

# The Digital Revolution and Transformation of the US Health Care System

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# UC San Diego



- Established in 1960
- Founded with an engineering, technology and science focus
- Among top 3 in U.S. for positive impact on country<sup>1</sup>
- Top 10 best public university nationally<sup>2</sup>
- Top 15 research university globally<sup>3</sup>
- 6<sup>th</sup> in nation for total research output<sup>4</sup>

1. *Washington Monthly's 2017 College Guide*
2. *U.S. News & World Report*
3. *U.S. News & World Report*
4. *Nature's 2016 Index*



# UC San Diego Health – La Jolla Campus – 2018





HMM,  
HEADACHE,  
UPSET  
STOMACH,  
NAUSEA,  
ANXIETY,  
HIGH BLOOD  
PRESSURE...

...SOUNDS  
LIKE YOU'RE  
TRYING TO  
REFORM  
OBAMACARE.



HEDGEYE

B. R. R. R.

# Three Major Leaps Dependent on the Digital Revolution

- Value Over Volume

- Data

  - Big Data

  - Population Health

  - Universal Adoption of Electronic Health Records

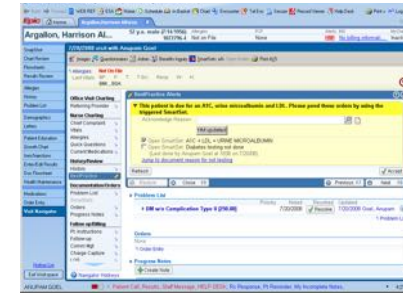
- Consumerism

  - Quality and Cost Data Readily Available on the Internet

  - Social Media

  - Non-Traditional Healthcare Encounters and Patient Experience

$$\text{V (VALUE)} = \frac{\text{Q (QUALITY)} + \text{S (SERVICE)}}{\text{\$ (COST)}}$$



# Health Care Value

“The arc of history is increasingly clear: Health care is shifting focus from the volume of service delivered to the value created for patients, with “value” defined as the outcomes achieved relative to the costs”

Porter, ME, “What is Value in Health Care”, NEJM 2010;363:2477-81.

## Principles of Value-Based Health Care Delivery

- The overarching goal in health care must be **value for patients**, not access, cost containment, convenience, or customer service

