Intermountain Healthcare

Healthy Dialogues

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Creating the Best Medical Result at the Lowest Necessary Cost

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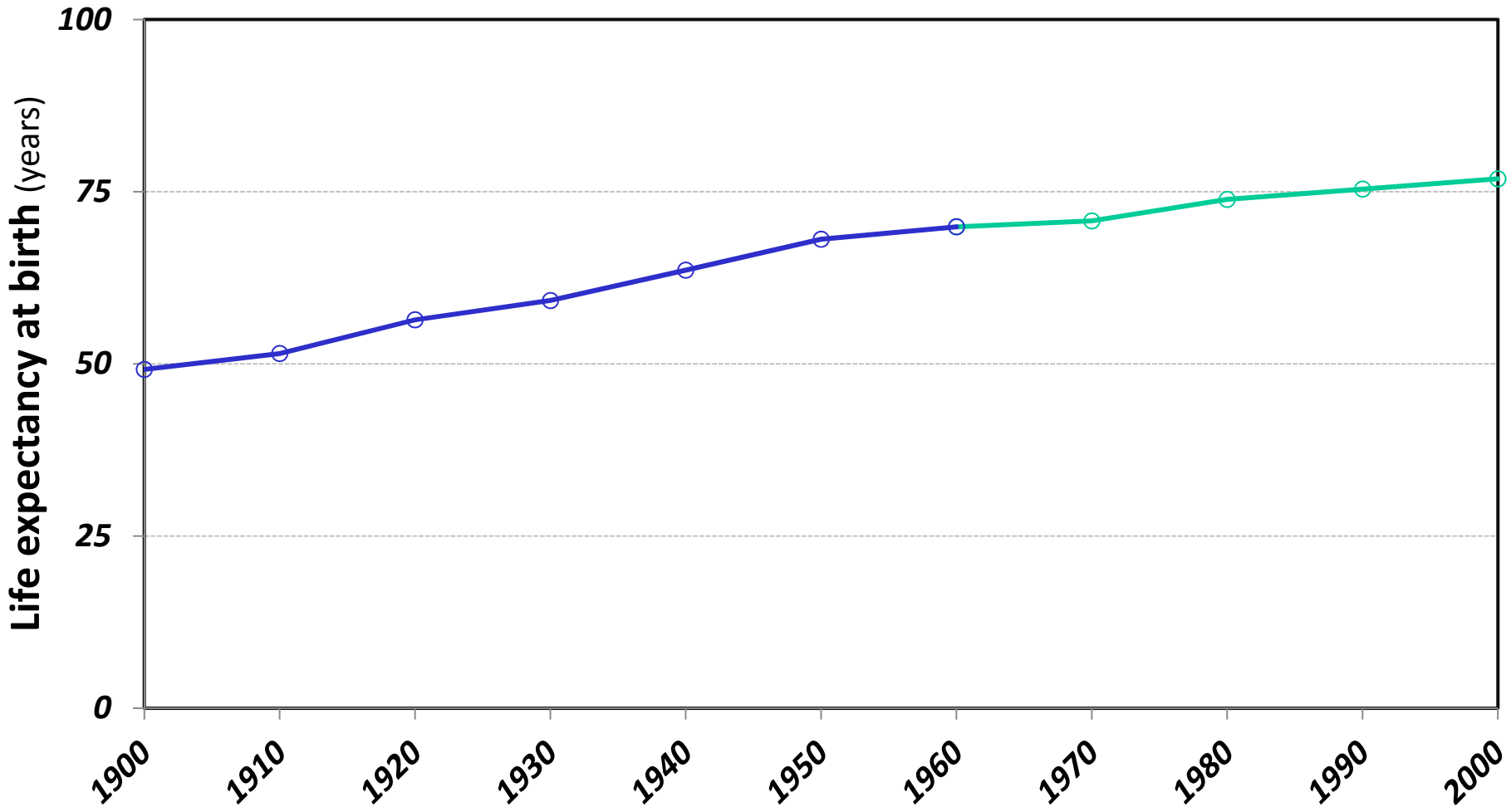
The emergence of modern medicine

