method of data submission
Domain: patient/caregiver experience				
ACO-1	CAHPS: Getting Timely care, Appointments, and Information	0005	AHRQ	Survey
ACO-2	CAHPS: How Well Your Providers Communicate	0005	AHRQ	Survey
ACO-3	CAHPS: Patients' Rating of Provider	0005	AHRQ	Survey
ACO-4	CAHPS: Access to Specialists	N/A	CMS/AHRQ	Survey
ACO-5	CAHPS: Health Promotion and Education	N/A	CMS/AHRQ	Survey
ACO-6	CAHPS: Shared Decision Making	N/A	CMS/AHRQ	Survey
ACO-7	CAHPS: Health Status/Functional status	N/A	CMS/AHRQ	Survey
ACO-34	CAHPS: Stewardship of Patient Resources	N/A	CMS/AHRQ	Survey



# ACO Readmissions – 7 measures

ACO #	Measure title	NQF #	Measure steward	Method of data submission
Domain: care coordination/ patient safety				
ACO-8	Risk Standardized, All Condition Readmission	1789 (adapted)	CMS	Claims
ACO-35	Skilled Nursing Facility 30-Day All-Cause Readmission Measures (SNFRM)	2510 (adapted)	CMS	Claims
ACO-36	All-Cause Unplanned Admissions for Patients with Diabetes	N/A	CMS	Claims
ACO-37	All-Cause Unplanned Admissions for Patients with Heart Failure	N/A	CMS	Claims
ACO-38	All-Cause Unplanned Admissions for Patients with Multiple Chronic Conditions	N/A	CMS	Claims
ACO-9	Ambulatory Sensitive Conditions Admissions: Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults	0275	AHRQ	Claims
ACO-10	Ambulatory Sensitive Conditions Admissions: Heart Failure	0277	AHRQ	Claims

# ACO Quality – 18 measures

ACO #	Measure title	NQF #	Measure steward	Method of data submission
ACO-39 (CARE-3)	Documentation of Current Medications in the Medical Record	0419	CMS	GPRO WI
ACO-13 (CARE-2)	Falls: Screening for Future Fall Risk	0101	AMA/PCPI/NCQA	GPRO WI
Domain:				
Preventive Health				
ACO-14 (PREV-7)	Preventive Care and Screening: Influenza Immunization	0041	AMA/PCPI	GPRO WI
ACO-15 (PREV-8)	Pneumonia Vaccination Status for Older Adults	0043	NCQA	GPRO WI
ACO-16 (PREV-9)	Preventive Care and Screening: Body Mass Index Screening and Follow-Up	0421	CMS	GPRO WI
ACO-17 (PREV-10)	Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention	0028	AMA/PCPI	GPRO WI
ACO-18 (PREV-12)	Preventive Care and Screening: Screening for Clinical Depression and Follow-up Plan	0418	CMS	GPRO WI
ACO-19 (PREV-6)	Colorectal Cancer Screening	0034	NCQA	GPRO WI
ACO-20 (PREV-5)	Breast Cancer Screening	N/A	NCQA	GPRO WI

ACO #	Measure title	NQF #	Measure steward	Method of data submission
ACO-21 (PREV-11)	Preventive Care and Screening: Screening for High Blood Pressure and Follow-Up Documented	N/A	CMS	GPRO WI
ACO-42 (PREV-13)	Statin Therapy for the Prevention and Treatment of Cardiovascular Disease	N/A	CMS	GPRO WI
Domain: at-risk population				
Depression				
ACO-40 (MH-1)	Depression Remission at 12 Months	0710	MNCM	GPRO WI
Diabetes				
ACO-27 (DM-2)	Diabetes: Hemoglobin A1c Poor Control	0059	NCQA	GPRO WI
ACO-41 (DM-7)	Diabetes: Eye Exam	0055	NCQA	GPRO WI
Hypertension				
ACO-28 (HTN-2)	Controlling High Blood Pressure	0018	NCQA	GPRO WI
Ischemic vascular disease				
ACO-30 (IVD-2)	Ischemic Vascular Disease: Use of Aspirin of Another Antithrombotic	0068	NCQA	GPRO WI
Heart failure				
ACO-31 (HF-6)	Heart Failure: Beta-Blocker Therapy For Left Ventricular Systolic Dysfunction	0083	AMA/PCPI/ACC/AHA	GPRO WI
Coronary artery disease				
ACO-33 (CAD-7)	Coronary Artery disease: Angiotensin-Converting Enzyme Inhibitor or Angiotensin Receptor Blocker Therapy—Diabetes or Left Ventricular Systolic Dysfunction (LVEF < 40%)	0066	AMA/PCPI/ACC/AHA	GPRO WI



## BECKER'S Hospital Review

### 15 Medicare Shared Savings ACOs that generated the most savings in 2013

In performance year one, Medicare Shared Savings Program accountable care organizations with April 2012 and July 2012 start dates held spending to \$652 million below their targets, according to CMS.

Here are the 15 MSSP ACOs that generated the most savings in performance year one.

1. Houston-based Memorial Hermann ACO — **\$57.83 million**
2. Palm Springs, Fla.-based Palm Beach ACO — **\$39.57 million**

## Top MSSP ACOs in quality, shared savings for 2015

Written by Emily Rappleye (Twitter | Google+) | August 26, 2016 | Print | Email

20

in Share

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4

f Share

0

G+

In the fourth performance year of the Medicare Shared Savings Program — 2015 — accountable care organizations generated net savings of \$429 million for Medicare and improved quality performance on several different measures, according to data released Thursday by CMS.

About 30 percent of the 393 ACOs participating in 2015 earned shared savings, marking a steady growth in the proportion of ACOs that have generated shared savings. Many improved in quality, too. In four particular measures, the average quality performance score improved by more than 15 percent: screening for fall risk, depression screening and follow-up, blood pressure screening and follow-up and administering pneumonia vaccinations.

Here are the top 10 ACOs that led the way in shared savings in 2015, all of which are in Track 1 of the program.

1. Memorial Hermann ACO (Houston) — \$41,912,527
2. Palm Beach ACO (Palm Springs, Fla.) — \$36,834,657
3. Advocate Physician Partners Accountable Care (Rolling Meadows, Ill.) — \$33,537,591
4. Millennium Accountable Care Organization (Fort Myers, Fla.) — \$17,636,121
5. Atlantic ACO (Morristown, N.J.) — \$16,719,376
6. Cleveland Clinic Medicare ACO — \$16,614,051
7. Hackensack (N.J.) Alliance ACO — \$15,640,878
8. UT Southwestern Accountable Care Network (Dallas) — \$14,188,861
9. Orange Accountable Care of South Florida (Miami Lakes, Fla.) — \$13,442,691
10. RGV ACO Health Providers (Donna, Texas) — \$12,619,152

