UNIVERSITY OF UTAH
HEALTH CARE

Creating Healthcare Analytics to Drive Increased Value

Charlton Park
Chief Analytics Officer
University of Utah Health Care

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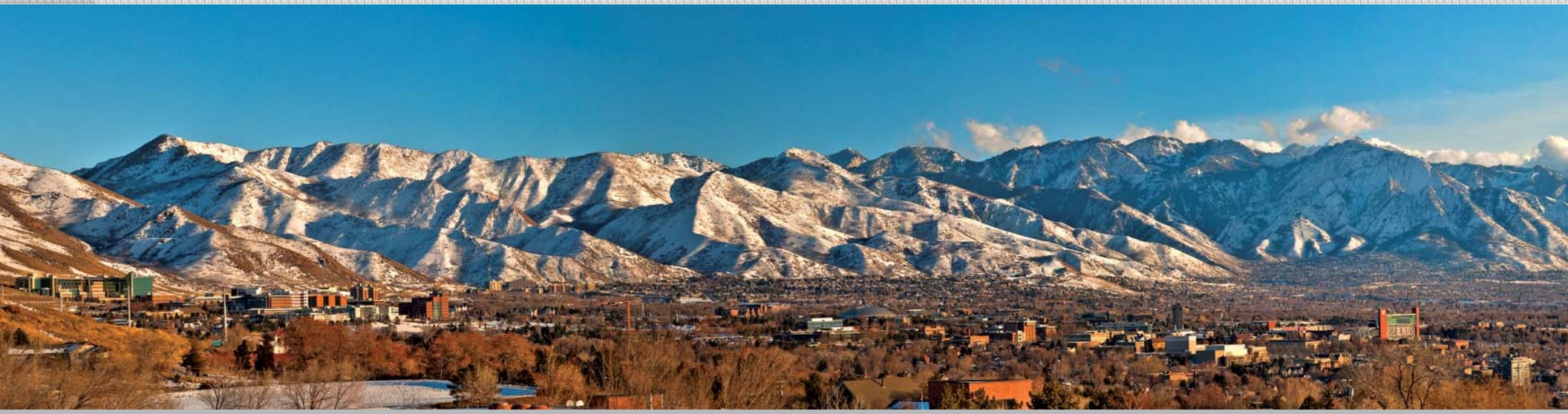

- Primary + Specialty + Subspecialty care
- 4 Hospitals
- 11 Neighborhood Health Centers

- 200 Medical Specialties
- 1,300 Board-Certified Physicians
- 30,000 discharge
- 1.3 M visits

Data & Analytics Overview

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- Clinical Systems:
  - Epic Inpatient and Epic Ambulatory
- Financial/Procurements Systems:
  - Peoplesoft, Lawson
- Enterprise Data Warehouse:
  - Oracle
- Business Intelligence tools:
  - SAP BusinessObjects, Tableau

Hospital Costs

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- Understanding care costs is challenging due to the highly complex, fragmented, and variable nature of healthcare delivery[1]
- Billing charges are often confused with the costs of delivering care. However, charges are an inaccurate estimate of the actual costs incurred[1]
- True costing numbers are critical to developing and monitoring strategies to reduce costs, supporting the adoption of value-based reimbursement systems, and encouraging innovation[1]

[1]Kawamoto K, Martin CJ, Williams K, et al. Value Driven Outcomes (VDO): a Pragmatic, Modular, and Extensible Software Framework for Understanding and Improving Health Care Costs and Outcomes. *Journal of the American Medical Informatics Association* 2015;22(1):223-235.

Rising Healthcare Costs

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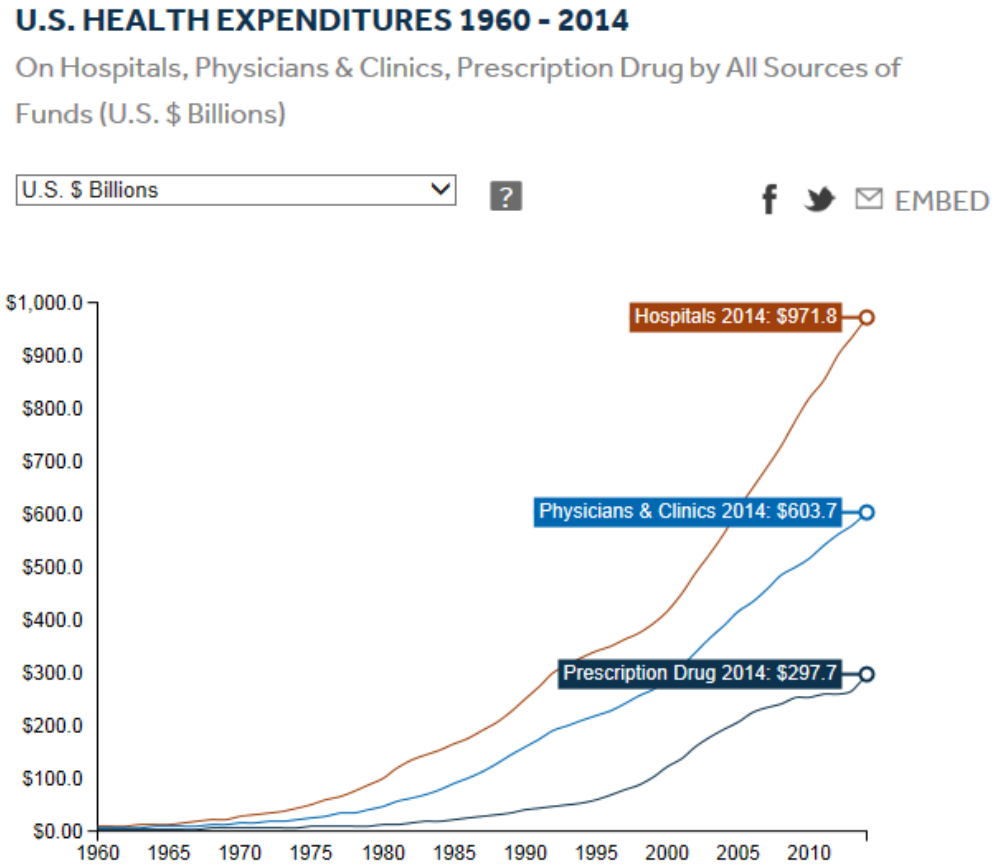
- In 1970 the U.S. devoted 6.9% of its gross domestic product to total health spending (both through public and private funds). [2]
- By 2014 the amount spent on health had increased to 17.5% of GDP. [2]



[2]Peterson-Kaiser Health System Tracker. http://www.healthsystemtracker.org/chart-collection/how-has-health-spending-changed-over-time/

DataTransparency

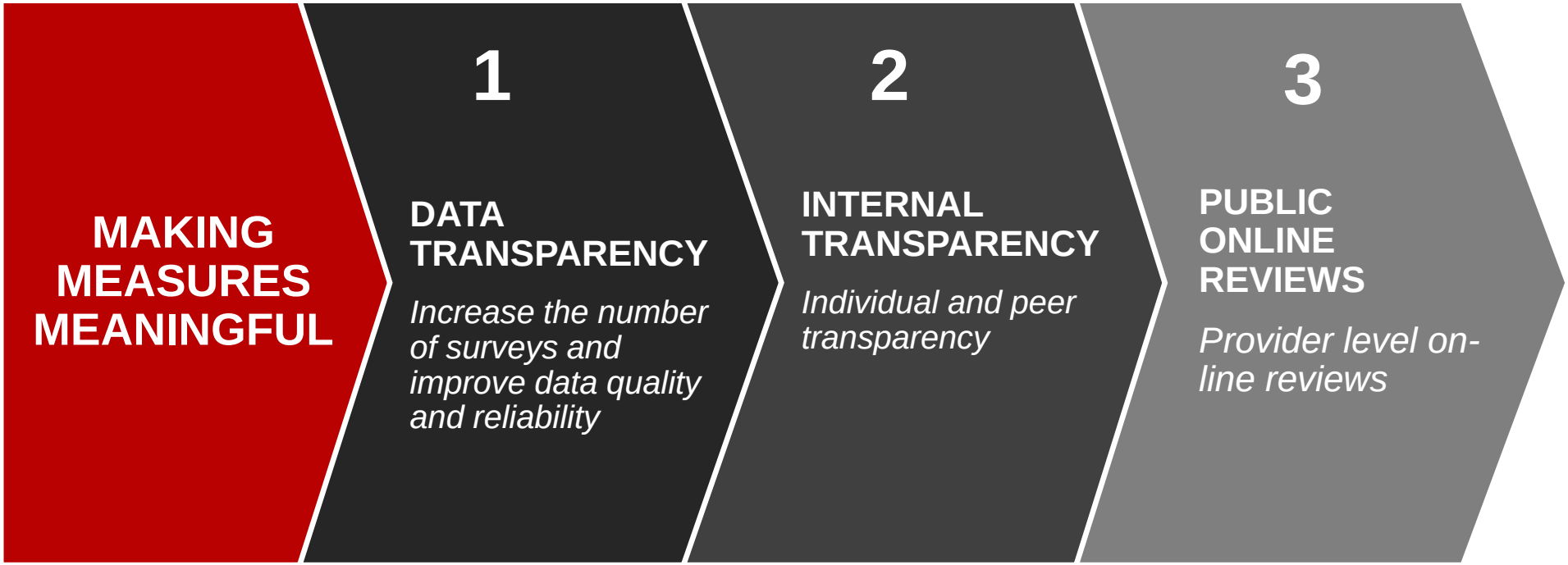
Transparency

"Everyone wants transparency to be a trick. It's not a trick. Transparency doesn't start from the outside, it starts from within an organization when we look to each other and learn from each other. That's how change happens."

Vivian S. Lee, MD, PhD, MBA

Senior Vice President University of Utah Health Sciences

Patient Satisfaction



Individual Scorecards

Provider Scorecard:

- N>30
- 2 x year
- Rolling 12 months
- Provider Section
- Wait and Delay
- Ease of Scheduling
- Comments

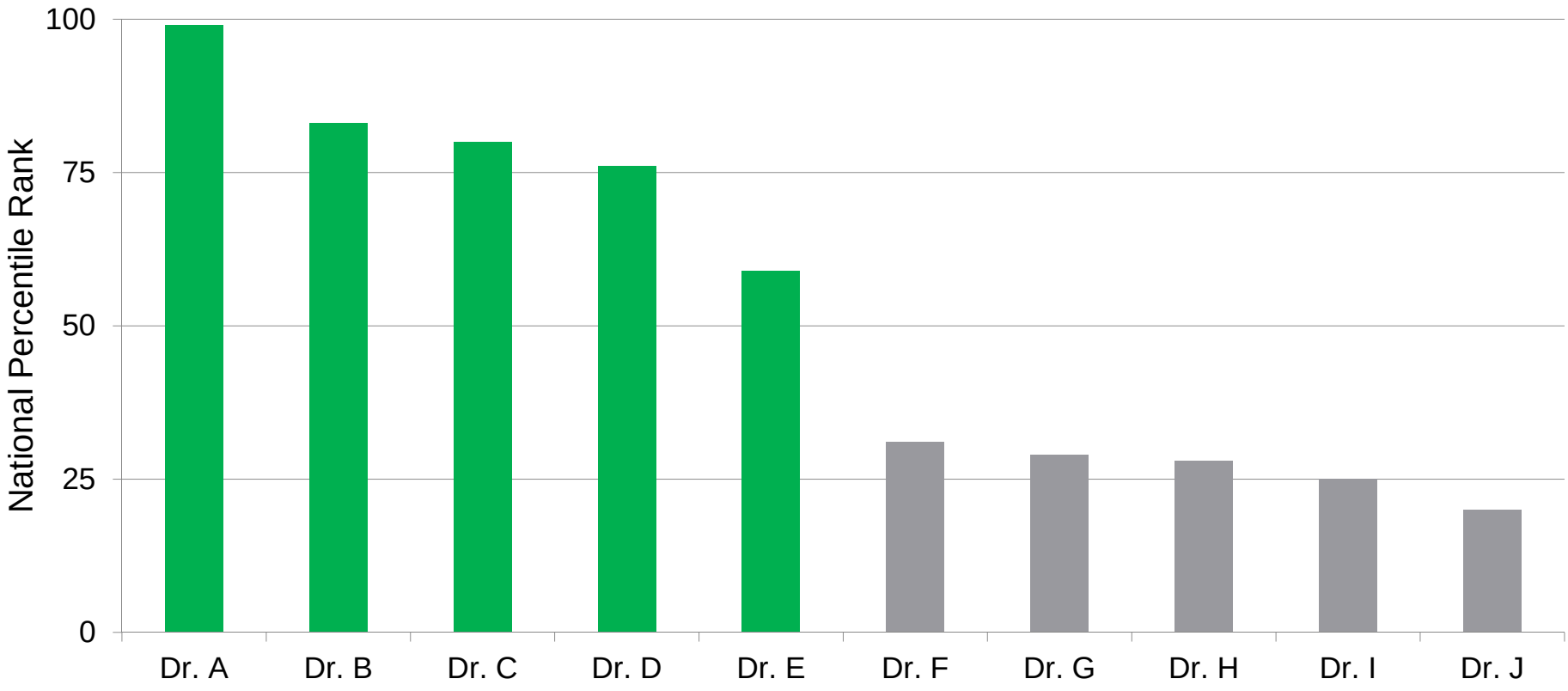
University of Utah Health Care
Provider Scorecard FY 2012

Miller, Thomas
Specialty: Internal Medicine
Number of Surveys: 57

Percentile Rank	Survey Question
99	**Overall Patient Satisfaction**
99	Information about delays
99	Wait time at clinic
99	**Care Provider Section Summary**
99	Friendliness/courtesy of care provider
99	Care provider explanation of prob/condition
99	Care provider concern for questions/worries
99	Care provider efforts to include in decisions
99	Care provider information about medications
99	Care provider instructions for follow-up care
99	Care provider spoke using clear language
99	Time care provider spent with patient
99	Patients' confidence in care provider
99	Likelihood of recommending care provider
99	Likelihood of recommending practice

*All Facilities Database – Includes the following
Number of patients – 2,130,825
Number of physicians – 112,466
*Scores reflect data from July 1, 2011 through July 6, 2012 and includes all UUHC clinics at which the provider practices.