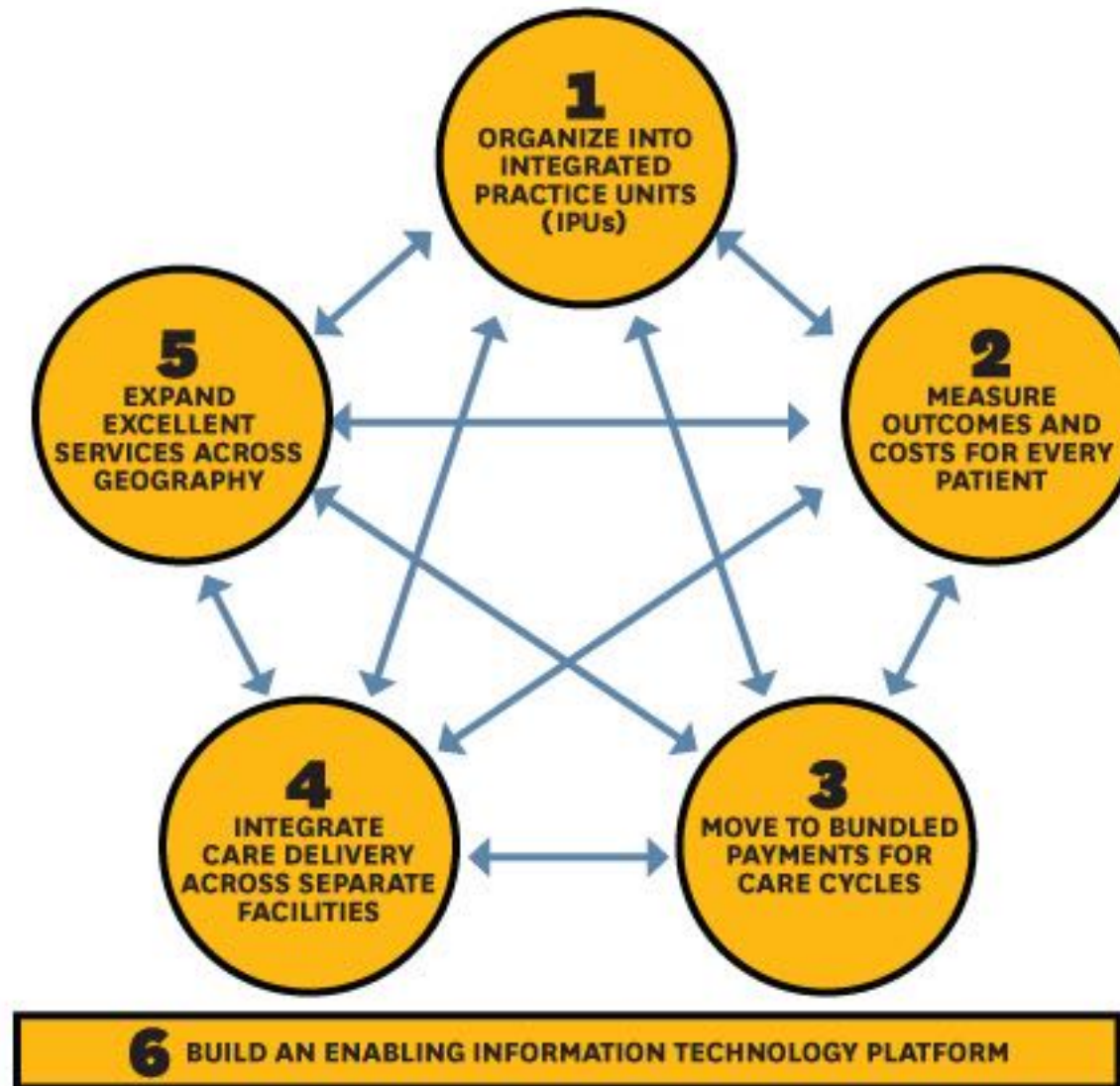
$$\text{Value} = \frac{\text{Health outcomes}}{\text{Costs of delivering the outcomes}}$$

- Outcomes are the **health results that matter for a patient's condition** over the care cycle
- Costs are the **total costs of care for a patient's condition** over the care cycle



## THE VALUE-BASED SYSTEM

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





Can Mount Sinai be serious? The answer is a resounding yes. In fact, we couldn't be more serious.

Mount Sinai's number one mission is to keep people out of the hospital. We're focused on population health management, as opposed to the traditional fee-for-service medicine. So instead of receiving care that's isolated and intermittent, patients receive care that's continuous and coordinated, much of it outside of the traditional hospital setting.

Thus the tremendous emphasis on wellness programs designed to help people stop smoking, lose weight and battle obesity, lower their blood pressure and reduce the risk of a heart attack. By being as proactive as possible, patients can better maintain their health and avoid disease.

Our Mobile Acute Care Team will treat patients at home who would otherwise require a hospital admission for certain conditions. The core team involves physicians, nurse practitioners, registered nurses, social workers, community

paramedics, care coaches, physical therapists, occupational therapists, speech therapists, and home health aides.

Meanwhile, Mount Sinai's Preventable Admissions Care Team provides traditional care services to patients at a high risk for readmission. Through a comprehensive bedside assessment, social workers partner with patients and caregivers to identify known risks such as allergies to medication. They'll even deal with concerns like housing and literacy.

It's a sweeping change in the way that health care is delivered. And with the new system comes a new way to measure success. The number of empty beds.

1-800-MD-SINAI  
mountsinaihealth.org



IF OUR  
BEDS ARE FILLED,  
IT MEANS  
WE'VE FAILED.

An iceberg floating in a dark blue ocean under a lighter blue sky. The tip of the iceberg is above the water, while the much larger base is submerged. The words "BIG DATA" are written in large white letters across the submerged part of the iceberg. To the right of the iceberg, there are two lines of text, each preceded by a left-pointing arrow. The overall image serves as a metaphor for the vastness of Big Data compared to the small portion that is immediately apparent.

