Using New Technology to Improve Quality

Lawrence Friedman, M.D.
Professor of Pediatrics and Medicine
Associate Dean for Clinical Affairs
CEO International Clinical Programs
UC San Diego Health System

UC San Diego
HEALTH SYSTEM

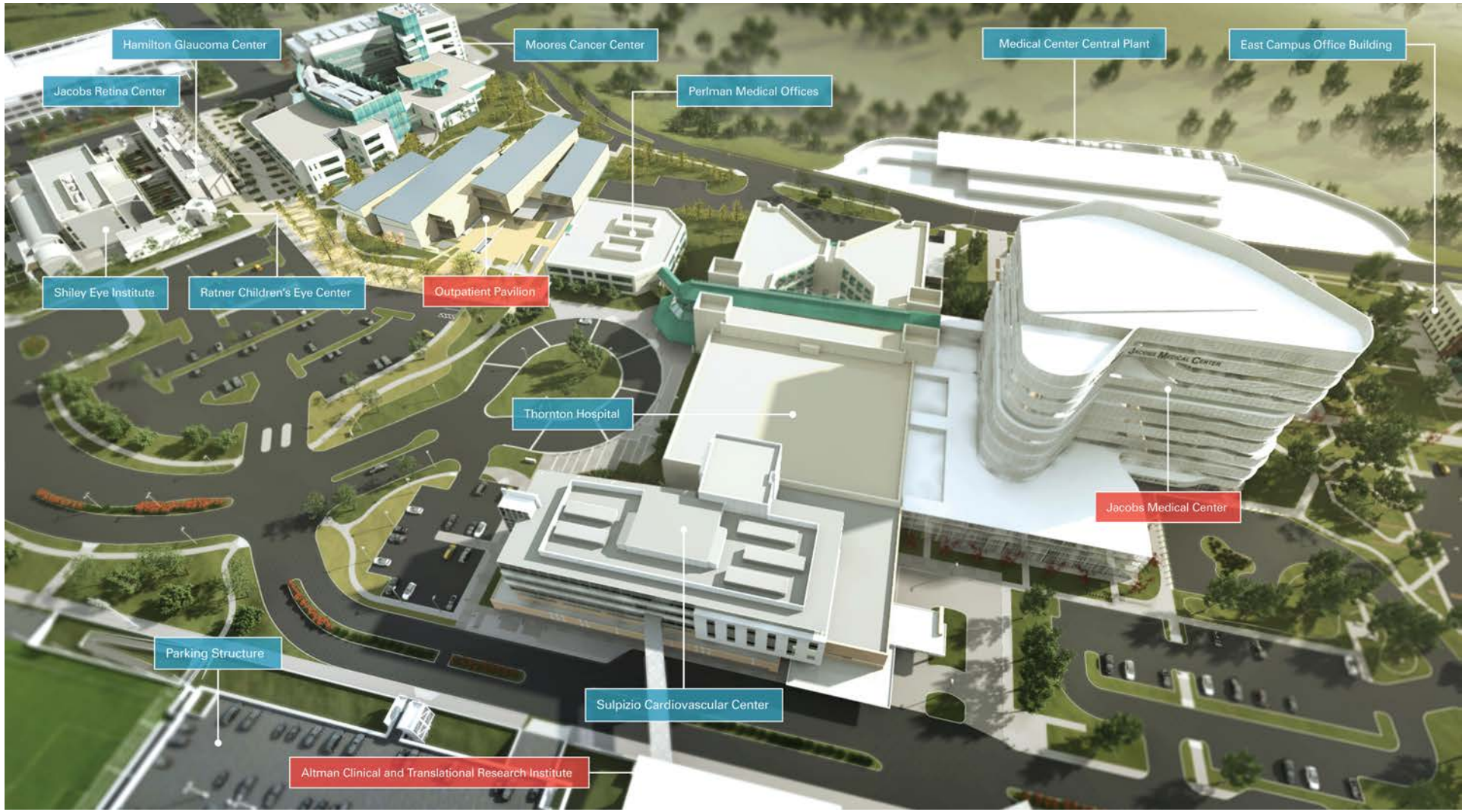
US and Peru Crossed Flags *by Vexillophile* Zazzle

UC San Diego

- Established in 1960
- Founded with a focus on engineering, technology and science
- Ranked 1st in nation for seventh year for its positive impact on the country[1]
- Ranked world's 15th best university by *U.S. News & World Report*

1. Washington Monthly's 2016 College Guide

UC San Diego Health La Jolla – 2017



UCSD Jacobs Medical Center (2016)

245 New Inpatient Beds and Outpatient Pavilion

- Hospital for Advanced Surgery
- The Pauline and Stanley Foster Hospital for Cancer Care
- Hospital for Women and Infants
- Thornton Hospital (existing)
- Sulpizio Cardiovascular Center (existing)
- Outpatient Pavilion (planning phase)