Peer Scorecards



System Scorecards

FY15 Patient Satisfaction Scorecard - Entity Composite

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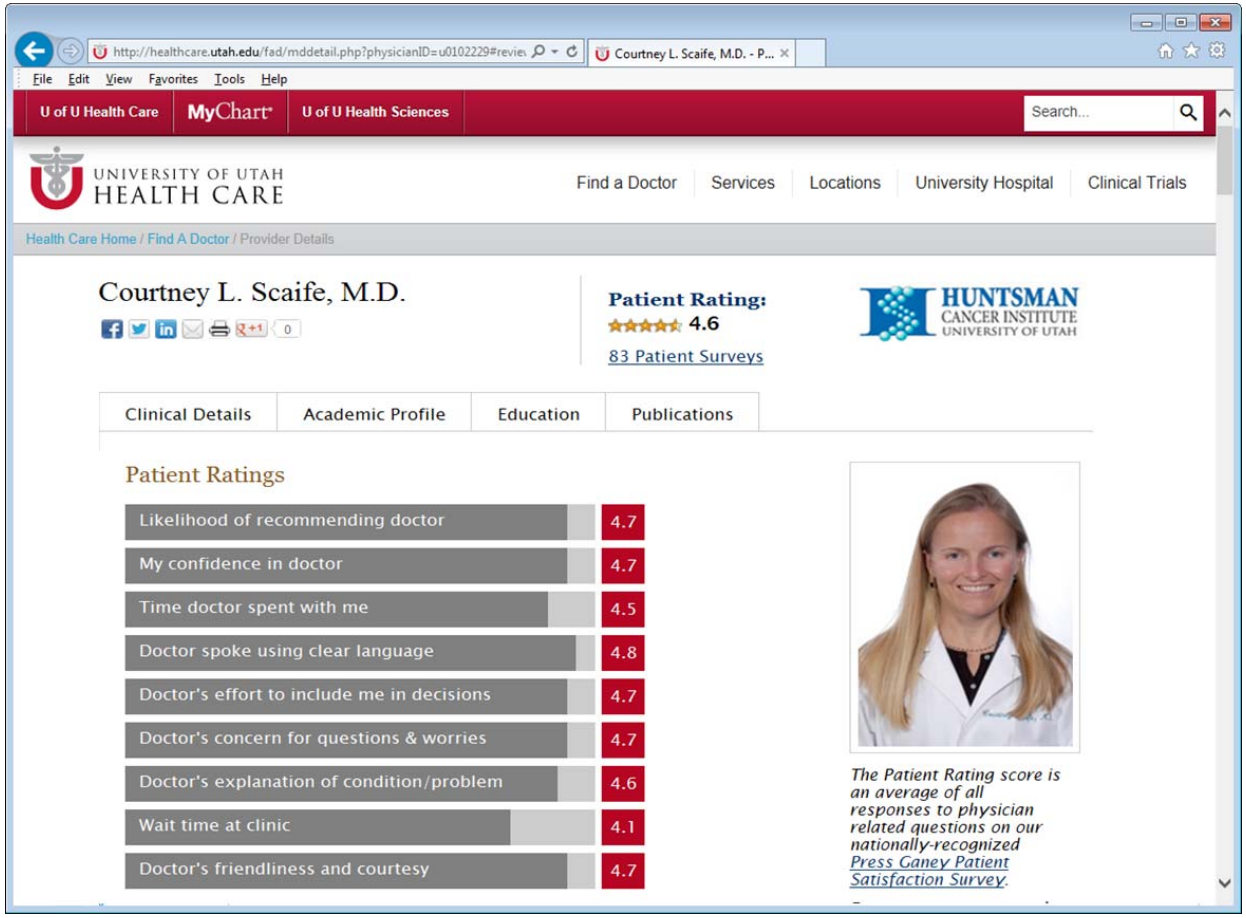
**Current QTD: 04/01/15 - 04/29/15
All scores based on RECEIVED DATE

	QTD Performance to Goal	Executive	Medical Director	FY14 %ile	FY15 Goal	Q1 FY15 %ile	Q2 FY15 %ile	Q3 FY15 %ile	Current QTD %ile	Current QTD n
System		David Entwistle	Sean Mulvihill, MD	77	81	74	85	87	86	4951
MD Communication			Tom Miller, MD	33	60	26	29	80	64	327
Nurse Communication		Margaret Pearce		32	60	21	29	71	39	330
Pain Management		Margaret Pearce	Tom Miller, MD	32	60	35	39	62	39	262
Pain was controlled				17	60	25	18	47	23	261
Staff did everything to help with pain				52	60	43	69	75	58	262
Wait time in clinic		Quinn McKenna	Tom Miller, MD	61	70	57	82	84	86	4634
New patient ease of scheduling		Quinn McKenna	Tom Miller, MD	37	50	41	70	59	58	1053
UH - 40%		Quinn McKenna	Tom Miller, MD	66	76	60	77	81	81	994
Inpatient (45%) Recommend-HCAHPS		Quinn McKenna	Tom Miller, MD	70	75	58	69	83	77	277
Outpatient (45%)		Dan Lundergan	Tom Miller, MD	72	77	63	85	86	86	675
Emergency (10%)		Margaret Pearce	Christy Hopkins, MD	60	86	56	80	55	76	42
UNI - 15%		Ross VanVranken	Jim Ashworth, MD	94	90	92	93	96	97	301
Huntsman Cancer - 20%		Ray Lynch	John Sweetenham, MD	97	90	91	99	99	99	695
Inpatient (50%) Recommend-HCAHPS		Sue Childress	John Sweetenham, MD	99	90	99	99	99	99	50
Outpatient (50%)		Don Milligan	William Dunson, MD	94	90	82	99	99	99	645
UOC - 5%		Bart Adams	Charles Saltzman, MD	54	68	65	67	71	80	614
Inpatient (45%) Recommend-HCAHPS		Laura Adams	Chris Pelt, MD	75	75	84	59	92	91	73
Outpatient (55%)		Ryan Vanderwerff	Patrick Greis, MD	37	60	49	73	55	71	500
Moran Vision Services - 5%		Wayne Imbrescia	Randall Olson, MD	69	79	75	82	75	72	803
Community Clinics - 15%		Wayne Imbrescia	Susan Terry, MD	74	79	75	87	83	80	1544

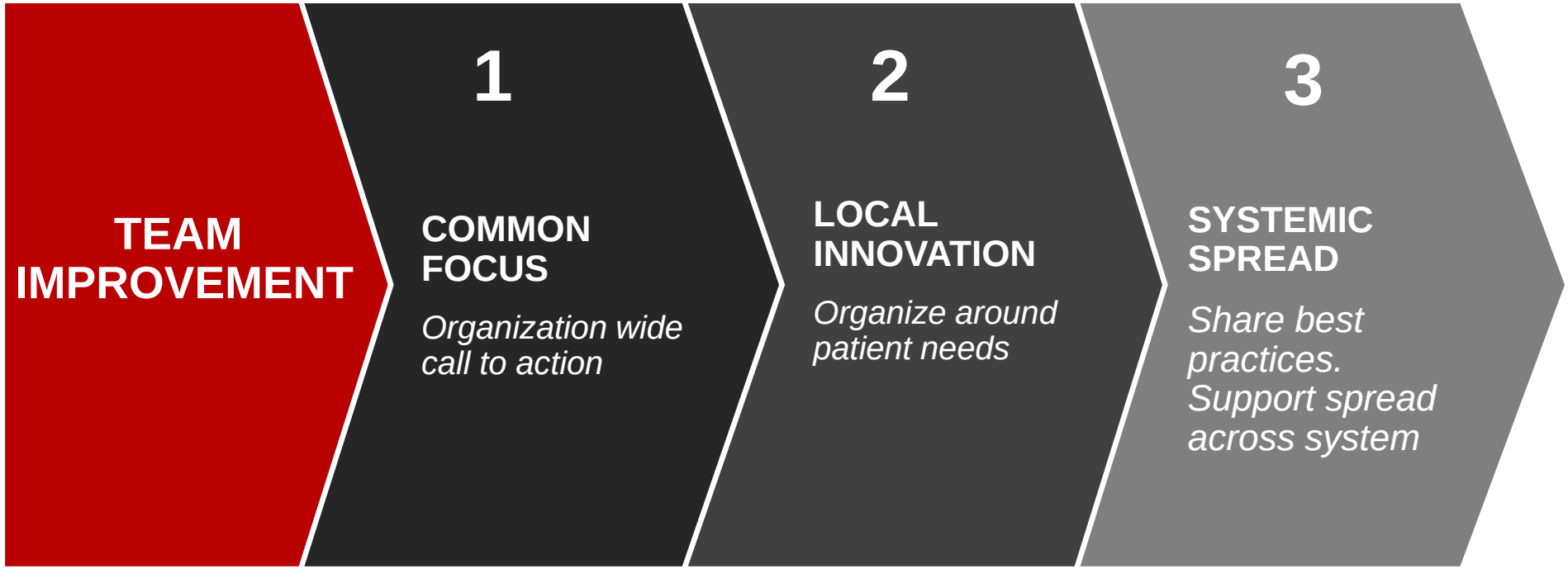
Column Key:

- 11th%tile or more below goal
- Within 10th%tile of goal
- Met goal OR 90th%tile and above

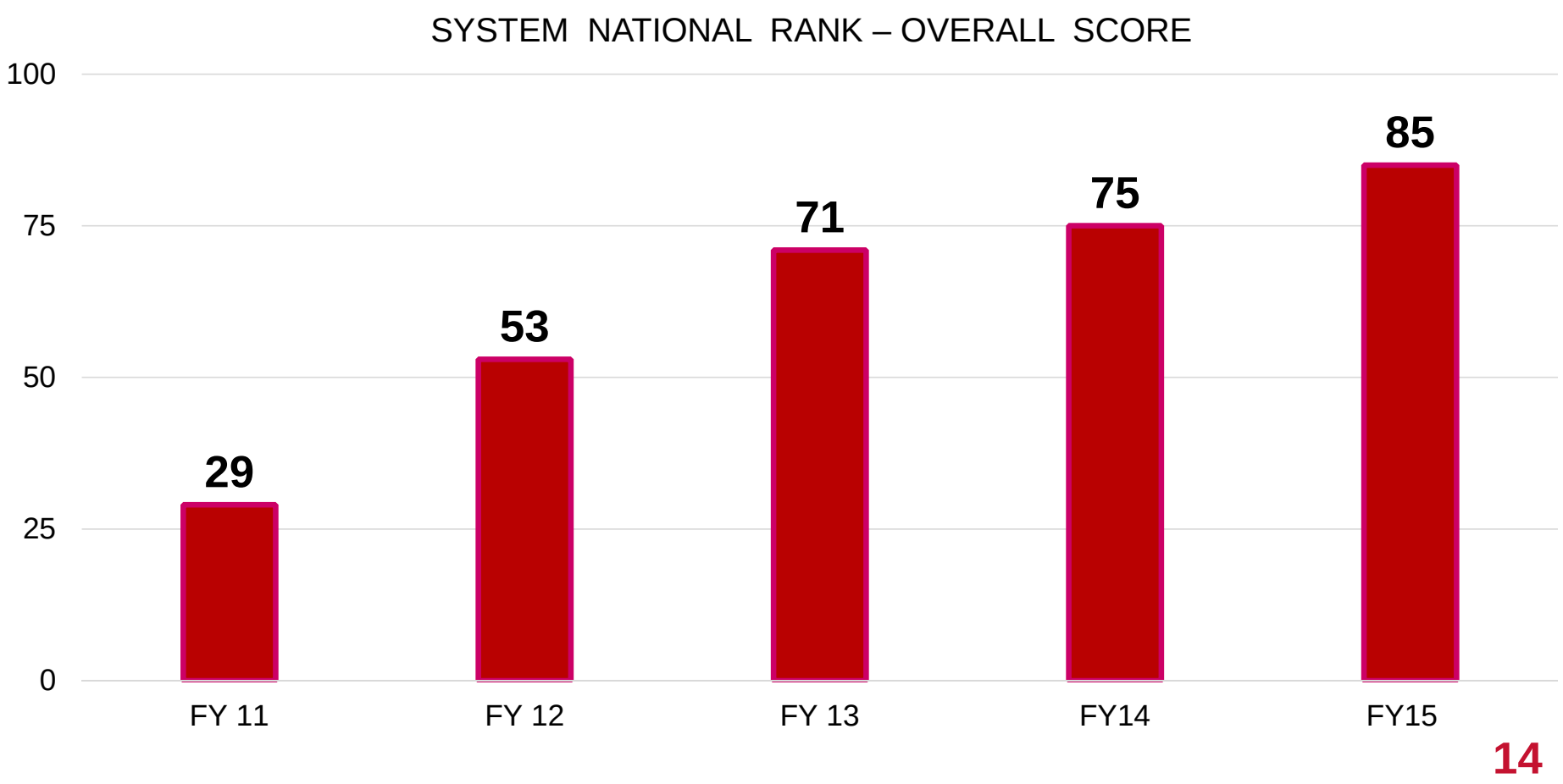
Public Scorecards



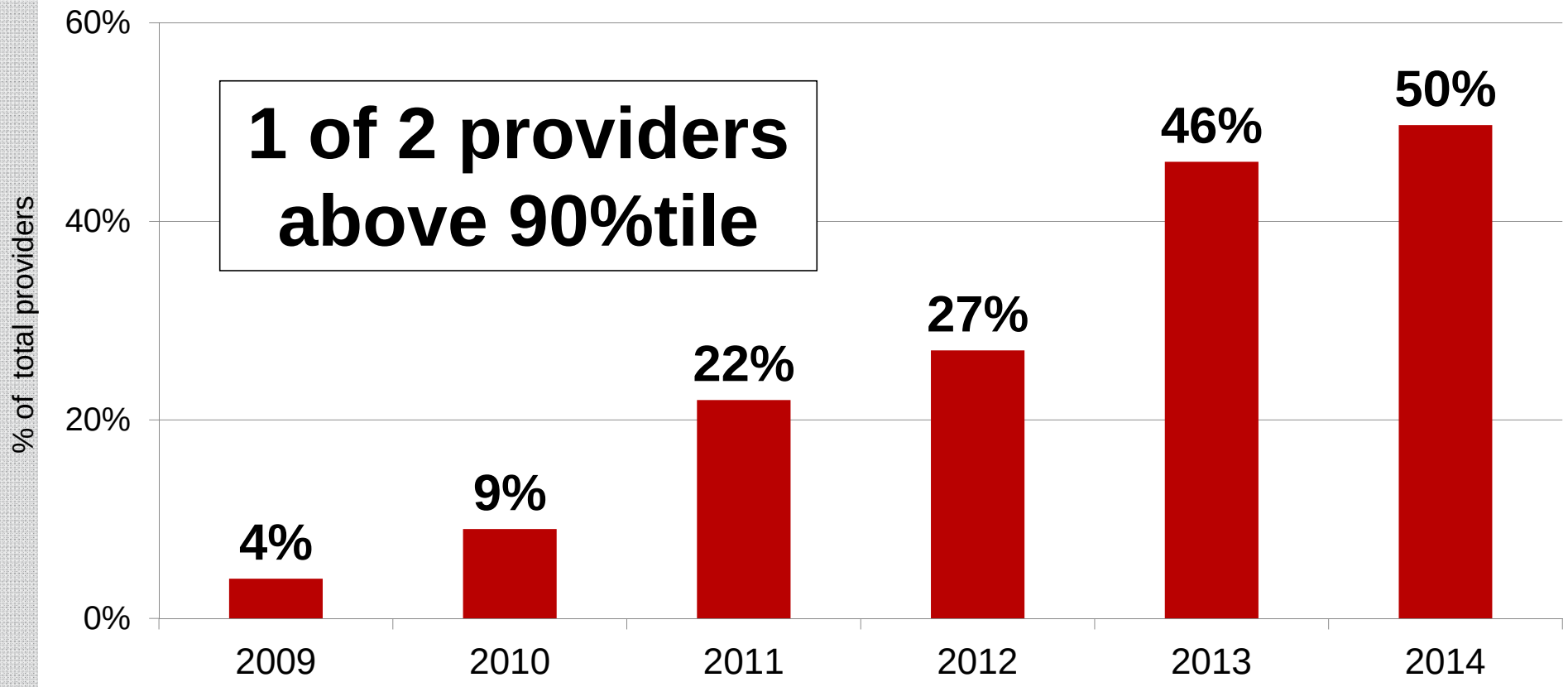
Support


TEAM IMPROVEMENT
1
COMMON FOCUS
Organization wide call to action
2
LOCAL INNOVATION
Organize around patient needs
3
SYSTEMIC SPREAD
Share best practices. Support spread across system

