

# What's with All the Metrics? Unified Quality Symposium: Types of Data, Measures

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# Outline and Objectives

When finished with this exercise, you should be able to:

- Describe the evolution of the medical record and what clinical documentation represents in healthcare today
- Understand the difference between administrative/claims and clinical data
- Recognize the importance of data registries to an integrated health system delivering population health



# Who Are We?

## Dave Michael, MD

- Chief Medical Information Officer, Vidant Health

## Joseph Pye, MD

- Vice President of Medical Affairs, Region, Vidant Health

- No financial disclosures



# Quiz

- If we didn't have to record patient care encounter details, would we?
- If there were no rules, what information would you record?
- Why do we have to record the data?
- What would you do with it?



# Perspectives of Healthcare Data

5/22/29 (M) 136#  
 150/80 No edema - Cortsam  
 Abdomen 7/82 - Lungs clear / Diarrhea 160/125/100  
 30x2  
 B.P. 4 weigh 158/85 7/82 Abdomen 127# 4-2-02  
 Lungs clear No edema - Cortsam  
 S.P. 140/84 7/82 Domy with 130# 5-1-02  
 No edema - Walcontsam  
 Tick - 142/86 Painful 133# 7-12-02  
 Legs after walking - in evening  
 Heel pain warm + legs pulse felt  
 better  
 1) Fry Ultracet + Opioid  
 2) Rivastigmine



