

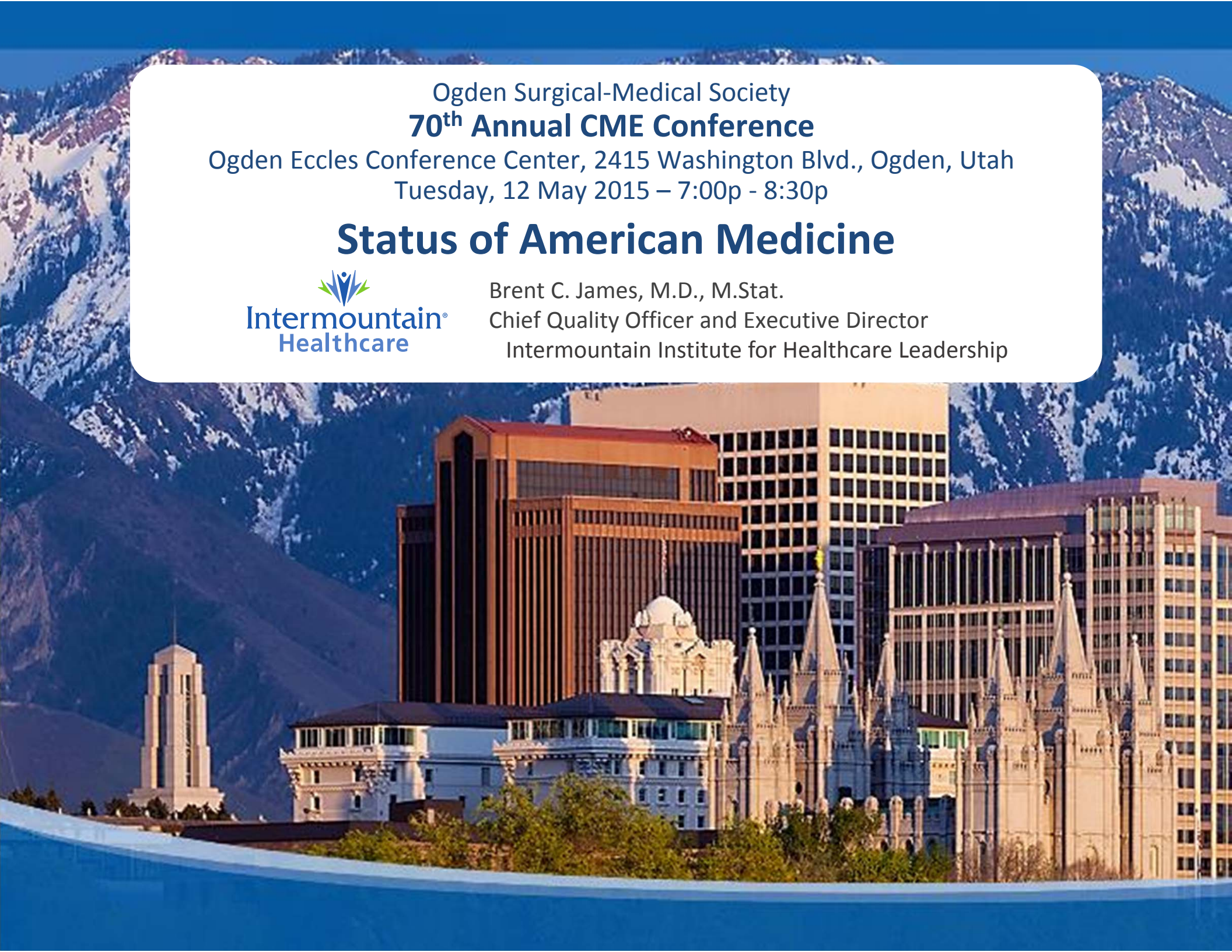
Ogden Surgical-Medical Society  
**70<sup>th</sup> Annual CME Conference**

Ogden Eccles Conference Center, 2415 Washington Blvd., Ogden, Utah  
Tuesday, 12 May 2015 – 7:00p - 8:30p

## Status of American Medicine



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# Disclosures

*Neither I, Brent C. James, nor any family members, have any relevant financial relationships to be discussed, directly or indirectly, referred to or illustrated with or without recognition within the presentation.*

*I have no financial relationships beyond my employment at Intermountain Healthcare.*

# Core idea behind variation research

***Apply rigorous measurement tools  
developed for **clinical research*****

*to*

***routine **care delivery performance*****

# Quality, Utilization, and Efficiency (QUE)

- ◆ **Six clinical areas studied over 2 years:**

- transurethral prostatectomy (TURP)
- open cholecystectomy
- total hip arthroplasty
- coronary artery bypass graft surgery (CABG)
- permanent pacemaker implantation
- community-acquired pneumonia

- ◆ **pulled all patients treated over a defined time period**  
*across all Intermountain inpatient facilities - typically 1 year*

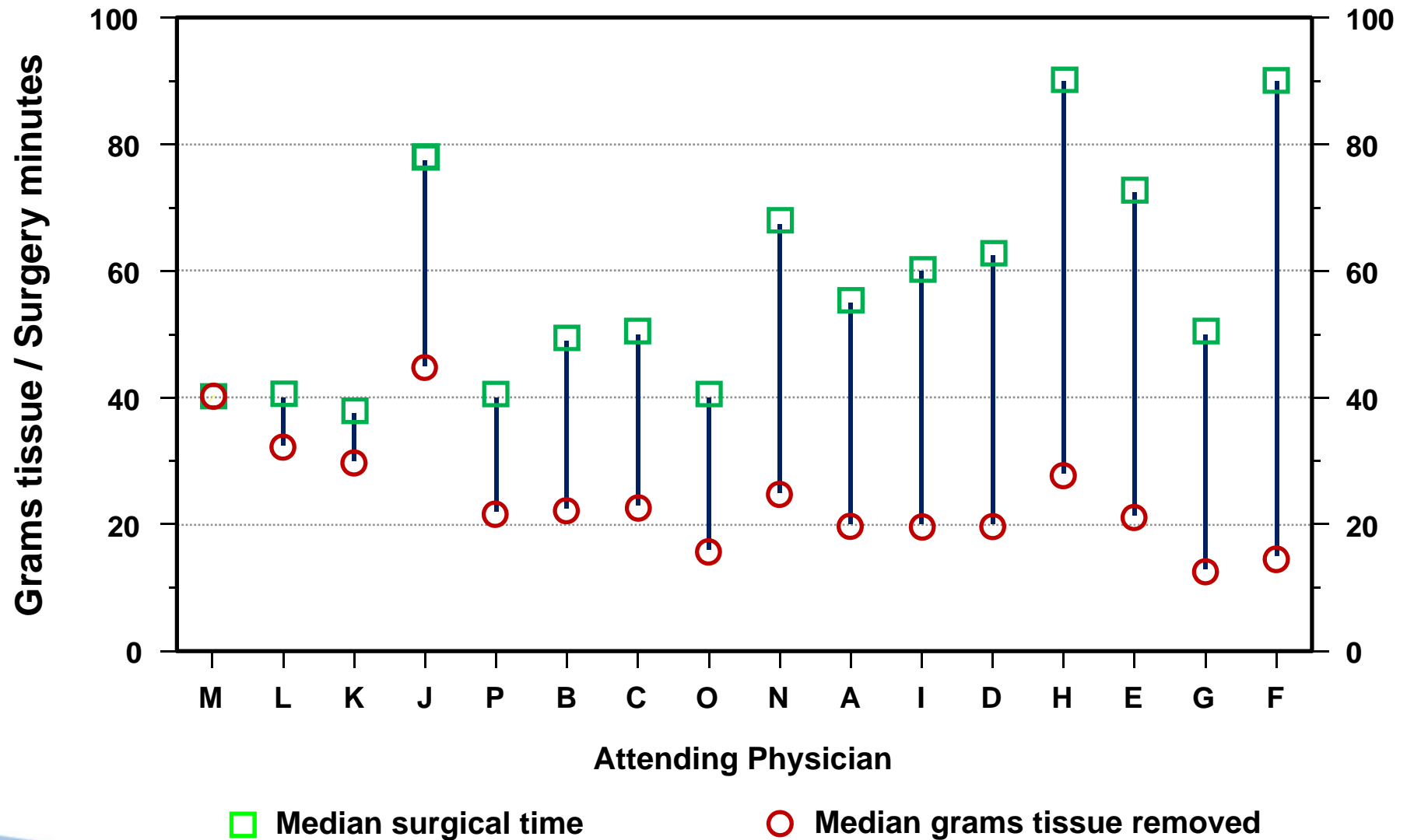
- ◆ **identified and staged** *(relative to changes in expected utilization)*

- severity of presenting primary condition
- all comorbidities on admission
- every complication
- measures of long term outcomes

- ◆ **compared physicians with meaningful # of cases**  
*(low volume physicians included in parallel analysis, as a group)*