Clinic Patient Satisfaction

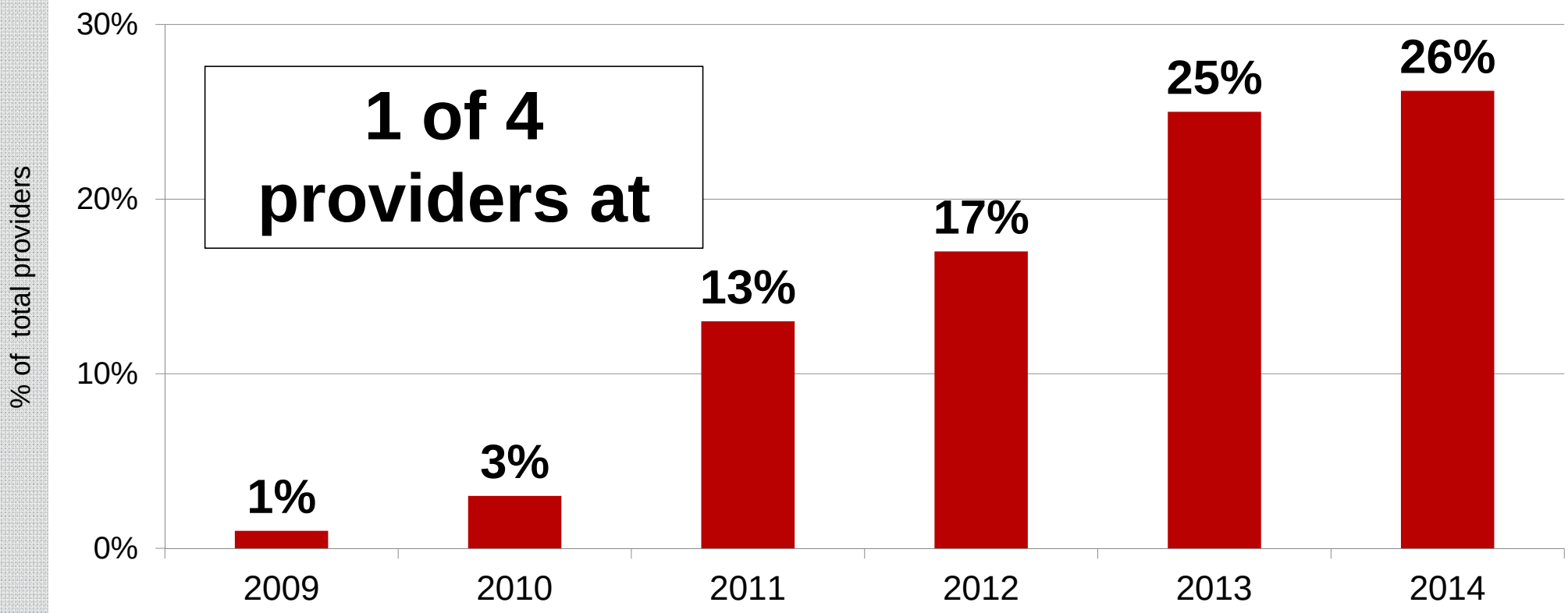


% of Providers at 90%tile or above



*All Facilities Database includes the following
Number of Physicians: 142,411
Number of Patients: 2,783,597

Percent of Providers at 99%tile



*All Facilities Database includes the following
Number of Physicians: 142,411
Number of Patients: 2,783,597

"Fixing health care will require a radical transformation…[d]octors, of course, must be central players in the transformation: Any ambitious strategy that they do not embrace is doomed."

Thomas H. Lee, MD
Toby Cosgrove, MD

MeasuringValue

Health Care Costs…

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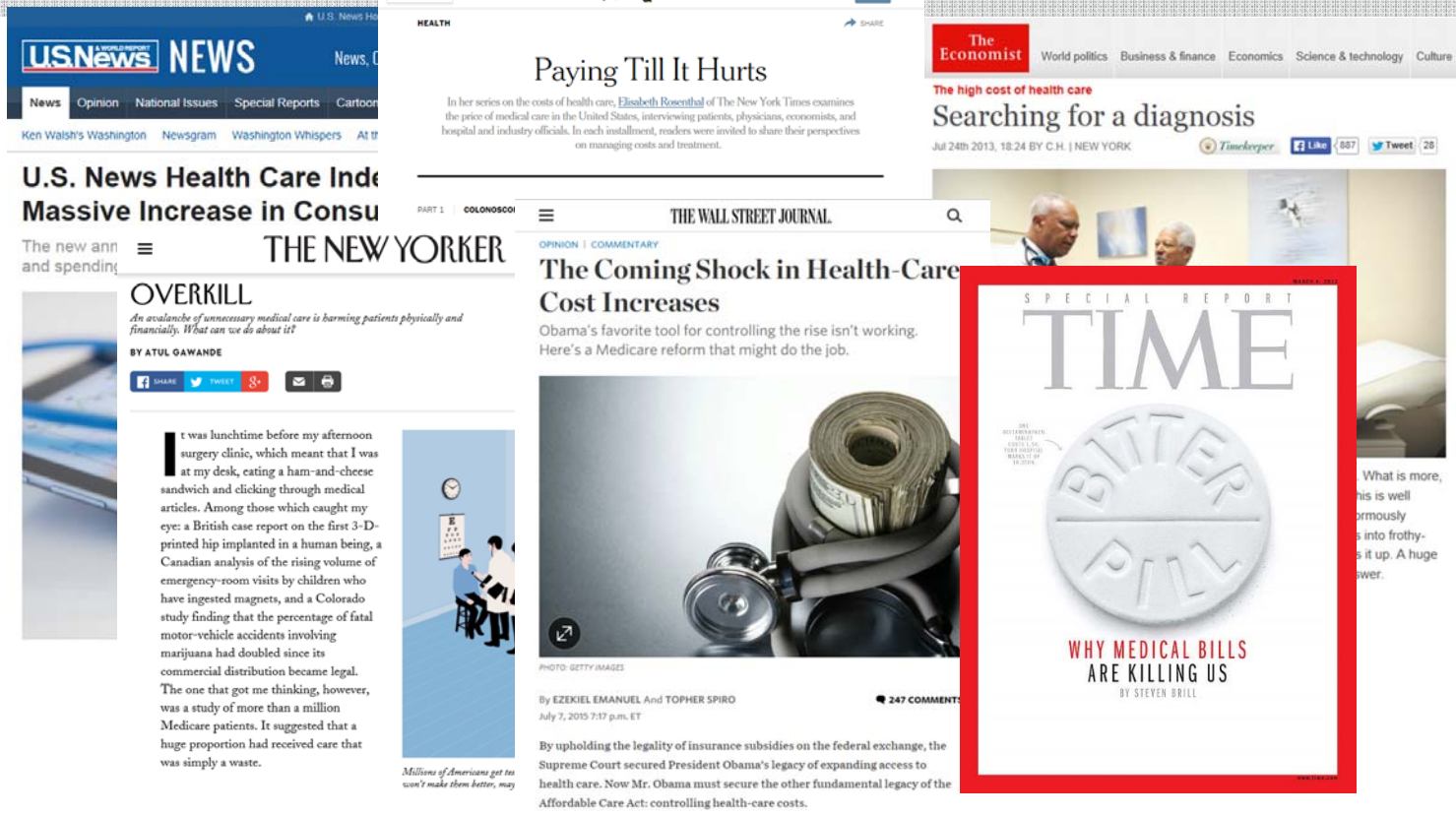

Value Driven Outcomes

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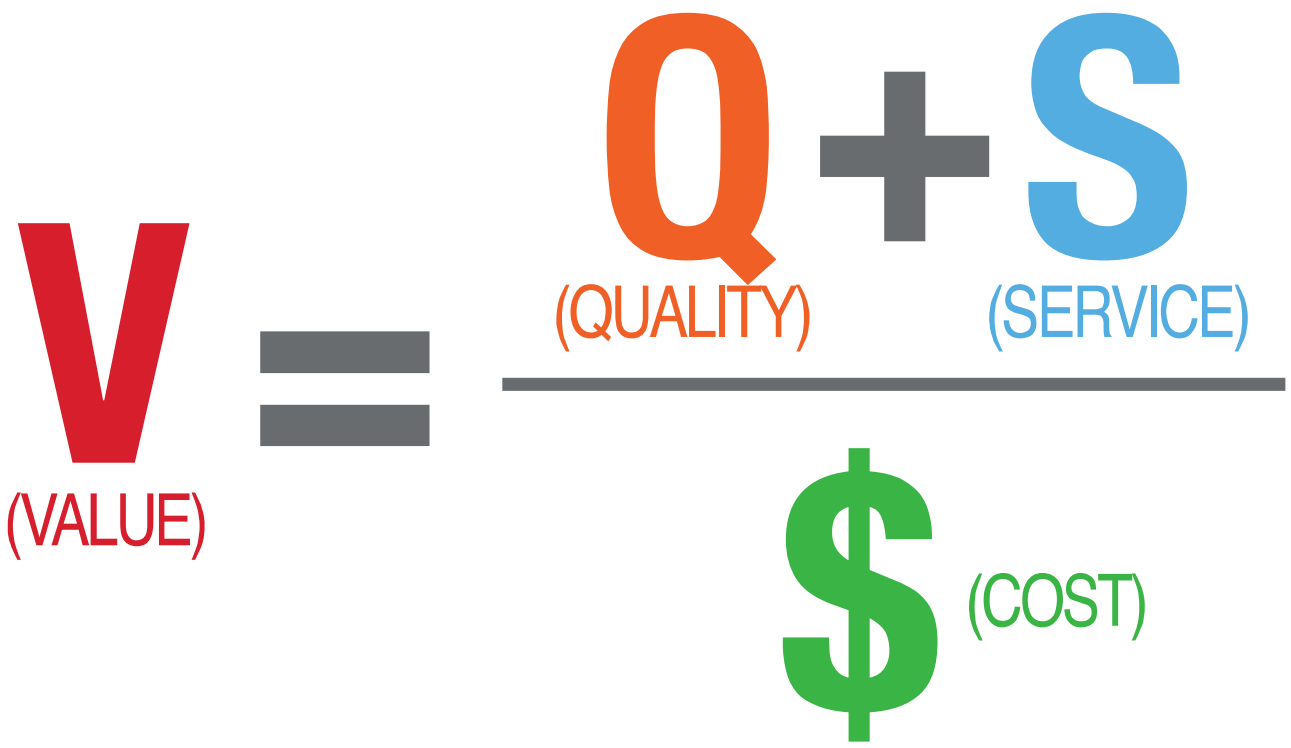
The New York Times

What Are a Hospital's Costs? Utah System Is Trying to Learn

The Value Equation



Measuring Value

"… A fundamental and largely unrecognized problem: We don't know what it costs to deliver health care to individual patients, much less how those costs compare to the outcomes achieved."

"Understanding costs could be the single most powerful lever to transform the value of health care."