ountable Care IPA — **\$27.92 million**

ntable Care — **\$24.68 million**

are Medical Group — **\$21.91 million**

CO — **\$21.69 million**

— **\$21.51 million**

— **\$20.24 million**

**19.88 million**

as — **\$19.10 million**

outheast Wisconsin — **\$17.70 million**

**million**

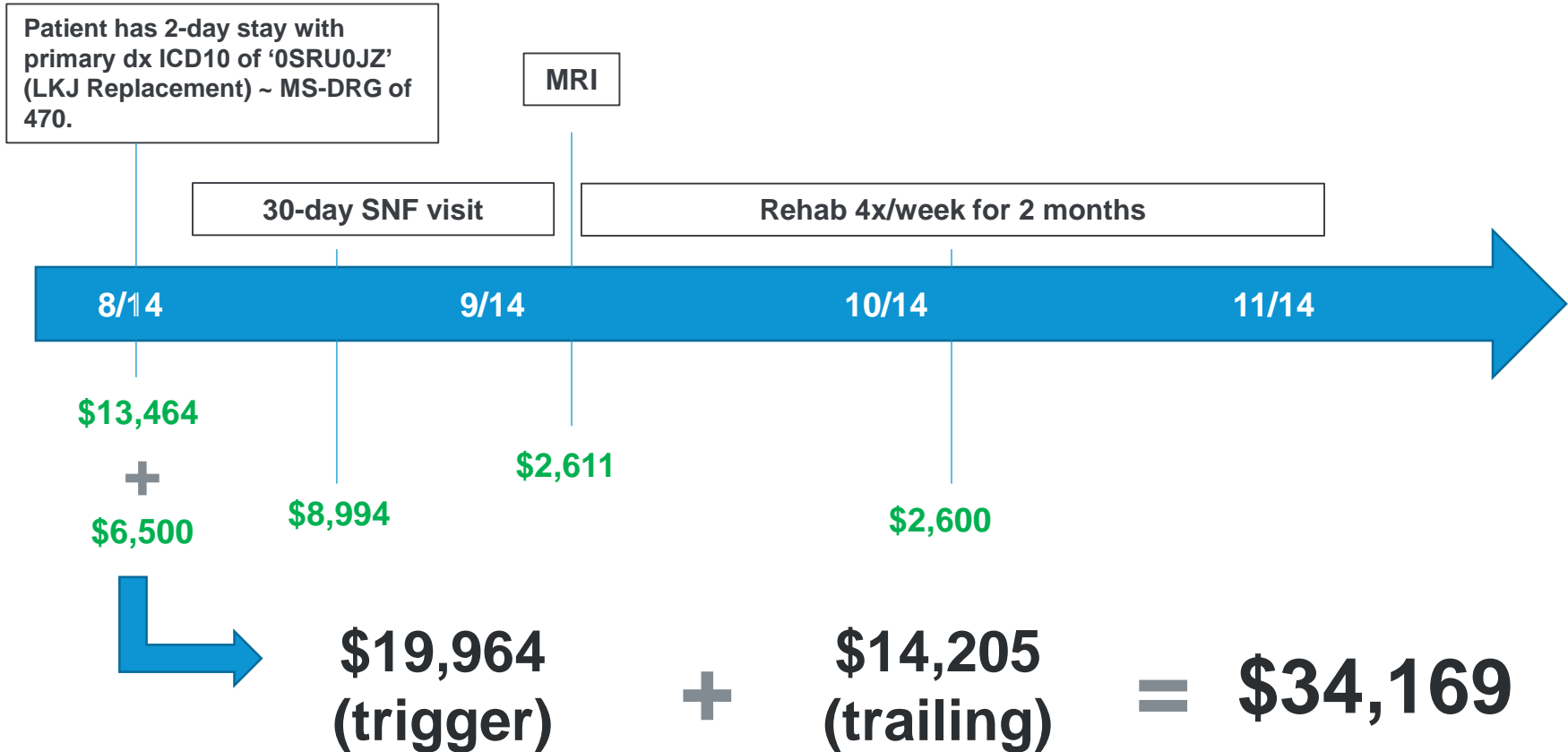
i — **\$17.03 million**

**illion**

ve — **\$14.07 million**

or by any means without the express written consent of Cerner.

# Bundled Payments



United  
ACO  
RAF  
HEDIS  
APM  
SNOMED  
DSRIP  
CPT  
MMIS  
HCC  
ICD  
CMS  
DRG  
MACRA  
Aetna  
BPCI  
NQF  
MIPS  
LOINC  
RxNorm  
BCBS  
AHRQ  
Multum  
CJR  
HHS



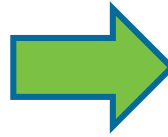
# How do providers keep track?



Ok, is this patient on Medicare, Aetna, or Anthem? What measures do they have to meet?



# How Do Providers Feel?



# What **Makes** Us Healthy



**10%**  
ACCESS  
TO CARE



**20%**  
GENETICS



**20%**  
ENVIRONMENT



**50%**  
HEALTHY  
BEHAVIORS

# What We **Spend** On Being Healthy



**4%**  
HEALTHY  
BEHAVIORS



**8%**  
OTHER



**88%**  
MEDICAL  
SERVICES

Taken from: <http://www.tbf.org/tbf/56/~-/media/3A4F43041179488CB0D8D523268FE8F4.pdf>



# The Next Generation

## Business Model Shifts

Reactive Sick Care



Proactive Management of Health

Fragmented Care



Cross-Continuum System of Care

Reward for Volume



Rewarded for Quality, Safety and Efficiency

## Health IT Shifts

Record



Plan

Transaction-Oriented



Intelligence-Oriented

Provider Enablement

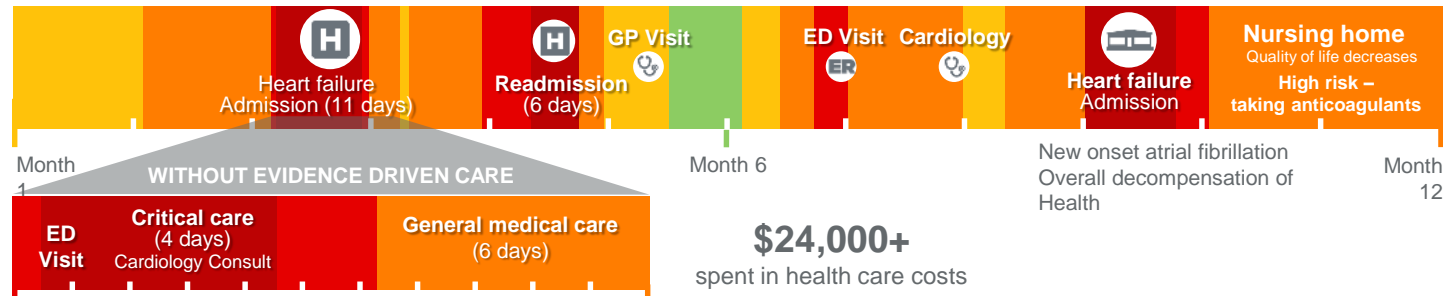


Consumer Enablement

## Fragmented and reactive care delivery approach



67-year-old patient with a history of heart failure, poor understanding of disease, poor compliance with diet and medications.

