HFMA WAAK Winter Conference

Last Frontier Summit: Cold Challenges, Warm Solutions

Alyeska Resort, Girdwood, Alaska

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Quality Excellence Drives Financial Success: The Foundation of Population Health and Value-Based Care

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Disclosures

*I receive a monthly retainer as a part-time (3 days / month) senior advisor for **Health Catalyst**, and own (a small amount of) Health Catalyst stock.*

*I serve on the board of directors of **SaVia**, a start-up, privately-held software company that supports clinical workflow design.*

*I also serve on an advisory board for **Amplifire**, a privately-held company that provides computer-based health care education products.*

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

Two clinical examples

- *cath lab 'appropriate care' indications guidelines*
- *'Move upstream:' Team-based care for chronic disease*

Case 1: Evidence-based indications for cardiac cath lab interventions *(led by Dr. Donald Lappe)*

- *Diagnostic cardiac catheterization*
- *Angioplasty and stents (PCI)*
- *Implantation of permanent pacemakers*
- *Implantation of defibrillators*
- *Nuclear stress testing*

➢ ***Deployed evidence-based indications guidelines***
  – *a 1 sheet form for each procedure; just check off 1 or more indications*
  – *coordinated with insurance pre-authorization approvals*

➢ ***At start, near the bottom of the U.S. in terms of population-adjusted use rates*** *(bottom quintile)*

➢ ***Existing system in place that tracked long-term clinical outcomes***

Angioplasty & Stents

Date_____ Patient Name_____ EMPI_____ Date of Birth_____

Clinical Information on this page should be completed before the procedure.

☐ **Patient has Acute Coronary Syndrome** *(no further documentation beyond medical record is needed)*

Elective PCI

- Anginal / Ischemic Symptoms
  - ☐ CCS 0 *(asymptomatic)*
  - ☐ CCS I-II
  - ☐ CCS III-IV
- Results of Noninvasive Testing *(see Table A2)*
  - ☐ Not Available
  - ☐ Normal / Equivocal
  - ☐ Low Risk
  - ☐ Intermediate Risk
  - ☐ High Risk
- Heart Failure Symptoms
  - ☐ Asymptomatic
  - ☐ NYHA Class I
  - ☐ NYHA Class II
  - ☐ NYHA Class III
  - ☐ NYHA Class IV
- Left Ventricular Systolic Function
  - ☐ Normal (greater than or equal to 55%)
  - ☐ 45 - 55%
  - ☐ 35 - 44%

Table A2: Noninvasive Risk Stratification

High-Risk (greater than 3% annual mortality rate)

1. Severe resting left ventricular dysfunction (LVEF less than 35%)
2. High-risk treadmill score (score less than or equal to -11)
3. Severe exercise left ventricular dysfunction (exercise LVEF less than 35%)
4. Stress-induced large perfusion defect (particularly if anterior)
5. Stress-induced multiple perfusion defects of moderate size
6. Large, fixed perfusion defect with LV dilation or increased lung uptake (thallium-201)
7. Stress-induced moderate perfusion defect with LV dilation or increased lung uptake (thallium-201)
8. Echocardiographic wall motion abnormality (involving greater than two segments) developing at low dose of dobutamine (less than or equal to 10 mg/kg/min) or at a low heart rate (less than 120 beats/min)
9. Stress echocardiographic evidence of extensive ischemia

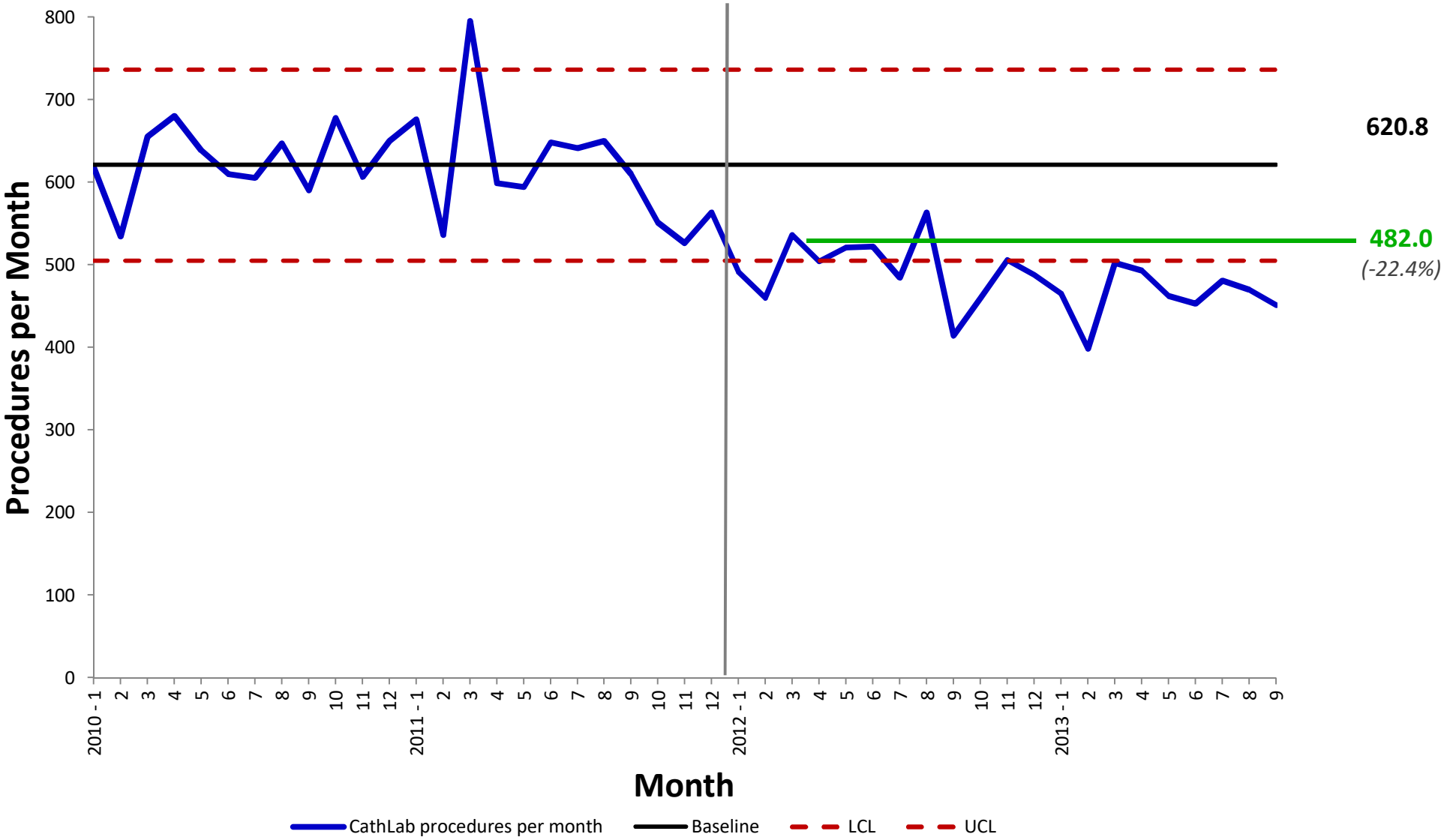
Intermediate-Risk (1% to 3% annual mortality rate)