ICD-9-CM	ICD-10	ICD-9-CM	ICD-10	ICD-9-CM	ICD-10
33000	I33.0	33000	I33.0	33000	I33.0
33001	I33.1	33001	I33.1	33001	I33.1
33002	I33.2	33002	I33.2	33002	I33.2
33003	I33.3	33003	I33.3	33003	I33.3
33004	I33.4	33004	I33.4	33004	I33.4
33005	I33.5	33005	I33.5	33005	I33.5
33006	I33.6	33006	I33.6	33006	I33.6
33007	I33.7	33007	I33.7	33007	I33.7
33008	I33.8	33008	I33.8	33008	I33.8
33009	I33.9	33009	I33.9	33009	I33.9
33010	I33.99	33010	I33.99	33010	I33.99
33011	I34.0	33011	I34.0	33011	I34.0
33012	I34.1	33012	I34.1	33012	I34.1
33013	I34.2	33013	I34.2	33013	I34.2
33014	I34.3	33014	I34.3	33014	I34.3
33015	I34.4	33015	I34.4	33015	I34.4
33016	I34.5	33016	I34.5	33016	I34.5
33017	I34.6	33017	I34.6	33017	I34.6
33018	I34.7	33018	I34.7	33018	I34.7
33019	I34.8	33019	I34.8	33019	I34.8
33020	I34.9	33020	I34.9	33020	I34.9
33021	I34.99	33021	I34.99	33021	I34.99
33022	I35.0	33022	I35.0	33022	I35.0
33023	I35.1	33023	I35.1	33023	I35.1
33024	I35.2	33024	I35.2	33024	I35.2
33025	I35.3	33025	I35.3	33025	I35.3
33026	I35.4	33026	I35.4	33026	I35.4
33027	I35.5	33027	I35.5	33027	I35.5
33028	I35.6	33028	I35.6	33028	I35.6
33029	I35.7	33029	I35.7	33029	I35.7
33030	I35.8	33030	I35.8	33030	I35.8
33031	I35.9	33031	I35.9	33031	I35.9
33032	I35.99	33032	I35.99	33032	I35.99
33033	I36.0	33033	I36.0	33033	I36.0
33034	I36.1	33034	I36.1	33034	I36.1
33035	I36.2	33035	I36.2	33035	I36.2
33036	I36.3	33036	I36.3	33036	I36.3
33037	I36.4	33037	I36.4	33037	I36.4
33038	I36.5	33038	I36.5	33038	I36.5
33039	I36.6	33039	I36.6	33039	I36.6
33040	I36.7	33040	I36.7	33040	I36.7
33041	I36.8	33041	I36.8	33041	I36.8
33042	I36.9	33042	I36.9	33042	I36.9
33043	I36.99	33043	I36.99	33043	I36.99
33044	I37.0	33044	I37.0	33044	I37.0
33045	I37.1	33045	I37.1	33045	I37.1
33046	I37.2	33046	I37.2	33046	I37.2
33047	I37.3	33047	I37.3	33047	I37.3
33048	I37.4	33048	I37.4	33048	I37.4
33049	I37.5	33049	I37.5	33049	I37.5
33050	I37.6	33050	I37.6	33050	I37.6
33051	I37.7	33051	I37.7	33051	I37.7
33052	I37.8	33052	I37.8	33052	I37.8
33053	I37.9	33053	I37.9	33053	I37.9
33054	I37.99	33054	I37.99	33054	I37.99
33055	I38.0	33055	I38.0	33055	I38.0
33056	I38.1	33056	I38.1	33056	I38.1
33057	I38.2	33057	I38.2	33057	I38.2
33058	I38.3	33058	I38.3	33058	I38.3
33059	I38.4	33059	I38.4	33059	I38.4
33060	I38.5	33060	I38.5	33060	I38.5
33061	I38.6	33061	I38.6	33061	I38.6
33062	I38.7	33062	I38.7	33062	I38.7
33063	I38.8	33063	I38.8	33063	I38.8
33064	I38.9	33064	I38.9	33064	I38.9
33065	I38.99	33065	I38.99	33065	I38.99
33066	I39.0	33066	I39.0	33066	I39.0
33067	I39.1	33067	I39.1	33067	I39.1
33068	I39.2	33068	I39.2	33068	I39.2
33069	I39.3	33069	I39.3	33069	I39.3
33070	I39.4	33070	I39.4	33070	I39.4
33071	I39.5	33071	I39.5	33071	I39.5
33072	I39.6	33072	I39.6	33072	I39.6
33073	I39.7	33073	I39.7	33073	I39.7
33074	I39.8	33074	I39.8	33074	I39.8
33075	I39.9	33075	I39.9	33075	I39.9
33076	I39.99	33076	I39.99	33076	I39.99
33077	I40.0	33077	I40.0	33077	I40.0
33078	I40.1	33078	I40.1	33078	I40.1
33079	I40.2	33079	I40.2	33079	I40.2
33080	I40.3	33080	I40.3	33080	I40.3
33081	I40.4	33081	I40.4	33081	I40.4
33082	I40.5	33082	I40.5	33082	I40.5
33083	I40.6	33083	I40.6	33083	I40.6