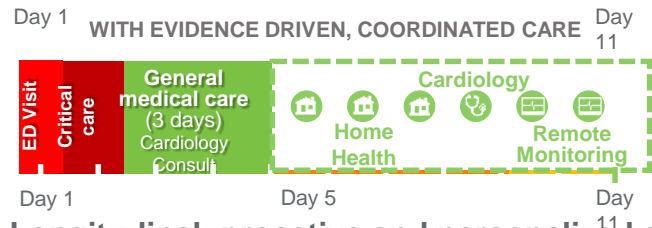


Good health

Poor health

### TYPICAL CARE

- Paper Clipboards
- Siloed Record
- Prolonged ED Visit
- Heart Failure Order Set
- Redundant Assessments
- Nursing Documentations
- More ...



## Longitudinal, proactive and personalized care delivery approach



67-year old patient with personalized plan for health that includes education, nutrition, maintenance meds, quarterly GP visits and proactive surveillance.



### EVIDENCE DRIVEN LONGITUDINAL CARE

#### Episode of Care

- Care Process Models
- Adaptive Order Sets
- Smart Referrals
- Readmission Risk Prediction
- Transition of Care
- More ...

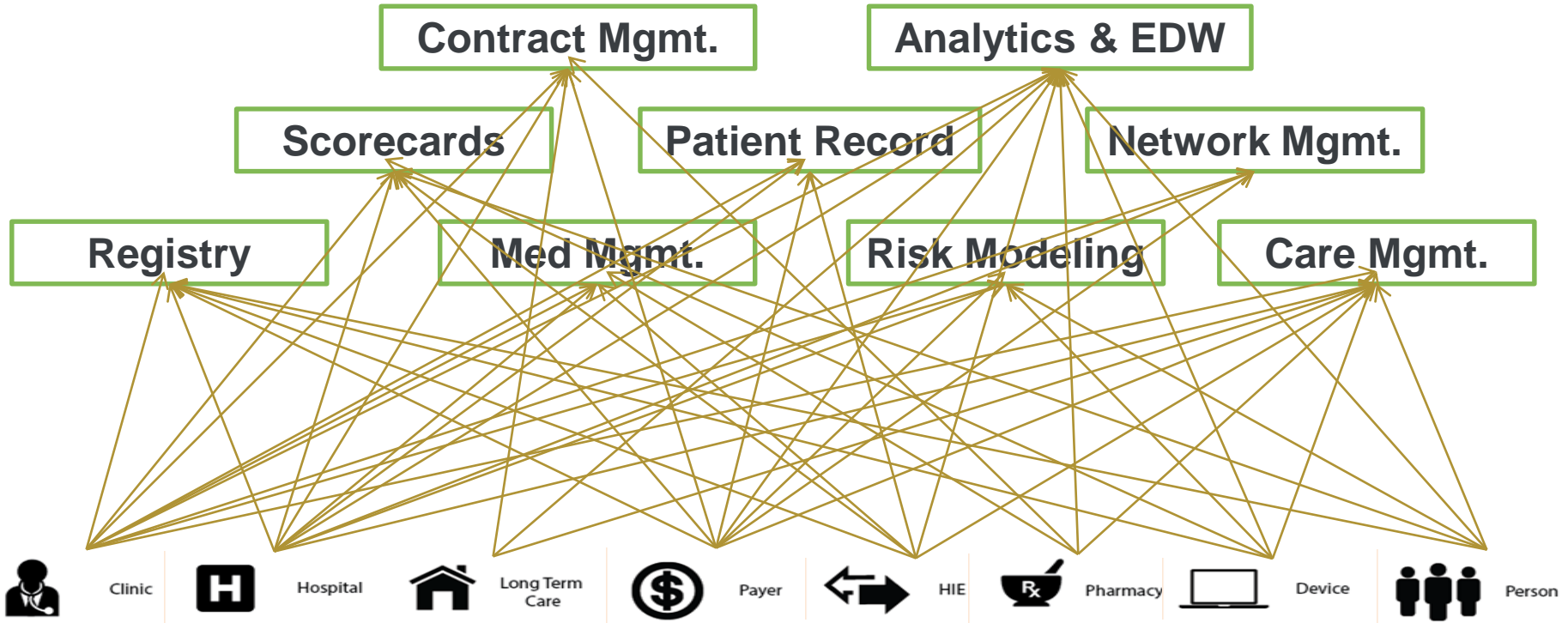
#### Longitudinal Personalized Care

- HealthIntent Programs
- Longitudinal Record
- Longitudinal Lifetime Plan
- Proactive physician visits
- Continuous Surveillance
- Admission Risk Prediction
- Medication Adherence
- Shared Decision Making
- More ...



Centralized data aggregation

# Common Approach to Pop Health Solutions



# Cerner's Approach

Contract Mgmt.

Analytics & EDW

Scorecards

Patient Record

Network Mgmt.

Registry

Med Mgmt.

Risk Modeling

Care Mgmt.

*HealthIntent*



Clinic



Hospital



Long Term  
Care



Payer



HIE



Pharmacy



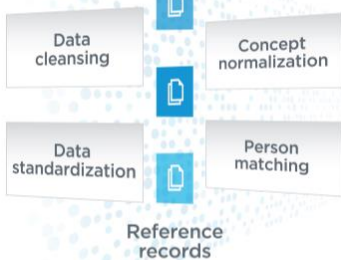
Device



Person

# HealthIntent platform

## Aggregate and normalize



## Create and apply intelligence



## Act and measure



- Person
- Health coach
- Care manager
- Home health assistant
- Clinician
- Provider
- Data scientist
- Executive

# Aggregate and normalize

## Create organized, meaningful concepts

LOINC ICD-10  
Medi-Span CPT  
NDC ICD-9  
MEDCI  
N

Allergies	Medications
Conditions	Procedures
Immunizations	Visits
Lab results	Vitals

Medication	Most recent Date	Source
aspirin 300 mg oral delayed release tablet	3/24/2014	Westwatch Bay
Aspirin (vmitum.d00170)	10/17/2013	Baseline East
ASA 500 MG Oral Tablet [Bayer Aspirin]	9/23/2013	Westwatch Bay
Aspirin	4/23/2013	Get Well Now
aspirin	2/18/2013	Westwatch Bay
Aspirin	5/14/2012	Baseline East
aspirin 300 mg oral tablet	6/20/2011	Get Well Now

## Match persons

John Doe	A
SSN Jon Doe	B
Address Jane	C
SSN 111-22-2345	
Address: 100 main, Lenexa, KS 66215	
Hospital B	

SSN First name Last name  
DOB Race Alias  
Address Gender Ethnicity

No link | Manual | Auto link

EID 2468	
Record ID A	Record ID B
John Doe	Jon Doe
SN 111-22-1234	SN 111-22-1234
DOB 11/30/75	11/30/75
100 Main, Lenexa, KS	100 Main, Lenexa, KS