1. Mild / moderate resting left ventricular dysfunction (LVEF 35% to 49%)
2. Intermediate-risk treadmill score (score between -11 and less than 5)
3. Stress-induced moderate perfusion defect without LV dilation or increased lung intake (thallium-201)
4. Limited stress echocardiographic ischemia with a wall motion abnormality only at higher doses of dobutamine involving less than or equal to 2 segments

Low-Risk (less than 1% annual mortality rate)

1. Low-risk treadmill score (score greater than or equal to 5)

All Cath Lab procedures *(system-wide; 2012-14)*



Evidence-based use of cardiac interventions

Clinical Outcomes: ***Remained excellent*** *(slight, nonsignificant, uptick)*

Cost impact:

# Cases:	↓	**137 / month**
Variable costs:	↓	**$18,918,519**
Total costs:	↓	**~$40,000,000**

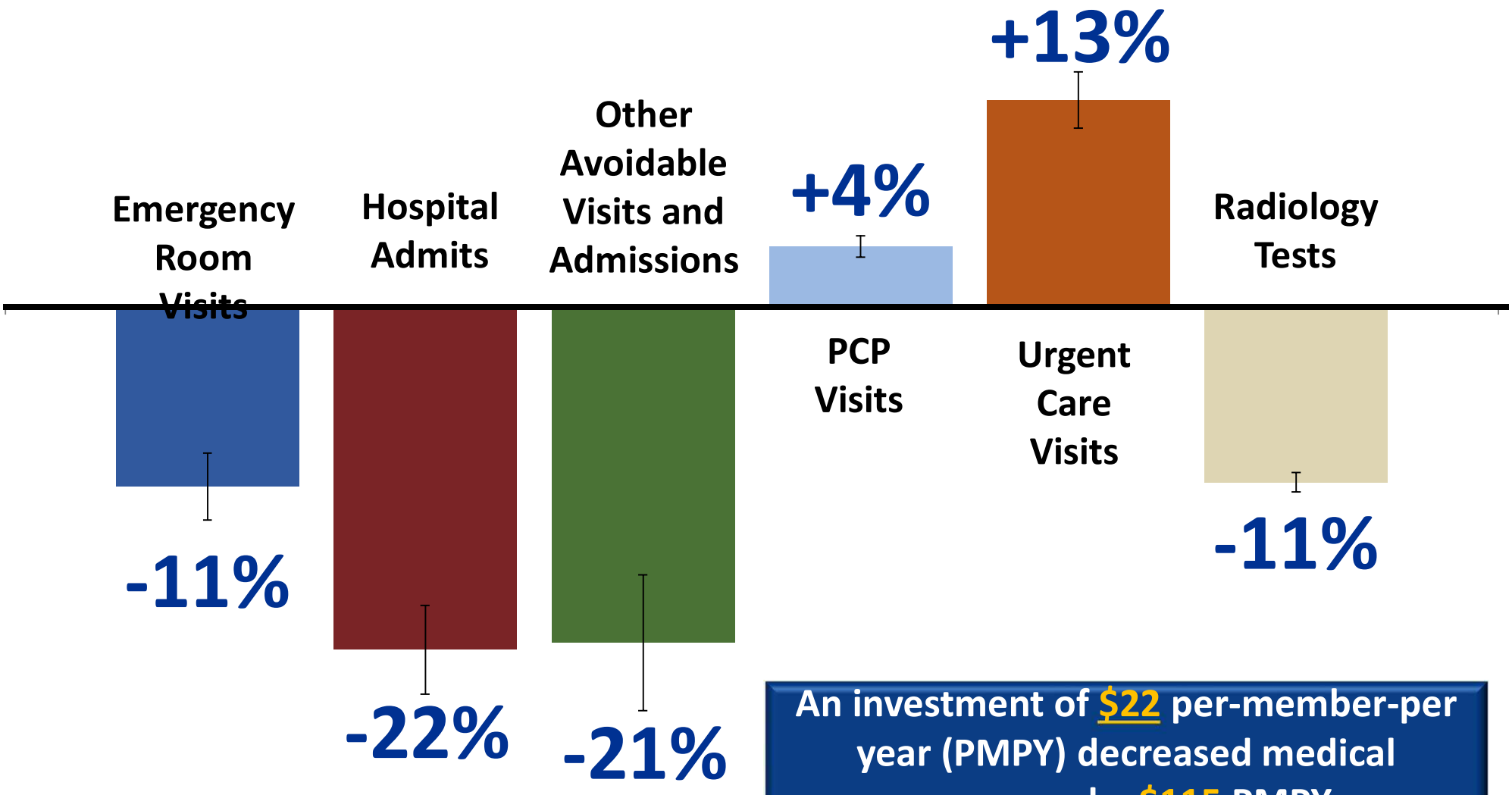
Evidence-based use of cardiac interventions

How did the hospital administrator feel about that?

Much better care, but 'no good deed goes unpunished'

Case 2: Team-Based Care

(3rd generation coordinated medical home)



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

Reiss-Brennan B, Brunisholz KD, Dredge C, Briot P, Grazier K, Wilcox A, Savitz L, and James B. Association of integrated team-based care with health care quality, utilization, and cost. *JAMA* 2016; 316(8):826-34 (Aug 23/30).

“Upstream” chronic disease management

How did the hospital administrator feel about that?

Much better care, but … primary care costs went up, and hospital revenues fell

ChenMed

- ***Built around "move upstream" primary care***
- ***Only Medicare Advantage*** *(at present)*
  – *sought out sickest patients (underserved minority populations, mostly)*
  – *classic disruptive innovation*
- ***Concierge practice***
  – *400 patients per physician-led team*
  – *each patient has the physician's (team's, actually) cell phone number*
- ***Insist on full capitation***
  – hospitalization rates down by 40 to 50%
  – *very agile; under COVID, shifted to full telehealth in less than a week*
- ***CAGR: ~40 to 50%***
  – *started in south Florida area*
  – *currently in 24 cities, 80+ clinics, Miami to Chicago, Philadelphia to Houston – requests to move into 75+ more cities*
- ***Lots of copy-cats***

Again …

How did the hospital administrator feel about that?