◀ WHAT WE KNOW...

◀ THE REST...

**BIG DATA**

# Population Health Analytics





# Real-time feedback



UNIVERSITY of CALIFORNIA, SAN DIEGO  
MEDICAL CENTER

← Back → Forward WEB REF ESA Home Schedule In Basket Chart Encounter Tel Enc Secure Record Viewer Help Desk Print Log Out

**Epic** Home [Redacted] EpicCare

**Argallan, Harrison A...** 32 y.o. male (7/14/1956) Allergies PCP Alerts INS MyChart  
1072796.4 Not on File None **HM!** No billing informati... Inactive

**7/20/2008 visit with Anupam Goel**

Images Questionnaires Admin Benefits Inquiry SmartSets Open Orders Print AYS

**Allergies: Not On File**  
Last Vitals: BP: P: T: T Src: Resp: W: H:  
BMI: , BSA:

**Office Visit Charting**  
Referring Provider  
**Nurse Charting**  
Chief Complaint  
Vitals  
Allergies  
Quick Questions  
Current Medications  
**History/Review**  
History  
**BestPractice**  
**Documentation/Orders**  
Problem List  
SmartSets  
Orders  
Progress Notes  
**Follow-up/Billing**  
Pt. Instructions  
Follow-up  
Comm Mgt  
Charge Capture  
INS

**BestPractice Alerts**

**This patient is due for an A1C, urine microalbumin and LDL. Please pend these orders by using the triggered SmartSet.**  
Acknowledge Reason: HM updated  
☒ Open SmartSet: A1C + LDL + URINE MICROALBUMIN  
☐ Open SmartSet: Diabetes testing not done  
(Last done by Anupam Goel at 1836 on 7/20/08)  
[Jump to document reason for not testing](#)  
Refresh Accept

Restore Close F9 Previous F7 Next F8

**Problem List**

	Priority	Noted	Resolved	Updated
DM w/o Complication Type II [250.00]		7/20/2008	Resolve	7/20/2008 Goel, Anupam

Problem List

**Orders**  
None  
Order Entry

**Progress Notes**  
Create Note

Hotkey List  
Exit Workspace  
Navigator Hotkeys

ANUPAM GOEL Patient Call, Results, Staff Message, HELP DESK, Rx Response, Pt Reminder, My Incomplete Notes, 4:25 PM

My Panel

Panel Details

MD

This is a header test



My Panel - Active Patients



MSSP Patients



Managed Care Patients



Total PC Encounters

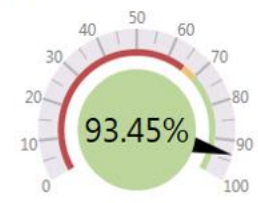
	Dec 16	Jan	Feb	Mar	Apr	May
> My Panel - Active Patients	-	-	-	-	235	234
> MSSP Patients	-	-	-	-	187	178
> Managed Care Patients	-	-	-	-	10	12
> Total PC Encounters	-	-	-	-	280	465

This is a footer test

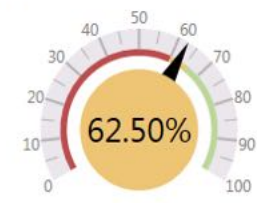
My Panel Metrics - Move the Measure©

MD

This section highlights quality measures that are identified for targeted efforts to move the measure to improve patient health



Tobacco Assessment and Counseling



Hypertensive Blood Pressure Control

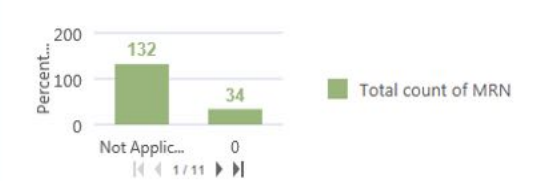
	Apr	May	MTD
> Tobacco Cessation - Copy	-	92.77%	93.45%
> Blood Pressure Control 18-85	64.00%	62.67%	62.50%