- *Robert S. Kaplan & Michael E. Porter*

Costing Progression

- Vendor system
- Quarterly costing
- Manually updated RVUs
- Average costs

- Internal solution
- Existing sources in DW
- Costs at a visit level
- Automated monthly

- Costing at utilization level
- Clinical data
- Acquisition costs
- Flexible and extendible
- Professional costs
- BI/Analytics

Investment: The "Sequester" Team

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IT and Informatics
Ken Kawamoto, M.D., Ph.D.
Cheri Hunter
Ming Tu, MS
Cary Martin, MS
Reid Holbrook, M.D.
Bruce Bray, M.D.
Chris Fillmore, M.D.
Catherine Staes, BSN, MPH, Ph.D.
Michael Sherwood, MSIS
Michael White, M.D.
Micky Daurelle
Mike Crotty

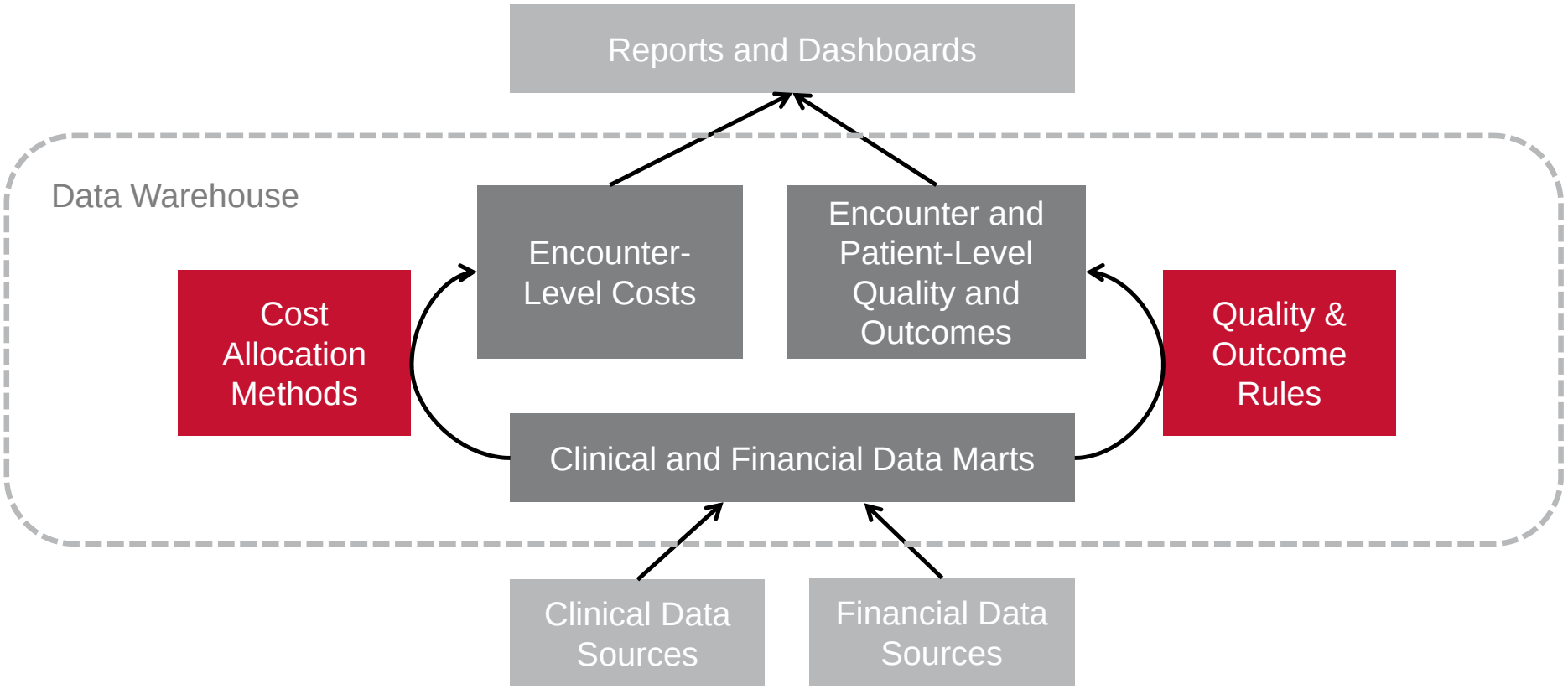
Decision Support
Charlton Park, MBA, MHSM
Kip Williams, MBA
Scott Morris, MBA
Eric Lund, MBA
Matt Fedderson

Medical Group
Kristin Acree, MPH
Brian Nordberg

Consultant & Intern
Amy Sletta, Project Manager
David Ryerse

- Sequester three days a week
- Co-located
- Resourced as a top institutional priority
- Expectation of prototype in 3 month, operational in 6 months

Data Flow


Reports and Dashboards
Data Warehouse
Encounter-Level Costs
Encounter and Patient-Level Quality and Outcomes
Cost Allocation Methods
Quality & Outcome Rules
Clinical and Financial Data Marts
Clinical Data Sources
Financial Data Sources

Ex: Emer. Appendectomy, 3.12 LOS

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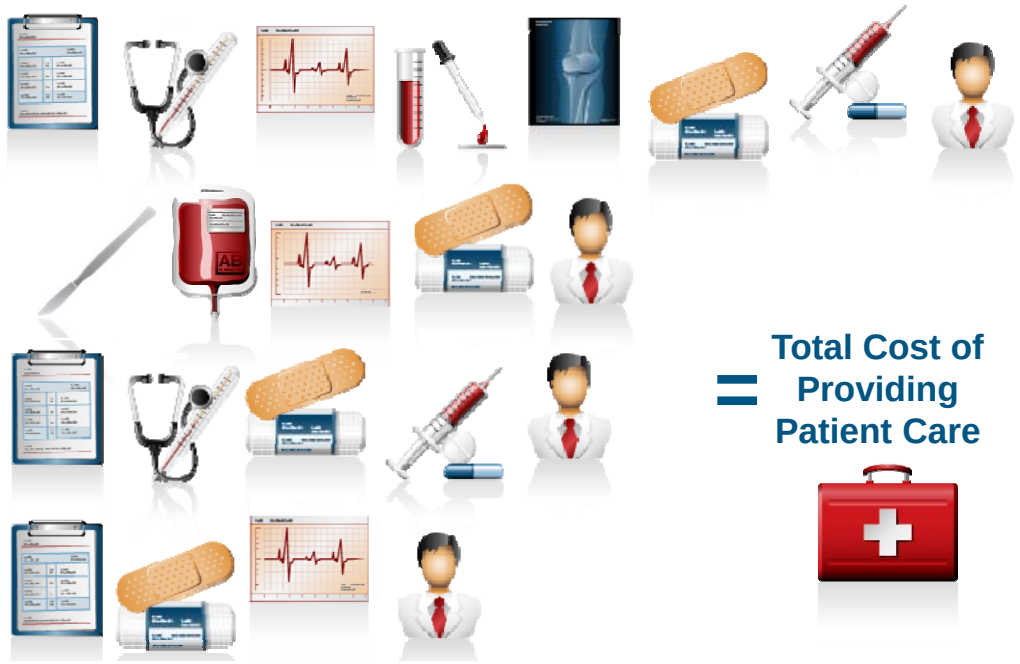
10:54am - Day 1		Day 2	Day 3	Day 4 – 1:45pm
Emergency Department 10:54am	OR 9:46 to 10:48	SICU Surgical ICU 2:16am	IMCU Intermediate Care Unit 1:30pm	SSTU Surgical Specialty & Trans. Unit 3:25pm

Emergency Department
Labor
Supplies
Imaging
Pharmacy
Lab
Other
Services

Operating Room
Labor
Supplies
Other
Services

Surgical ICU
Labor
Supplies
Pharmacy
Lab

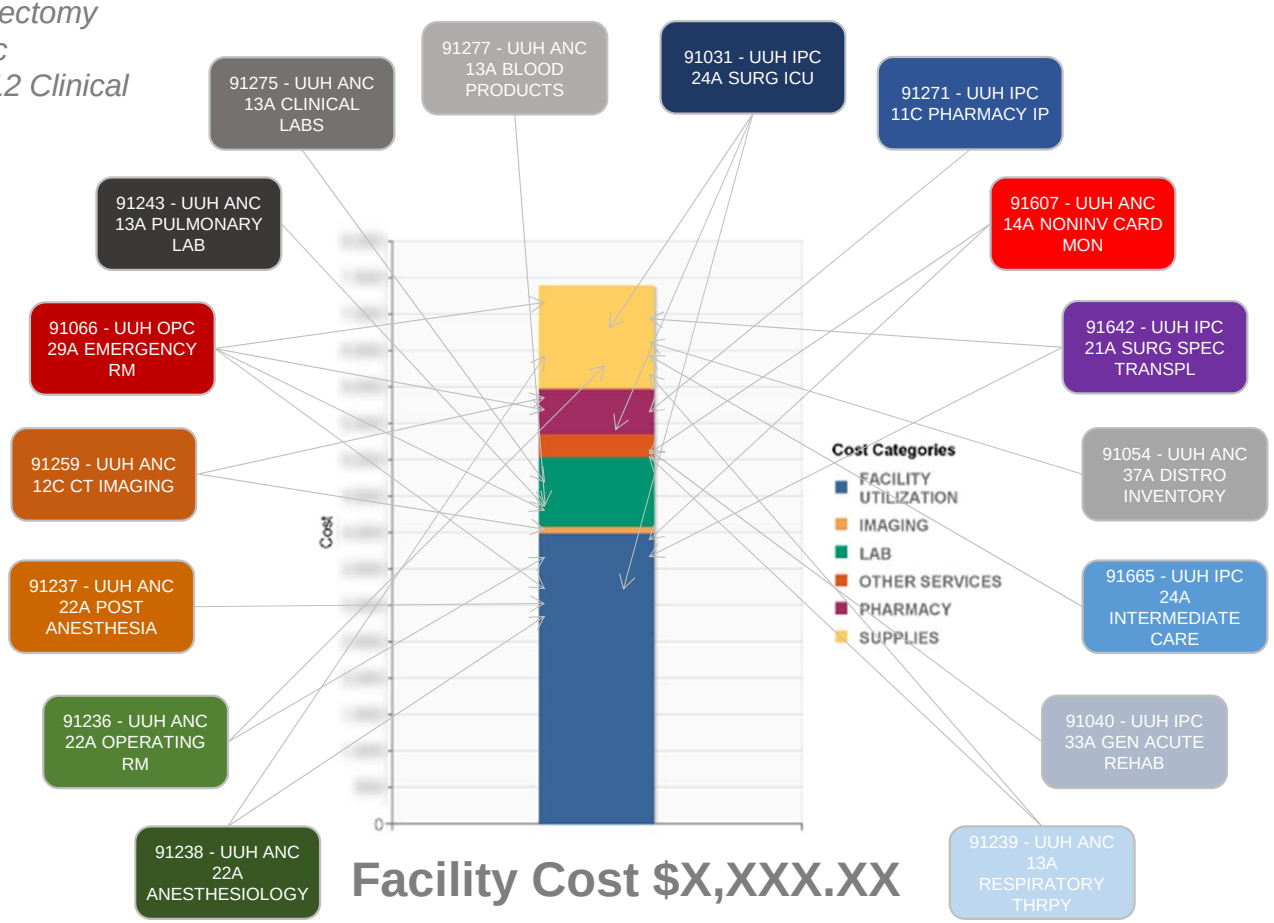
Step down and Floor Units
Labor
Supplies
Other
Services