A new business model, with large gains for primary care funded by taking away hospital revenues

Deming's fundamental insight

Quality controls *(operating)* ***costs***

More accurately, they are 2 sides of the same coin;
changing one *(quality)* ***can***
change the other *(cost)* ***in a positive direction.***

(it's basically a mathematical proof – and proofs don't get much better than that)

Nearly always *with proper clinical management*
better care is cheaper care *through waste elimination*
(quality controls cost – Deming's 2nd premise)

The path to financial success leads through clinical excellence

The foundation of “value-based care”:

Unwarranted clinical variation causes waste.

Definition of “quality-associated waste”

under Deming’s quality theory

1. ***Quality improves***

which ***causes***

2. ***costs to fall***

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"***

James, B.C. Testimony to the U.S. Senate Finance Committee, February 2009

How much "waste" opportunity?

30-50+% *of all health care resource expenditures are*

quality-associated waste:

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

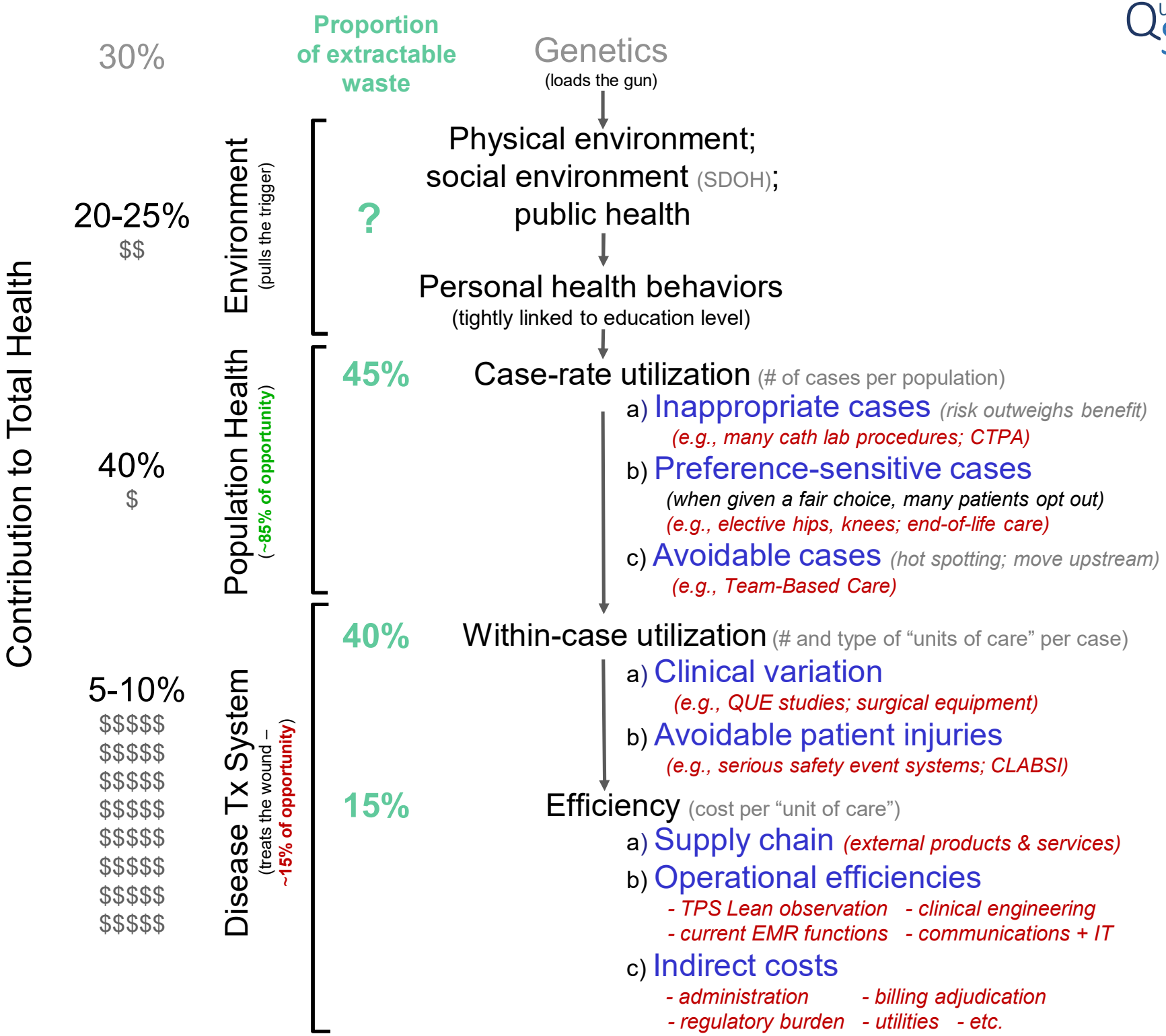
Institute of Medicine Roundtable on Value and Science-Driven Healthcare. T*he Healthcare Imperative: Lowering Costs and Improving Outcomes*. Yong, Pierre L., Saunders, Robert S., and Olsen, LeighAnne, editors. Washington, DC: National Academy Press, 2010.

Some viable estimates suggest

*as much as **65%** of all care delivery spending is quality-associated waste.*

In 2024, that's as much as $2 trillion in financial opportunity;

***10 to 100 times** greater than opportunities associated with traditional revenue models*


Quality Science
Contribution to Total Health
30%
20-25%
$$
40%
$
5-10%
$$$$$
$$$$$
$$$$$
$$$$$
$$$$$
$$$$$
$$$$$
$$$$$
Proportion of extractable waste
Genetics
(loads the gun)
Environment
(pulls the trigger)
?
Physical environment;
social environment (SDOH);
public health
Personal health behaviors
(tightly linked to education level)
Population Health
(~85% of opportunity)
45%
Case-rate utilization (# of cases per population)
a) Inappropriate cases (risk outweighs benefit)
(e.g., many cath lab procedures; CTPA)
b) Preference-sensitive cases
(when given a fair choice, many patients opt out)
(e.g., elective hips, knees; end-of-life care)
c) Avoidable cases (hot spotting; move upstream)
(e.g., Team-Based Care)
Disease Tx System
(treats the wound –
~15% of opportunity)
40%
Within-case utilization (# and type of "units of care" per case)
a) Clinical variation
(e.g., QUE studies; surgical equipment)
b) Avoidable patient injuries
(e.g., serious safety event systems; CLABSI)
15%
Efficiency (cost per "unit of care")
a) Supply chain (external products & services)
b) Operational efficiencies
- TPS Lean observation - clinical engineering
- current EMR functions - communications + IT
c) Indirect costs
- administration - billing adjudication
- regulatory burden - utilities - etc.