Use the reports and protocols provided to move your My Panel patients towards better health

Demographics

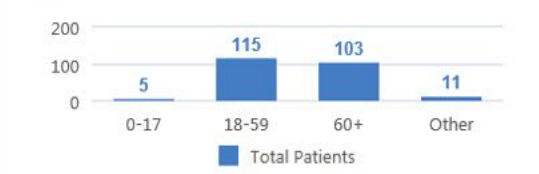
General Risk for Adults

This score was developed by Managed Care to indicate a patients general health risk



Run report and hover over score to see detailed breakdown of patient score

Age

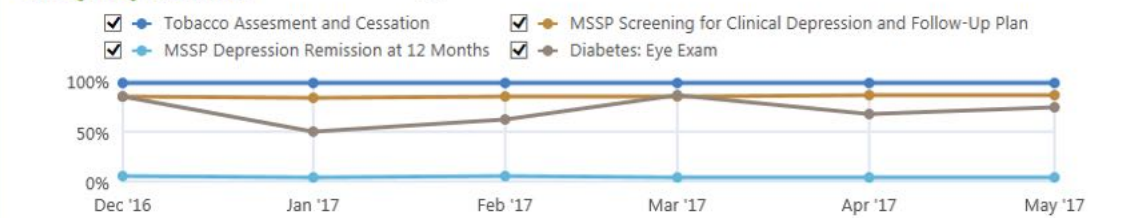


Race

Quality Metrics

CIN Quality Measures

MD



	Dec 16	Jan	Feb	Mar	Apr	May
> Tobacco Assessment and Cessation	97.51%	97.90%	97.93%	97.92%	97.92%	98.32%
> MSSP Screening for Clinical Depression and Follow-Up Plan	84.58%	83.90%	85.04%	84.94%	85.53%	85.47%
> MSSP Depression Remission at 12 Months	6.12%	4.18%	5.42%	5.11%	5.13%	4.27%
> Diabetes: Eye Exam	84.00%	50.00%	61.76%	86.21%	67.50%	74.29%

My Panel - Wellness

MD

	Last Month	Change from Last Month	This Month Last Year	Change from this Month Last Year	Goal
> Breast Cancer Screening	93.10%	-4.10%	89.47%	-0.21%	72.00%
> Osteoporosis Screening	95.65%	4.54%	93.62%	6.81%	72.00%

Links

Quick Links

Slicer Dicer Reports

- My Patients - Diabetics
- My Patients - Cardiovascular Disease
- My Encounters - Payor Mix

Quality Metric Documentation

- My Panel Dashboard Guide
- MSSP Quality Measure Guide

Reporting Workbench Recently Run and Saved Reports

Report Name	Results	Status
Breast Cancer Screening by Department		Ready to view
Breast Cancer Screening by Provider		Ready to view
CVD LDL Control by Department		
CVD LDL Testing by Department		
Diabetes Hemoglobin A1c by Department		

Demo Data

# In Order to Benefit From Big Data

- Align Financial Incentives to Encourage Use of Integrated Electronic Records
- Capture Data in Discrete Fields
  - Organize Data Meaningfully and Searchable
- Not Just Doctor Driven
  - Include Data from Nurses, Pharmacists, Social Workers, Case Managers
- Use Data to Improve Quality and Outcomes
  - Use Benchmarks
  - Use Outcomes Important to Patients



# Big Data Risks

- Too Much
  - What is Important and What is Not Important
- Too Fast
  - Who Will Monitor Everyone with a Mobile Device?
- It is Still “One Patient at a Time”
  - Will it Eliminate Physician Judgment
  - Will We Lose The Patient Doctor Interaction?
- Privacy
  - Electronic Health Record, Device, Product Security