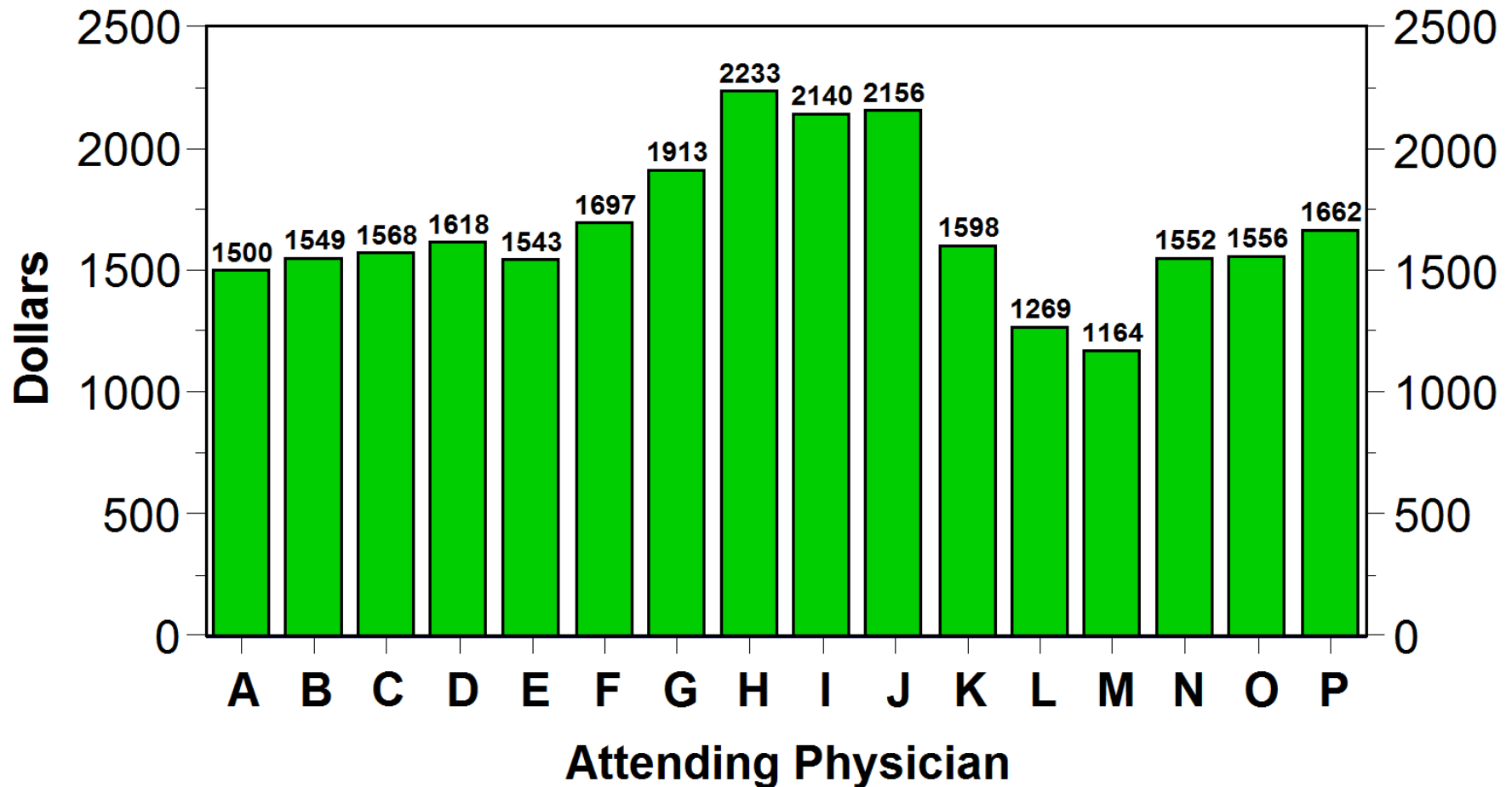
# Intermountain TURP QUE Study

## Median Surgery Minutes vs Median Grams Tissue



# Intermountain TURP QUE Study

## Average true cost to hospital



# The opportunity *(care falls short of its theoretic potential)*

- 1. Massive variation in clinical practices** *(beyond even the remote possibility that all patients receive good care)*
- 2. High rates of inappropriate care** *(where the risk of harm inherent in the treatment outweighs any potential benefit)*
- 3. Unacceptable rates of preventable care-associated patient injury and death**
- 4. Striking inability to "do what we know works"**
- 5. Huge amounts of waste, leading to spiraling prices that limit access to care**

# We know why variation occurs

- (1) **Continued reliance on the "craft of medicine"**  
*(clinicians as stand-alone experts)*

***encounters***

- (2) **Complexity; a.k.a. clinical uncertainty**  
*- the fruits of 100 years of clinical discovery*

*“The complexity of modern medicine exceeds the capacity of the unaided expert mind.”*

*Dr. David Eddy, Stanford University -- the father of evidence-based medicine)*





# The craft of medicine

## *An individual physician*

- ♦ *placing her patient's health care needs before any other end or goal,*
- ♦ *Drawing on extensive clinical knowledge gained through formal education and experience*

## *can craft*

- ♦ *a unique diagnostic and treatment regimen customized for that particular patient.*

## *Medicine's promise:*

*This approach guarantees the best result possible for each patient.*



# Clinical uncertainty *(a hundred years of science ... the primary sources of practice variation)*

- 1. Lack of valid clinical knowledge** *regarding best treatment  
(poor evidence)*
- 2. Exponentially increasing new medical knowledge**  
*(doubling time has decreased to <8 years; at current rates, a clinician will need to learn, unlearn, then relearn half of her medical knowledge base 5+ times during a typical career)*
- 3. Continued reliance on subjective judgment**  
*(subjective recall is dominated by anecdotes, and notoriously unreliable when estimating results across groups or over time)*
- 4. Limitations of the expert mind when making complex decisions** *(Miller, 1956: The magic number 7, plus or minus 2:  
some limits on our capacity for processing information)*

*Which, when combined with the craft of medicine, leads to:*

*Enthusiasm for unproven methods ... Mark Chassin, MD*

*The maxim, "If it might work, try it" ... David Eddy, MD, PhD*

*Quality means "spare no expense" ... Brent James, MD, MStat*

# Two methods to manage complexity

**Subspecialize** (*analytic method; reductionism; 'divide and conquer'*)

*An old joke: You know more and more about less and less until you know everything about nothing*

**Mass customize** (*a shared baseline: focus on that relatively small subset of factors that are unique for each individual patient [typically 5-15% of all factors], concentrating your most important resource -- the trained human mind -- where it can have the greatest impact*)

# Dr. Alan Morris, LDS Hospital, 1991

- ◆ **NIH-funded randomized controlled trial**  
*assessing an Italian "artificial lung" vs. standard ventilator management for acute respiratory distress syndrome (ARDS)*
- ◆ **discovered large variations in ventilator settings**  
*across and within expert pulmonologists*
- ◆ **created a protocol** for ventilator settings in the control arm of the trial
- ◆ **implemented the protocol using Lean principles**  
*(Womack et al., 1990 - The Machine That Changed the World)*
  - *built into clinical workflows - automatic unless modified*
  - *clinicians encouraged to vary based on patient need*
  - *variances and patient outcomes fed back in a Lean Learning Loop*

# Problems with “best care” protocols

- ◆ **Lack of evidence for best practice**

- Level 1, 2, or 3 evidence available only about 15-25% of the time

- ◆ **Expert consensus is unreliable**

- experts can't accurately estimate rates relying on subjective recall  
(produce guesses that range from 0 to 100%, with no discernable pattern of response)
  - what you get depends on whom you invite (specialty level, individual level)

- ◆ **Guidelines don't guide practice**

- systems that rely on human memory execute correctly ~50% of the time (McGlynn: 55% for adults, 46% for children)

- ◆ **No two patients are the same; therefore, no guideline perfectly fits any patient** (with very rare exception)