Why this model?

- ***Comprehensive***
  - *"contains" all elements / examples of waste found in other models*

- ***Nested***
  - *eliminates overlaps between categories (e.g., must eliminate all inappropriate care, before estimating gains to be had from optimizing care execution)*
  - *that enables accurate estimates of the total amount of waste, and the relative size of different waste categories*

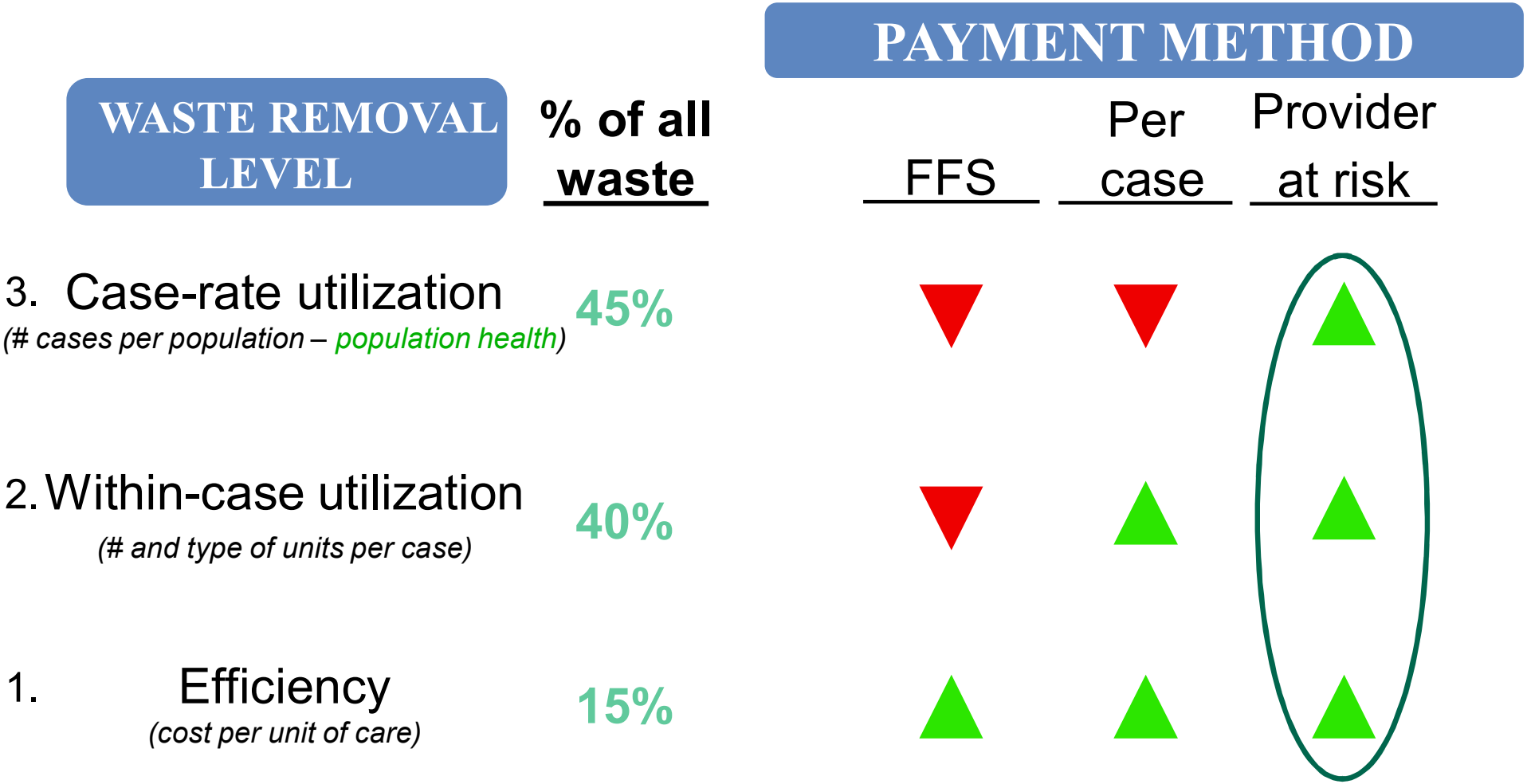
- ***Links to proven action***
  - *theory becomes "real" only when actual outcomes change*
  - *includes examples of successful waste elimination in every category*
  - *that's why it currently ignores Misdiagnosis – no proven solutions yet*

- ***Ties directly to payment mechanisms***
  - *the key to financial alignment*

Nested levels of *quality-associated* waste

Waste class	% of all waste	Waste subclasses
3. Case-rate utilization *(# cases per population)*	45%	a) Inappropriate cases *(risk outweighs benefit)* *(e.g., many cath lab procedures; CTPA)* b) Preference-sensitive cases *(when given a fair choice, many patients opt out)* *(e.g., elective hips, knees; end-of-life care)* c) Avoidable cases *(hot spotting; move upstream)* *(e.g., team-based care)*
2. Within-case utilization *(# and type of units per case)*	40%	a) Clinical variation *(e.g., QUE studies; surgical equipment)* b) Avoidable patient injuries *(e.g., serious safety event systems; CLABSI)*
1. Efficiency *(cost per unit of care)*	15%	a) Supply chain b) Operational efficiencies c) Indirect costs

Financial alignment under different payment mechanisms



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

James Brent C and Poulsen Gregory P. The case for capitation: It's the only way to cut waste while improving quality. *Harv Bus Rev* 2016; 94(7-8):102-11, 134 (Jul-Aug).

To be "business viable," ***value-based care requires financial alignment.***

Short term, that may mean matching the "level of waste"

to

the type of payment.

An interesting fact emerges …

Differences between case-level operating margins

are functionally equivalent,
on a health system's financial statements,

to "at risk" payment.