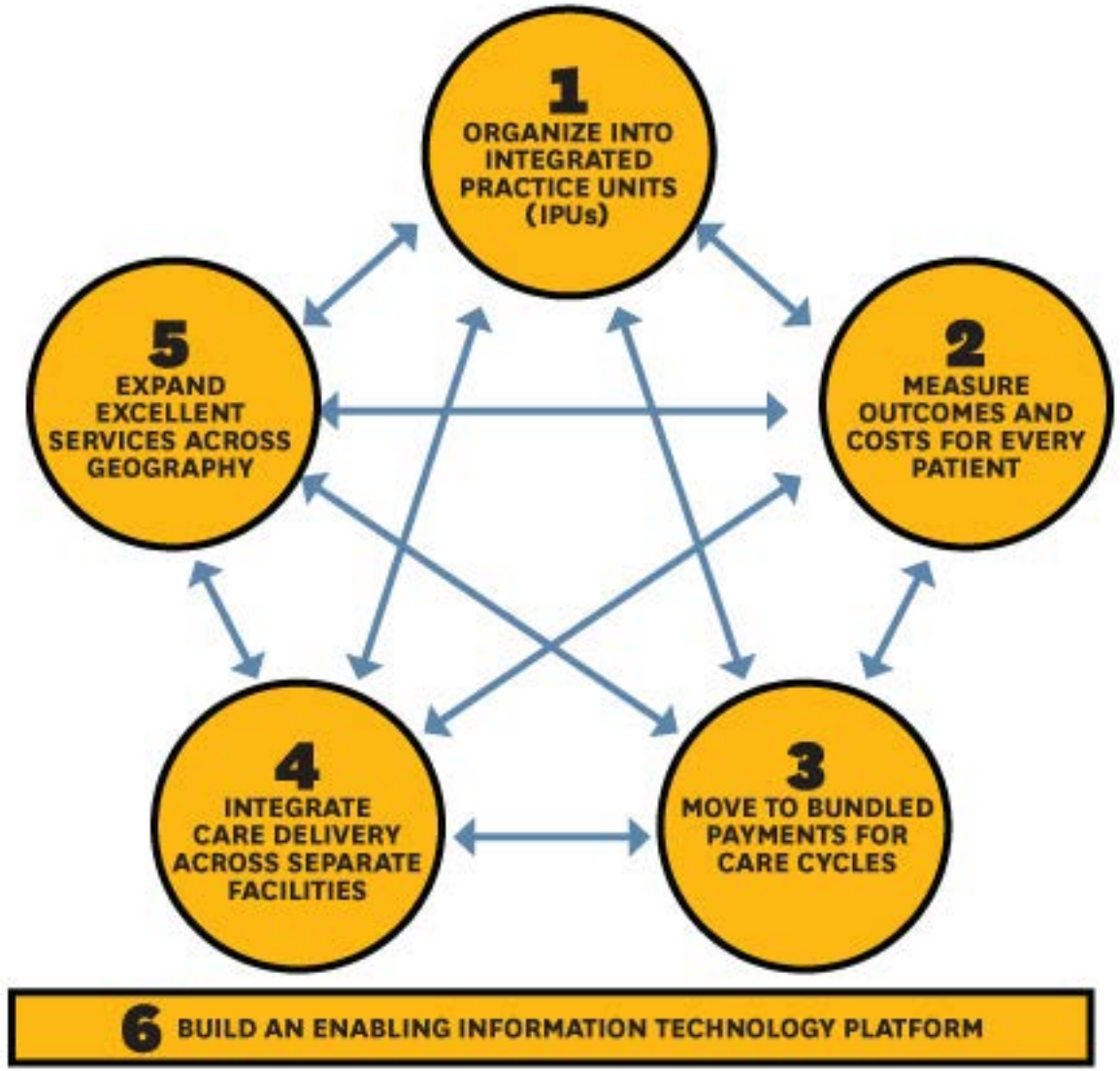
Four Major Healthcare Trends: And Technology Needed to Support Them

- Value Over Volume
- Transparency
  - National and Regional Data Bases at Individual Provider Level
- Data
  - Big Data
    - Driven by Small Data
  - Almost Universal Adoption of Electronic Health Records
- Consumerism
  - Quality Data Available on Multiple Government Websites
  - Social Media Postings

All Roads Lead to Value

THE VALUE-BASED SYSTEM

The strategic agenda for moving to a high-value delivery system has six interdependent elements.



SOURCE MICHAEL E. PORTER

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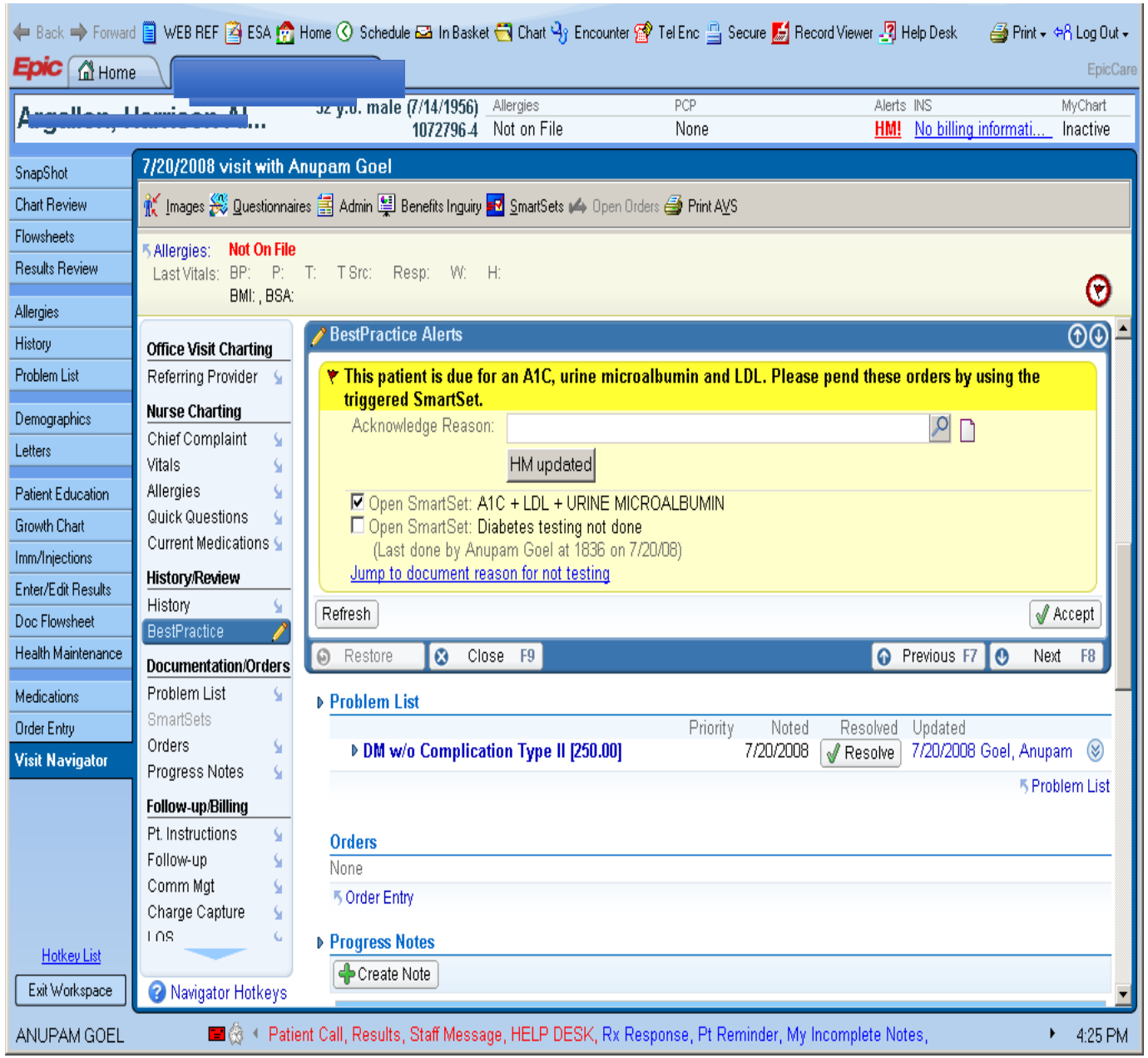
MEDICAL CENTER