~1860 - 1910:

- ***new high standards for clinical education***
  - *Flexner Report: more than half of all U.S. "medical schools" shut down*
  - *new model: hospital-based 2 year course of study (integrated clinical exposure)*
- ***strict requirements for professional licensing***
- ***clinical practice founded on scientific research***
  - *shift to germ theory, rather than "an imbalance of the 4 bodily humors," as the basis for understanding disease and its treatment*
  - *health care's first entry into "evidence-based medicine"*
- ***new internal organization for hospitals***

Porter, R. *The Greatest Benefit to Mankind: A Medical History of Humanity*. New York, NY: W.W. Norton and Co; 1997.
Barry, JM. *The Great Influenza: The Epic Story of the Deadliest Plague in History*. New York, NY: Penguin Group; 2004.
Starr, P. *The Social Transformation of American Medicine*. New York, NY: Basic Books (Perseus Books Group; 1984.
Rosenberg, CE. *The Care of Strangers: The Rise of the American Hospital System*. New York, NY: Basic Books; 1987.

"We routinely achieve miracles"



Since 1960, 6.97 years gained over 4 decades = 1.74 years / decade

(from 1900-1960, 20.7 years gained over 6 decades = 3.45 years / decade)

Cutler DM, Rosen AB, Vijan S. The value of medical spending in the United States, 1960-2000. New Engl J Med *2006; 355(9):920-7 (Aug 31).*

Current health care

is the best the world has ever seen

A few simple examples:

- ***From 1900 to 2000, average life expectancy at birth increased from 49 years to almost 77 years*** *(28 year gain)**.***
- ***Since 1960, age-adjusted mortality from heart disease*** *(#1 killer)* ***has decreased by 56%*** *(from 307.4 to 134.6 deaths / 100,000)**;*** ***and***
- ***Since 1950, age-adjusted mortality from stroke*** *(#3 killer)* ***has decreased by 70%*** *(from 88.8 to 26.5 deaths / 100,000)*

Initial life expectancy gains almost all resulted from public health initiatives -- clean water, safe food, and (especially) widespread control of epidemic infectious disease. But since about 1960, direct disease treatment has made increasingly large contributions.

Centers for Disease Control. Decline in deaths from heart disease and stroke--United States, 1900-1999. *JAMA* 1999; 282(8):724-6.

National Center for Health Statistics. *Health, United States, 2000 with Adolescent Health Chartbook.* Hyattsville, MD: U.S. Dept. of Health and Human Services, Center for Disease Control and Prevention, 2000; pg. 7 (DHHS Publication No. (PHS) 2000-1232-1).

U.S. Department of Health and Human Services, Public Health Service. *Healthy People 2000: National Health Promotion and Disease Prevention Objectives.* Washington, DC: U.S. Goverment Printing Office, 1991 (DHHS Publication No. (PHS) 91-50212).