This means that

almost all care delivery groups *(integrated delivery systems, hospitals, outpatient practices)* ***already bear a considerably higher level of "at risk" care than they realize …***

At risk includes:

- *employees / families (if they offer health benefits)*
- *uncompensated (charitable) care (think capitation at a $0 payment rate)*
- *existing "at risk" contracts*
- *fully integrated health plans*
- ***actual marginal differences from any case where payment doesn't cover full costs of operations or has lower margins than other available cases, regardless of payment type***

It's called 'payer-mix adjusted key clinical process analysis'

Identifies clinical areas where "at risk" / population health clinical management strategies offer financial advantage right now, regardless of current payment mechanisms

(i.e., those clinical areas that are already "underwater")

That's where to start the transition *…*

an essential part of a long-term clinical management strategy

A coordinated approach

Clinical teams improve quality, reducing quality-associated waste; this produces

light green dollars

(Maureen Bisognano)

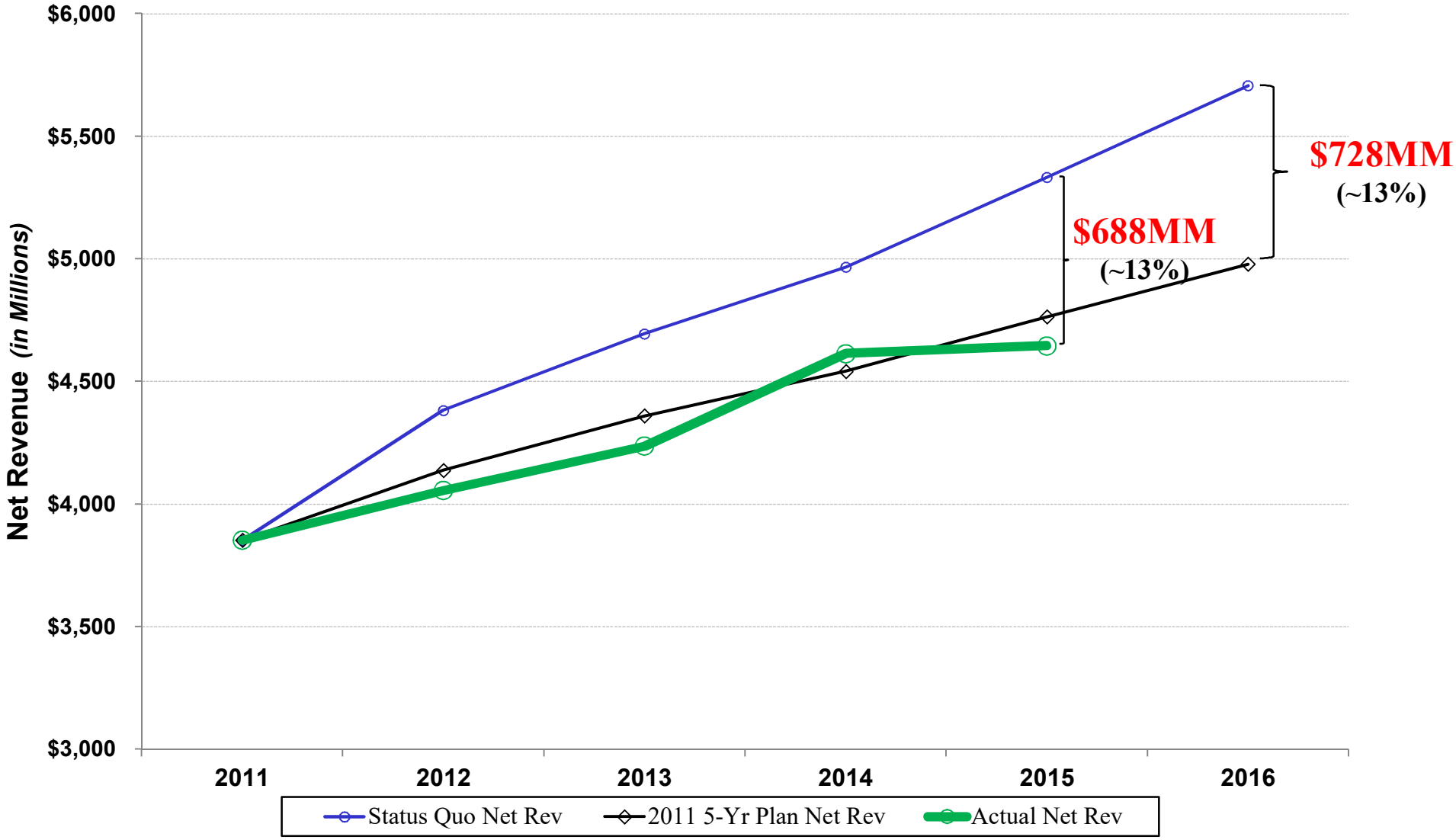
Their administrative counterparts align financials, turning

light green dollars into dark green dollars

(real bottom line)

Financial impact of "value-based care"

– the "best clinical result at the lowest necessary cost"



James Brent C and Poulsen Gregory P. The case for capitation: It's the only way to cut waste while improving quality. *Harv Bus Rev* 2016; 94(7-8):102-11, 134 (Jul-Aug).

The final take-away:

As a financial strategy, wise care delivery groups will vigorously develop their internal capability for clinical management and value-based care ...

In parallel, they will

actively learn how to harvest dark green dollars

(in the long term, that probably means moving toward "at risk" payment)