= **Total Cost of Providing Patient Care**

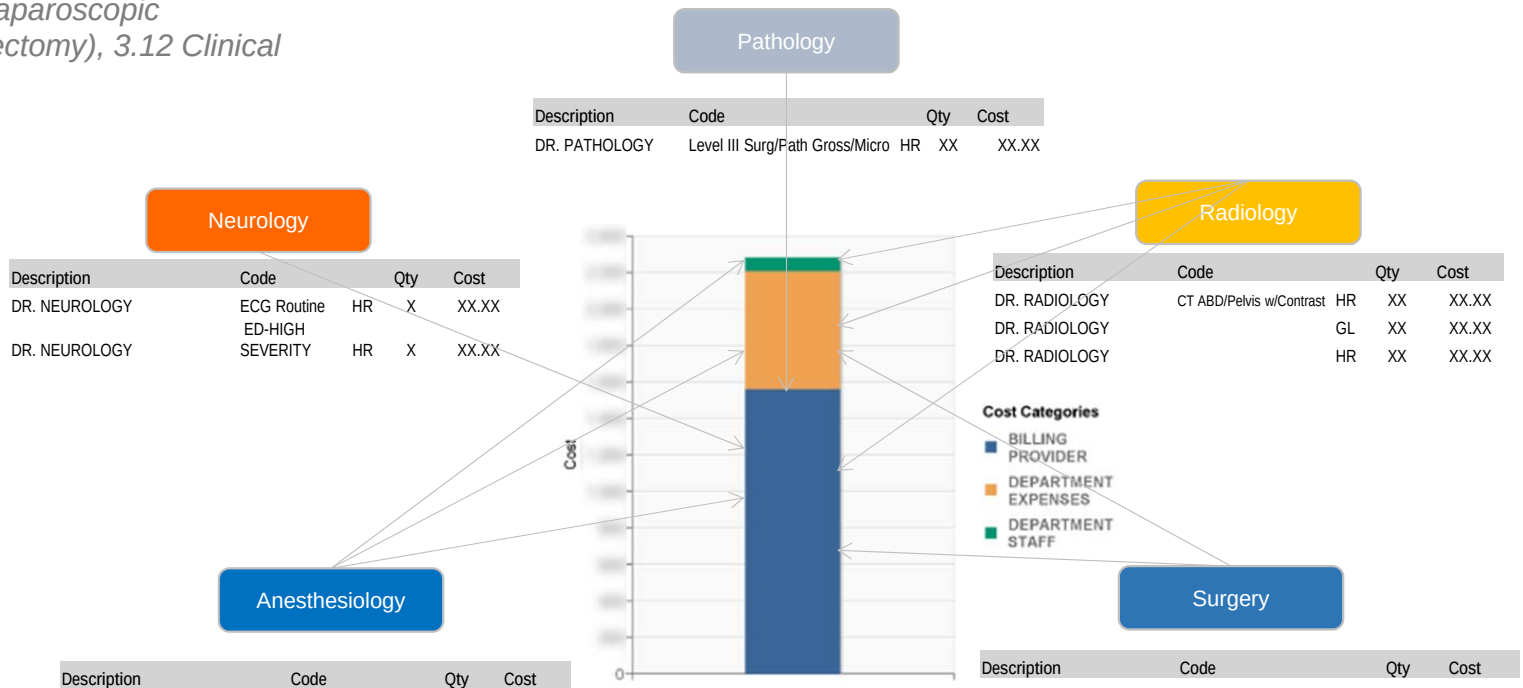
Facility Cost Allocations

Emergency Appendectomy (47.01 Laparoscopic Appendectomy), 3.12 Clinical LOS



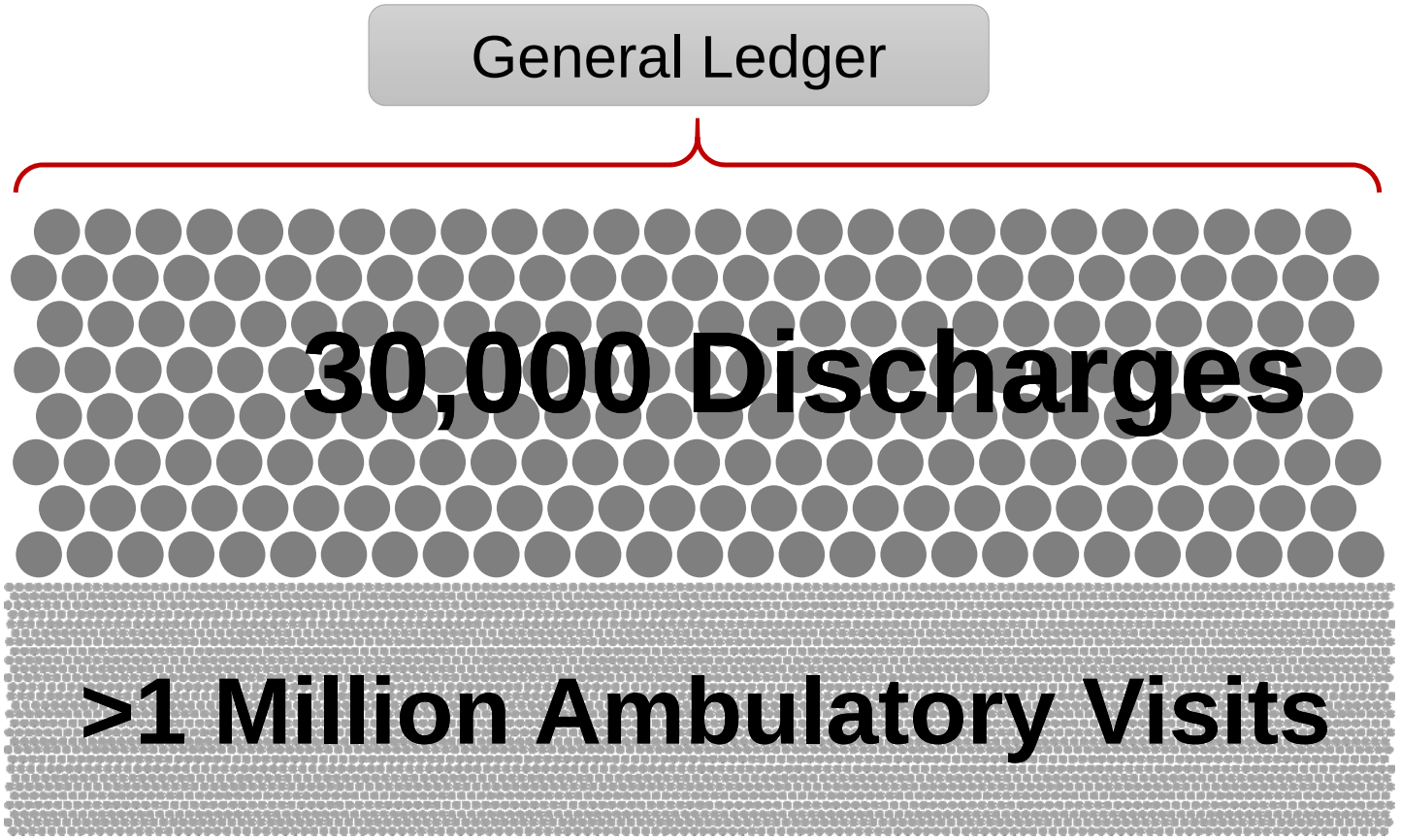
Professional Cost Allocations

Emergency Appendectomy (47.01 Laparoscopic Appendectomy), 3.12 Clinical LOS



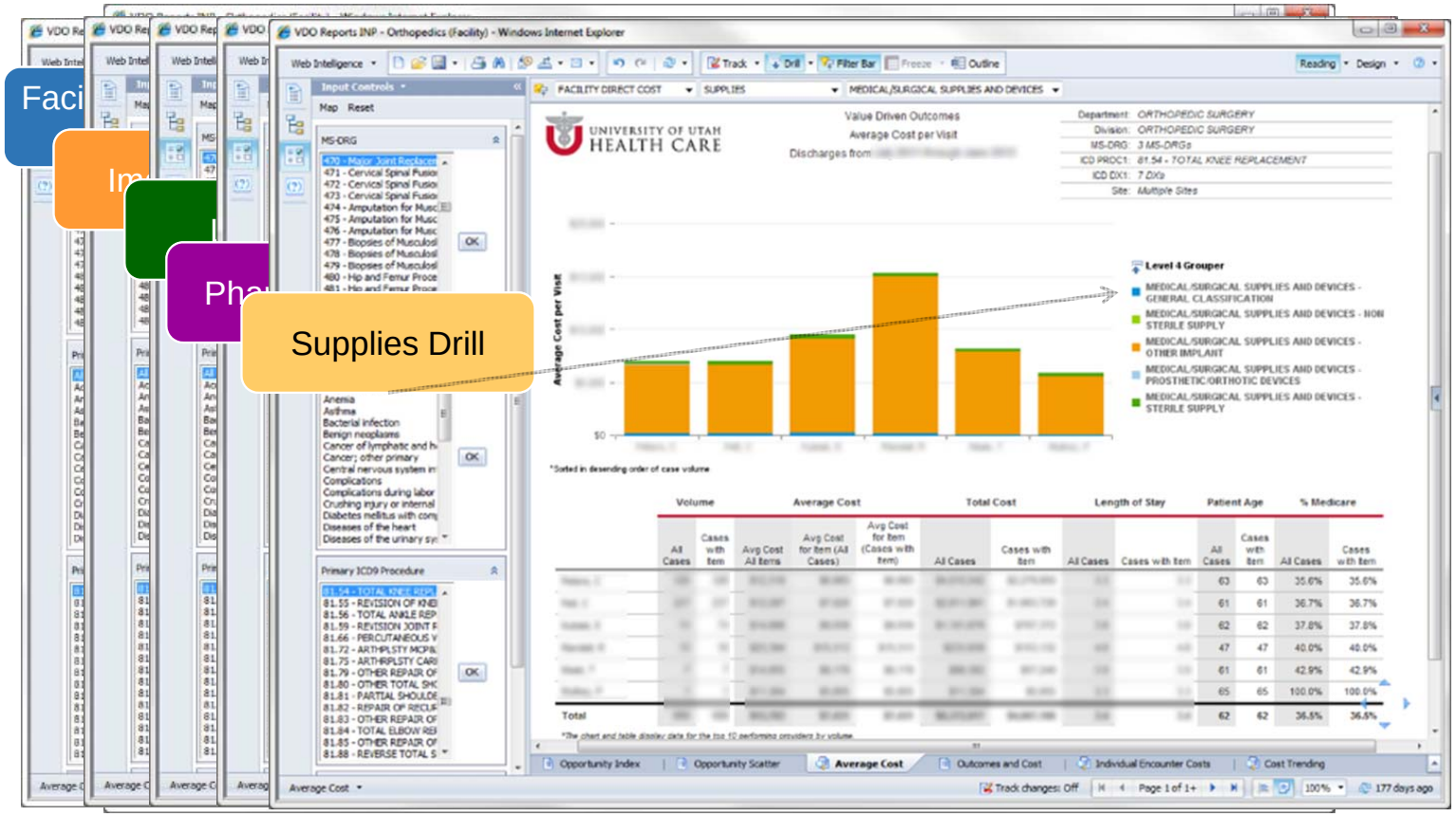
Professional Cost
$X,XXX.XX

Allocating Cost



VDOAnalytics

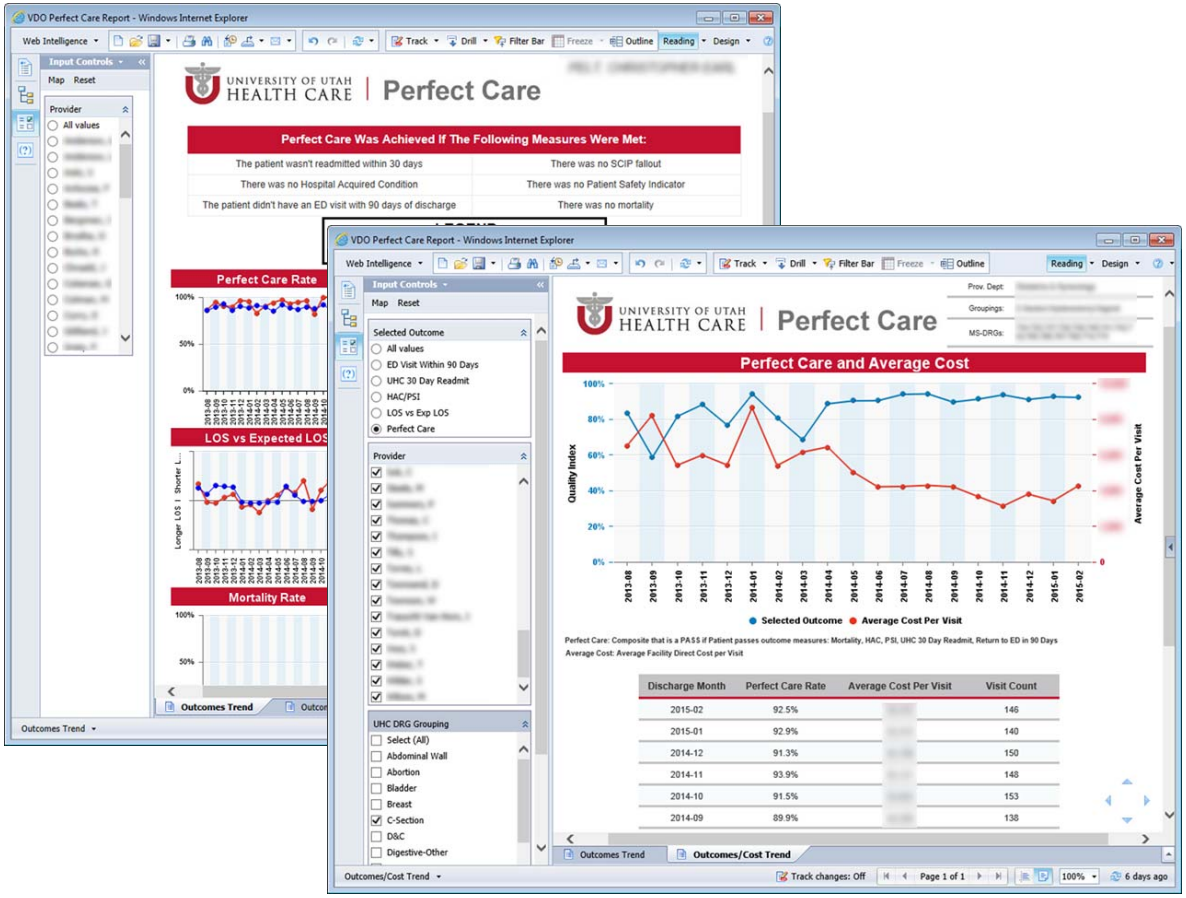
Cost Analytics



Ambulatory Surgery Value Explorer

- Compare procedure specific costs across providers
- Identify variation within cost categories
- Drill through to item cost details

Costs and Outcomes



- Compare outcomes and quality across providers
- Identify variation within a provider group
- Plot cost relative to outcomes

Engage Providers with Analytics

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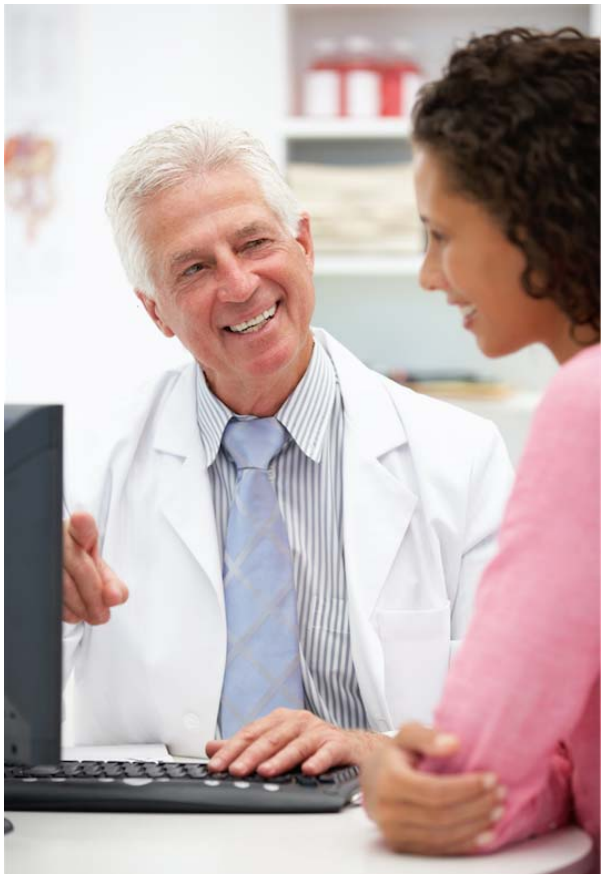
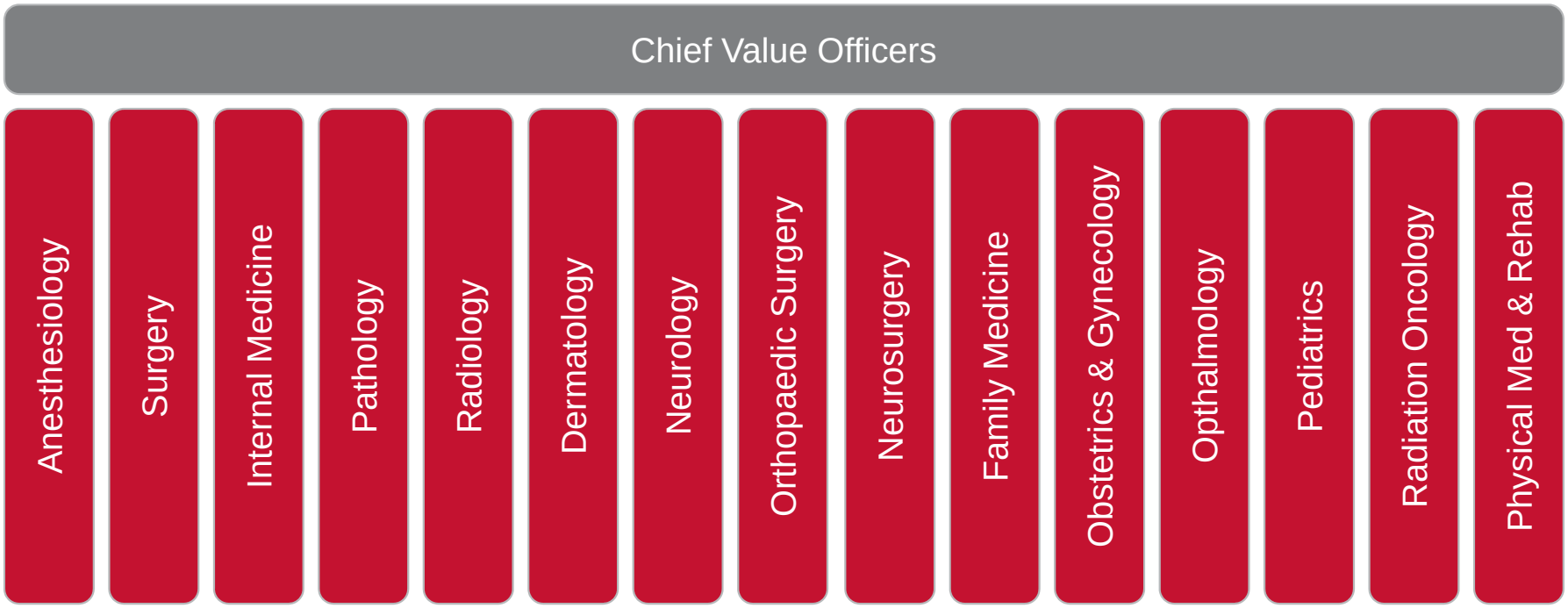
- Use data to engage providers to be problem solvers
- Involve providers in the development of analytics
- Include the metrics that are meaningful to the providers