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

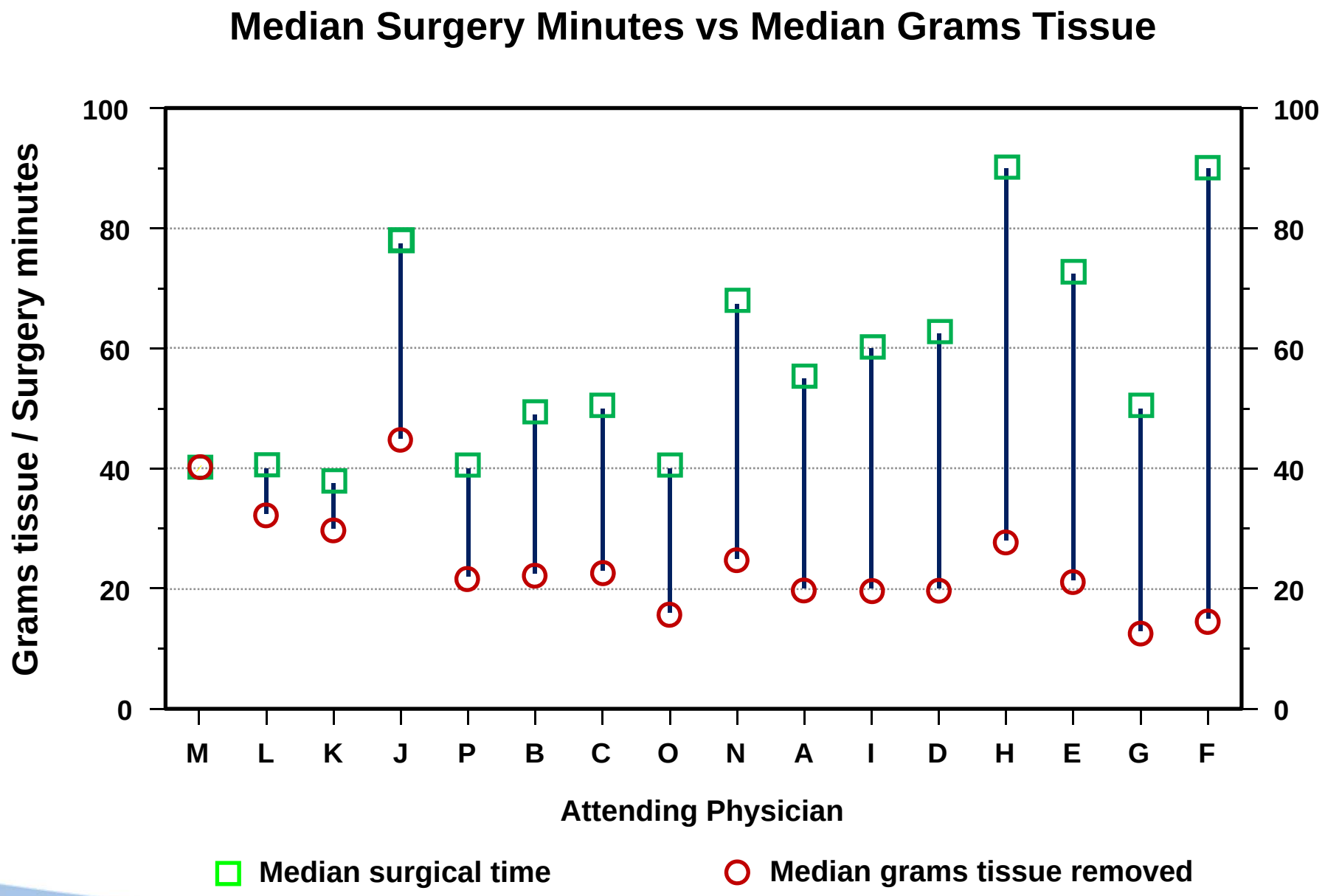
- ***identified and staged*** *(relative to changes in expected utilization)*