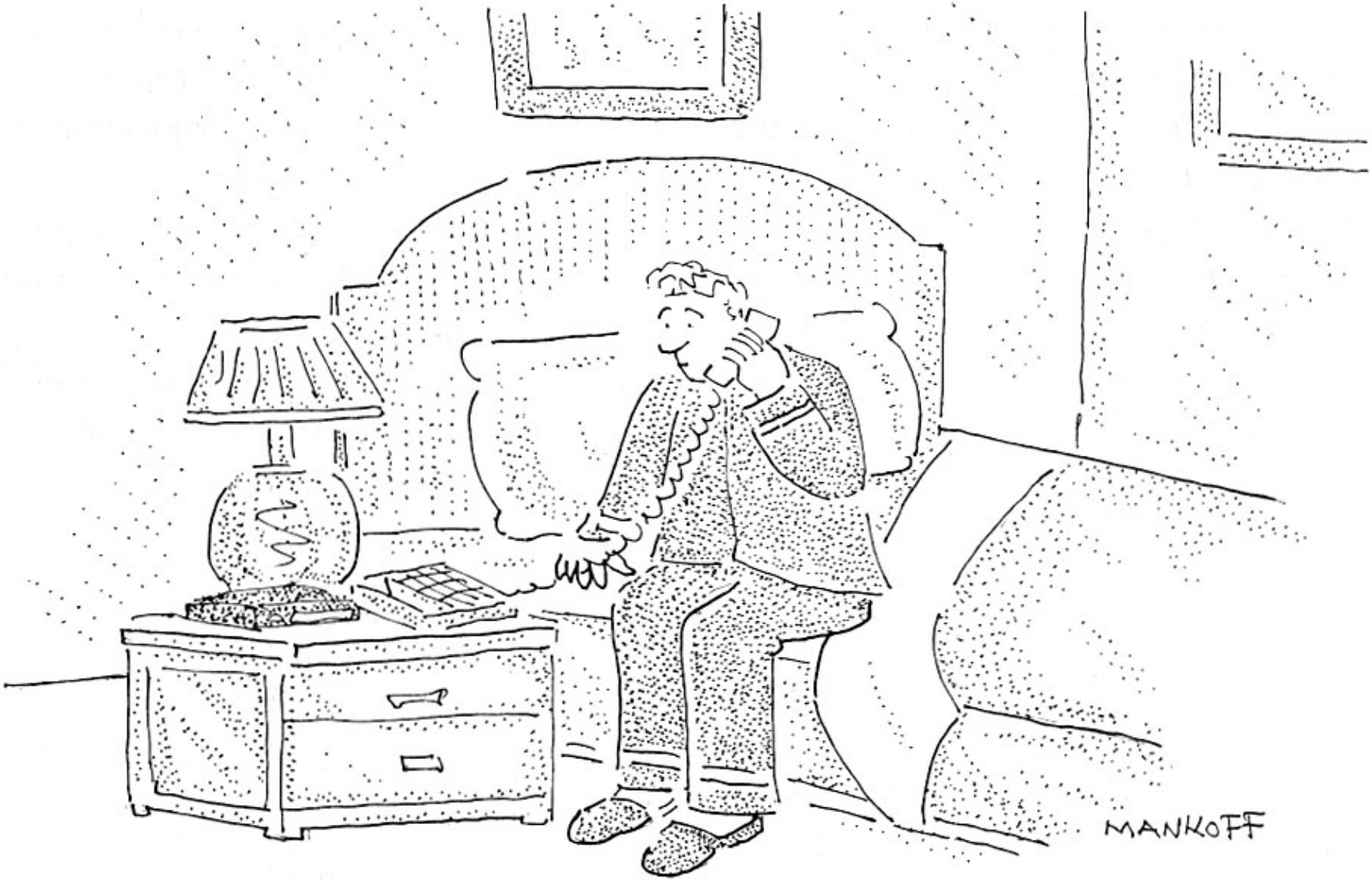
Quality Science

If you rely on traditional methods,

you will not be able to compete

with those who can

manage at a clinical process level



"This is your wake-up call—change or die."

Quality Science

Better has no limit ...

an old Yiddish proverb

Why value-based care has much higher financial leverage

Quality Science

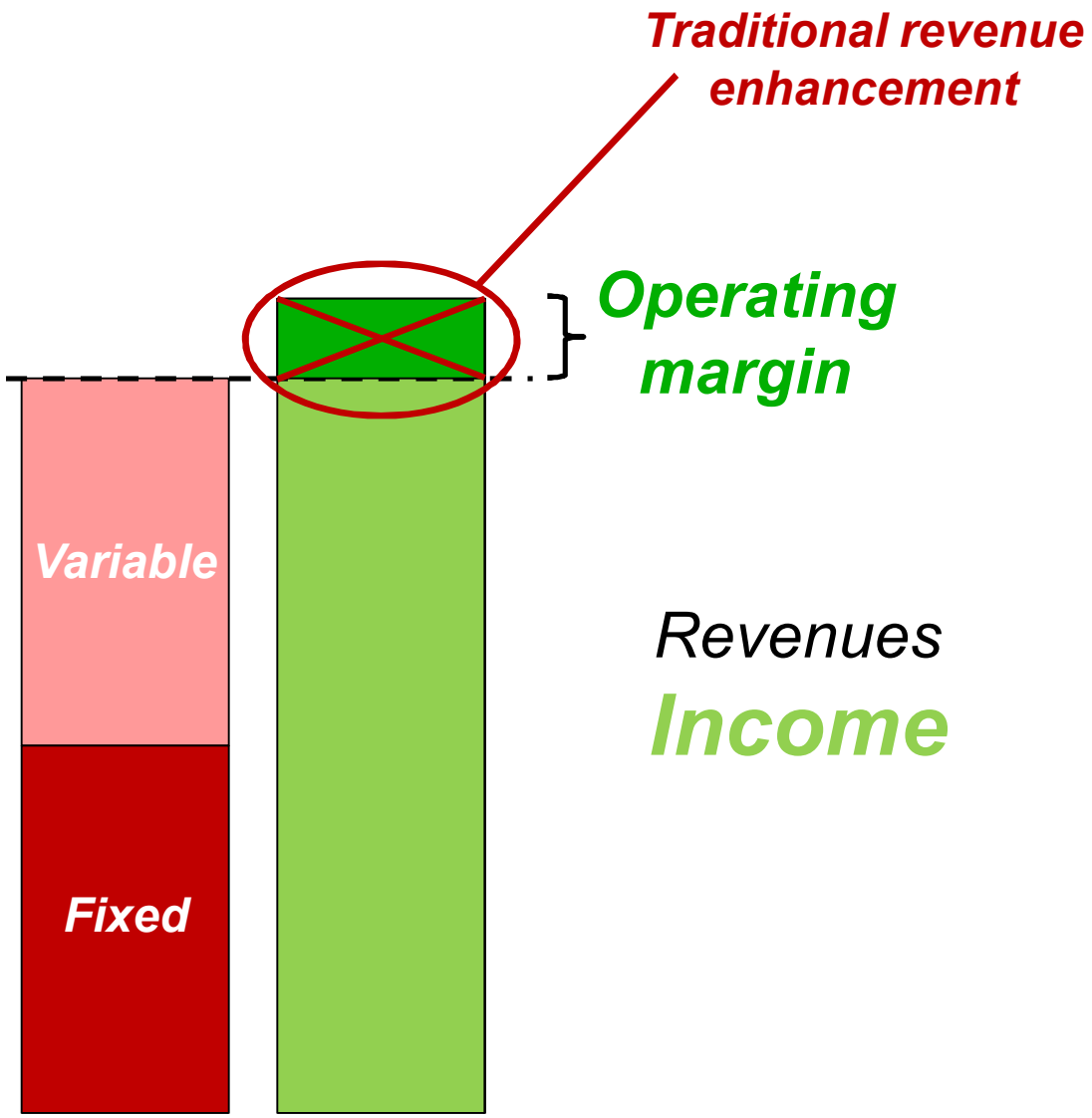
When you take waste out of a system,

the variable cost subcomponent
of the eliminated waste
accrues directly to the bottom line;

while

the fixed cost subcomponent
remains as unused capacity
(reduced duty cycle).