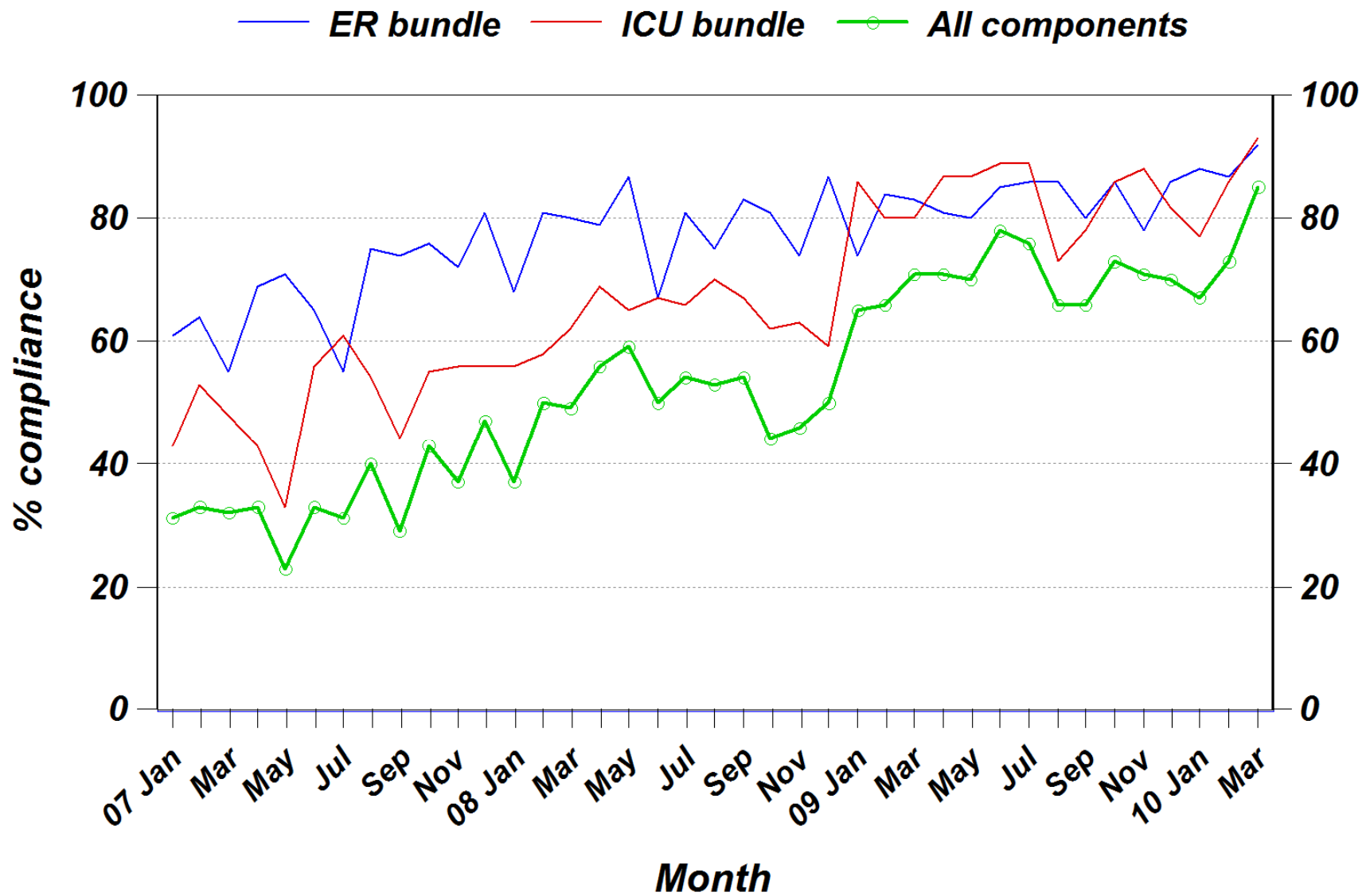
# Shared Baseline “Lean” protocols (*bundles*)

1. **Identify a high-priority clinical process** (*key process analysis*)
2. **Build an evidence-based best practice protocol**  
(*always imperfect: poor evidence, unreliable consensus*)
3. **Blend it into clinical workflow** (= *clinical decision support; don't rely on human memory; make "best care" the lowest energy state, default choice that happens automatically unless someone must modify*)
4. **Embed data systems to track (1) protocol variations and (2) short and long term patient results** (*intermediate and final clinical, cost, and satisfaction outcomes*)
5. **Demand that clinicians vary based on patient need**
6. **Feed those data back** (*variations, outcomes*) **in a Lean Learning Loop** - *constantly update and improve the protocol*

# Results:

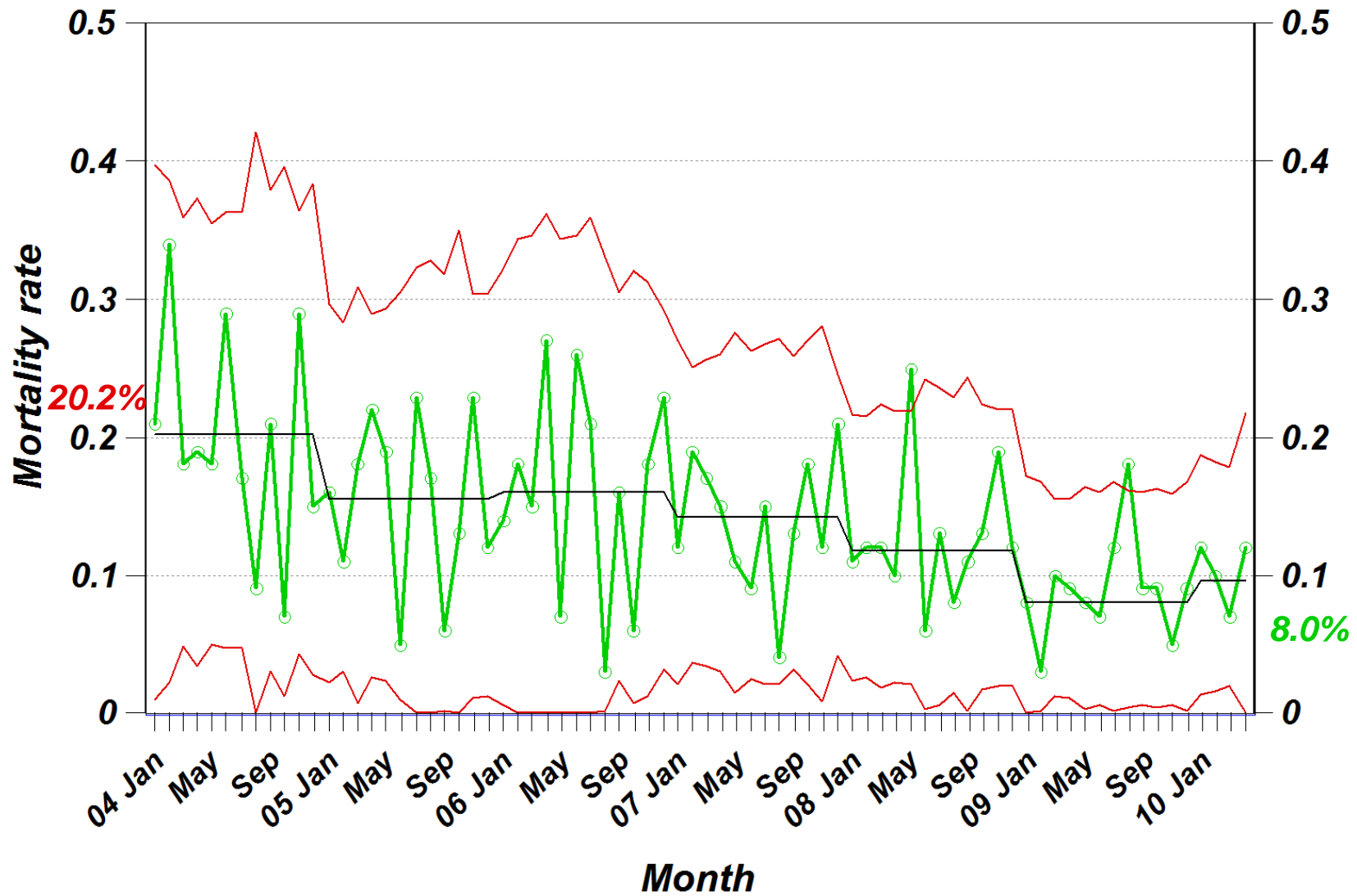
- **Survival** (for ECMO entry criteria patients) **improved from 9.5% to 44%**
- **Costs fell by ~25%** (from ~\$160,000 to ~\$120,000 per case)
- **Physician time fell by ~50%** (a major increase in physician productivity)

# Sepsis bundle compliance





# Sepsis mortality - ER-ICU transfers



125+ fewer inpatient deaths per year

# Lesson 1

***We count our successes in lives***

# Sepsis costs - all ER-ICU transfers

*Adjusted for age and severity at admission (CCIS); inflation adjusted to 2012 dollars*

<u>Year</u>	<u># cases</u>	<u>Compliance rate</u>	<u>Mortality rate</u>	<u>Total cost reduction (\$)</u>	<u>Annual NOI impact (\$)</u>
2004	384	4.4%	21.2%	18,062	9,967
2005	469	23.2%	15.0%	115,628	63,752
2006	395	24.8%	14.5%	103,774	57,362
2007	680	35.0%	13.5%	252,652	139,374
2008	756	50.0%	13.2%	401,436	221,760
2009	927	70.2%	8.8%	692,416	381,746
2010	965	73.4%	8.7%	752,292	414,876
2011	1097	81.2%	9.1%	948,500	523,658
2012	1146	85.1%	8.2%	1,036,648	573,038
2013	1405	87.3%		1,302,379	719,258