Real-time feedback



Pay for Performance Scorecard August 2017

Managed Care Commercial Only

w/o 100% Pharmacy Data Measures

1.87 %

1 Month Change

		Attainment		Improvement	Aug 2016	Aug 2017				
Measure	Champion	IHA 2015 75th Percentile	IHA 2015 95th Percentile	UCSD 2015 Final Rate (%)	Last Year at This Time (%)	Current Rate (%)	Num	Denom	Score	1 Month Change
Blood Pressure: In Control (Non-Diabetic w/ HTN): Ages 18-85	Lunde	66.64	83.81	64.07	58.18	↑ 65.93	778	1180	1	
Diabetes: Blood Pressure Control (<140/90 mm Hg)**	Morn	70.94	84.09	68.06	62.69	↑ 68.58	478	697	0	
Diabetes: HbA1c Control < 8.0%		65.42	71.19	69.84	60.04	↑ 63.27	441	697	0	
Diabetes: HbA1c Poor Control > 9.0%***		22.91	15.87	10.12	10.15	↓ 28.55	199	697	0	
Diabetes: One HbA1c Test		INFO ONLY	INFO ONLY	INFO ONLY	INFO ONLY	↑ 80.63	562	697	INFO ONLY	
Diabetes: Two HbA1c Tests		67.24	83.37	63.49	90.51	↑ 32.86	229	697	0	
Diabetes: Medical Attention for Nephropathy		93.31	95.16	96.43	16.11	↑ 80.49	561	697	0	
Diabetes: Optimal Care - Combination		34.61	43.85	49.21	16.80	↑ 17.50	122	697	0	
Children With Pharyngitis: Appropriate Testing	N/A	92.59	96.27	SD	0.00	100.00 (same)	37	37	10	+10
Immunizations for Children: Combination 10*	Rosenblum	58.96	67.92	50.00	66.48	↑ 43.65	79	181	0	
Immunizations for Adolescents: Combo2 (Meni & Tdap & HPV)*		NEW	NEW	NEW	92.50	29.07 (same)	25	86	NEW	
Colorectal Cancer Screening: Ages 50-75	Nguyen	74.57	80.69	79.15	77.15	↑ 79.10	3428	4334	8	+3
Breast Cancer Screening: Ages 50-74	Wastila	85.14	89.36	86.50	82.37	↑ 81.08	1821	2246	0	
Chlamydia Screening: Ages 16-24		66.8	74.59	77.66	71.99	↑ 50.11	219	437	0	
Cervical Cancer Screening		82.51	91.19	80.77	69.71	↑ 82.33	3598	4370	2	
Cervical Cancer Overscreening***		15.23	6.98	6.98	5.65	↑ 11.30	442	3913	5	
								Acquired Points	26	
								Total Possible Points	160	
								UCSD Grade	16.25%	

SD: Small Denominator (<30)
* Population shared with pediatrics.
** Most recent lab value only.
*** Lower rate is better.
†: Rate will be inverted after IHA submission.

Note: All modifiers and overrides included in above rates and could overstate official P4P rates.
Note: Rates include unassigned patients.

UC San Diego Health

Updated 08-07--2017

Physiologic data *(JAMIA*, April 2016)

RECEIVED 31 May 2015
REVISED 29 October 2015
ACCEPTED 8 December 2015

Automated integration of continuous glucose monitor data in the electronic health record using consumer technology

RB Kumar,[1,2,*] ND Goren,[1] DE Stark,[3] DP Wall,[1] and CA Longhurst[4]

ABSTRACT

The diabetes healthcare provider plays a key role in interpreting blood glucose trends, but few institutions have successfully integrated patient home glucose data in the electronic health record (EHR). Published implementations to date have required custom interfaces, which limit widescale replication. We piloted automated integration of continuous glucose monitor data in the EHR using widely available consumer technology for 10 pediatric patients with insulin-dependent diabetes. Establishment of a passive data communication bridge via a patient's/parent's smartphone enabled automated integration and analytics of patient device data within the EHR between scheduled clinic visits. It is feasible to utilize available consumer technology to assess and triage home diabetes device data within the EHR, and to engage patients/parents and improve healthcare provider workflow.