How much money is in play?



Operating expenses

Costs

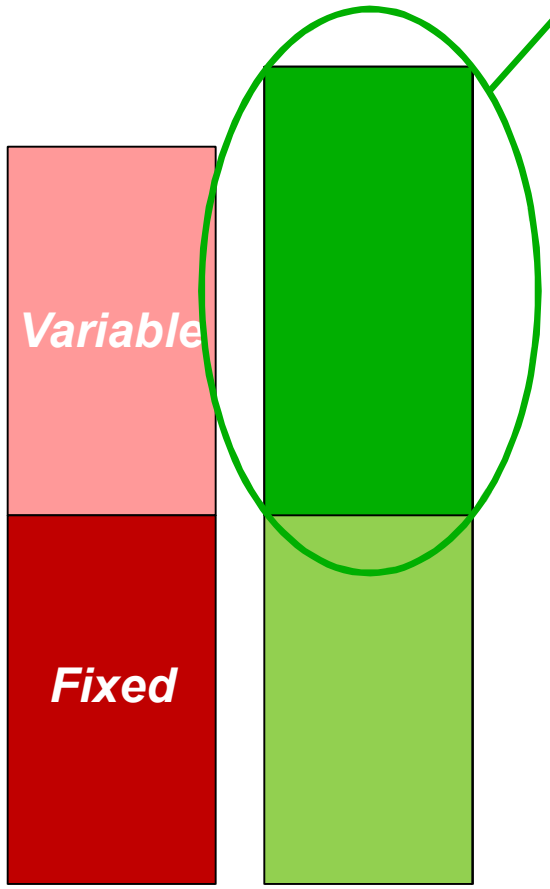
Revenues

Income

How much money is in play?

"Move upstream"
value-based care
(simple version)

Operating expenses
Costs

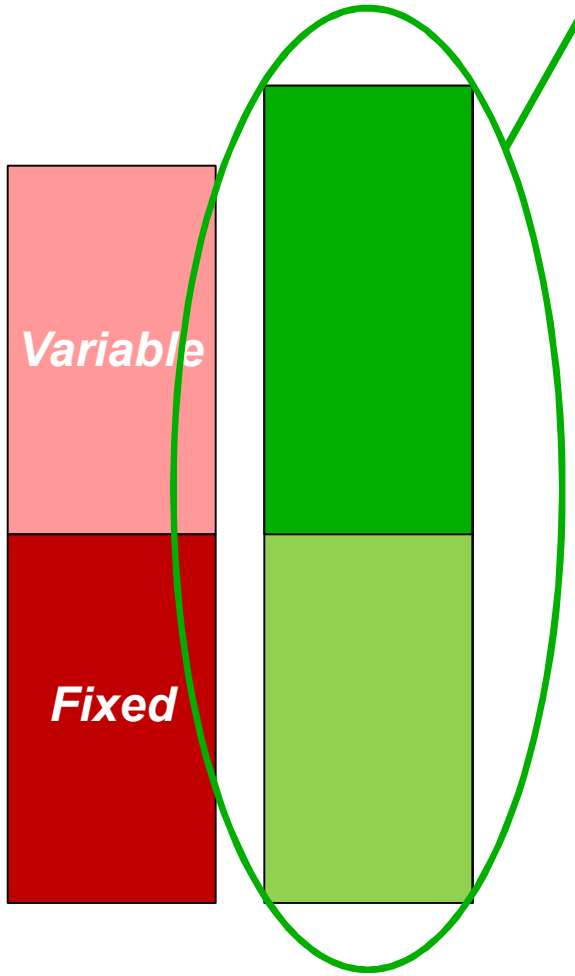


Former Payment level

How much money is in play?

"Move upstream"
value-based care
(enhanced version)

Operating expenses
Costs



Former Payment level

Quality Science

We know why unwarranted clinical variation happens

Causes of clinical variation

1. ***Complexity*** *(clinical uncertainty)* *in the context of*

2. *continued, primary* ***Reliance on human memory***
   – *the "craft of medicine"* *in the context of an*

3. ***Unhelpful care delivery environment***
   – ***Low transparency*** *– poor data linking clinical choices to patient outcomes in routine practice*
   – ***Payment that promotes volume, not value***

Change strategies that fail to address these root causes will perform suboptimally or fail entirely

The ground shifted under our feet

- ***120 years of clinical science*** *that*
  - *vastly increased our understanding* *of the human organism in health and disease*
  - *produced literally thousands of effective treatments*; *but also*
  - *massively increased complexity* *(how much an expert clinician must know, to function effectively)*

- ***Shifted pattern matching to rate estimation***
  - *the expert mind has amazing built-in ability to pattern match*
    (almost magical – we can't replicate it analytically), but …
  - *it cannot accurately estimate rates using subjective experience*
    (attempting to do so produces grossly inaccurate, highly biased, estimates)

"The complexity of modern medicine exceeds the capacity of the unaided expert mind."

David M. Eddy, MD, PhD

A key operational take-away

1. ***The primary cause of unwarranted clinical variation is increasing levels of complexity***

2. ***while relying on human memory as our primary means of executing correctly.***

3. ***"Solutions" that don't address these underlying causes usually fail*** *(at least, over time – 'working harder' can make things better for a little while, but it doesn't sustain).*

Quality Science

We have found proven solutions

(a clinical management method,
that links nicely to embedded clinical research)

It's all about managing complexity at the front line, which translates to clinical decision support

Two methods to manage complexity

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

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

Mass customize *– deploy "**standard work**" to "**make it easy to do it right**;" then vary based on individual customer need.*

An oxymoron?

The key to effective variation is standardization.

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*

James Brent C., Savitz Lucy A. How Intermountain trimmed health care costs through robust quality improvement efforts. *Health Affairs* 2011; 30(6):1185-91 (June).

Quality Science

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)*

James Brent C., Savitz Lucy A. How Intermountain trimmed health care costs through robust quality improvement efforts. *Health Affairs* 2011; 30(6):1185-91 (June).

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- ***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

James Brent C., Savitz Lucy A. How Intermountain trimmed health care costs through robust quality improvement efforts. *Health Affairs* 2011; 30(6):1185-91 (June).