*No significant inflation-adjusted financial change for patients presenting w septic shock.*

*For patients presenting with severe sepsis, savings of*

*11% (\$2557 per case) in total cost,*

*12% (\$1288 per case) in variable cost.*

# Lesson 2

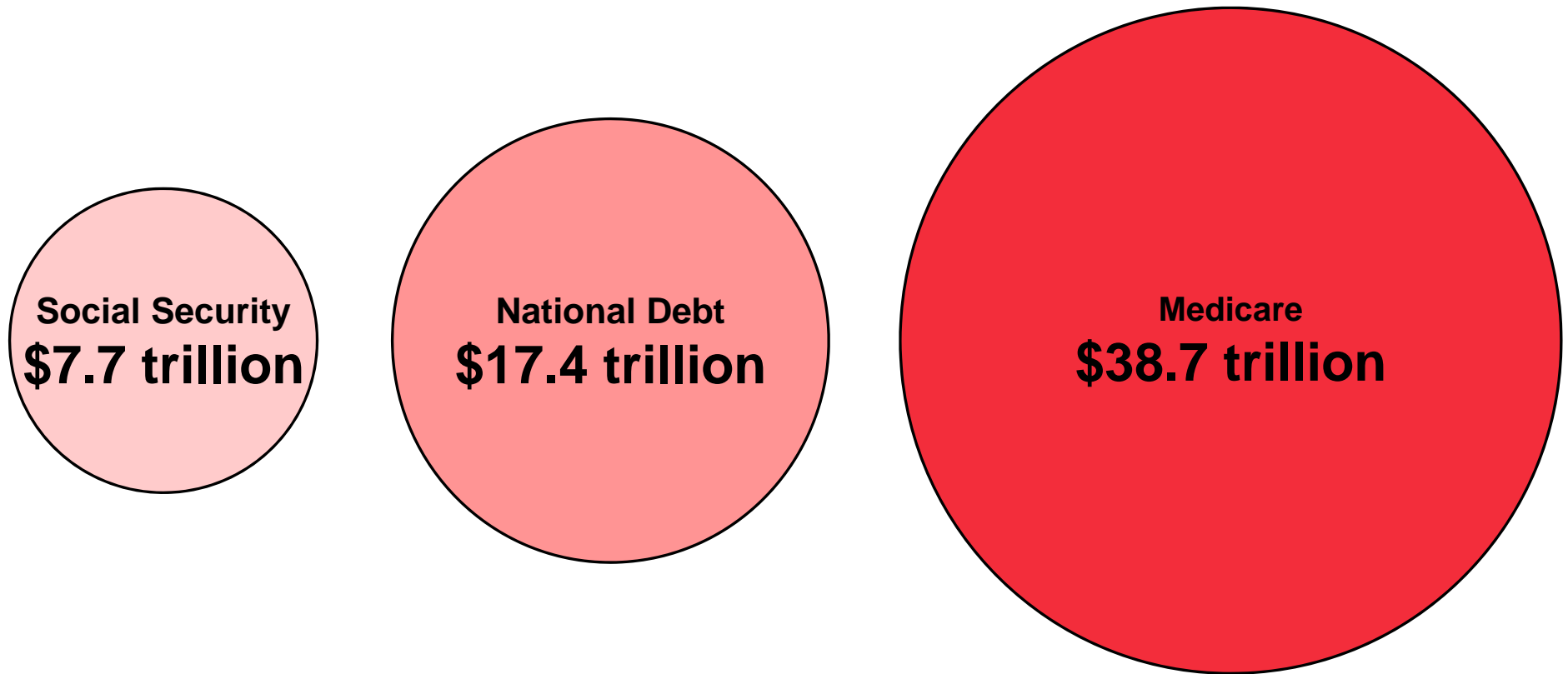
***Most often***  
*(but not always)*

***better care is cheaper care***

***Financial pressures intensify***

# The Fiscal Gap

**Unfunded federal obligations, 2014** *(all NPV -- net present value)*

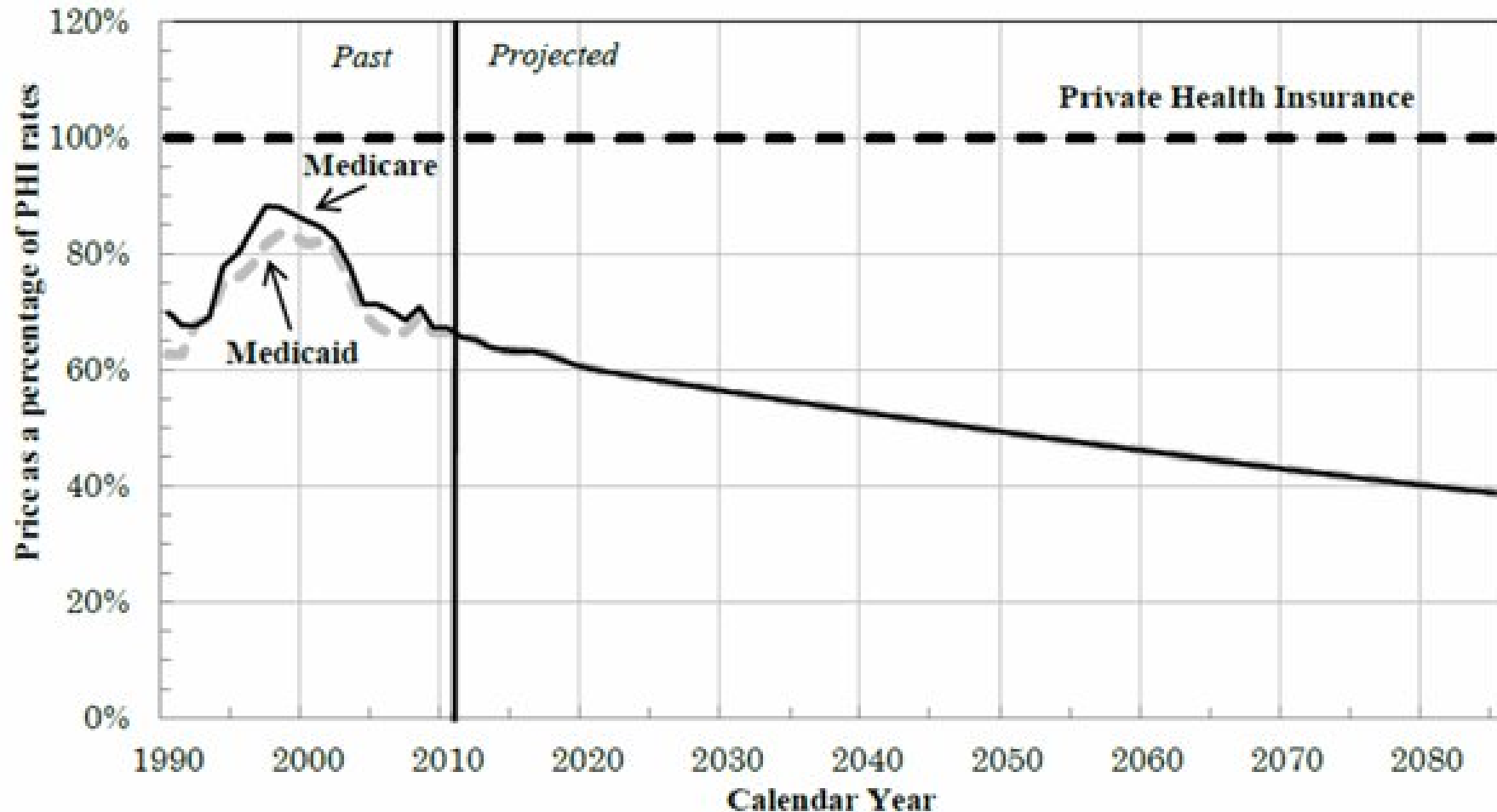


**Total = \$63.8 trillion+**

CMS Office of Actuary (Foster): ~\$120 trillion, \$211 trillion

# Hospital payments under PPACA

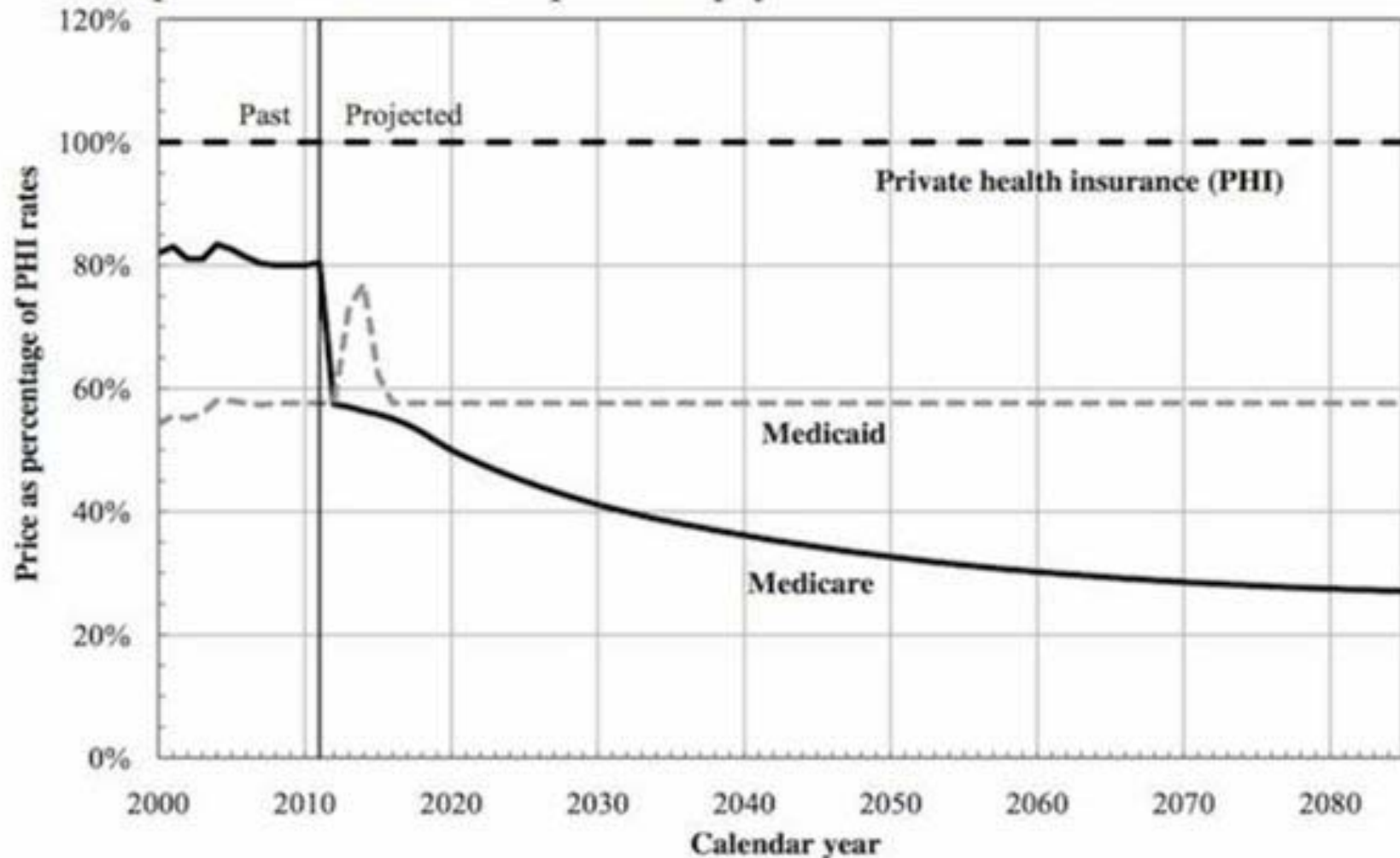