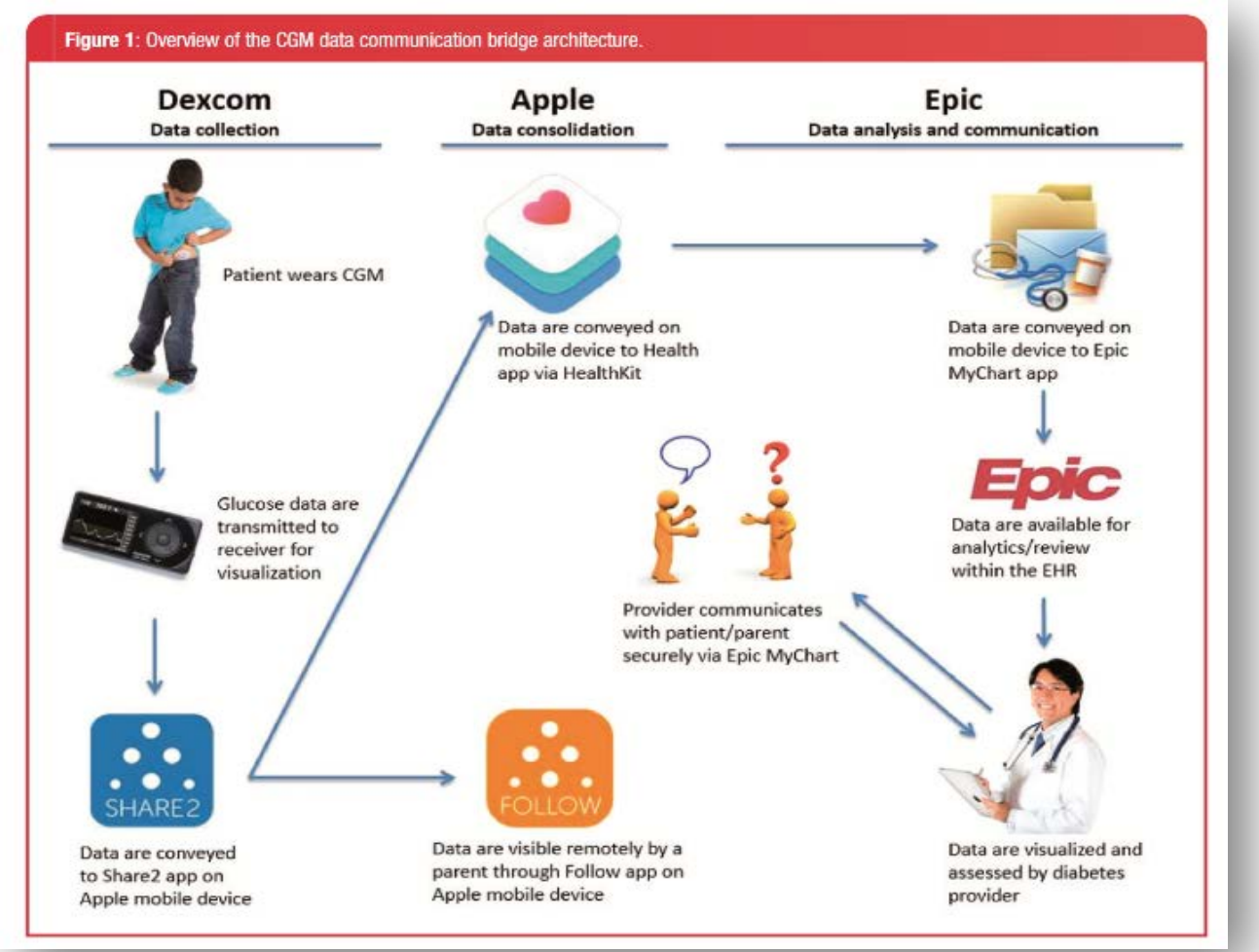
Keywords: electronic health records, patient generated health data, mobile applications, blood glucose, clinical informatics

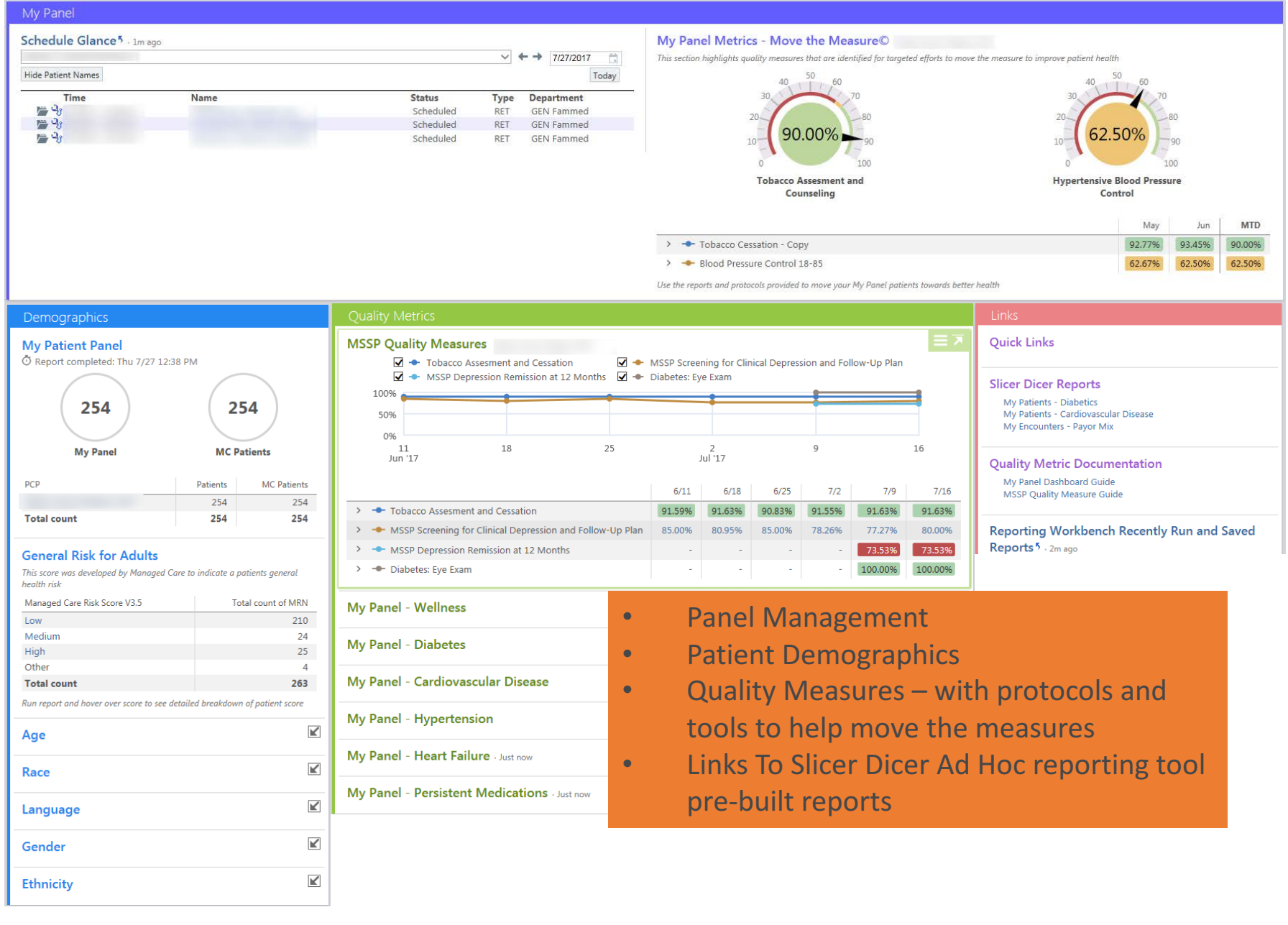
INTRODUCTION

Type 1 diabetes is one of the most common chronic diseases of childhood, and its incidence and prevalence continue to rise.[1–3] Tight control of hyperglycemia (high blood glucose) with intensive insulin therapy, including in early childhood, decreases the risk of serious long-term diabetes complications.[4–6] However, aggressive insulin dosing may result in hypoglycemia (low blood glucose) with risk of adverse changes in the central nervous system.[7,8] As a result, self-monitoring of blood glucose is critical for affected children and their parents to guide mealtime insulin dosing and to facilitate interventions

announced that its patient portal app ("MyChart") would be HealthKit compatible, our team recognized the opportunity to use this platform for integration of patient device data into the EHR.[19] Subsequently, a major continuous glucose monitor (CGM) device company (Dexcom, San Diego, CA, USA) announced compliance of its patient-facing app with the described platform, and we launched a pilot initiative to assess the feasibility of EHR integration of home-based continuous glucose monitoring. Our Institutional Review Board exempted this quality improvement initiative from oversight.