33084	I40.7	33084	I40.7	33084	I40.7
33085	I40.8	33085	I40.8	33085	I40.8
33086	I40.9	33086	I40.9	33086	I40.9
33087	I40.99	33087	I40.99	33087	I40.99
33088	I41.0	33088	I41.0	33088	I41.0
33089	I41.1	33089	I41.1	33089	I41.1
33090	I41.2	33090	I41.2	33090	I41.2
33091	I41.3	33091	I41.3	33091	I41.3
33092	I41.4	33092	I41.4	33092	I41.4
33093	I41.5	33093	I41.5	33093	I41.5
33094	I41.6	33094	I41.6	33094	I41.6
33095	I41.7	33095	I41.7	33095	I41.7
33096	I41.8	33096	I41.8	33096	I41.8
33097	I41.9	33097	I41.9	33097	I41.9
33098	I41.99	33098	I41.99	33098	I41.99
33099	I42.0	33099	I42.0	33099	I42.0
33100	I42.1	33100	I42.1	33100	I42.1
33101	I42.2	33101	I42.2	33101	I42.2
33102	I42.3	33102	I42.3	33102	I42.3
33103	I42.4	33103	I42.4	33103	I42.4
33104	I42.5	33104	I42.5	33104	I42.5
33105	I42.6	33105	I42.6	33105	I42.6
33106	I42.7	33106	I42.7	33106	I42.7
33107	I42.8	33107	I42.8	33107	I42.8
33108	I42.9	33108	I42.9	33108	I42.9
33109	I42.99	33109	I42.99	33109	I42.99
33110	I43.0	33110	I43.0	33110	I43.0
33111	I43.1	33111	I43.1	33111	I43.1
33112	I43.2	33112	I43.2	33112	I43.2
33113	I43.3	33113	I43.3	33113	I43.3
33114	I43.4	33114	I43.4	33114	I43.4
33115	I43.5	33115	I43.5	33115	I43.5
33116	I43.6	33116	I43.6	33116	I43.6
33117	I43.7	33117	I43.7	33117	I43.7
33118	I43.8	33118	I43.8	33118	I43.8
33119	I43.9	33119	I43.9	33119	I43.9
33120	I43.99	33120	I43.99	33120	I43.99
33121	I44.0	33121	I44.0	33121	I44.0
33122	I44.1	33122	I44.1	33122	I44.1
33123	I44.2	33123	I44.2	33123	I44.2
33124	I44.3	33124	I44.3	33124	I44.3
33125	I44.4	33125	I44.4	33125	I44.4
33126	I44.5	33126	I44.5	33126	I44.5
33127	I44.6	33127	I44.6	33127	I44.6
33128	I44.7	33128	I44.7	33128	I44.7
33129	I44.8	33129	I44.8	33129	I44.8
33130	I44.9	33130	I44.9	33130	I44.9
33131	I44.99	33131	I44.99	33131	I44.99
33132	I45.0	33132	I45.0	33132	I45.0
33133	I45.1	33133	I45.1	33133	I45.1
33134	I45.2	33134	I45.2	33134	I45.2
33135	I45.3	33135	I45.3	33135	I45.3
33136	I45.4	33136	I45.4	33136	I45.4
33137	I45.5	33137	I45.5	33137	I45.5
33138	I45.6	33138	I45.6	33138	I45.6
33139	I45.7	33139	I45.7	33139	I45.7
33140	I45.8	33140	I45.8	33140	I45.8
33141	I45.9	33141	I45.9	33141	I45.9
33142	I45.99	33142	I45.99	33142	I45.99
33143	I46.0	33143	I46.0	33143	I46.0
33144	I46.1	33144	I46.1	33144	I46.1
33145	I46.2	33145	I46.2	33145	I46.2
33146	I46.3	33146	I46.3	33146	I46.3
33147	I46.4	33147	I46.4	33147	I46.4
33148	I46.5	33148	I46.5	33148	I46.5
33149	I46.6	33149	I46.6	33149	I46.6
33150	I46.7	33150	I46.7	33150	I46.7
33151	I46.8	33151	I46.8	33151	I46.8
33152	I46.9	33152	I46.9	33152	I46.9
33153	I46.99	33153	I46.99	33153	I46.99
33154	I47.0	33154	I47.0	33154	I47.0
33155	I47.1	33155	I47.1	33155	I47.1
33156	I47.2	33156	I47.2	33156	I47.2
33157	I47.3	33157	I47.3	33157	I47.3
33158	I47.4	33158	I47.4	33158	I47.4
33159	I47.5	33159	I47.5	33159	I47.5
33160	I47.6	33160	I47.6	33160	I47.6
33161	I47.7	33161	I47.7	33161	I47.7
33162	I47.8	33162	I47.8	33162	I47.8
33163	I47.9	33163	I47.9	33163	I47.9
33164	I47.99	33164	I47.99	33164	I47.99
33165	I48.0	33165	I48.0	33165	I48.0
33166	I48.1	33166	I48.1	33166	I48.1
33167	I48.2	33167	I48.2	33167	I48.2
33168	I48.3				