Identify like-reference records

Determine similarity score to confirm records match

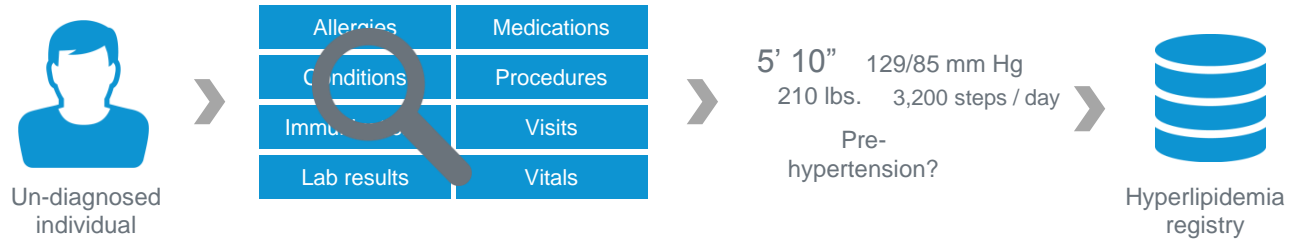
Assign unique EID number to linked records



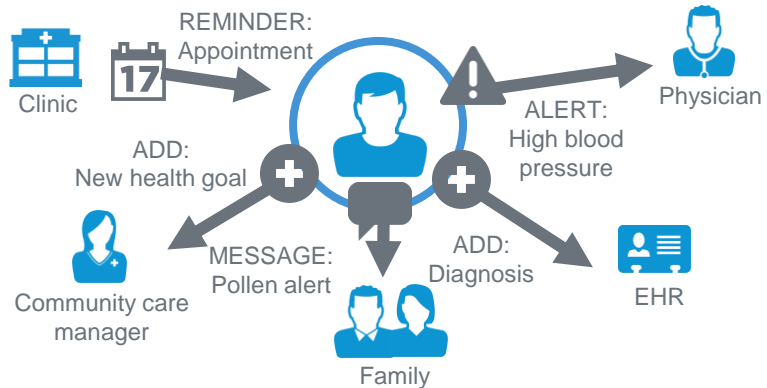
# Create and apply intelligence



## Infer new knowledge



## Measure, monitor and predict health status





# Act and measure



Longitudinal record

Registries and scorecards

Community care management

Enterprise data warehouse

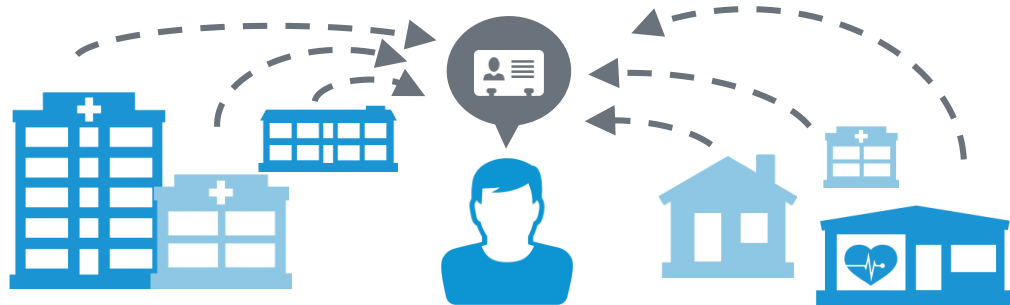
Referral and network management\*

Contract management\*

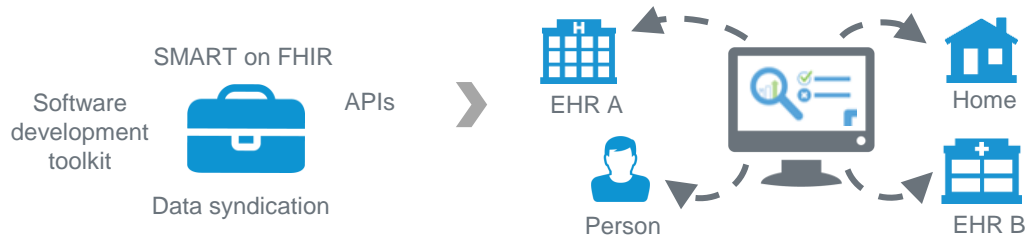
Consumer relationship management\*

*\*Future planned solutions.*

## Access record and plan anywhere, anytime



## Create ecosystem of innovation



# Standardize - proprietary code standardization

- Match proprietary data to standard clinical terminology codes
- Allows data to be recognized and utilized in algorithms and reporting
- Clinical experts review proprietary codes and assign industry standards

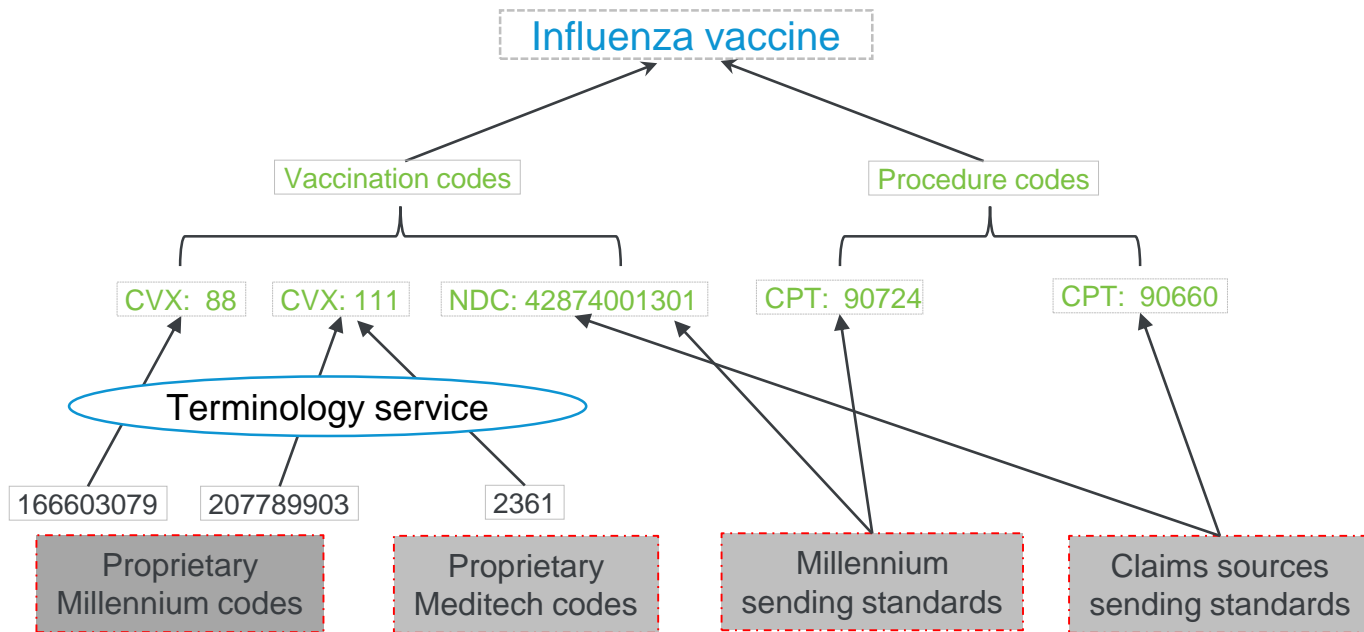


- Medical Laboratory Scientists
- Registered Nurses
- PharmDs
- Pharmacy Technicians



# Normalize - creating the concept

- Concept – a grouping of standards terminology codes that are being treated semantically equivalent
- Context – a grouping of concepts for a particular purpose