# The Rise of Healthcare Transparency

## Consumer Driven Health Care

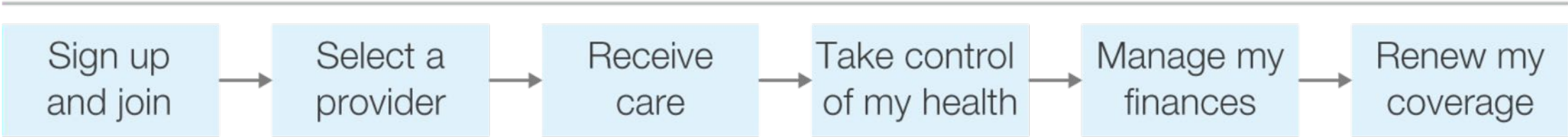
- Use of The Internet for Health Information
- Use of the Internet for Public Reporting
- The ability to judge care, costs and satisfaction from outside the organization by viewing published elements that paint a picture of supposed competency
- Transparent data and information allows consumers, providers and stakeholders to compare and make informed decisions



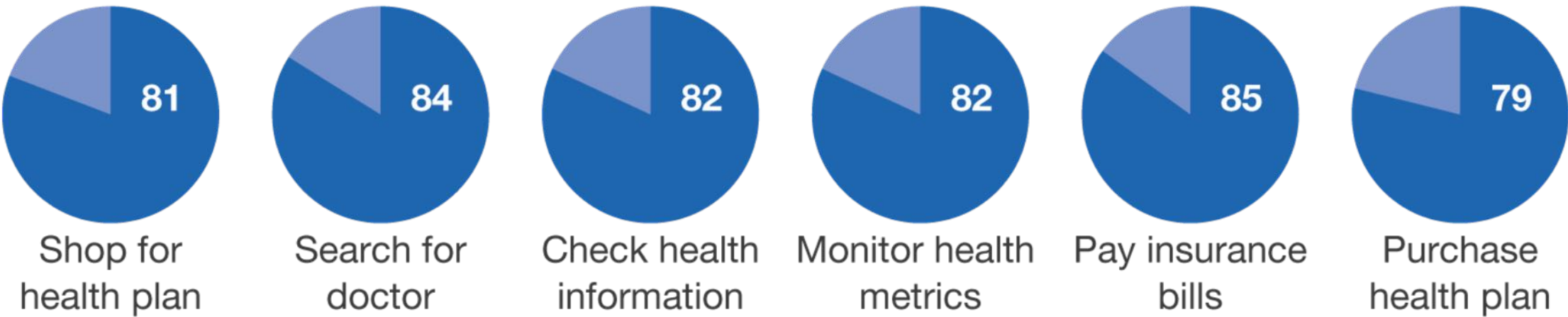
# Many consumers view digital solutions as the most effective way to meet healthcare needs

% of respondents who view digital solutions as the most effective way to perform healthcare activities