Figure 1. Illustrative comparison of relative Medicare, Medicaid, and private health insurance prices for inpatient hospital services under current law



Shatto & Clemens. Projected Medicare expenditures under the PPACA. Washington, DC: Medicare Office of the Actuary. May 18, 2012.

# Physician payments under PPACA

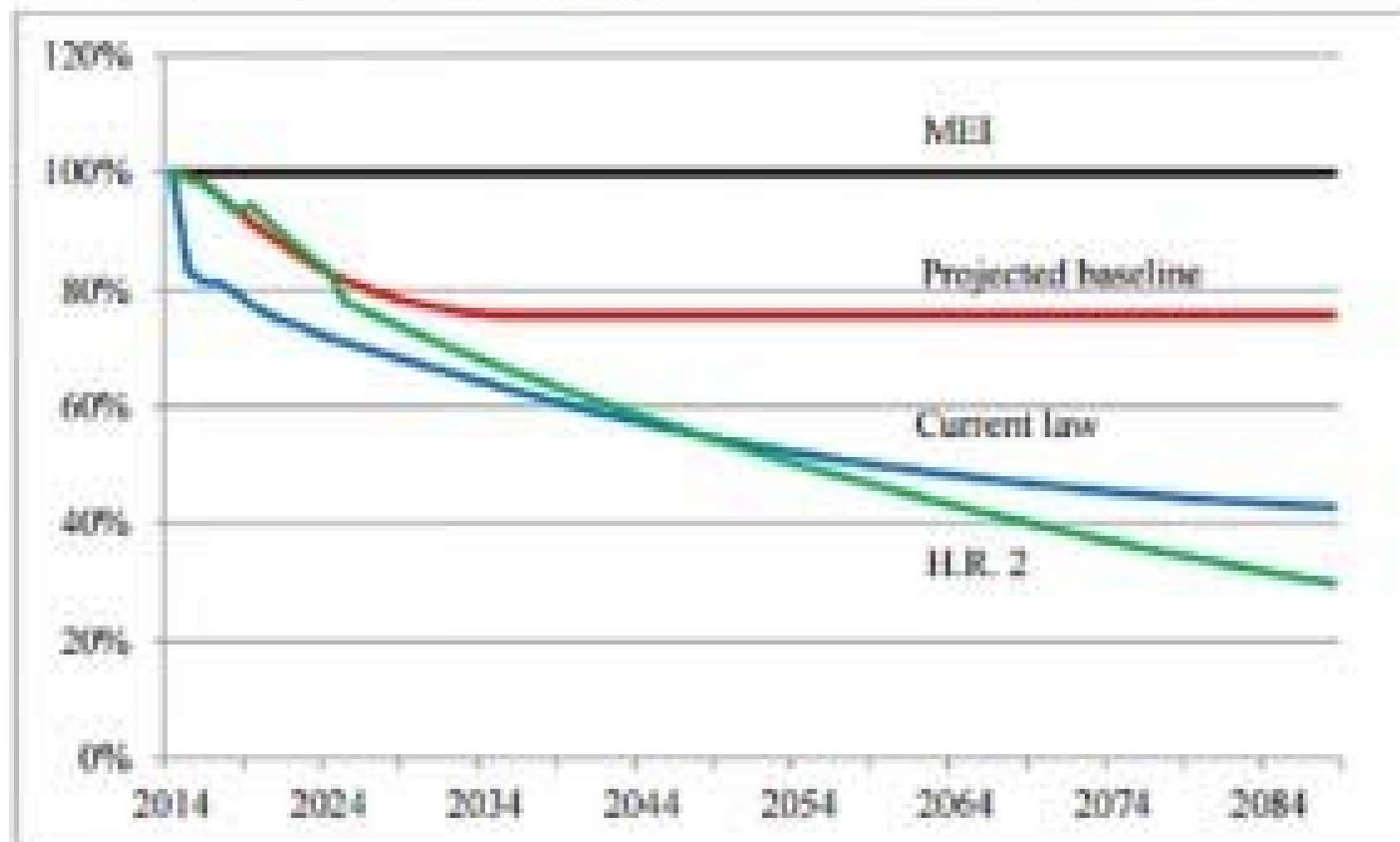
Figure 2—Illustrative comparison of relative Medicare, Medicaid, and private health insurance prices for physician services under current law



Shatto & Clemens. Projected Medicare expenditures under the PPACA. Washington, DC: Medicare Office of the Actuary. May 18, 2012.