# A Long, Long, Time Ago...?

Aug 72 B.P. 5/22/29 M 126# 3-4-02  
B.P. 150/80 No edema - / Cort same  
Abdomen & NSR. Lung clear / Diovan 160/125TD  
30x2

B.P. & weigh 158/85 NSR Abdomen & 127# 4-2-02  
Lung clear No edema - Cort same

B.P. 140/84 NSR Doing well 130 1/2# 5-1-02  
No edema - Will cort same

Talk - 142/86 Painful 133# 7-12-02  
legs after walking - in evening -  
the legs are warm + light pulse felt  
Color pretty good 1) Try 2 Ultracet + observe  
2) Pericortin 20 + tidac 30x2



**EP & CRM**

v-15 / G / Res Libr / XYZ EP&CRM and pdf G / CLIENT / OFC / XYZ / SUPERBILLS etc.

Place of Service				

Patient Name			PT Account #	
Type	Admit Date	DOS	Referring Doc	
In-Pat				
Out-Pat				

PACEMAKER IMPLANTS		DX
Dual chamber PM implant	33208	
Bi-V PM implant	33208 + 33225	
Single chamber PM (V lead) implant	33207	
Single chamber PM (A lead) implant	33206	
PM GEN CHANGE & UPGRADES		DX
Single chamber generator change	33227	
Dual chamber generator change	33228	
Multi chamber generator change	33229	
Upgrade single chamber to dual	33214	
Upgrade any PM to BiV PM	33229 + 33225	
Generator change, new RA lead	33233 + 33206	
Generator change, new RV lead	33233 + 33207	
Generator change, new RA & RV	33233 + 33208	
Upgrade any PM to single or dual ICD and DFT	33233 + 33249-Q0 + 93641-26	
Upgrade any PM to BiV ICD and DFT	33233 + 33249-Q0 + 93641-26 + 33225	
Secondary Prevention - remove Q0 modifier (above)		
Unsuccessful LV lead - add 53 mod to 33225 (above)		
No DFT; remove 93641-26 (above)		

DEFIBRILLATOR IMPLANTS		DX
Single or dual chamber ICD implant and DFT	33249-Q0 + 93641-26	
Bi-V ICD implant and DFT	33249-Q0 + 33225 + 93641-26	
Secondary prevention - remove Q0 mod (above)		
Unsuccessful LV lead - add 53 mod to 33225 (above)		
No DFT - remove 93641-26 (above)		

DEVICE CHECKS (Hospital-based)		DX
PM- Evaluation - single chamber	93279-26	
PM- Evaluation - dual chamber	93280-26	
PM- Evaluation - multi chamber	93281-26	
PM- Interrogation (no threshold test)	93288-26	
PM- Pre- procedural re-program	93286-26	
PM- Post- procedural re-program	93286-26-59	
ICD- Evaluation - single chamber	93282-26	
ICD- Evaluation - dual chamber	93283-26	
ICD- Evaluation - multi chamber	93284-26	
ICD- Interrogation (no threshold test)	93289-26	
ICD- Pre- procedural re-program	93287-26	
ICD- Post- procedural re-program	93287-26-76	

PACEMAKER MISCELLANEOUS		DX
Temporary PM	33210	
PM Pocket relocation	33222-59	
RA/RV Lead reposition (return to OR)	33215-78	
LV Lead reposition (return to OR)	33226-78	
Remove PM lead(s) from single chmbr syst	33234	
Remove PM lead(s) from dual chmbr syst	33235	
Remove PM generator	33233	
New A or V lead - no generator	33216	
New A and V lead - no generator	33217	
New LV lead - no generator	33224	
Diag fluoroscopy (no 'lead work')	76000-26	

ICD GEN CHANGE & UPGRADES		DX
Single chamber gen change & DFT	33262-Q0 + 93641-26	
Dual chamber gen change & DFT	33263-Q0 + 93641-26	
Multi chamber gen change & DFT	33264-Q0 + 93641-26	
Upgrade dual chamber to BiV & DFT	33264-Q0 + 93641-26 + 33225	
Gen change, new RA and/or RV & DFT	33241 + 33249-Q0 + 93641-26	
Secondary prevention - remove Q0 mod (above)		
Unsuccessful LV lead - add 53 mod to 33225 (above)		
No DFT - remove 93641-26 (above)		