# Registries and scorecards: HealthRegistries



- Identifies a population for registries and appropriate measures
- Provides visibility to the quality measures for the provider's population and performance
- Produces client-defined, performance scorecards at specific or rollup levels
- Provides executive dashboards with drill-down capabilities

# HealthRegistries: available registries



## Cerner registries

### Chronic disease

- Atrial fibrillation
- Asthma
- COPD
- Depression
- Diabetes
- Heart failure
- Hepatitis C
- Hyperlipidemia
- Hypertension
- IVD/CAD
- Kidney disease
- Rheumatoid arthritis

### Pediatric chronic disease

- Asthma
- Cardiomyopathy
- Diabetes
- Epilepsy
- Inflammatory bowel disease

### Cancer

- Breast cancer
- Colon cancer
- Leukemia
- Prostate
- Myelodysplastic syndrome

### Acute conditions

- Ambulatory urgent care
- Back pain

### Wellness

- Adult wellness
- Adolescent wellness
- Childhood wellness
- Comprehensive adult wellness
- Maternity health
- Pediatric wellness
- Senior wellness

### UK registries

- COPD
- Pediatric Diabetes
- Adult Diabetes
- Pediatric Asthma
- Adult Asthma



## Industry registries

### ACO registries

- MSSP 2016 quality measures
- MSSP 2016 event-based quality measures

### HEDIS-based registries

- Administrative measures
- Event-based measures
- Hybrid measures

# Embedded Content to Drive Value

## Benchmarks



Hospital General Information  
Healthcare Associated Infections  
Readmissions, Complications, & Death  
Value Based Purchasing Scores  
Timely & Effective Care  
Outpatient Imaging Efficiency  
Relative Value Units  
Hospital Acquired Condition  
Heart Attack Payment Data  
Hospital ACS Measures  
Medicare Hospital Spending by Claim  
Medicare Volume  
Outpatient Procedures Volume  
Measure Dates  
HCAHPS  
Medicare Prescribing Data

## Evidence-based Algorithms\*



Potentially Preventable Events  
MS-DRG Grouper  
MDC Grouper  
Service Categorizations  
Episode Groupers  
Benchmarks



Service Categories



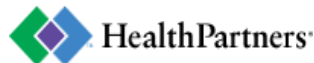
MARA Prospective risk score  
MARA Retrospective risk score



Emergency Department Visit  
Classification



HCC Suggested Diagnosis  
HCC Persistence Diagnosis  
Recommended Transition of Care  
Readmission Risk  
Sepsis Risk



TCRRV/TCOC

## Reference



Social  
Vulnerability  
Index



American  
Time Use  
Survey



Tract-Zip &  
Zip-Tract



\*Some content requires corresponding Analytics package

# 277+ *HealthIntent* data connections and counting



277+ HealthIntent<sup>SM</sup>  
data connections

# Adoption of Cerner's Population Health Platform

## DATA VARIETY



**360+**

total data connections



**24**

connected EHR systems (Epic, Allscripts, ...)



**39**

connected claims & payer vendors

## SCALABILITY



**32M+**

linked disparate records



**109 Clients**

ACOs, DSRIP, Bundles, APM, Employer



**88M Lives**

## INTELLIGENCE



**41**

registries;  
598+ measures



**95%**

of records linked  
using machine intelligence



**55**

standard terminologies;  
1.5M terminology codes grouped



# Developing HealthIntent, creating new technology

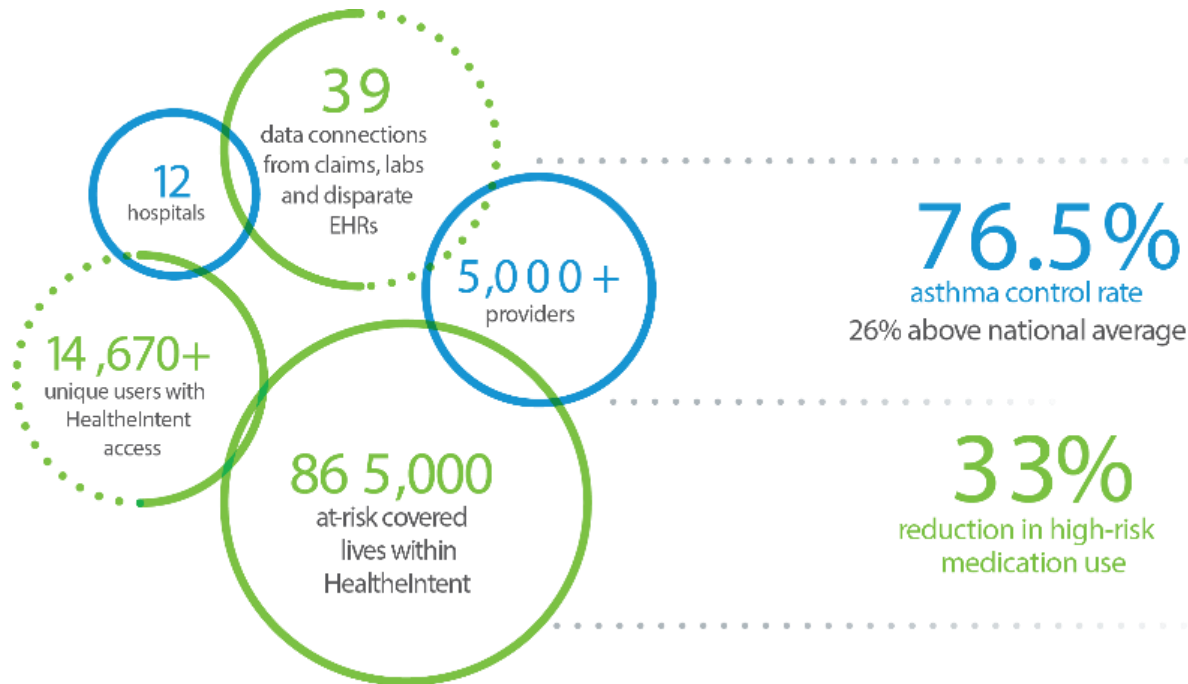
## Advocate Health Care and Advocate Physician Partners

Downer's Grove, Ill. | 3,300 beds | 4,600 physicians



### Goal

To create the technology infrastructure to enable enterprisewide change



## Understand performance related to cost, quality and utilization



Leveraged measures  
in registries



Included measures across  
seven at-risk contracts and  
payers



Created initial set of measures,  
dashboards and analytic  
experiences

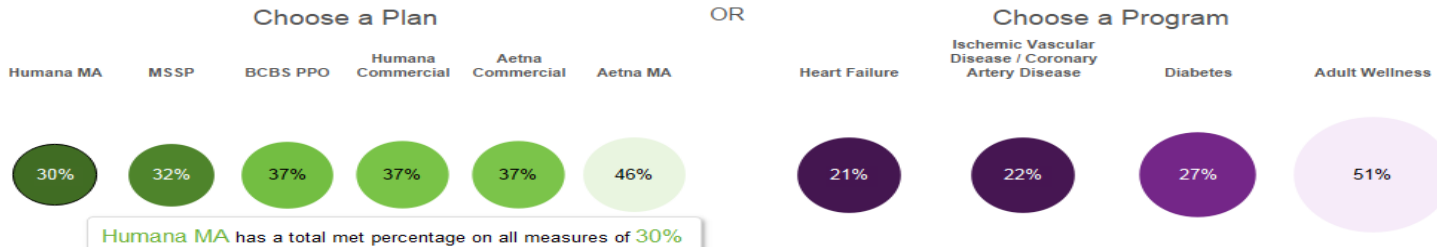
*“We never really knew how well we were performing at a population, regional, hospital, practice or provider level...and with HealthIntent we can. We now have insight that payers do not have.”*