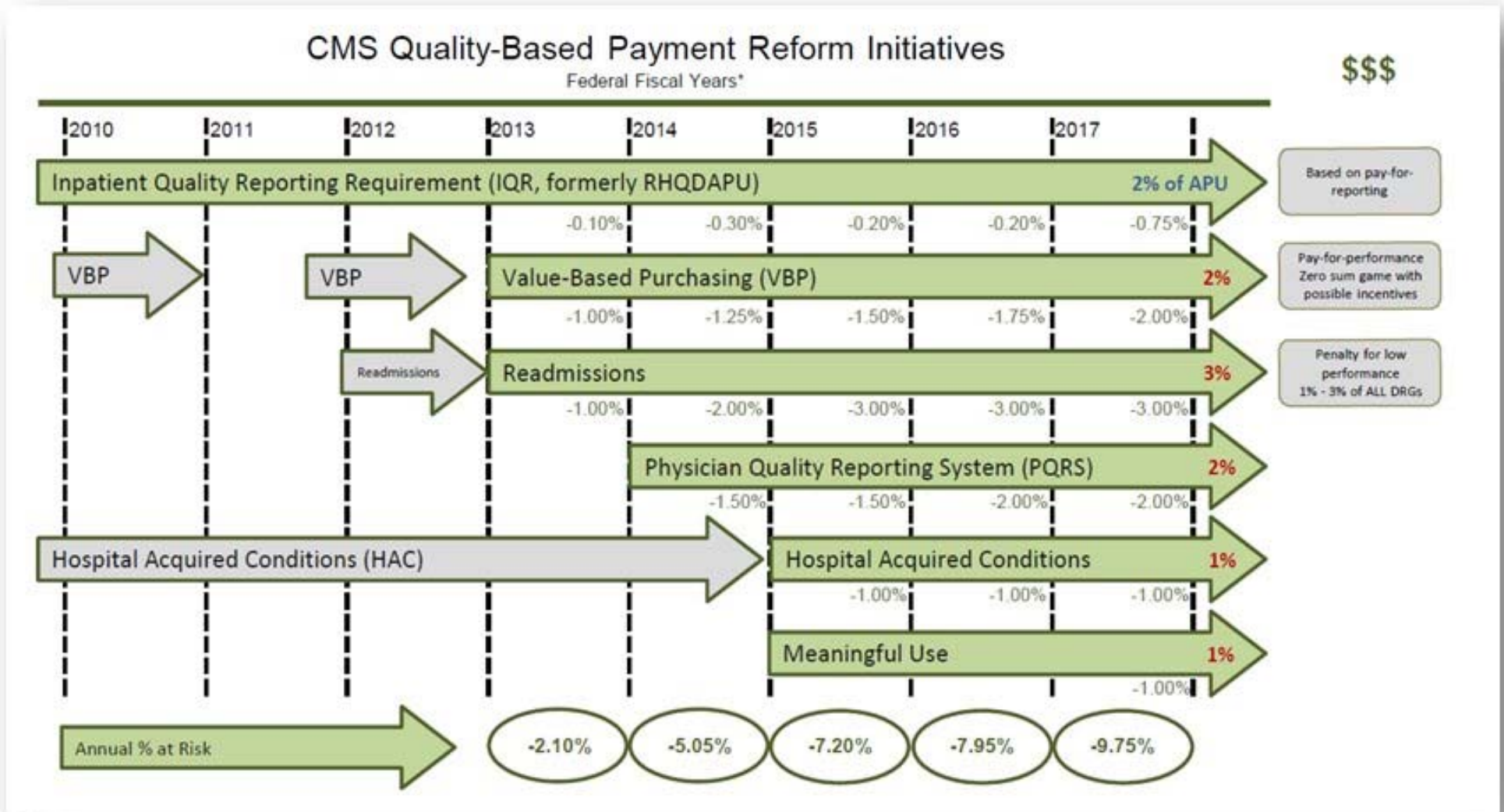


**Figure B : Illustrative Comparison of Medicare Prices for Physicians' Services under Current Law, the Projected Baseline, and H.R. 2 relative to the MEI**



Source: Paul Spitalnic, "Estimated Financial effects of the Medicare Access and CHIP Reauthorization Act of 2015 (H.R. 2)," Centers for Medicare & Medicaid Services, April 9, 2015, p. 8.

# Impact of government cost controls



# Financial survival = operating margins

**Total revenues (+)**  
(top line)



**Net  
Operating  
income**  
(NOI; margin)

**Total operating costs (-)**  
(bottom line)



## **1. Continued focus on top line revenue**

- *“ride this fee-for-service horse ‘til it drops”*
- *develop new products; expand services*
- *seek special legislative protections*
  - *demand larger budgets from government payers*
  - *require higher payment rates from private payers*
- *compete vigorously for cases (medical tourism)*

## **2. Shift focus to bottom line costs: eliminate waste**

*"all needed care, but only needed care; delivered at the lowest necessary cost"*

# Waste leverage is **MUCH** higher

**5 – 9% contribution**

*for each case added on the revenue side*



**Net  
Operating  
Income**  
*(NOI; margin)*

**100% contribution**

*for each case avoided on the cost side*



# Waste opportunity is **MUCH** larger

**>50%** of all hospital resource expenditures are

**quality-associated waste:**

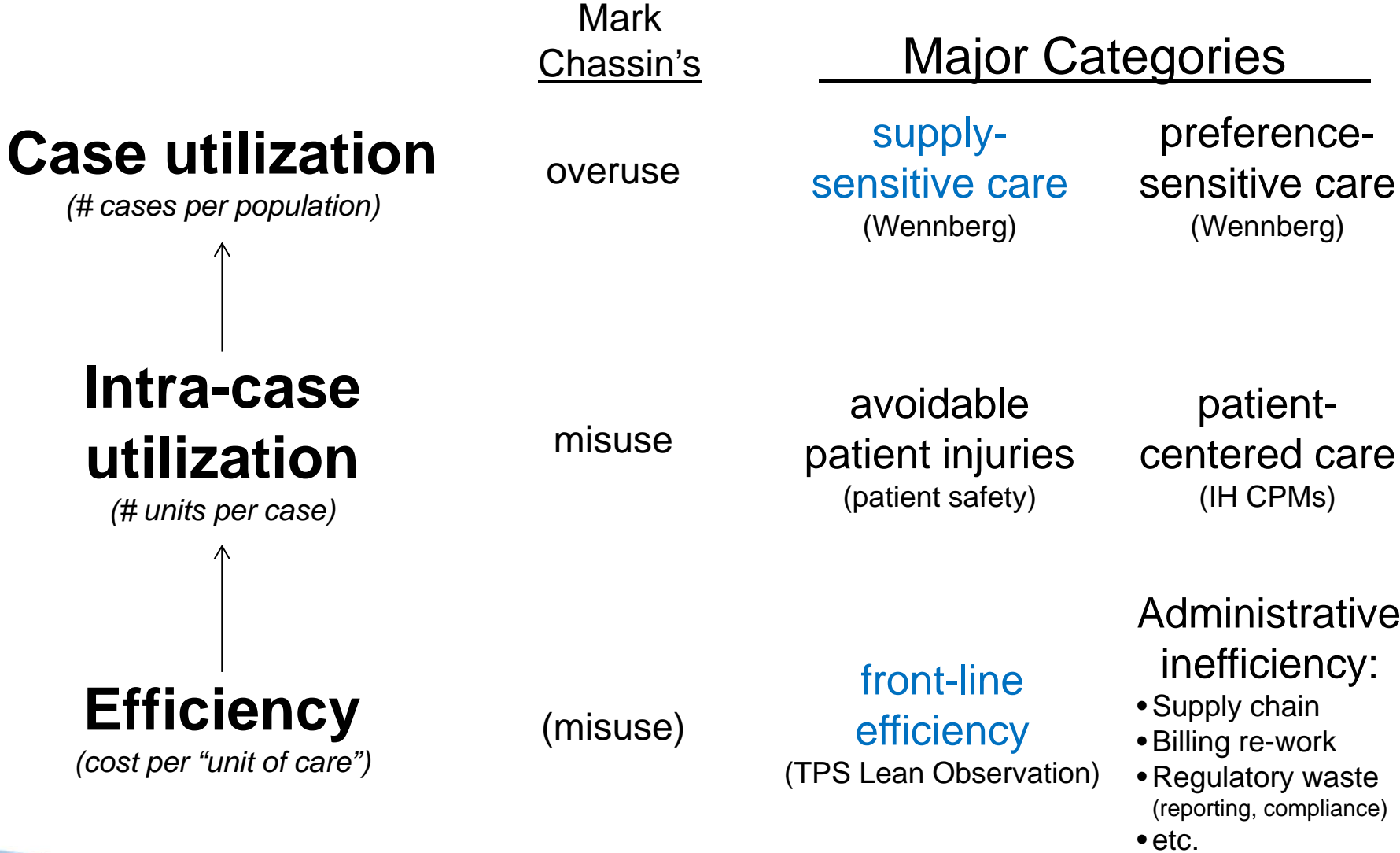
- *recovering from preventable foul-ups*
- *building unusable products*
- *providing unnecessary treatments*
- *simple inefficiency*

Andersen, C. 1991










James BC *et al.*, 2006

# Waste Model

(that showed >50% waste)



# Financial incentives for waste elimination under different payment mechanisms

WASTE REMOVAL AREA	PAYMENT METHOD		
	Discounted FFS	Per Case (DRG)	Provider at risk
Case utilization <i>(# cases per population)</i>			
Intra-case utilization <i>(# and type of units per case)</i>			
Efficiency <i>(cost per unit)</i>			

Note: For green arrows, savings from waste elimination accrue to the care delivery organization; for red arrows, savings go to payer organizations.