IMPLANTABLE LOOP RECORDER		DX
Implant	33282	
Removal	33284	

DEFIBRILLATOR MISCELLANEOUS		DX
Temporary PM	33210	
ICD - Pocket relocation	33223-59	
RA/RV Lead reposition (ret to OR)	33215-78	
LV Lead reposition (ret to OR)	33226-78	
ICD - Remove lead(s)	33244	
ICD - Remove generator	33241	
New A or V lead - no generator	33216	
New A and V lead - no generator	33217	
New LV Lead - no generator	33224	
DFT subsequent day to implant	93642-26	
Diag fluoroscopy (no 'lead work')	76000-26	

CARDIOVERSION		DX
External	92960	
Internal	92961	

OTHER		DX
Treadmill stress test: Supervision	93016	
Treadmill stress test: Report	93018	
Tilt table	93660-26	
Echocardiogram	93306-26	
Limited Echocardiogram	93308	
Transesophageal echo	93312-26, 93320-26, 93325-26	
Pericardiocentesis	33010	
Follow-up EP study to test therapy	93624-26	
NIPS	93724-26	
Ultrasound guided access w/ permanent recording	76937-26	
A-Line for Monitoring	36620-59	

Ablation(s)	DX	Add'l Discreet Mechanism	Infusion Followed by Induction	LA Pace and Record	LV Pace and Record	2-D Mapping	3-D Mapping	ICE	Trans-Septal Puncture
AV Node	93650	-	-	-	-	-	-	-	-
SVT (includes EPS)	93653	93655 (non-AF)	93623-26-59	93621-26	93622-26	93609-26	93613	93662-26	93462
A-FIB by PVI (includes EPS)	Initial = 93656 Add'l = 93657	93655 (non-AF)	93623-26-59	-	93622-26	93609-26	93613	93662-26	-
VT (includes EPS)	93654	93655 (non-AF)	93623-26-59	93621-26	-	-	-	93662-26	93462
EP Study	w/ Induction = 93620-26								
	w/out Induction = 93619-26		93623-26-59	92621-26	93622-26	93609-26	93613	93662-26	93462
	Limited Study = 93620-26-52								

OTHER SERVICES / PROCEDURES (or notes to billers)	

DX Item	DIAGNOSIS CODE (ICD-9) (see diagnosis sheet on reverse side)
A	
B	
C	
D	
E	

Provider																				
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# How Insurers Get Their Data (Hint: From Us)

- Every invoice (claim) submitted to an insurance company is attached to a diagnosis code, presenting a “complete” view of a patient’s medical picture
  - Pharmacy refills
  - Lab and radiology tests
  - Physician office visits
  - Medical procedures
  - Inpatient admissions
  - Emergency Department and Urgent Care visits
- MIB – Medical Insurance Bureau, Inc.
  - Consumer reporting agency comprised of 750+ member companies, accounting for 99% of all life insurance policies and 80% of all health insurance policies in the USA and Canada<sup>1</sup>
  - All diagnosis codes are submitted and pooled for access by private membership
  - Founded in 1890 to “ensure the livelihood of their businesses, the solvency of the insurance industry, and the fair and equitable pricing of policies.”<sup>2</sup>