## Consumer journeys



## Example of a step within each journey





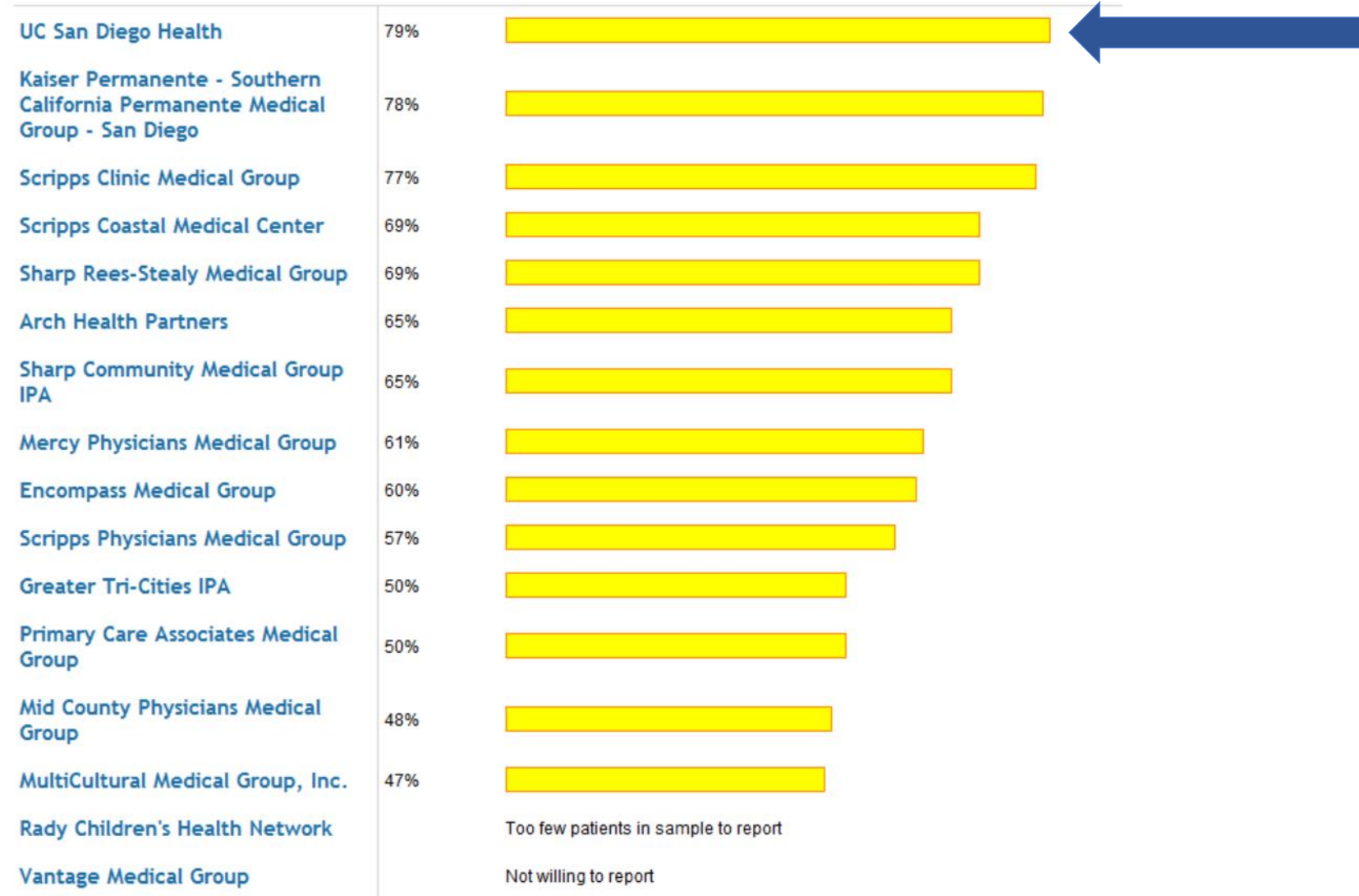
# Colorectal Cancer Screening 2015-16 Edition

[... read more](#)

When comparing medical groups, small differences between scores are expected. The larger differences are important.

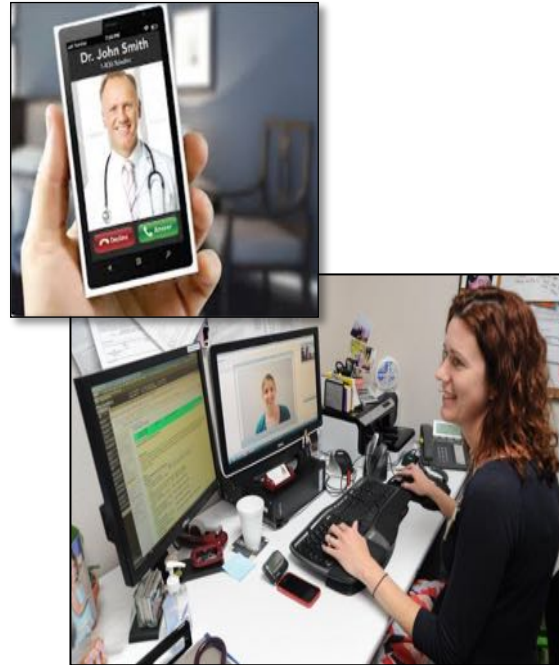
## COLORECTAL CANCER SCREENING

(Worse)  
0%



## 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