# Example: 2013 Case Utilization Savings

*(# cases per population)*

Contribution to Total Health

30%

20%

40%

10%

Population Health

Disease Treatment System

Genetics



Physical environment;  
social networks;  
public health



Personal health  
behaviors

(tightly linked to general education level)



1° Care



2° Care



Hospital Care

(including Emergency Room)



End of Life (EOL)

# "Move Upstream" strategies

(illustrations)

- housing for chronic homeless

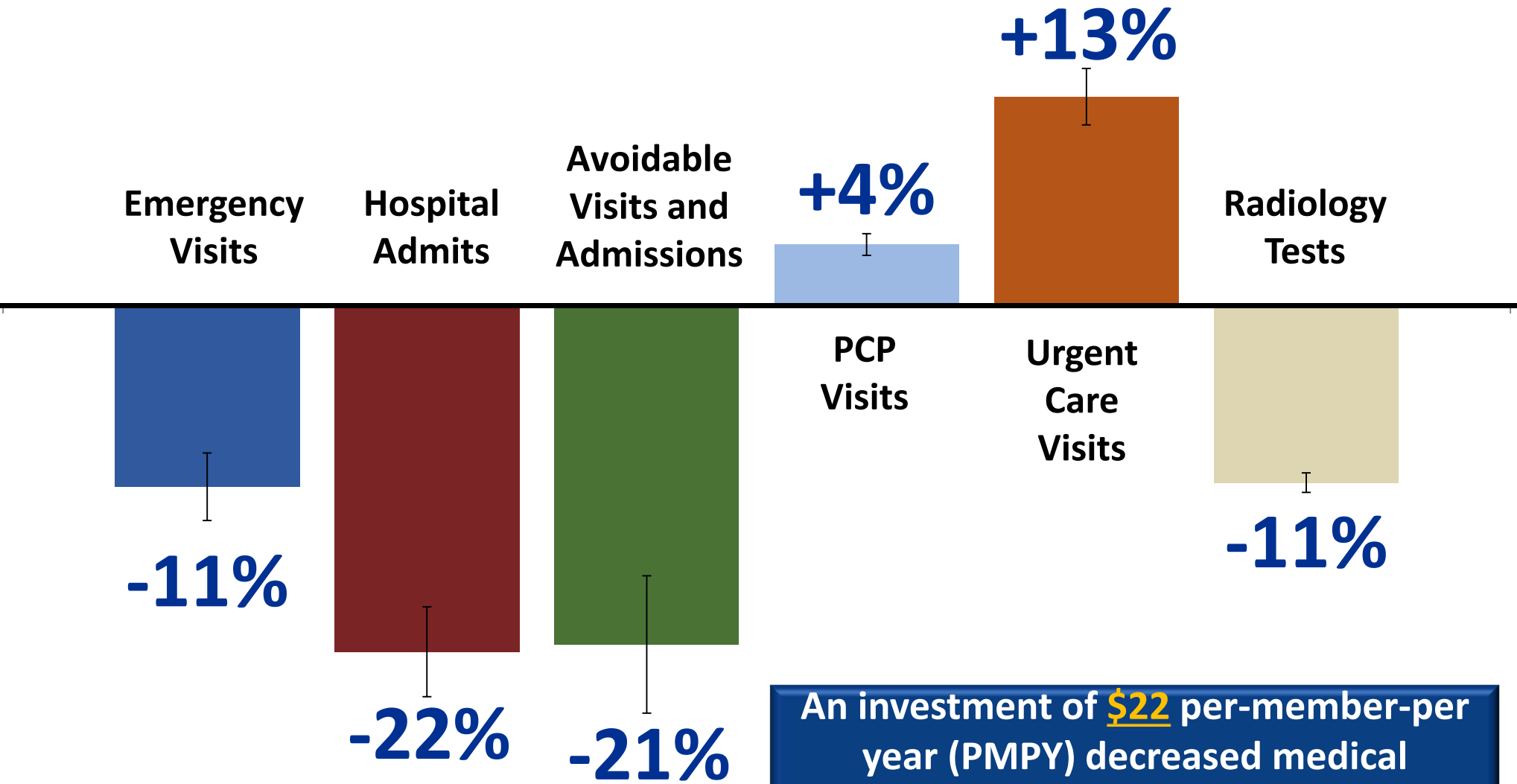


- AMH
- Iora patient activation
- SDM
- Hot spotting



# Team-Based Care

(coordinated medical home)



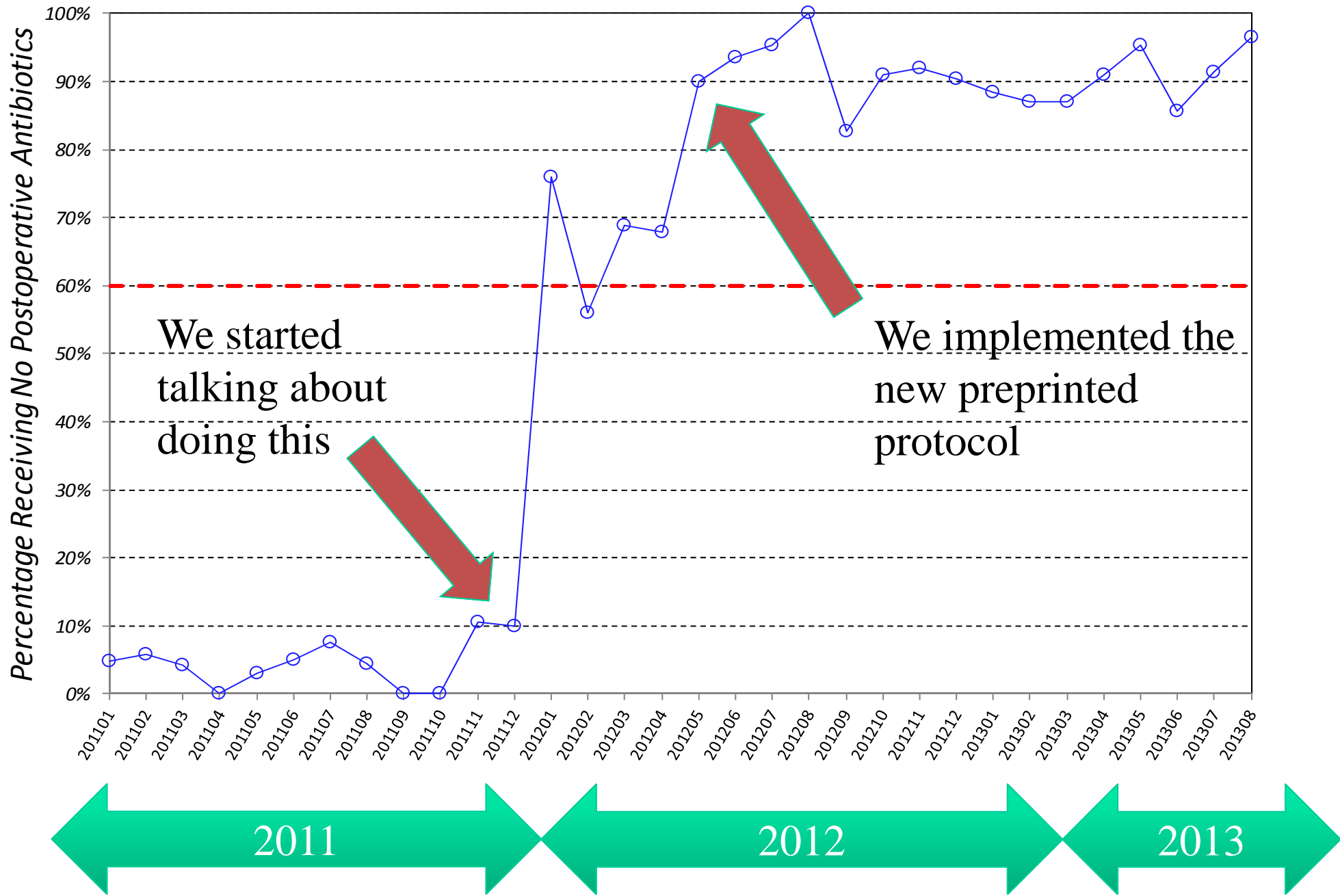
An investment of **\$22** per-member-per year (PMPY) decreased medical expenses by **\$115** PMPY