EHR Data Integration Architecture





- Panel Management
- Patient Demographics
- Quality Measures – with protocols and tools to help move the measures
- Links To Slicer Dicer Ad Hoc reporting tool pre-built reports

2017 Patient Assessment Survey (PAS) Results

2017 Scores are highlighted in yellow.

2016 Scores are highlighted in orange.

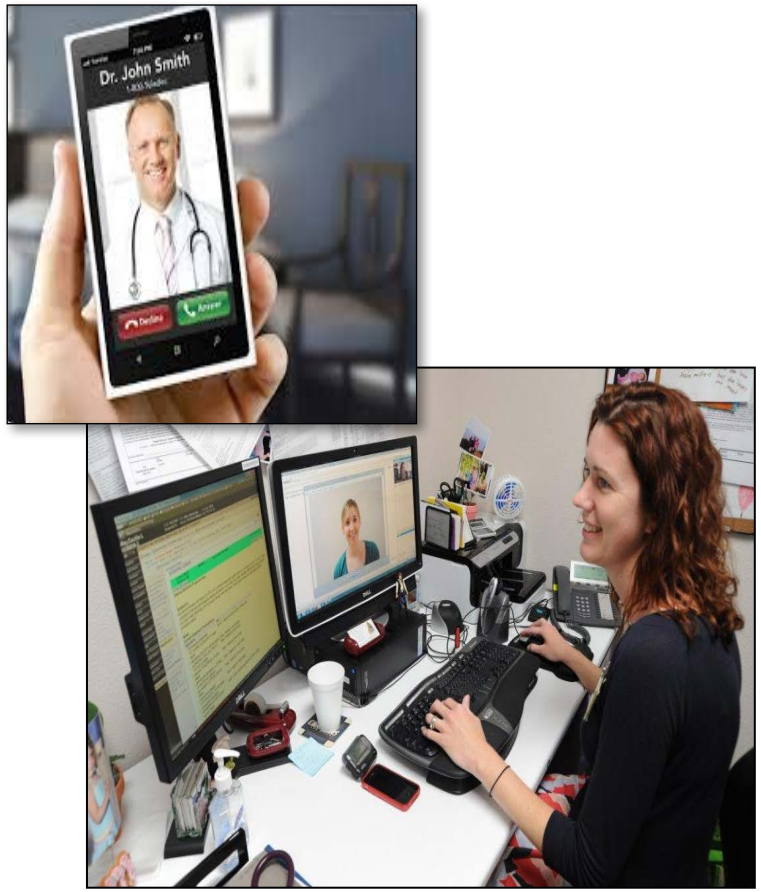
		2017 Group Scores				2016-2017 Trending^			2017 Statewide Percentiles†				
Variable	Question	Used in P4P	Number of Responses	Group Score	Statewide Percentile†	2016 Score	Absolute Change	Relative Change	10th	25th	50th	75th	90th
Ratings Composite (current year)													
Composite Score	**Q27 (combined), Q34 (combined)**	**YES**	**313**	**74.3%**	**75%**	**71.7%**	**2.6%**	**9.2%**	61.1%	65.8%	70.5%	74.3%	76.3%
Overall rating of doctor (combined)	Q27 (combined)	N/A	311	77.1%	76%	78.2%	-1.1%	-5.0%	64.5%	69.1%	72.7%	77.0%	79.3%
Overall rating of health care (combined)	Q34 (combined)	N/A	310	71.5%	71%	65.2%	6.3%	18.1%	58.1%	62.4%	67.6%	71.8%	74.4%
Provider Communication (current year)													
Composite Score	**Q14, Q15, Q17, Q18**	**YES**	**314**	**86.9%**	**94%**	**80.6%**	**6.3%**	**32.6%**	75.4%	78.4%	81.7%	84.7%	86.3%
Doctor explanations easy to understand	Q14	N/A	313	87.3%	90%	84.0%	3.2%	20.2%	76.0%	79.2%	82.3%	85.0%	87.2%
Doctor listens carefully	Q15	N/A	313	86.9%	90%	80.5%	6.4%	32.7%	75.7%	78.5%	82.4%	85.0%	86.9%
Doctor shows respect	Q17	N/A	312	90.0%	94%	84.6%	5.4%	35.1%	79.8%	81.9%	85.9%	88.1%	89.7%
Doctor spends enough time	Q18	N/A	313	83.5%	93%	73.2%	10.3%	38.5%	69.6%	73.1%	77.3%	80.8%	82.9%
Access to Care (current year)													
Composite Score	**Q6, Q8, Q10**	**YES**	**278**	**56.5%**	**25%**	**55.9%**	**0.6%**	**1.3%**	52.2%	56.5%	60.3%	64.6%	67.4%
Timely appt. for care needed right away	Q6	N/A	152	55.4%	32%	59.3%	-3.9%	-9.5%	48.6%	53.8%	58.8%	64.2%	69.3%
Timely appt. for check-up or routine care	Q8	N/A	220	55.2%	10%	55.9%	-0.8%	-1.8%	54.8%	60.0%	63.8%	67.7%	71.3%
Same day response to office hours contact	Q10	N/A	139	58.8% *	55%	52.5%	6.4%	13.4%	50.4%	54.4%	58.2%	62.2%	66.3%
Care Coordination (current year)													
Composite Score	**Q16, Q20, Q31**	**YES**	**314**	**69.0%**	**96%**	**65.4%**	**3.6%**	**10.3%**	52.8%	56.6%	61.1%	64.1%	66.7%
Doctor knows important medical history	Q16	N/A	312	81.0% *	96%	72.4%	8.6%	31.2%	67.2%	70.0%	74.3%	77.0%	79.7%
Office followed up on test results	Q20	N/A	228	72.5%	90%	71.9%	0.6%	2.0%	55.1%	60.0%	64.8%	69.3%	72.5%
Discussed all Rx medicines	Q29	N/A	274	55.1%	79%	52.4%	2.6%	5.6%	42.2%	45.2%	49.5%	54.1%	57.6%
Doctor informed about other care	Q31	N/A	228	67.3%	98%	64.9%	2.4%	6.8%	43.7%	48.6%	54.4%	59.3%	62.8%