Chief Value Officers



Top 50 Medical Conditions

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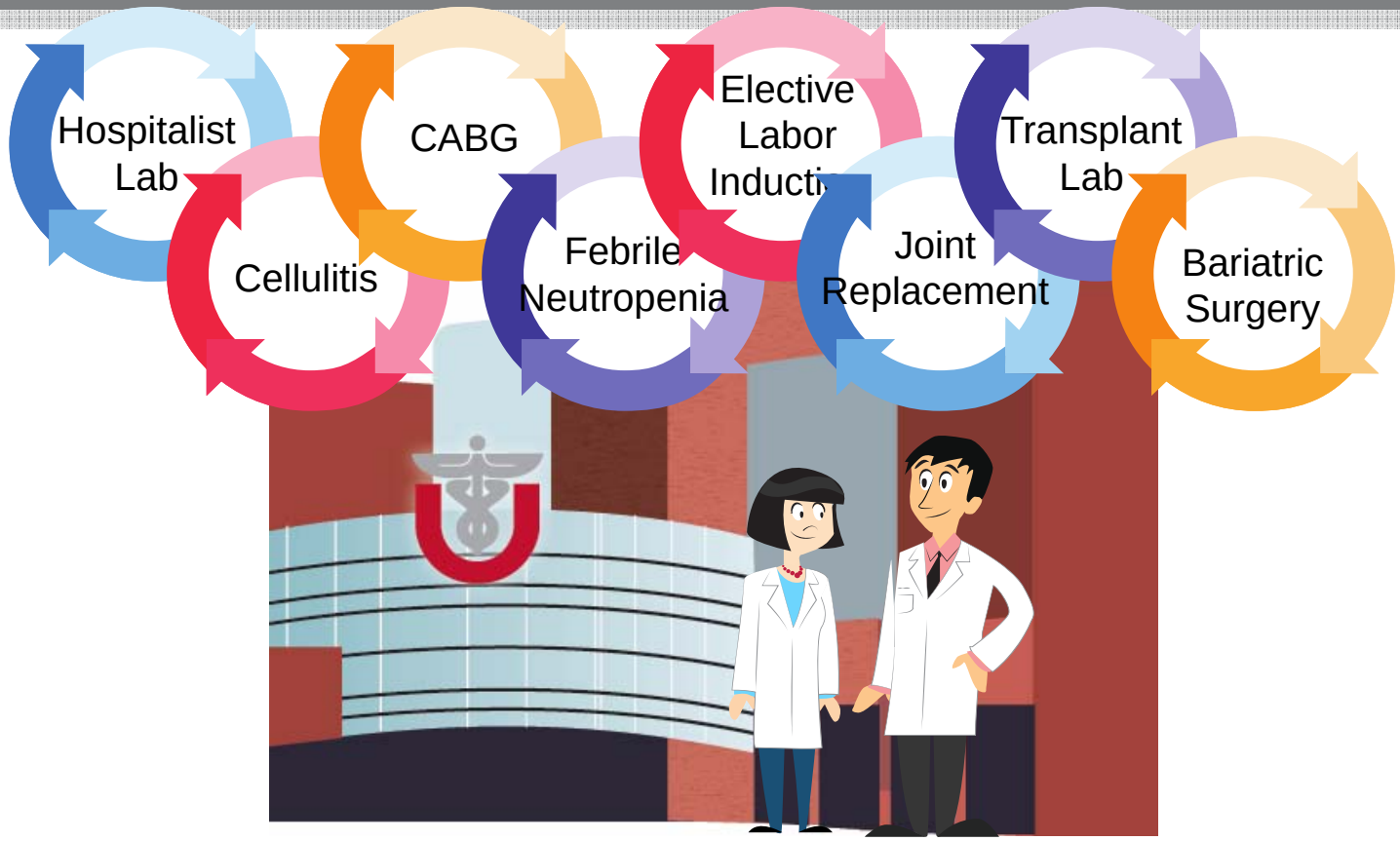
- Focus and Resources to Engage

Medical Condition	Department	MD Champion(s)	Value Engineering	Quality	Decision Support
Sepsis	Medicine	[illegible]dleton/Devin Horton	[illegible]llin Seabourne	Tim Nel[illegible]on	Daniel Fi[illegible]dley
Heart Failure	Medicine	Jim Fang, Joe Stelik	[illegible]ndy Spangler	Jim S[illegible]mos	Candi[illegible]Crawford
Joint replacement	Ortho	Chris Pelt	[illegible]teve Johnson	Tim [illegible]son	Jeff Y[illegible]ng
Rotator cuff/shoulder	Ortho	Patrick Preis	Lleyton Wade	Tim Nelson	Jeff Young
Stroke/TIA/intracranial hemm	Neurology/NSG	Jennifer Majersik, Philip Taussky	Andrew McLeod	Brian Black	Blake Bohe
Low back pain/spine surgery	NSG/Ortho	Darrel Brodke, Meic Schmidt	Gavin Brown	Brian Black/Tim Nelson	Blake Bohe/Jeff Young
Neck pain/cervical fusion	NSG	Darrel Brodke, Erica Bisson	Cynthia White	Brian Black/Tim Nelson	Blake Bohe/Jeff Young
A fib/A flutter	Medicine	Nassir Marrouche, Fred Han, John Ryan	Lleyton Wade	Jim Stamos	Candice Crawford
Heart transplant / LVAD	Medicine	Joe Stelik, MIke Gilbert, Craig Selzman	Gavin Brown	Eve Thorup	Tony Clawson
AMI/CAD/chest pain	Medicine	David Bull, Jack Morshazadeh, Fred Welt	Gavin Brown	Jim Stamos	Candice Crawford
CABG	Surgery	Craig Selzman	Steve Johnson	Susan Wright	Ben Helland
Normal Delivery	OBGYN	Howard Sharp	Collin Seabourne	Carol Henderson	William Johnson
C section	OBGYN	Howard Sharp	Collin Seabourne	Carol Henderson	William Johnson
Pneumonia	Medicine	Nathan Hatton, Barbara Jones	Blake Haas	Tim Nelson	Antoine Clawson
Hernia repair	Surgery	Rob Glasgow	Gavin Brown	Eve Thorup	Andrew Hansen
DVT/PE	Medicine	Stacy Johnson	Lleyton Wade	Tim Nelson	Blake Bohe
[illegible] (glioma)	Neurology/NSG	Randy Jensen	Lleyton Wade	Brian Black	Blake Bohe
[illegible]	[illegible]	Thomas Higgins, Erik Kubiak	Cynthia White	Tim Nelson	Jeff Young
[illegible]	[illegible]	[illegible]	Cindy Spangler	Jim Stamos	Candice Crawford
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Blake Bohe

VDO Projects



Top 50 Scorecards

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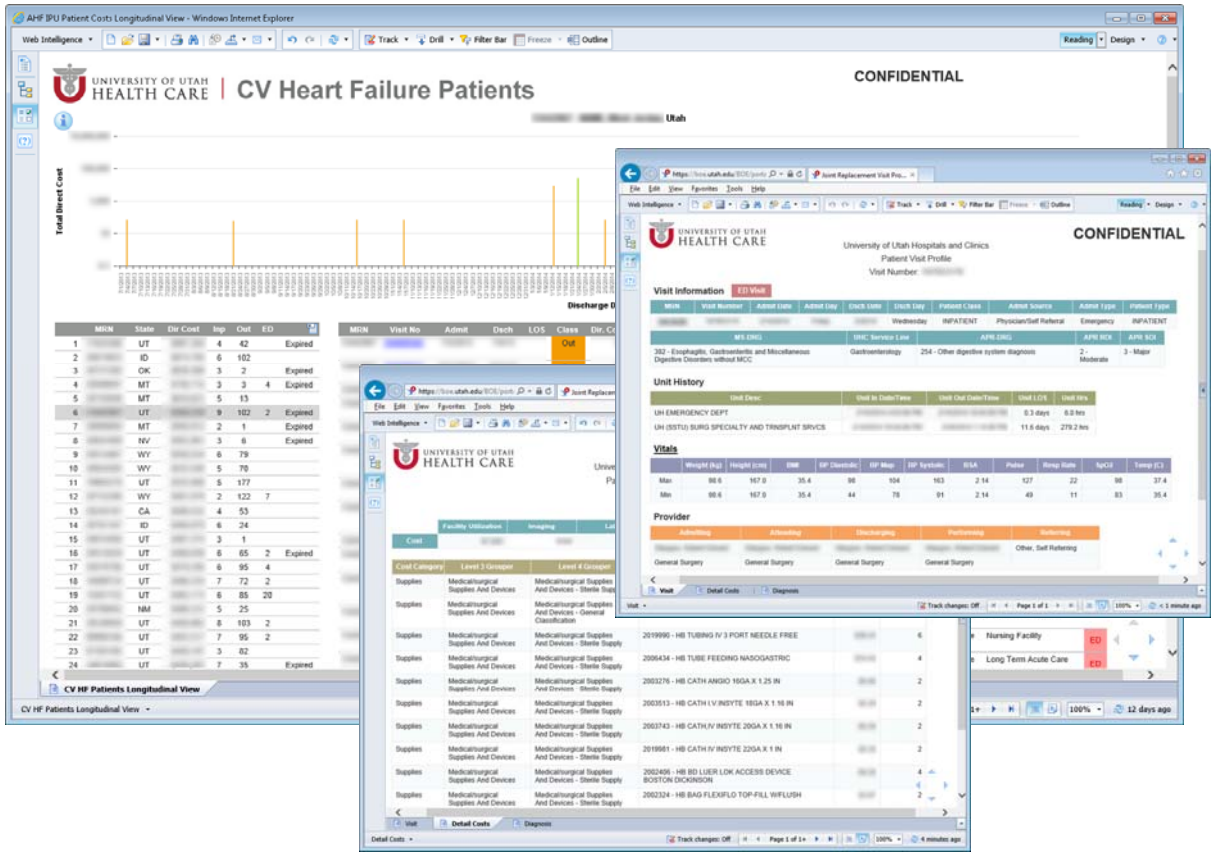
Longitudinal View



- Focus on populations
- Analyze interactions with patients over time
- Drill into individual patients

Operating Room Cost Analytics

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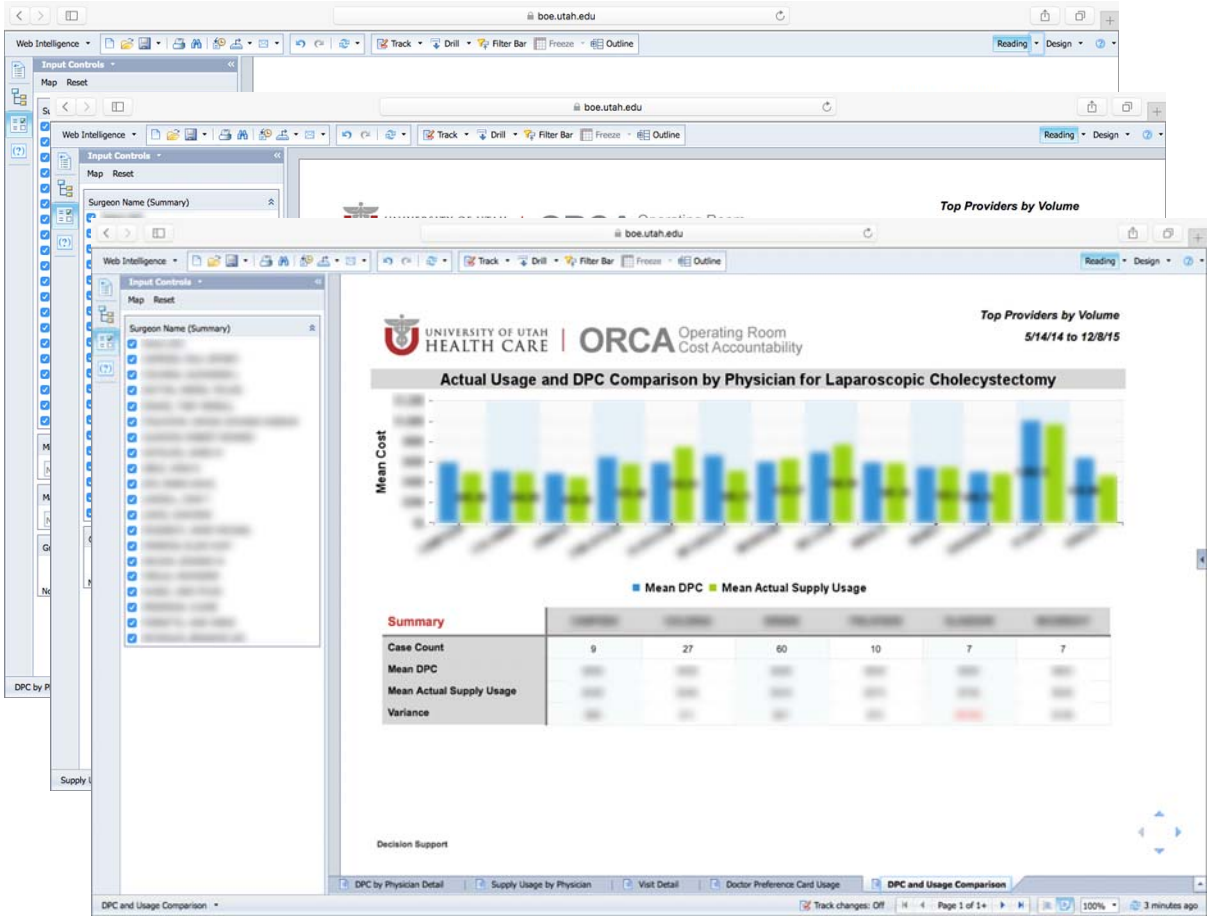
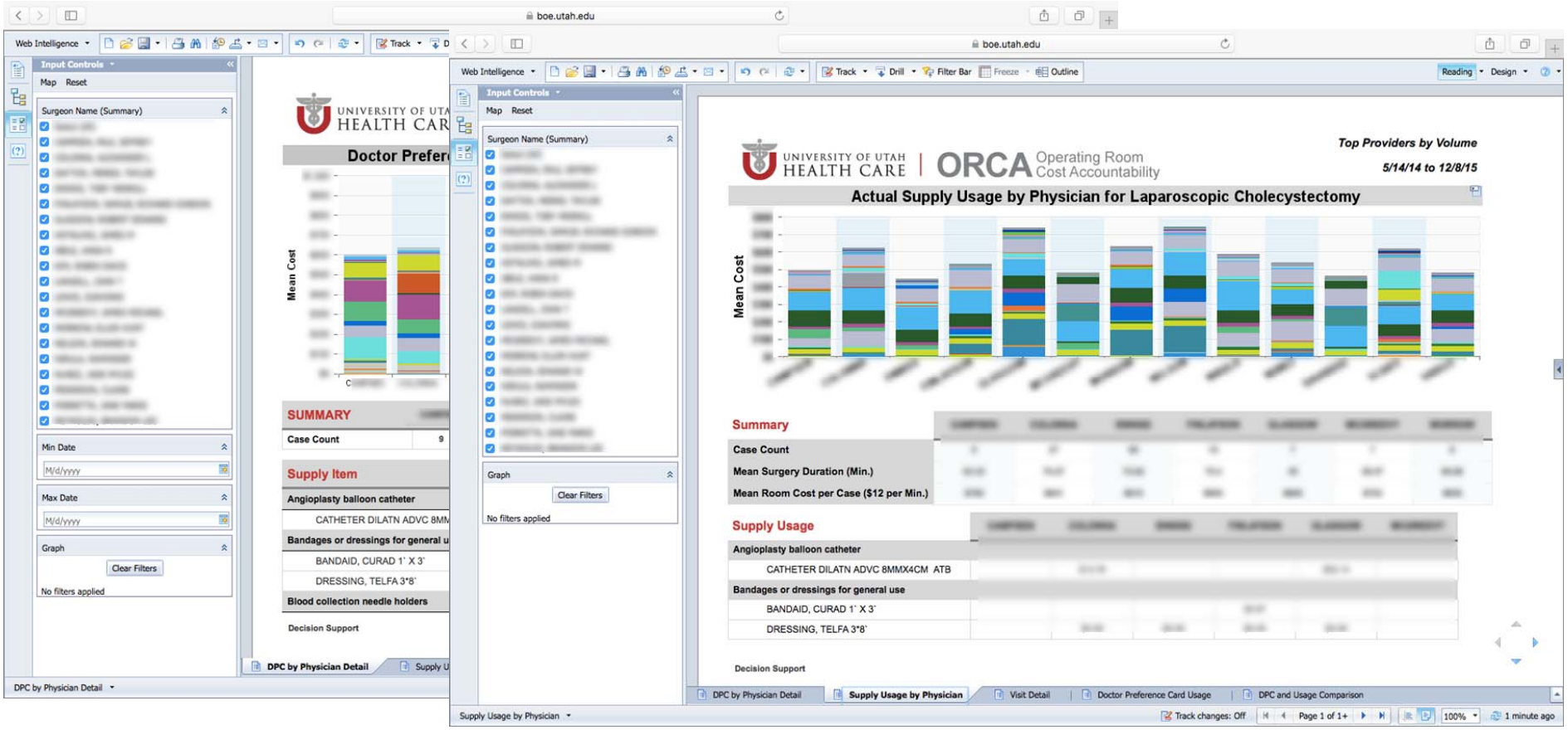