# Example: 2013 Intra-Case Utilization Savings

*(# units per case)*

# Post-Op Antibiotics for Non-Ruptured Appendicitis

Dr. David Skarda, Primary Children's Hospital



# Less Expensive Alternatives Exist

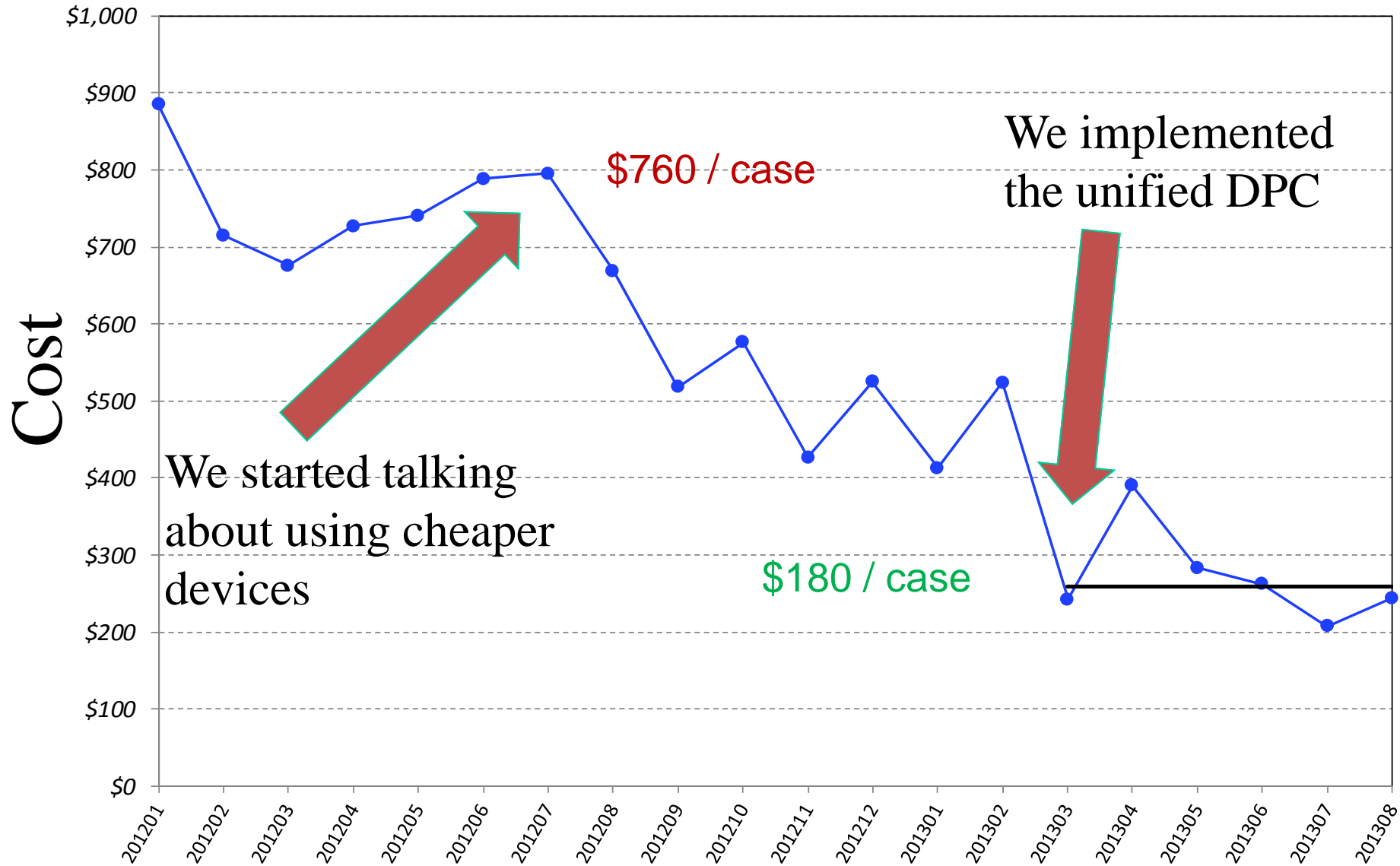
- Trocar
  - Current \$360 (\$120/trocar)
  - Available but not used \$66 (\$22/trocar)
- Polysorb loops instead of staplers
  - Stapler \$270
  - Loop \$36 (\$18)
- Unnecessary endocatch bag
  - Use the bag \$60
  - No use \$0
- Unnecessary disposable fascia closure device
  - Use the device \$30
  - No use \$0
- Heat source
  - Harmonic scalpel or ligasure \$600
  - Hook cautery \$0



# Non-Ruptured Operative Cost

Dr. David Skarda, Primary Children's Hospital

Average Operative Supply Cost per Case, Non-Ruptured Appendicitis



# Appendicitis – Total Cost Savings

Dr. David Skarda, Primary Children's Hospital

- Non-ruptured                      \$2454/patient
- Ruptured                              \$3509/patient
- Per year at PCH                      \$1,262,550 + open beds



# Example: 2013 Efficiency Savings

*(cost per “unit of care”)*



- Realized cost savings from supply chain initiatives **in excess of \$20 million annual target**

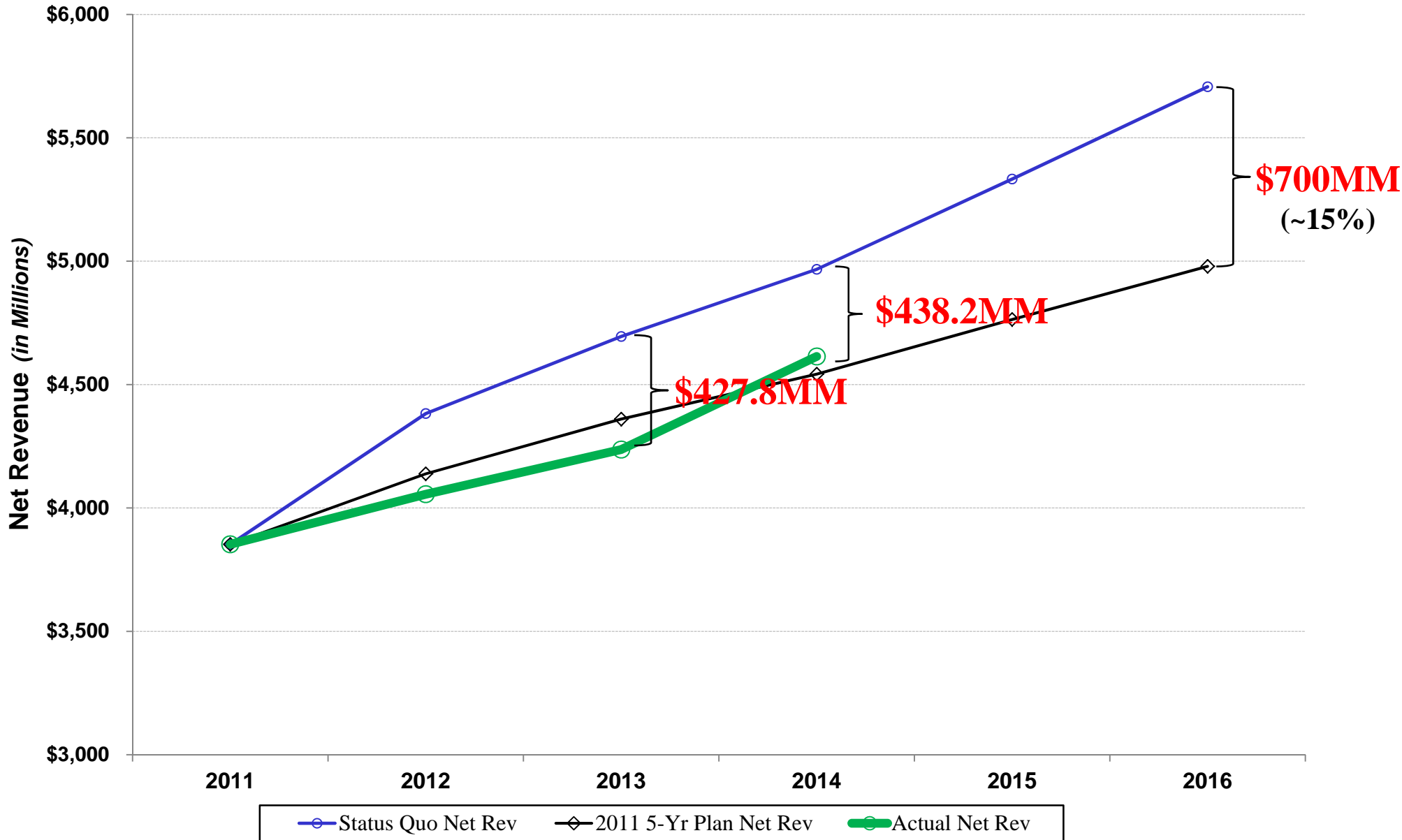
**Ranked 4<sup>th</sup> in Gartner Inc.’s  
“Supply Chain Top 25”**

**Recipient of ECRI Institute’s  
“Supply Chain Achievement  
Award”**

Without access,  
“quality” is meaningless;

***Accessible*** means ***Affordable***

# Goal: Limit rate increases to CPI+1%



Health Services

# Process management is the key

- ◆ ***better clinical results produces lower costs***
- ◆ ***more than half of all cost savings will take the form of unused capacity*** (*fixed costs: empty hospital beds, empty clinic patient appointments, reduced procedure, imaging, and testing rates*)
- ◆ ***balanced by increasing demand:***
  - *demographic shifts (Baby Boom);*
  - *population growth;*
  - *behavioral epidemics (e.g., obesity);*
  - *technological advances*



# A new health care delivery world ...

- ◆ **All the right care** (no underuse), **but**
- ◆ **only the right care** (no overuse);
- ◆ **Delivered free from injury** (no misuse);
- ◆ **At the lowest necessary cost** (efficient);
- ◆ **Coordinated along the full continuum of care** (timely; "move upstream");
- ◆ **Under each patient's full knowledge and control** (patient-centered; "nothing about me without me");
- ◆ **With grace, elegance, care, and concern.**

***Better has no limit ...***

*an old Yiddish proverb*