Reporting Year 2017, Measurement Year 2016


Rx Medical Report
Pulse
65
Checked
01011001
01100101
O2
2016 → 2017 → 2018 →

Patient Experience

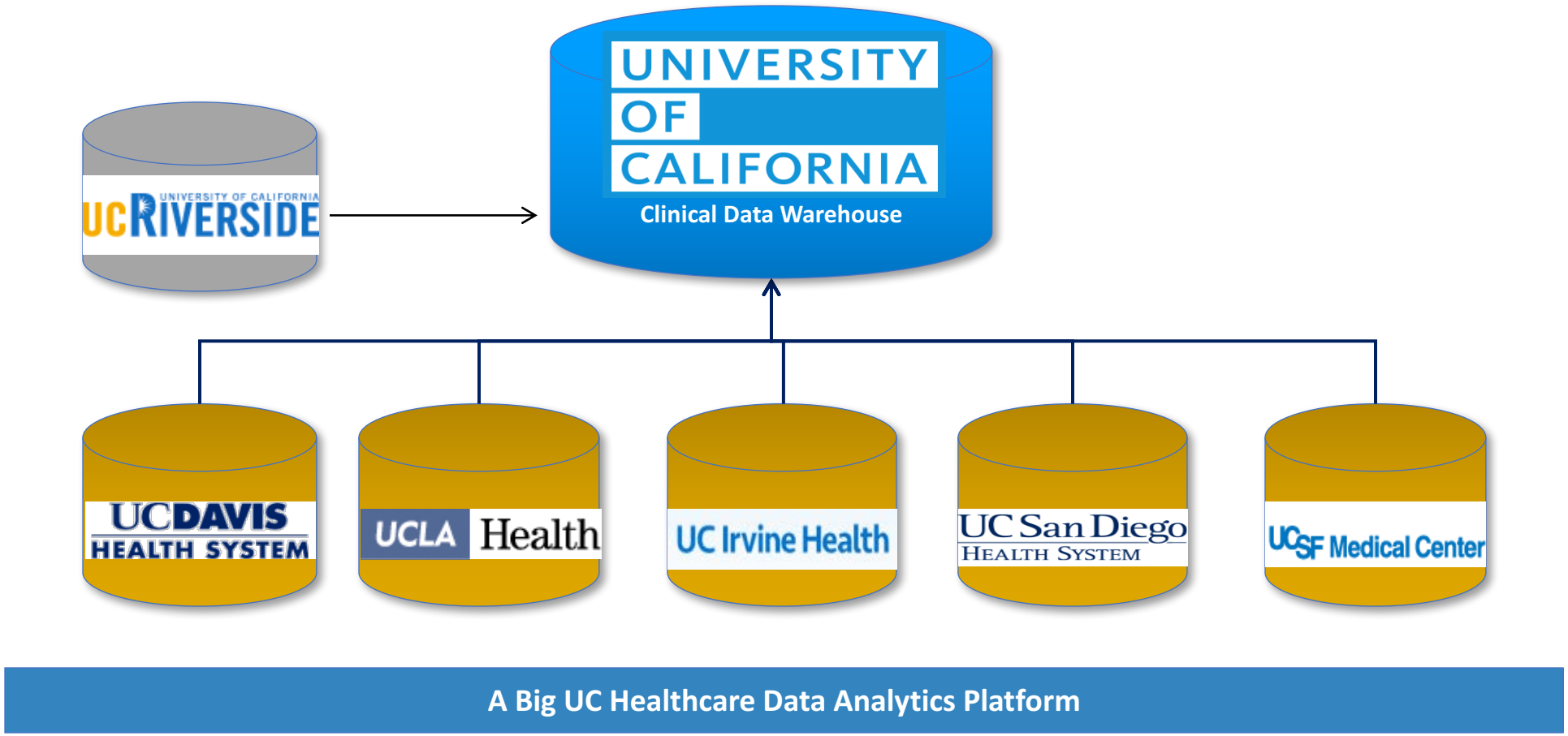
Office / Home Telemedicine Services



TELEMEDICINE SERVICES TO HOME OR OFFICE

- **Access to trusted physicians in your network**
  - Secure and private office visits and consultations with your network of providers
- **Mobile monitoring of health status**
  - Blood pressure and vital signs
- **Real-time feedback**
  - Online video and voice physician/patient communication
- **Health Maintenance Updates**
  - Real-time medication management
  - Upcoming or overdue health screenings
- **Online management of chronic conditions**
  - Diabetes, cardiovascular disease, and other chronic conditions monitored through routine online evaluations between visits

Combining healthcare data from across the six UC medical schools and systems

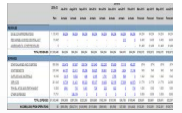
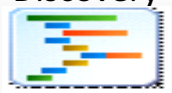
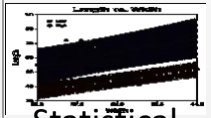
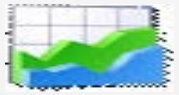