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

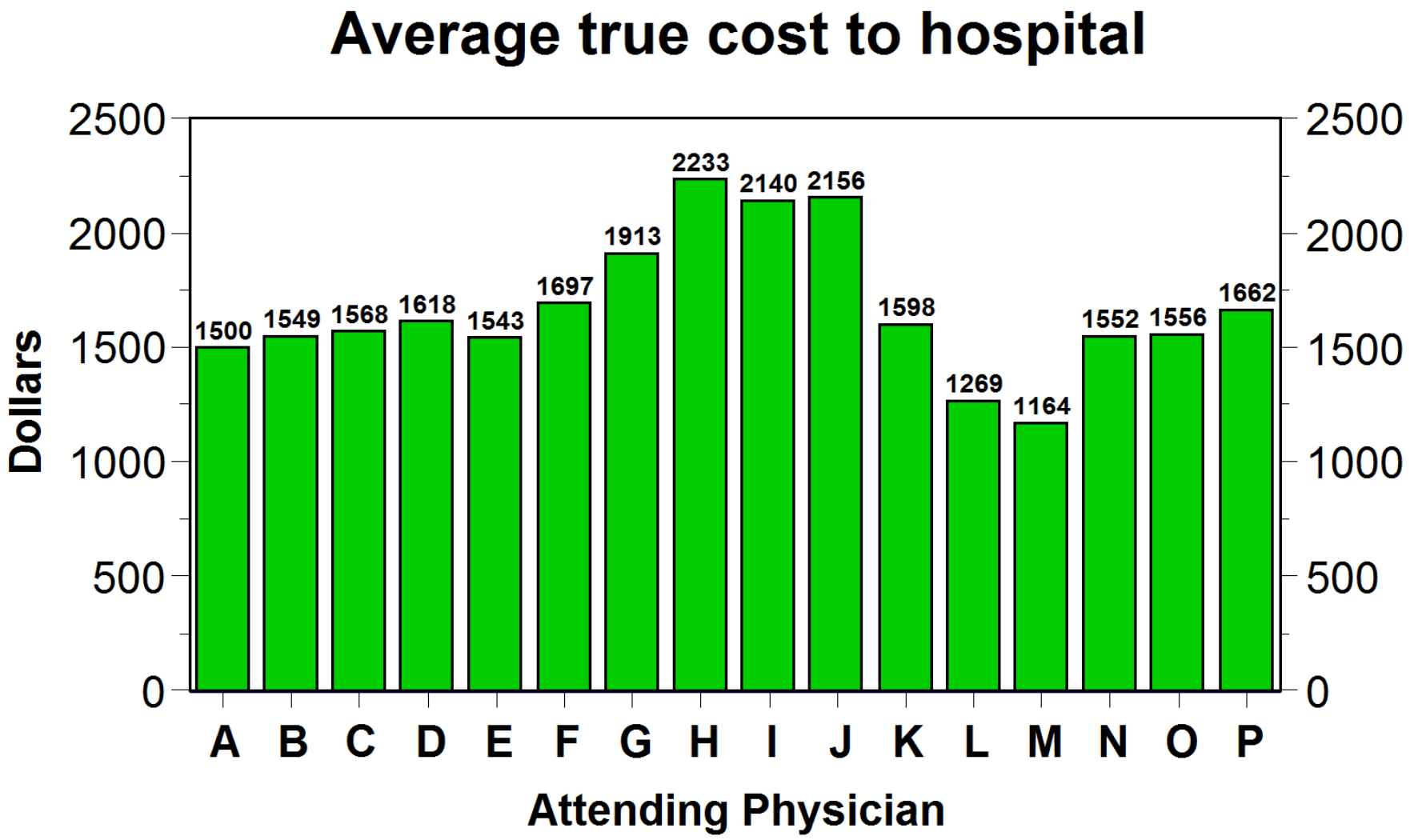
- ***compared physicians with meaningful # of cases***

(low volume physicians included in parallel analysis, as a group)

Intermountain TURP QUE Study



Intermountain TURP QUE Study



Intermountain Healthcare

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 routinely achieve miracles but
as healing professionals,