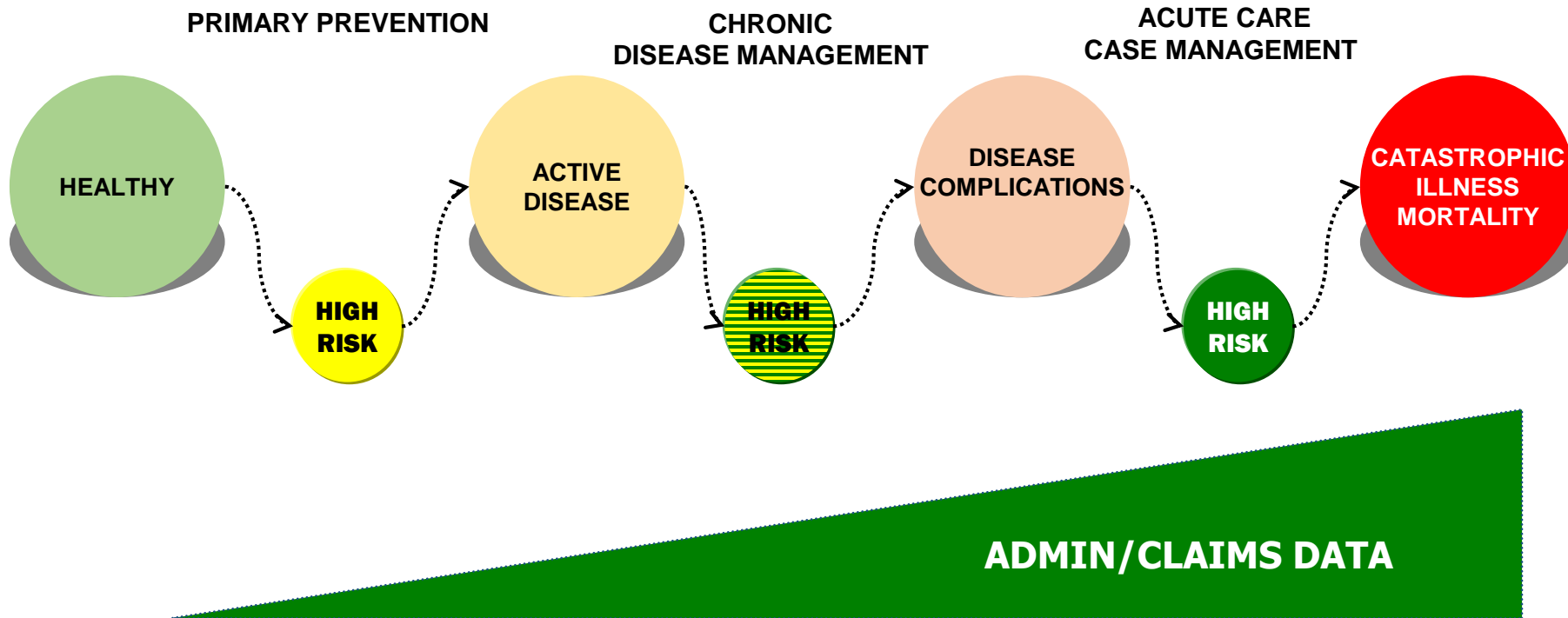


<sup>1</sup><https://www.ftc.gov/news-events/press-releases/1995/06/medical-information-bureau>

<sup>2</sup><http://www.annualmedicalreport.com/mib-inc-saves-money-for-corporations/>



# How Insurance Companies See the World



- Track and Manage Cost. Try to Predict Cost and Forecast Premiums.
  - An insurance company that can predict cost is more competitive.
  - In many ways, they know more about our patients than we do.
- Insurance premiums and therefore profitability are determined by claims data....that we provide to the insurance companies.

# Summary – What data comprise...

## **Administrative/Claims**

- Visits
- Physician
  - Name
  - Specialty
- Diagnosis
- Services billed to insurance
  - Lab type
  - Scan type
  - Prescription names, quantity
  - Procedure type

## **Clinical**

- Vital Signs
- Subjective clinical findings
- Objective clinical findings
- Problem List
- Assessment and Plan
- Lab results
- Scan impressions
- Prescription instructions
- Procedural notes



# A Case Example

John	Bill	Fred
45yo	45yo	45yo
Male	Male	Male
Uncontrolled Diabetes	Uncontrolled Diabetes	Uncontrolled Diabetes

Who is most at risk?