A Big UC Healthcare Data Analytics Platform

Bringing UC's clinical data together creates an asset with few (if any) peers

UC Big Health Data Governance

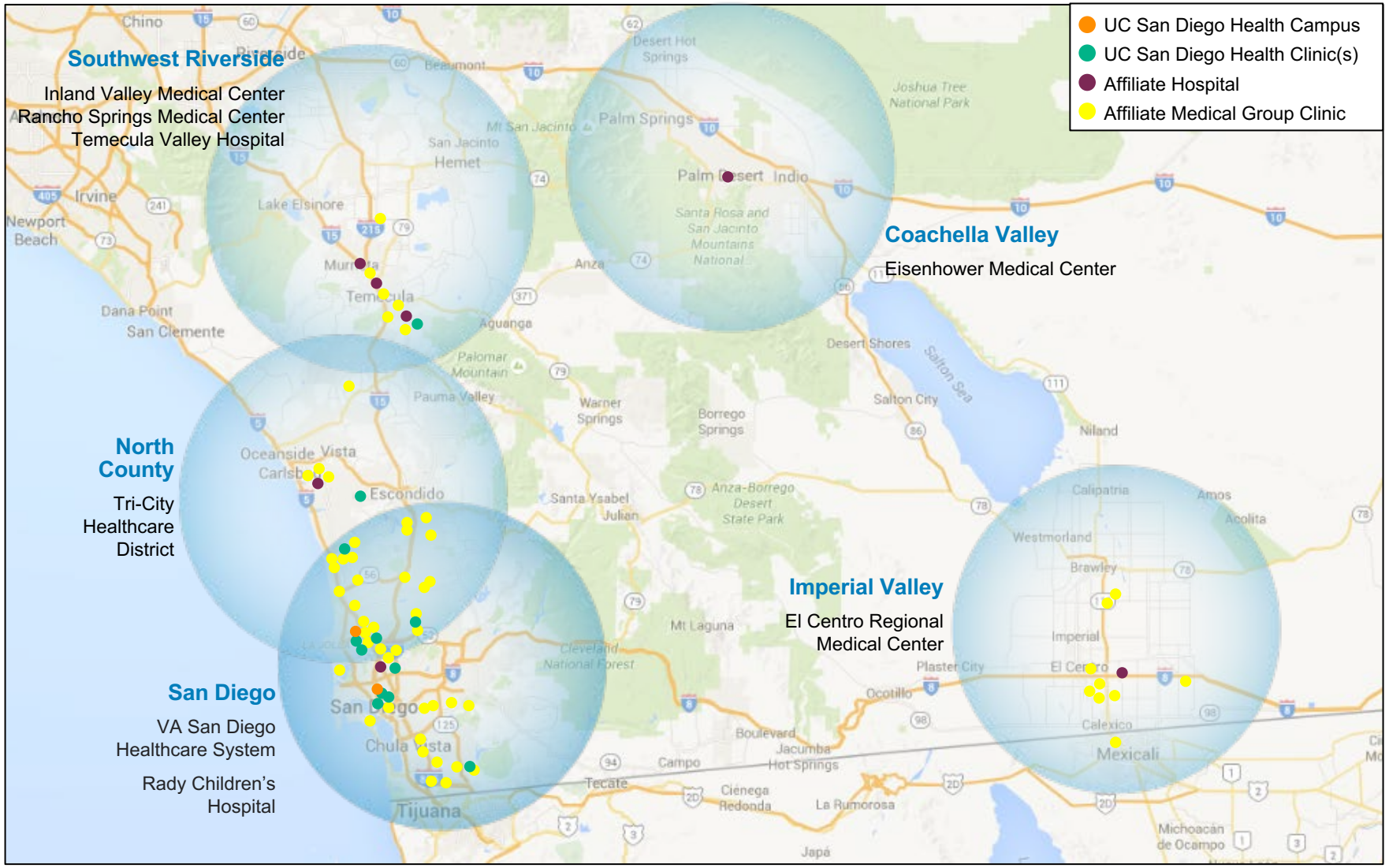
UC Big Health Data Platform

Platforms	Use Cases		Outputs/Visualizations
Phenotypic (Epic)	**Operational**	**Research**	 Reports
Financial / Claims	- Readmissions	- UCRex	 Information Discovery
Image Repository	- Sepsis	- PCORNET	
Bio-banking	- Quality	- NCATS ACT	 Scorecards/ Dashboards
'Omics	- Patient Sat.	- OMOP	 Alerts/Decision Support
Public Data Sources	- Efficiency	- Cohort Discovery	
High Frequency Data	- Pop Health	- Patient Data Sets	 Statistical Analysis
	- etc.	- etc.	 Predictive Analytics