we could be much better

We have found proven solutions

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

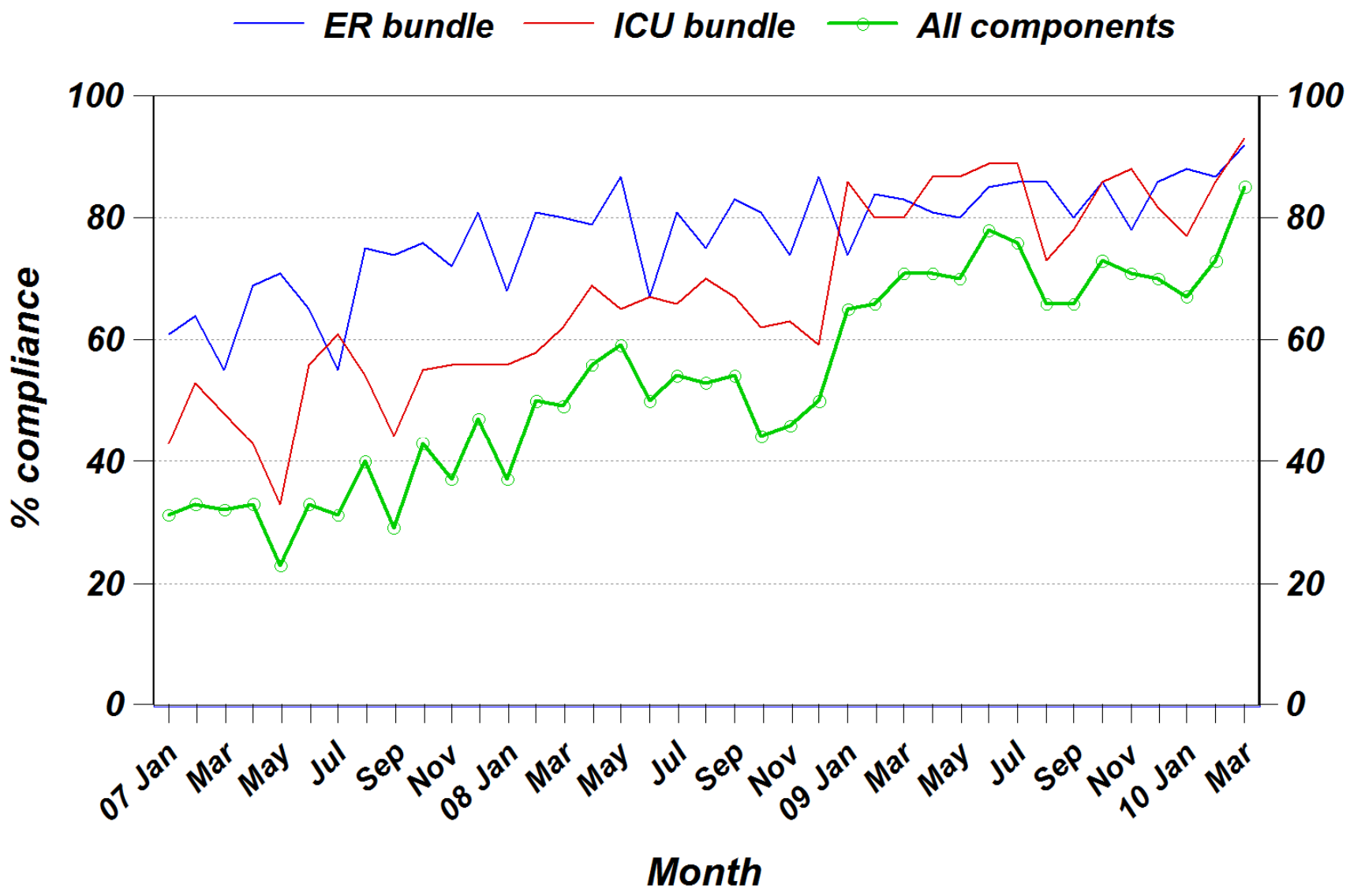
Shared Baseline "Lean" protocols *(bundles)*