- Focus on what is controllable for the surgeons … DPC
- What was opened vs. What was used?
- Surgeon to surgeon comparison
- Analyze the variation

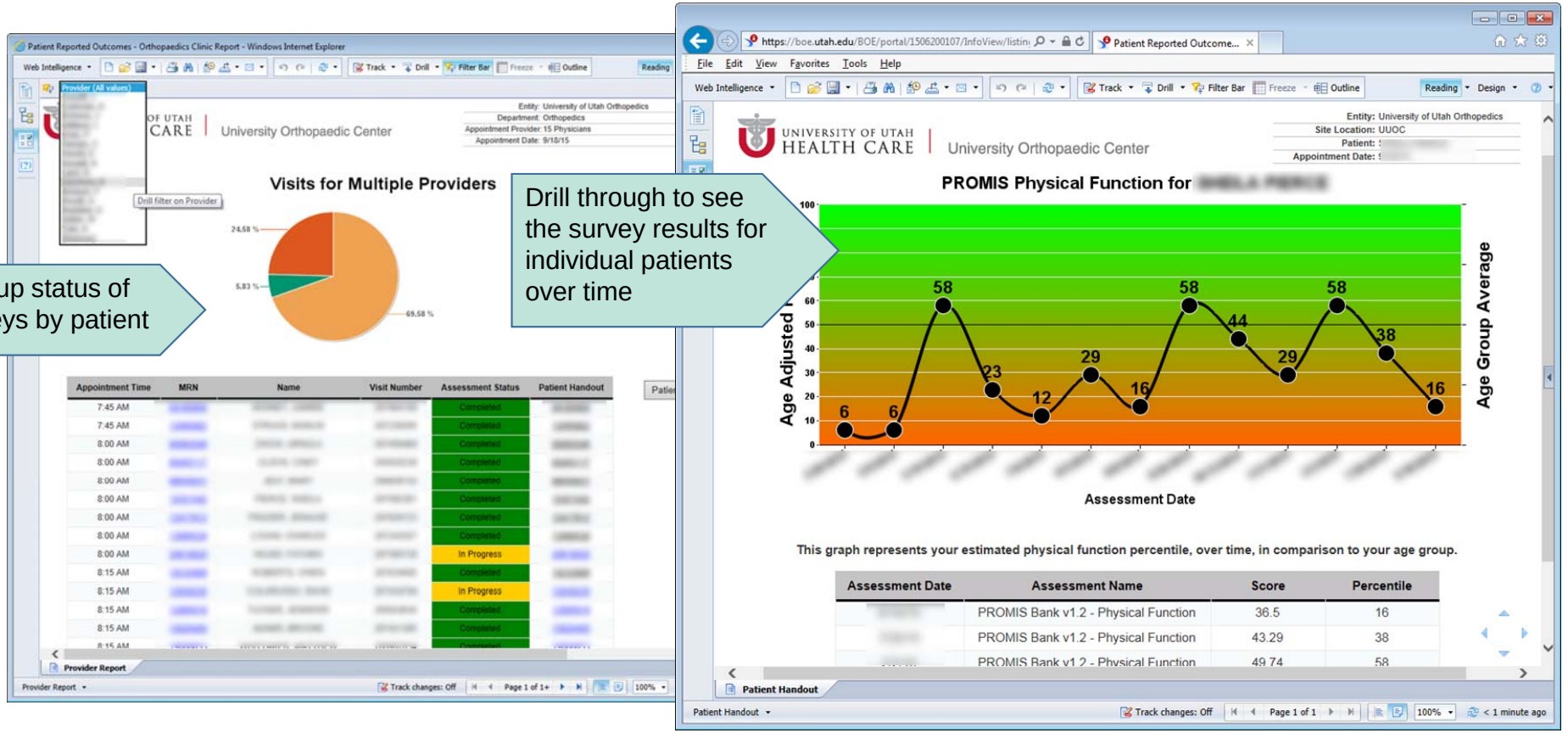
Supplies Pulled vs. Used



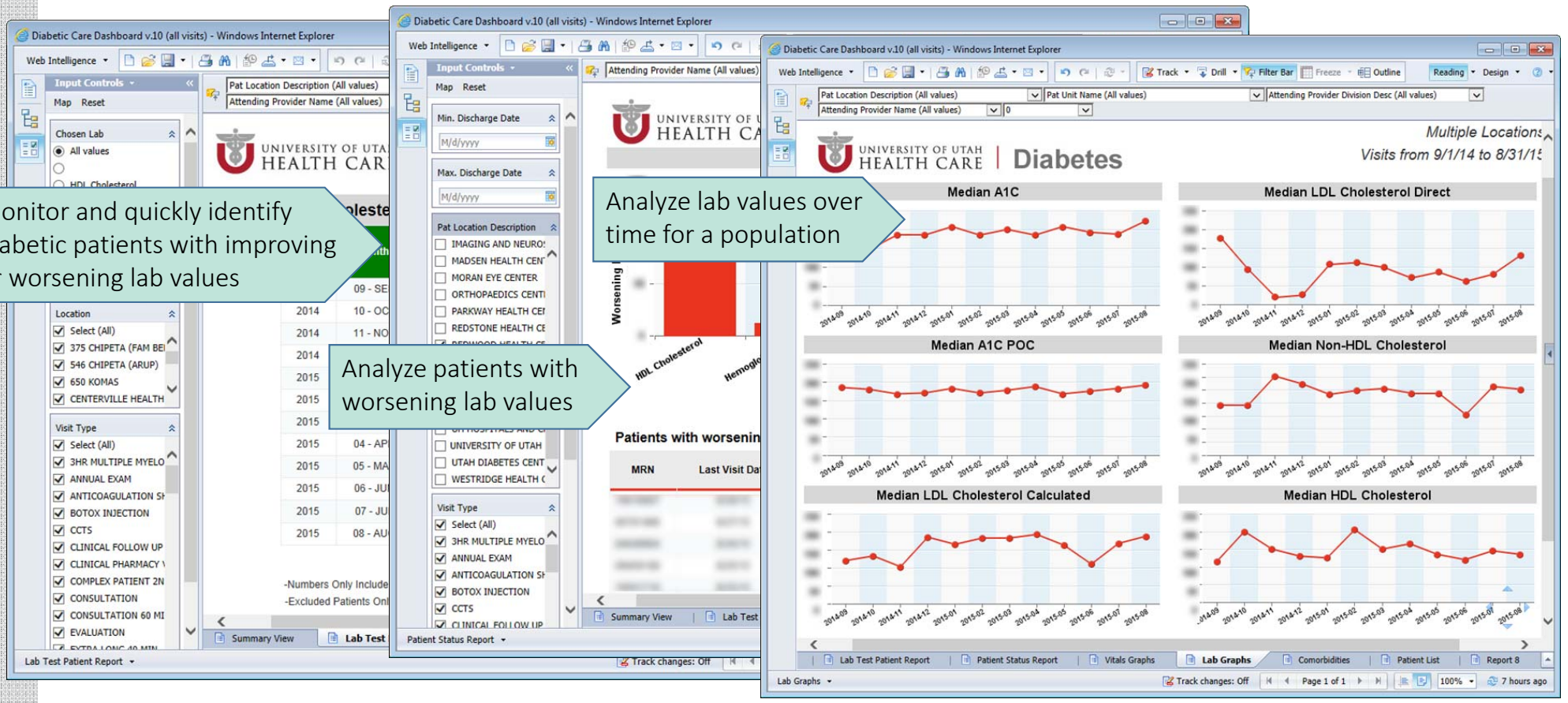
Supply Usage by Case

DPC vs. Usage Comparison

Patient Reported Outcomes



Diabetic Care Dashboard



Surgery Quality Scorecard

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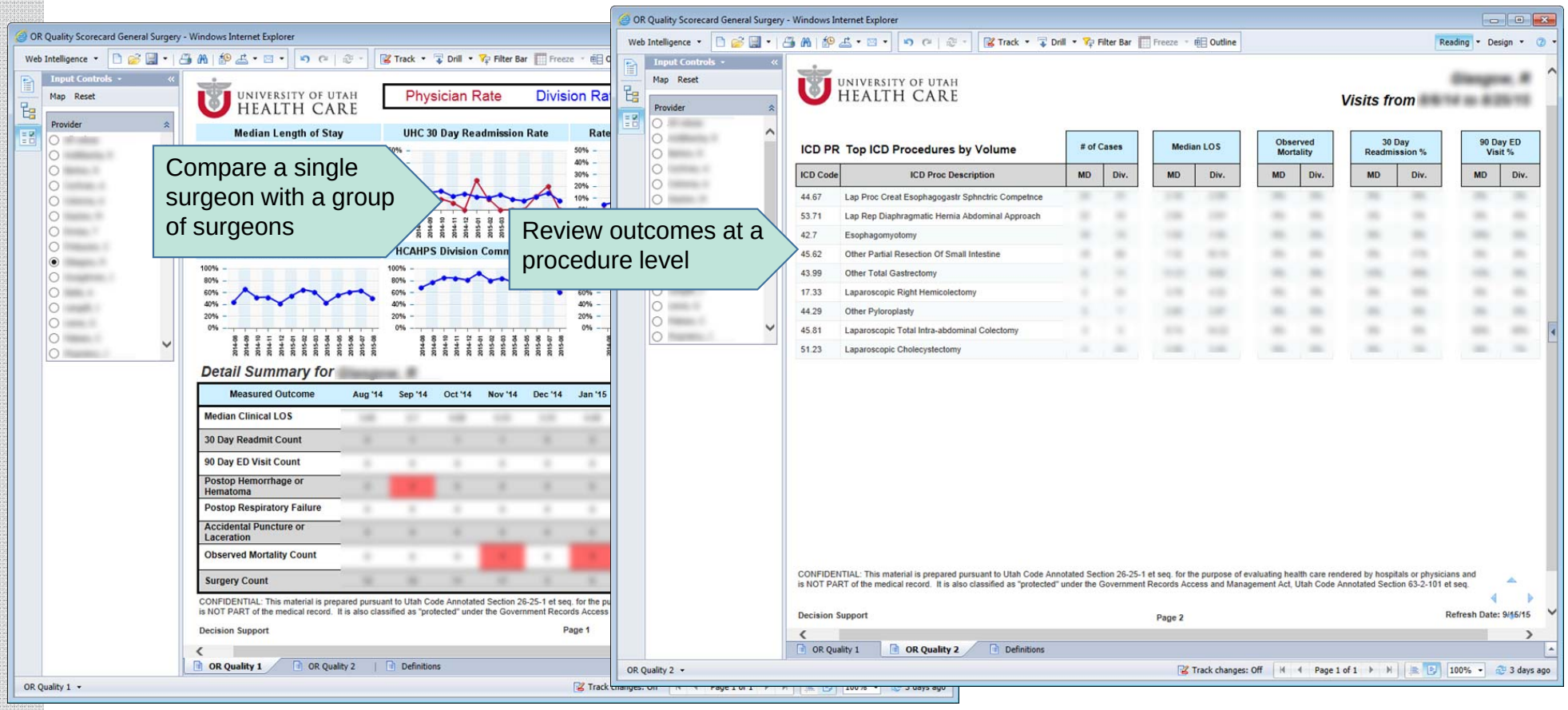