Amanda Hammel  
Vice President, IT Operations and Population Health  
Memorial Hermann Health System

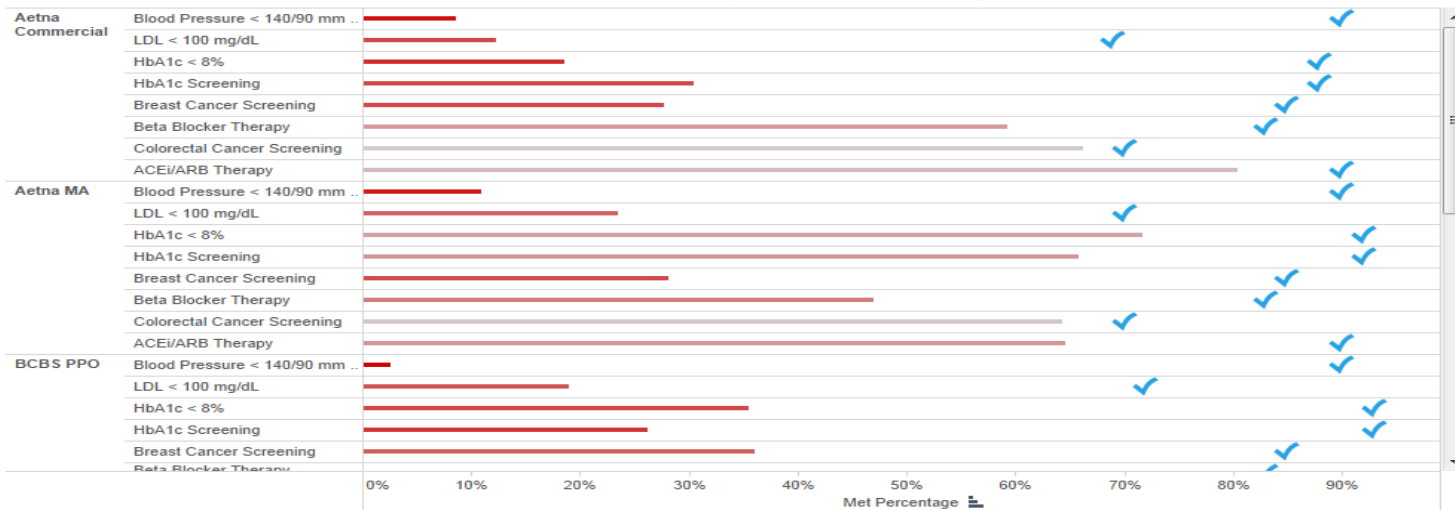
- Network leakage patterns and revenue opportunities
- Performance on value-based contracts
- Provider performance
- Post-acute network utilization

# Quality Measures

## Plan Contract Quality Measures



## Measure Met Percentage Compared to Target

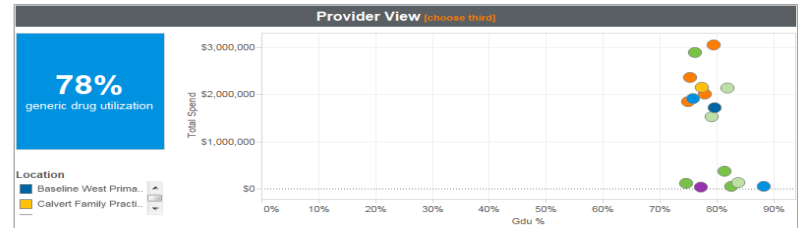
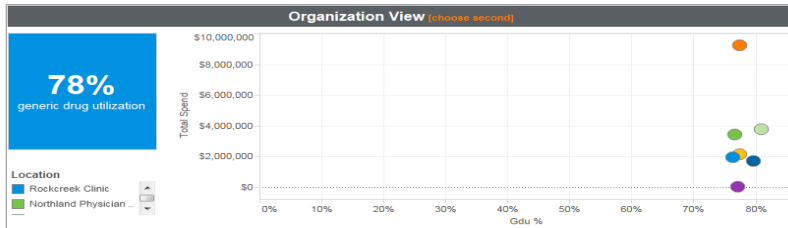
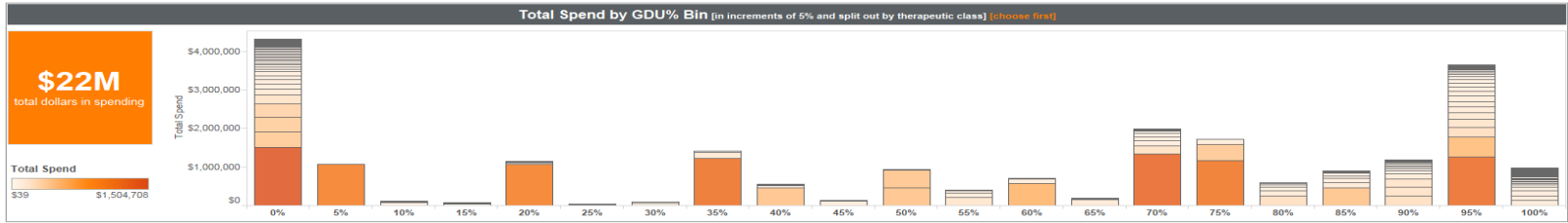


# Pharmacy



Service From Date  
11/1/2012 11/20/2013

Location  
(All)