# Group A: Insurance (Claims) Data

	John	Bill	Fred
Age	45	45	45
Gender	M	M	M
Primary Dx	Uncontrolled Diabetes	Uncontrolled Diabetes	Uncontrolled Diabetes
# A1c readings in past year	3	1	2
Prescriptions	Metformin	Lantus, Humalog, Metformin	Metformin, Januvia
Care Visits in last year	PCP x2, Endo x1	ED x2, PCP x4	PCP x1, ED x1



# Group B: Physician (Clinical) Data

	John	Bill	Fred
Most recent A1c Value	10.00	6.70	8.3
Prior A1c Value	8	13	8.35
Creatinine Value	2.5	0.9	1.3
Problem List	Carotid Bruit		
Notes		<ul style="list-style-type: none"><li>ED visit due to low blood sugar (improper diagnosis for visit in chart, correct diagnosis in notes)</li></ul>	

# Group C: Social Data (SDOH)

	John	Bill	Fred
Marital Status	Married	Single	Widower (recent)
Occupation	Physician	IT Analyst	Unemployed, just fired
Diet	Vegan	Vegetarian	
Access to Transportation	Owens car	Owens car	Drove work truck to appts
Personal Notes	None noted	None noted	Abnormal PHQ



# Quiz

Is the data shrinking or growing?

How do we manage this?





# Take Care of More. See Fewer.

## Primary Care & Prevention

- The average US PCP Panel is ~2,500 patients
  - A full time work year is 2080 hours
  - (<1 hour per patient per year)
- To manage chronic disease will take ~3-10 hours per day depending on level of control<sup>1</sup>
- To manage prevention per USPSTF will take 7.4 hours per day<sup>2</sup>
- Some estimates are as high as 21 hours aggregate daily

## Population Management<sup>3</sup>

- Patients receive 55% of the chronic and preventive services that they need
- There is a mismatch between PCP capacity and the work needed to be done
- Right-sizing panels to accommodate extra work and close gaps would reduce panels to less than 1,000 patients per PCP
- Healthcare costs now represent more than \$600 billion more than would be expected for a country of our size<sup>4</sup>

<sup>1</sup>Østbye T, Yarnall KS, Krause KM, Pollak KI, Gradison M, Michener JL. Is there time for management of patients with chronic diseases in primary care? Ann Fam Med. 2005;3(3):209-214.

<sup>2</sup>Kimberly S. H. Primary Care: Is There Enough Time for Prevention? American Journal of Public Health April 2003: Vol. 93, No. 4, pp. 635-641.

<sup>3</sup>Altschuler J, Margolius D, Bodenheimer T, Grumbach K. Estimating a reasonable patient panel size for primary care physicians with team-based task delegation. Ann Fam Med. 2012;10(5):396-400.

<sup>4</sup>Basel Kayyali. The big-data revolution in US health care: Accelerating value and innovation. McKinsey & Company. April 2013.



# How do We Prepare to do this in Healthcare?

- Focus on Developing Our Clinical Data<sup>1</sup>
  - Improve data accuracy and completeness
  - Increase discrete data through structured workflows
  - Focus on physician workflows which, when substantially varied, obscure efforts to reduce errors and increase efficiency
  - Simplify documentation. Burdensome documentation requirements drive physicians to use templates and copy/paste which reduces data accuracy
- Recognize the role of the EHR & Clinical Data Registries
  - The Healthcare Industry is on the verge of meaningful analytics<sup>2</sup> **Leverage the disease management and disease prevention advantages of clinical data registries in a problem-focused manner**
  - **Develop clinical data registries and integrate with claims data for a more real-time, holistic and valuable view of the patient**

<sup>1</sup><http://www.ajmc.com/journals/issue/2013/2013-1-vol19-n7/healthcares-big-data-challenge>

<sup>2</sup>Hede, K. "How Predictive Analytics are Transforming Health Care." *Hospital and Health Networks*. 7 Apr 2016. <http://www.hhnmag.com/articles/7011-predictive-analytics-is-transforming-health-care>. Accessed Jan 15, 2017.