Results

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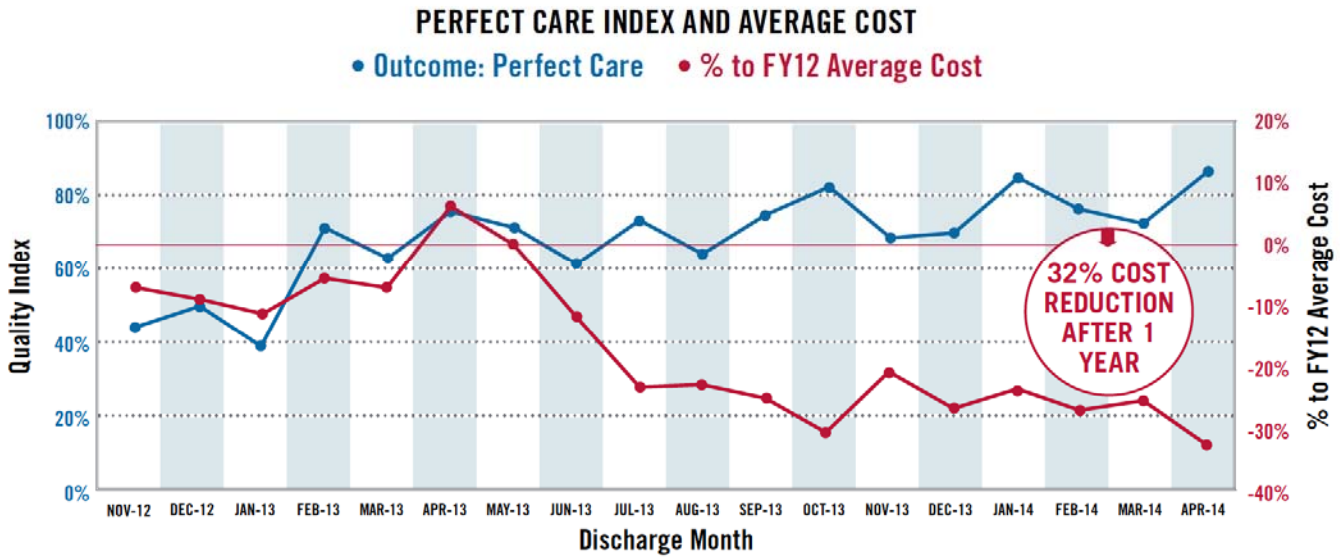
VALUE-DRIVEN OUTCOMES IN TOTAL JOINT REPLACEMENT:
Higher quality drives lower cost



Quality Index: Percentage of all visits where selected care measure was met
% to FY12 Average Cost: Ratio of that months avg. cost compared to baseline 2012 avg. cost

Results

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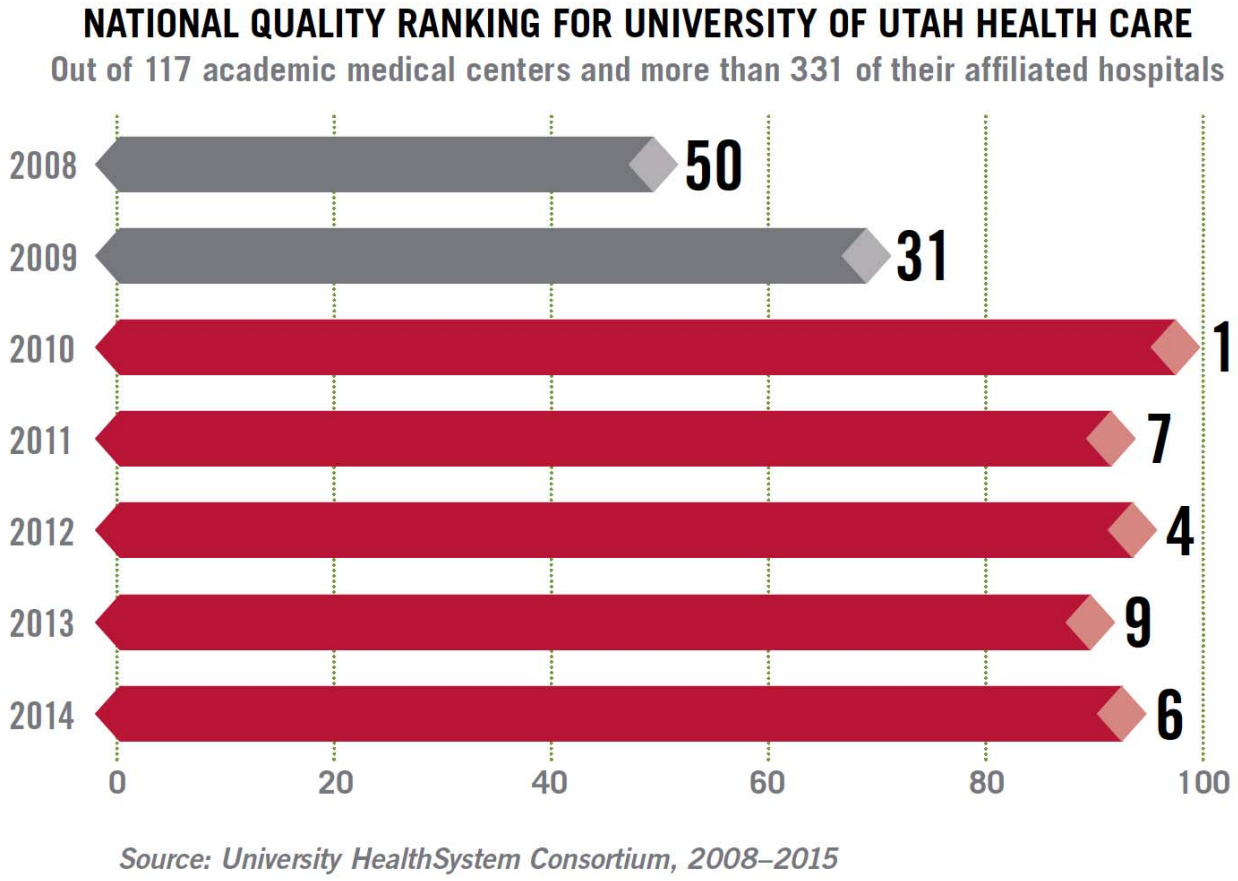

Source: University HealthSystem Consortium, 2008–2015

Results

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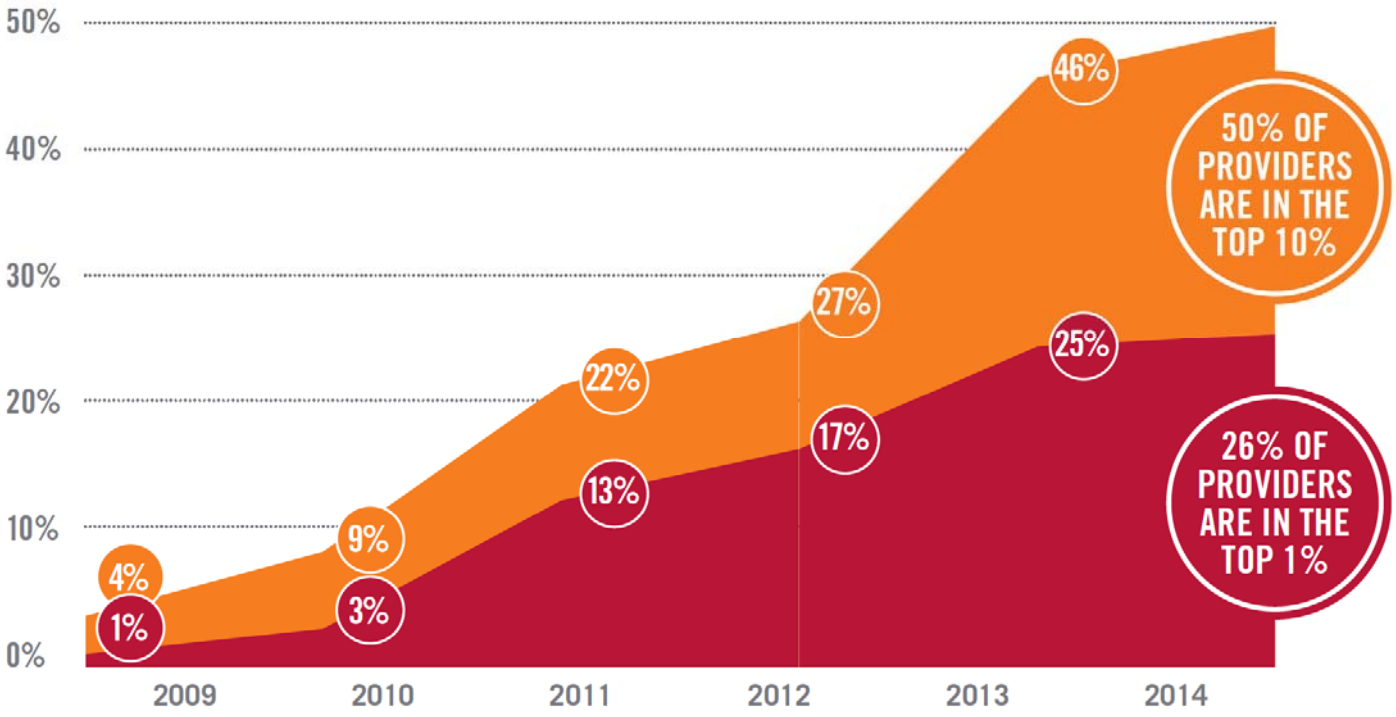
PATIENT SATISFACTION SCORES:
National benchmarks for University of Utah providers



Source: All Facilities Press Ganey Database includes the following: Number of Physicians: 142,411; Number of Patients: 2,783,597

Physician Engagement

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- Good data, then Transparency
- Involve providers in the process
- Resources/Support teams
- Focus
- MD Champions
- Organizational leadership…Culture

Top 50 Medical Conditions

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Medical Condition	Department	MD Champion(s)	Value Engineering	Quality	Decision Support
Sepsis	Medicine	Bob Pendleton/Devin Horton	Collin Seabourne	Tim Nelson	Daniel Findley
Heart Failure	Medicine	Jim Fang, Joe Stelik	Cindy Spangler	Jim Stamos	Candice Crawford
Joint replacement	Ortho	Chris Pelt	Steve Johnson	Tim Nelson	Jeff Young
Rotator cuff/shoulder	Ortho	Patrick Preis	Lleyton Wade	Tim Nelson	Jeff Young
Stroke/TIA/intracranial hemm	Neurology/NSG	Jennifer Majersik, Philip Taussky	Andrew McLeod	Brian Black	Blake Bohe
Low back pain/spine surgery	NSG/Ortho	Darrel Brodke, Meic Schmidt	Gavin Brown	Brian Black/Tim Nelson	Blake Bohe/Jeff Young
Neck pain/cervical fusion	NSG	Darrel Brodke, Erica Bisson	Cynthia White	Brian Black/Tim Nelson	Blake Bohe/Jeff Young
A fib/A flutter	Medicine	Nassir Marrouche, Fred Han, John Ryan	Lleyton Wade	Jim Stamos	Candice Crawford
Heart transplant / LVAD	Medicine	Joe Stelik, MIke Gilbert, Craig Selzman	Gavin Brown	Eve Thorup	Tony Clawson
AMI/CAD/chest pain	Medicine	David Bull, Jack Morshazadeh, Fred Welt	Gavin Brown	Jim Stamos	Candice Crawford
CABG	Surgery	Craig Selzman	Steve Johnson	Susan Wright	Ben Helland
Normal Delivery	OBGYN	Howard Sharp	Collin Seabourne	Carol Henderson	William Johnson
C section	OBGYN	Howard Sharp	Collin Seabourne	Carol Henderson	William Johnson
Pneumonia	Medicine	Nathan Hatton, Barbara Jones	Blake Haas	Tim Nelson	Antoine Clawson
Hernia repair	Surgery	Rob Glasgow	Gavin Brown	Eve Thorup	Andrew Hansen
DVT/PE	Medicine	Stacy Johnson	Lleyton Wade	Tim Nelson	Blake Bohe
Brain tumor (glioma)	Neurology/NSG	Randy Jensen	Lleyton Wade	Brian Black	Blake Bohe
Hip fracture	Ortho	Thomas Higgins, Erik Kubiak	Cynthia White	Tim Nelson	Jeff Young
Valve replacement	Medicine	David Bull, Fred Welt, Brent Wilson	Cindy Spangler	Jim Stamos	Candice Crawford
Epilepsy	Neurology/NSG	Susan Baggaley/Paul House	Cindy Spangler	Brian Black	Blake Bohe

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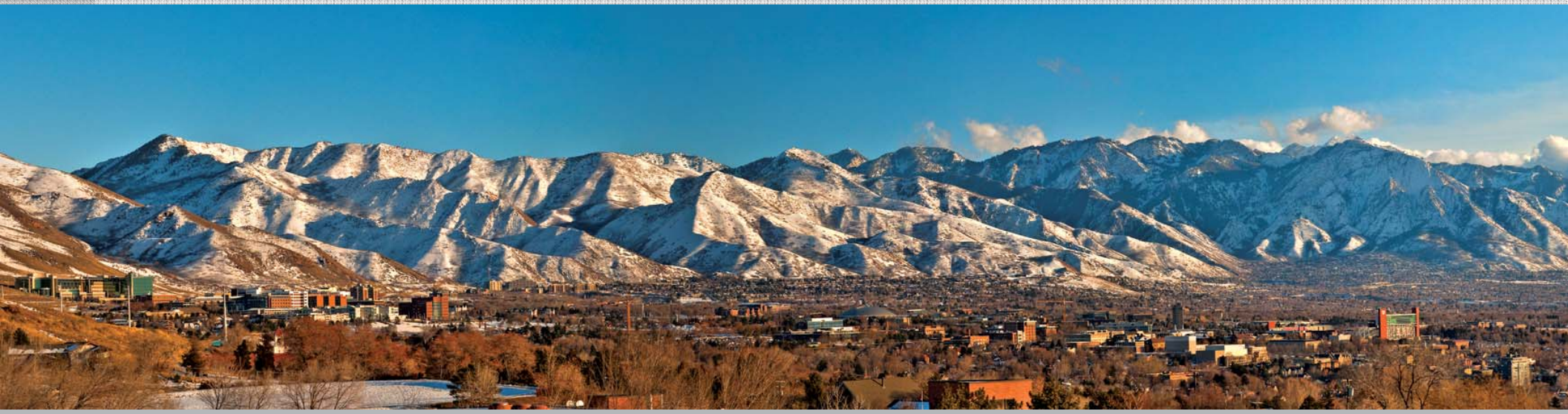

Thank You