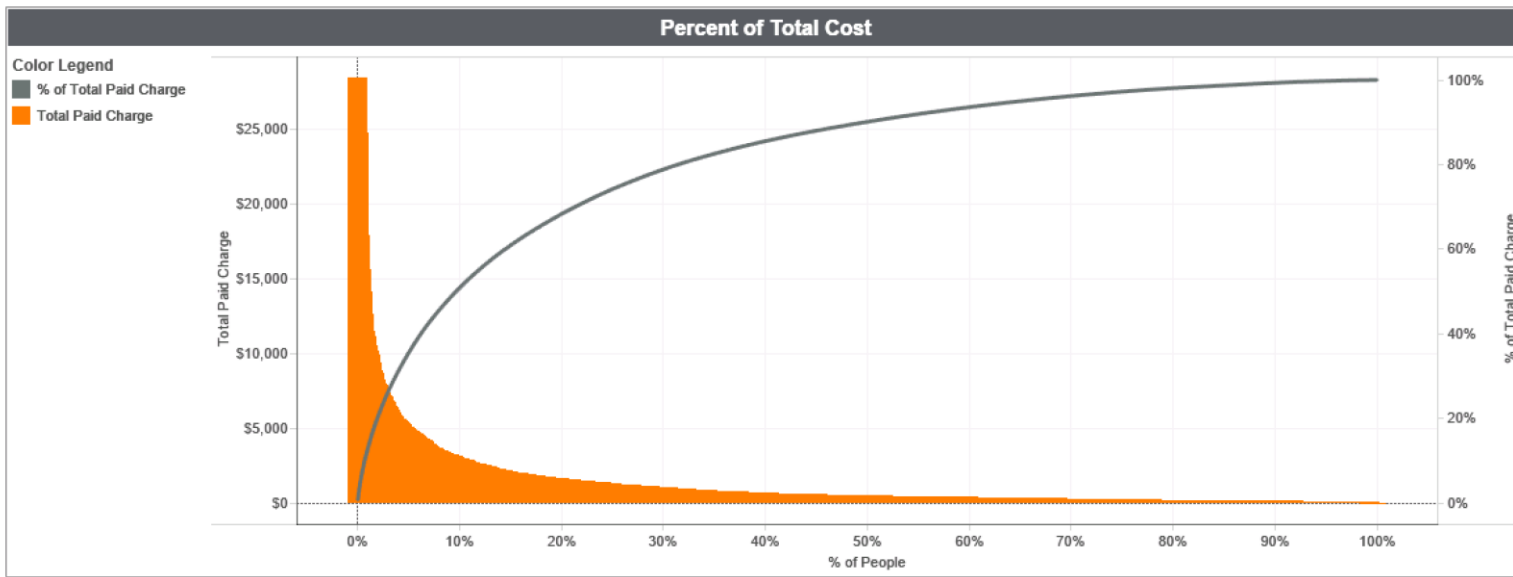
HealthAnalytics



# Avoidable Spend



<b>Visit Count Minimum</b> (Provider visual only)		<b>Service From Date Range</b>	
10	144	7/1/2015	9/30/2015
<b>Provider Name</b>		<b>Admitted?</b>	
(All)		(All)	



# C. diff Reporting

- Visibility to patients with a C. diff results, their antibiotics, and location at the time of the lab
- Through use of EDW Tools, visualizations were turned around within 1 week

HealthAnalytics Projects Data Models Data Sets Queries Andrew McShane

< Back CDIFF\_RESULTS Actions

Details

Mnemonic: CDIFF\_RESULTS  
Description: CDIFF Results  
Data Set Type: Uploaded File  
Schedule: None  
Owner: Andrew McShane  
Load Strategy: Replace

History

Run Time	User	Status
6 days ago	Andrew McShane	Succeeded

Data Preview

empl_id	gender_display	birth_date	nurse_unit	begin_dt_tm	end_dt_tm	e_id
00177ea-43c6-45e2-a0c1-6cad31d2d27	F	7/28/1926	EMT1 - EMT Registration Clinic	2010-09-04T21:45:22.000-05:00	2010-09-24T22:59:59.000-05:00	23551
00662942-9b0-4dab-8813-a4b94ee57e71	M	12/7/1930	17S1 - MICU	2015-04-05T05:24:52.000-05:00	2015-04-19T17:55:11.000-05:00	10086
007d804-8274-44d5-b0e2-8ec1192e2b22	Male	5/4/1943	16N - Medicine	2013-06-20T22:31:45.000-05:00	2013-06-24T16:59:00.000-05:00	10086
008edc1e-586d-4b87-a33c-4044a038e472	Female	8/19/1927	12S1 - Medicine	2011-04-11T00:14:18.000-05:00	2011-04-17T02:02:00.000-05:00	10052
00bbee69-ce4e-4f6a-9d80-0aaba4787869	F	12/29/1923	Cardiology-Hauppaugue	2014-12-01T13:17:29.000-06:00	2015-06-15T12:17:05.000-05:00	10082
00bbee69-ce4e-4f6a-9d80-0aaba4787869	Female	12/29/1923	Cardiology-Hauppaugue	2014-12-01T13:17:29.000-06:00	2015-06-15T12:17:05.000-05:00	10082
00af5b90-f129-4e4e-bc91-7edc1dc44773	M	6/27/1948	MODK - OncHematology	2011-06-15T08:58:20.000-05:00	2012-01-04T09:52:00.000-06:00	10056
00af5b90-f129-4e4e-bc91-7edc1dc44773	Male	6/27/1948	MODK - OncHematology	2011-06-15T08:58:20.000-05:00	2012-01-04T09:52:00.000-06:00	10056
00af5b90-f129-4e4e-bc91-7edc1dc44773	Male	6/27/1948	MODK - OncHematology	2011-11-30T11:15:10.000-06:00	2012-01-08T11:32:00.000-06:00	10056

HealthAnalytics Projects Data Models Data Sets Queries Andrew McShane

< Back C Diff Use Case Actions

Details

Description: C Diff Results with Medication  
Publish Status: Published  
Owner: Andrew McShane

Publications

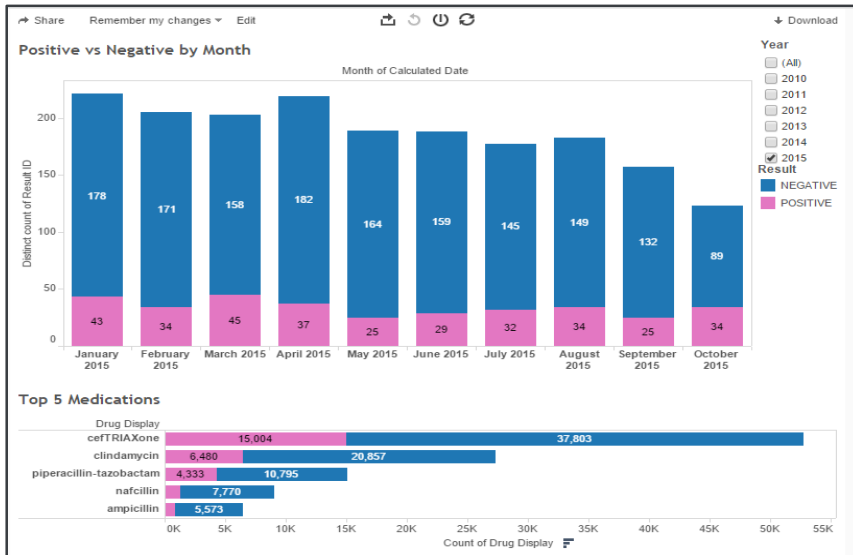
Time	User	Status
6 days ago	Andrew McShane	Published
6 days ago	Andrew McShane	Published

Data Sets

- C Diff PCR Results [ CDIFF\_RESULTS ]
- Medications [ CDIFF\_MEDICATION ]