# What is a Clinical Data Registry?

- Systematic clinical compilation of patient data
  - Usually by disease or care goal (i.e., hypertension, cancer screening)
  - Designed for a specific purpose
- Resource for patient management and quality improvement
- Support tool for physician and care team at a population level
- Engine driving clinical decision support
- Integration point of claims, clinical and patient-entered data

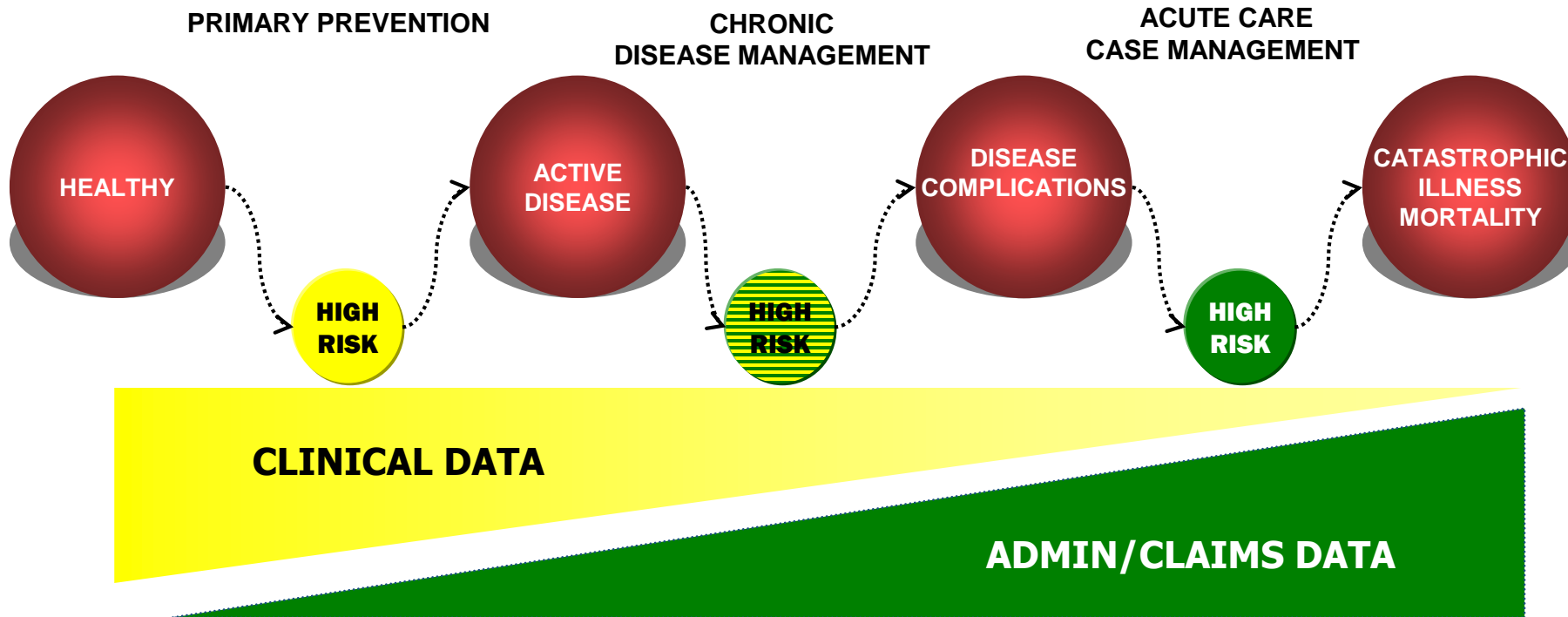


# Uses for Clinical Data Registries

- Track the course of a single disease (e.g., diabetes)
- Measure alignment of therapy with standard of care (e.g., eye exam)
- Integrate data from multiple health systems, claims and patient-entered sources into one uniform record
- Pre-fetch data for immediate availability in reports and analytical tools, dramatically reducing the time requirement for knowledge delivery
- Provide a “source of truth” to drive clinically-integrated care



# Registries: WIIFM? (Hint: Actionable Data)



- Clinical Data integrated with Claims data gives whole picture, beyond the EHR
- Population-based tools are designed for advantages over single-patient data
- Care for large numbers of patients requires enhanced speed and efficiency for planning
- Integrated tools empower clinical teams to extend physician care, all on same page

# Summary

When finished with this exercise, you should be able to:

- Describe the evolution of the medical record and what clinical documentation represents in healthcare today
- Understand the difference between administrative/claims and clinical data
- Recognize the importance of data registries to an integrated health system delivering population health