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*

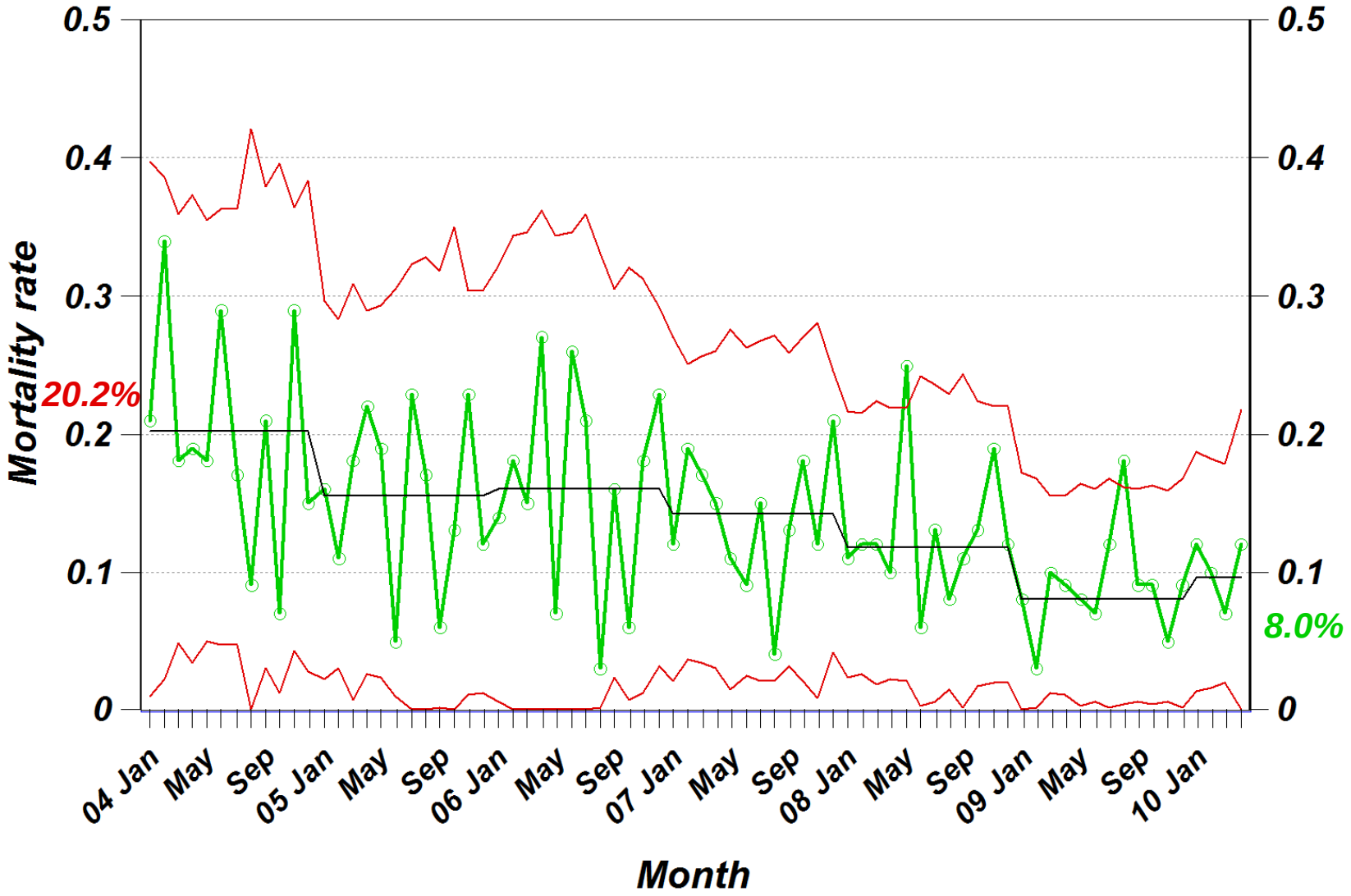
Results:

- ***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

Year	# cases	Compliance rate	Mortality rate	Total cost reduction ($)	Annual NOI impact ($)
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

No good deed goes unpunished

- ***Neonates > 33 weeks gestational age who develop respiratory distress syndrome*** *(RDS)*
- ***Treat at birth hospital with nasal CPAP*** *(prevents alveolar collapse)****, oxygen, +/- surfactant***
- ***Transport to NICU declines from 78% to 18%***
- ***Financial impact*** *(NOI; ~110 patients per year; raw $)****:***

	Before	After	NOI +/-
Integrated health plan	900,599	512,120	388,479
Medicaid	652,103	373,735	278,368
Other commerical payers	429,101	223,215	205,886
Payer total	1,981,803	1,109,070	872,733
Birth hospital	84,244	553,479	469,235
Transport (staff only)	22,199	- 27,222	- 49,421
Tertiary (NICU) hospital	958,467	209,829	-748,638
Delivery system total	1,064,910	736,086	-328,824