BusinessObjects / Tableau

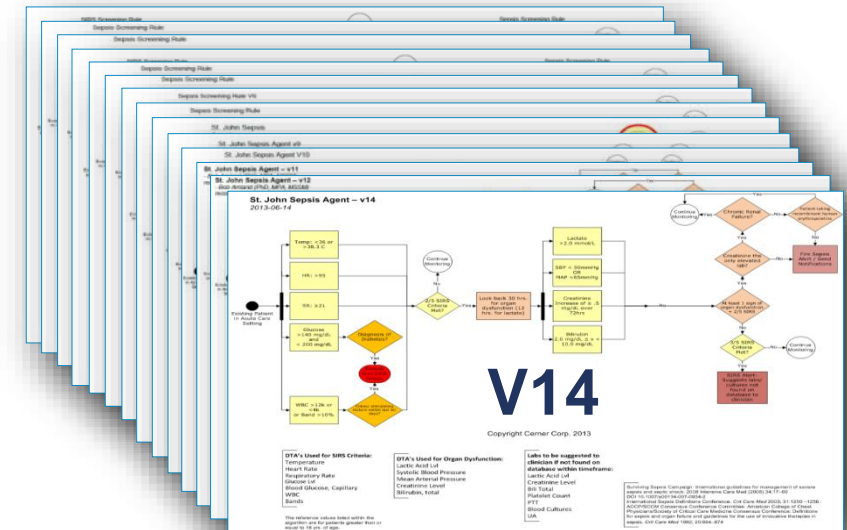
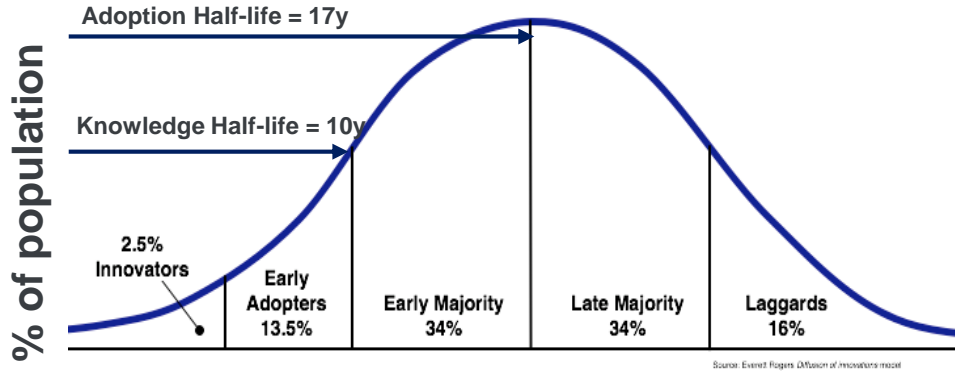
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# Moving from 17 years half life of adoption to 17 months

From time new knowledge discovered until 1/2 of physicians act on that knowledge = 15 - 17 years

From taking existing evidence, discovering new knowledge to broad adoption in 17 months



Cerner sepsis management continuously monitors 1M+ lives per day across 500+ hospitals

*“Finish medical school and residency knowing everything...read and retain 2 articles every single night...at the end of 1 year you’re only 1,225 years behind.”*

W Stead. JAMIA 2005;12:113-20  
Alper BS, Hand JA, Elliott SG, et al. J Med Lib Assoc 2004;92:429-37





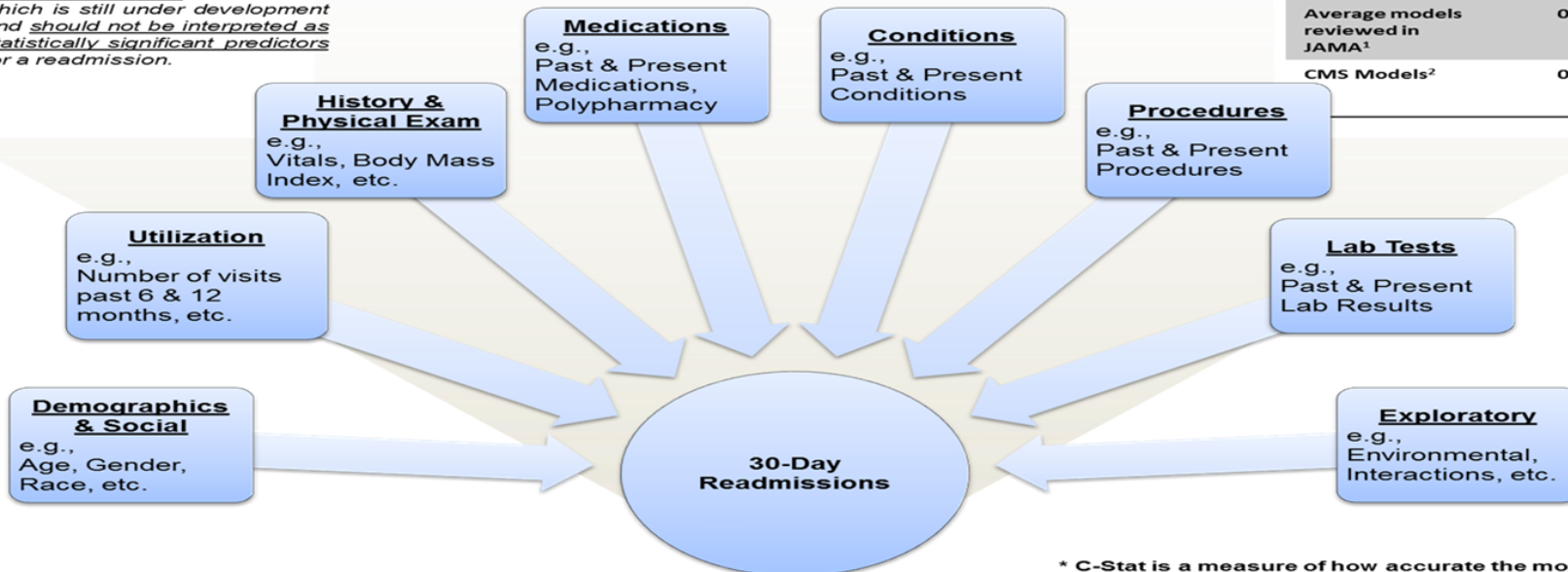


# Advanced Algorithm to Prevent Readmissions



**Readmission Risk Factors Analyzed > 700**

Please Note: The examples provided are intended to show a representation of the many variables analyzed in the model which is still under development and should not be interpreted as statistically significant predictors for a readmission.



Prediction Models	0-30 Day C-Stats*
<b>Early ACC Model</b>	<b>0.78</b>
Previous Model	0.69
Average models reviewed in JAMA <sup>1</sup>	0.66
CMS Models <sup>2</sup>	0.66

\* C-Stat is a measure of how accurate the model is

<sup>1</sup> Kansagra, et al., 2011. Risk prediction models for hospital readmission: a systematic review. JAMA

<sup>2</sup> Hospital-Wide All-Cause Unplanned Readmission Measure (HWR). Average c-statistic across specialty cohorts. NQF #1789

# What **Makes** Us Healthy



**10%**  
ACCESS  
TO CARE



**20%**  
GENETICS



**20%**  
ENVIRONMENT



**50%**  
HEALTHY  
BEHAVIORS

# What We **Spend** On Being Healthy



**4%**  
HEALTHY  
BEHAVIORS



**8%**  
OTHER



**88%**  
MEDICAL  
SERVICES

Thank You!