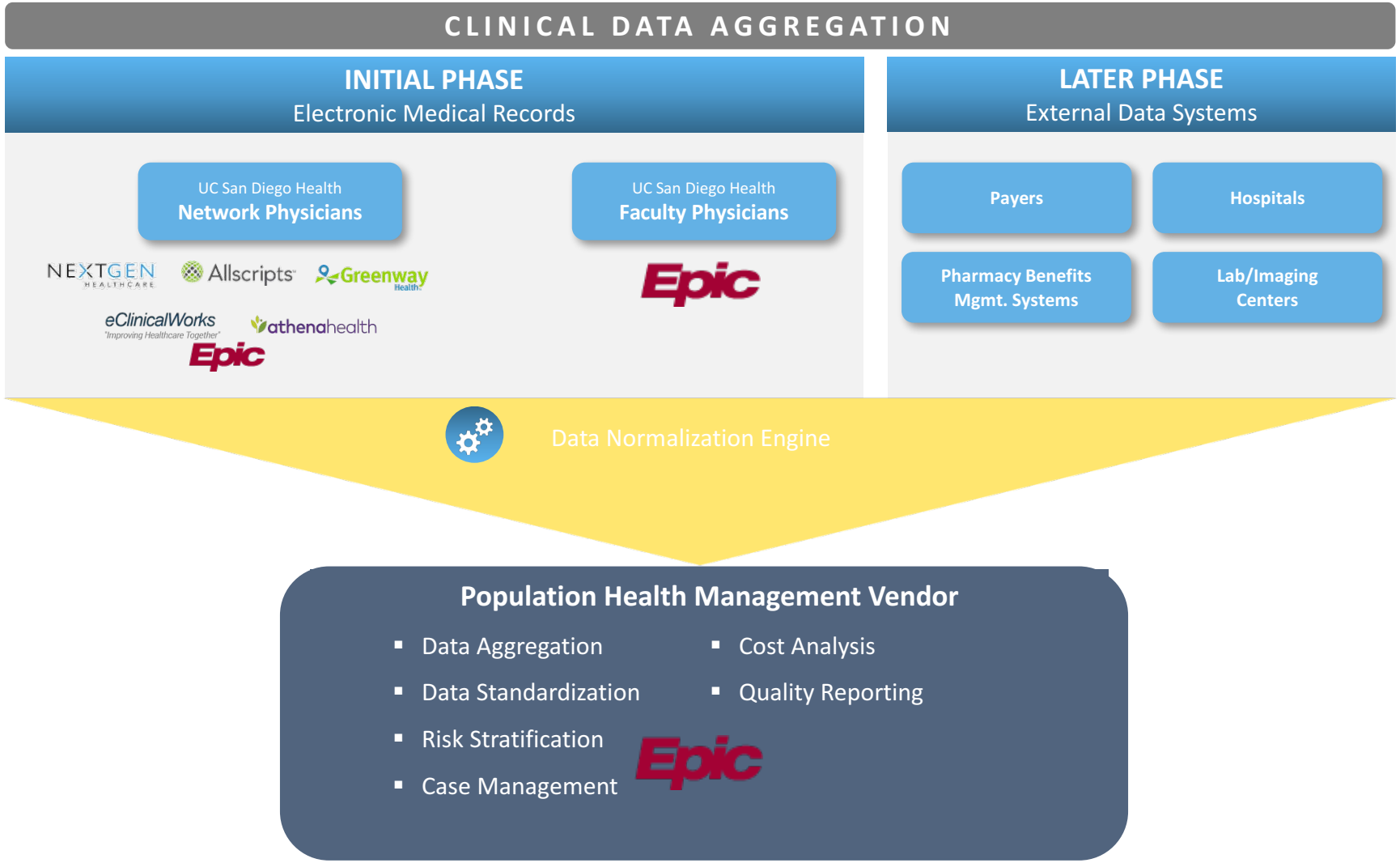
Technology Foundation

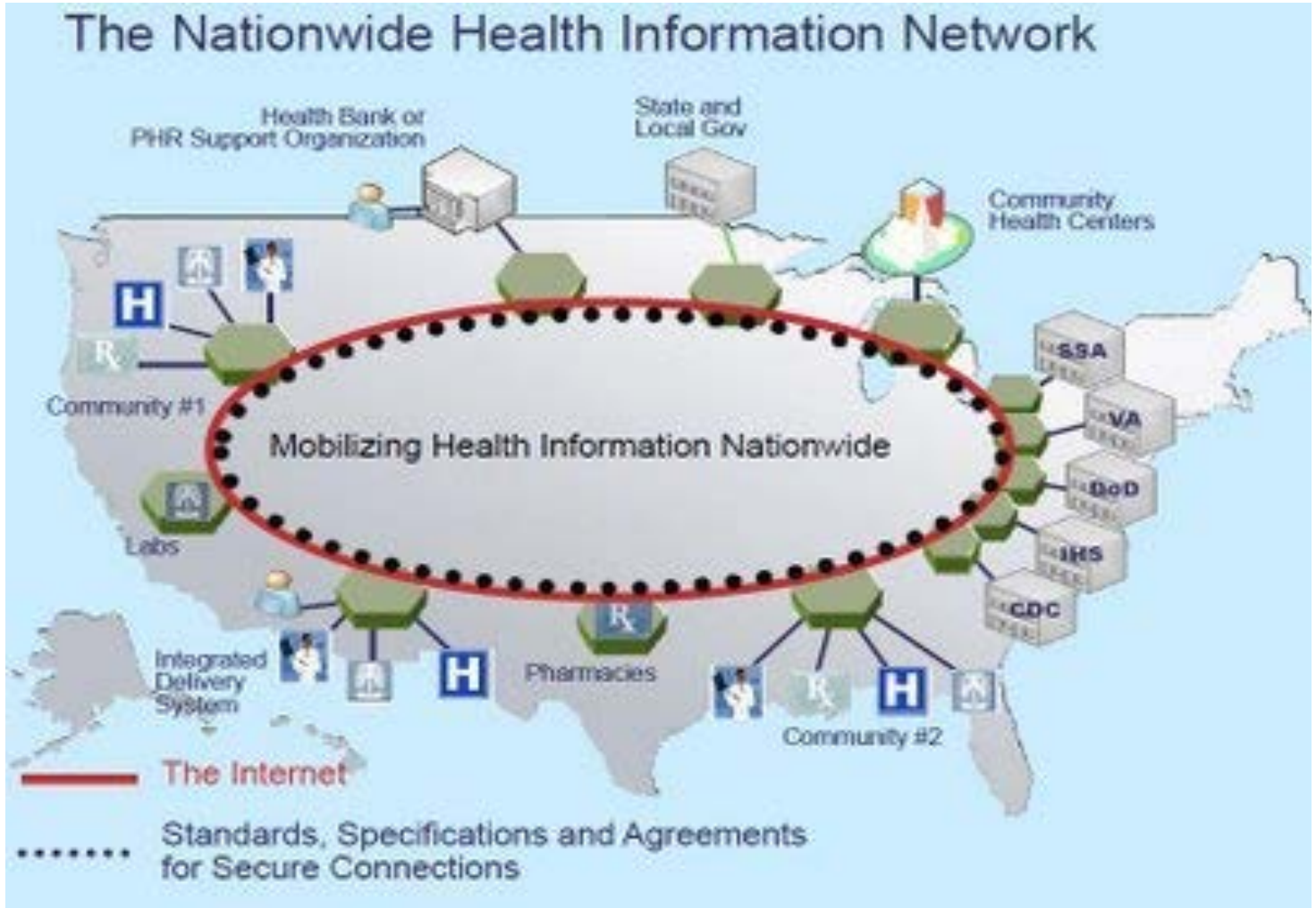
Metadata Mgmt	Master Data Mgmt	Terminology Mgmt	KB/Ontology Mgmt	Natural Language Processing	Analytic Tools	Big Data Technologies	Geospatial Processing	BI Technologies

Our Affiliates!



Clinical Integration Requires Aggregation of Data from Multiple Sources into a common data warehouse




The Nationwide Health Information Network
Health Bank or
PHR Support Organization
State and
Local Gov
Community
Health Centers
Community #1
Mobilizing Health Information Nationwide
SSA
VA
DoD
IHS
CDC
Labs
Integrated
Delivery
System
Pharmacies
Community #2
The Internet
Standards, Specifications and Agreements
for Secure Connections

“Skate to Where the Puck is Going, Not Where the Puck Has Been”

Wayne Gretzky