Lesson 3

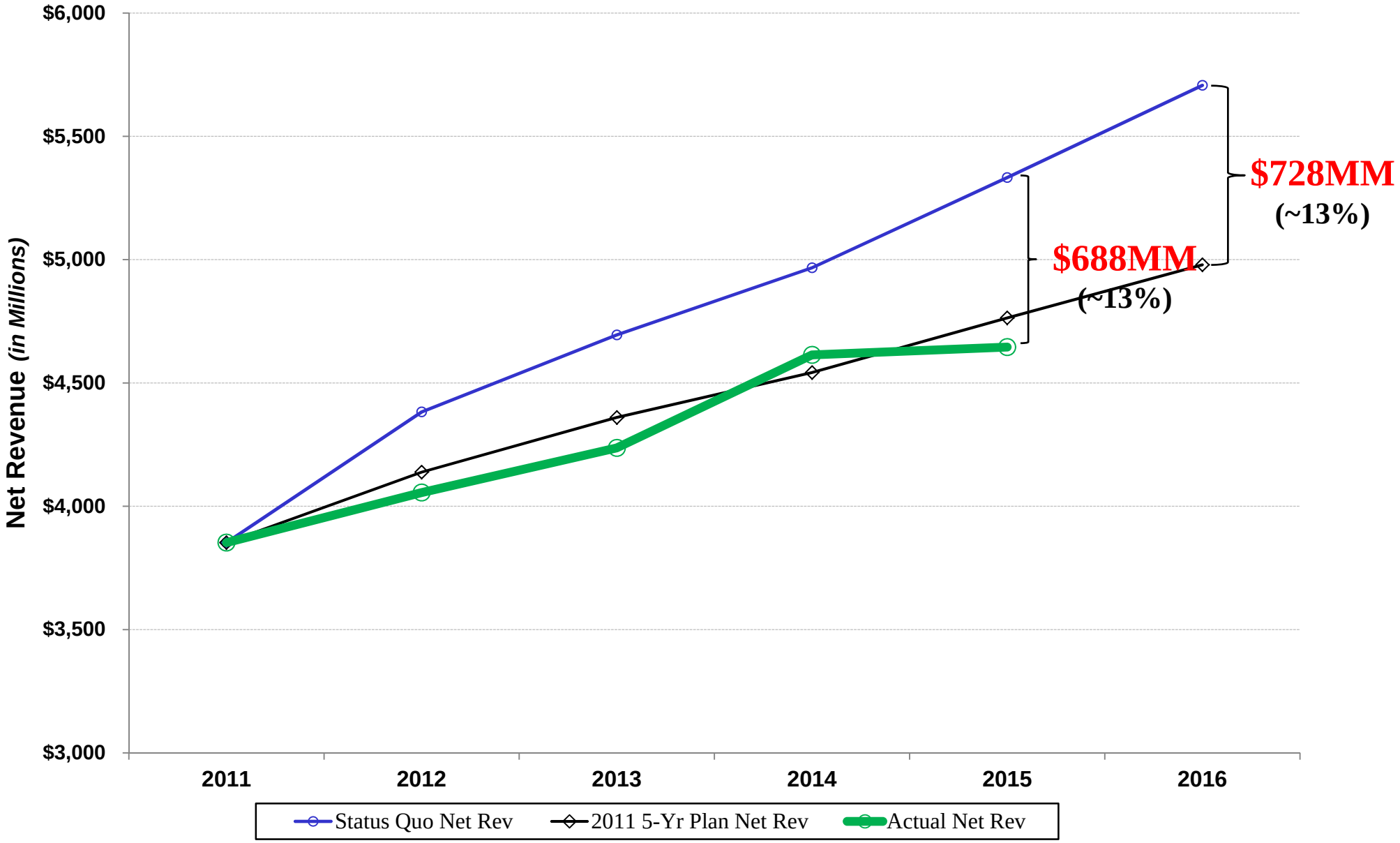
The long-term organizational viability of clinical quality improvement strategies

requires aligned financial incentives

Without access,
"quality" is meaningless;

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

Goal: Limit rate increases



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 model health care system,

changing the health care delivery world

the **ATP** *- Advanced Training Program in Clinical Practice Improvement*

- started in 1992; *emerged from Facilitator Workshop Series (FWS), which started in 1987*

- 5,000+ senior health leader graduates *– 42% physician executives, 25% nursing leaders, 17% support staff, 8% C-suite*

- 50+ "sister" training programs *- ~10 international: Australia, Singapore (2), Canada (2), Argentina, Israel, Switzerland, Scotland, England (2), Sweden, France*

- Formal collaborations in France, Sweden

Better has no limit ...

an old Yiddish proverb