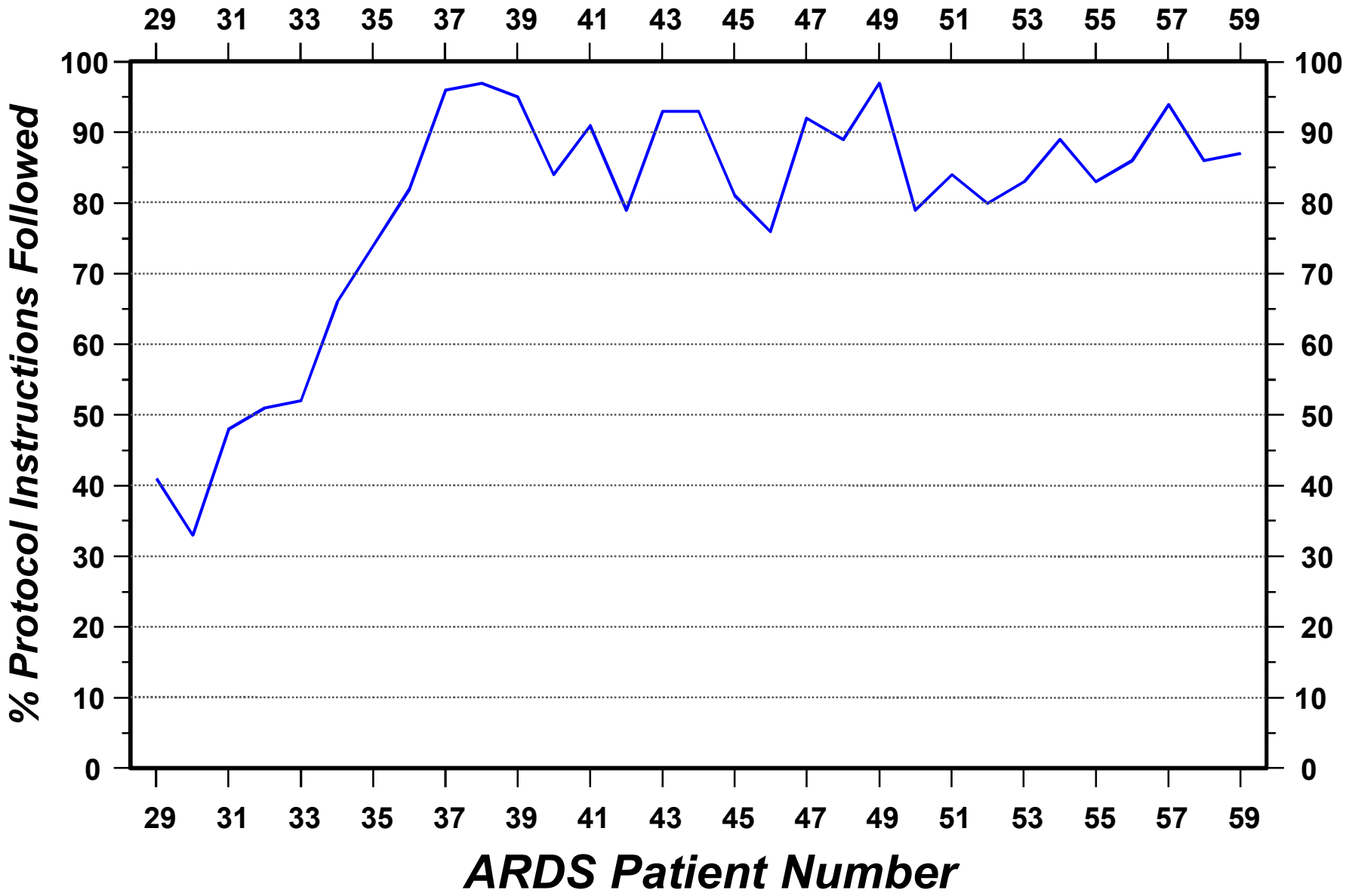
Quality Science

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*

James Brent C., Savitz Lucy A. How Intermountain trimmed health care costs through robust quality improvement efforts. *Health Affairs* 2011; 30(6):1185-91 (June).

ARDS Protocol Compliance



East Thomas D, Morris Alan H, Clemmer T, Orme James F, Wallace C Jane, Henderson Susan, Sittig Dean F, gardner Reed M. Development of computerized critical care protocols – a strategy that really works! *Proceedings – The Fourteenth Annual Symposium on Computer Applications in Medical Care. Washington, DC: IEEE Computer, 564-8* (5-7Nov1990).

This “shift” happened every time

(across more than 100 Shared Baseline protocols –
we called them Care Process Models - CPMs*)*

You must have a** (formal, consistent) **method to

“tune” theory to reality

(fundamental knowledge – quality improvement’s 3rd premise)

ARDS trial 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)*

James Brent C., Savitz Lucy A. How Intermountain trimmed health care costs through robust quality improvement efforts. *Health Affairs* 2011; 30(6):1185-91 (June).

Clinical case 3:

Reducing complexity in front-line care delivery

(The problem isn't primarily motivation and accountability, the key is reducing complexity!!!!)

Cardiac discharge meds *for inpatients – CHD & HF*

Five meds:

1) *Beta blockers*
2) *ACE/ARB inhibitors*
3) *Statins for lipid control*
4) *Antiplatelets (usually ASA) for patients w IHD*
5) *Warfarin for patients with atrial fibrillation*

Baseline (to illustrate):

– *valid random survey of all patient records*
– *57% appropriate beta blocker use*
– *comparative rates: 49% in major academic centers,*
34% in community hospitals,
41% overall, nationally

(cream of the crap; tallest of the 7 dwarves)

Our initial efforts

Distributed articles demonstrating clinical value *– these things really work!!*

Major grand rounds presentations *– very well received; almost everyone shared that they had learned a great deal, and that they had changed their practice*

Displayed weekly performance *– hospital level*

Impact?

No change

We upped the ante

Displayed weekly performance by physician –

with names blacked out, but each physician got their own personal score so they could see how they stacked up against their peers

Impact?

No change

Our next try

- ***CMO personalized "atta-boy!" letters of commendation to high performers***

- ***CMO personally, privately contacted poor performers*** *– lives depend on this, your patients deserve better,* ***get with it!!***

- ***We were in discussions about linking performance to financial incentives, or even medical staff privilege penalties***

Impact?

No change

Now we're really getting serious!!

- ***We were in discussions about linking performance to financial incentives, or even medical staff privilege penalties***

What were we doing wrong?

What was the defect in our thinking?

Getting the diagnosis right

1. ***Complexity***

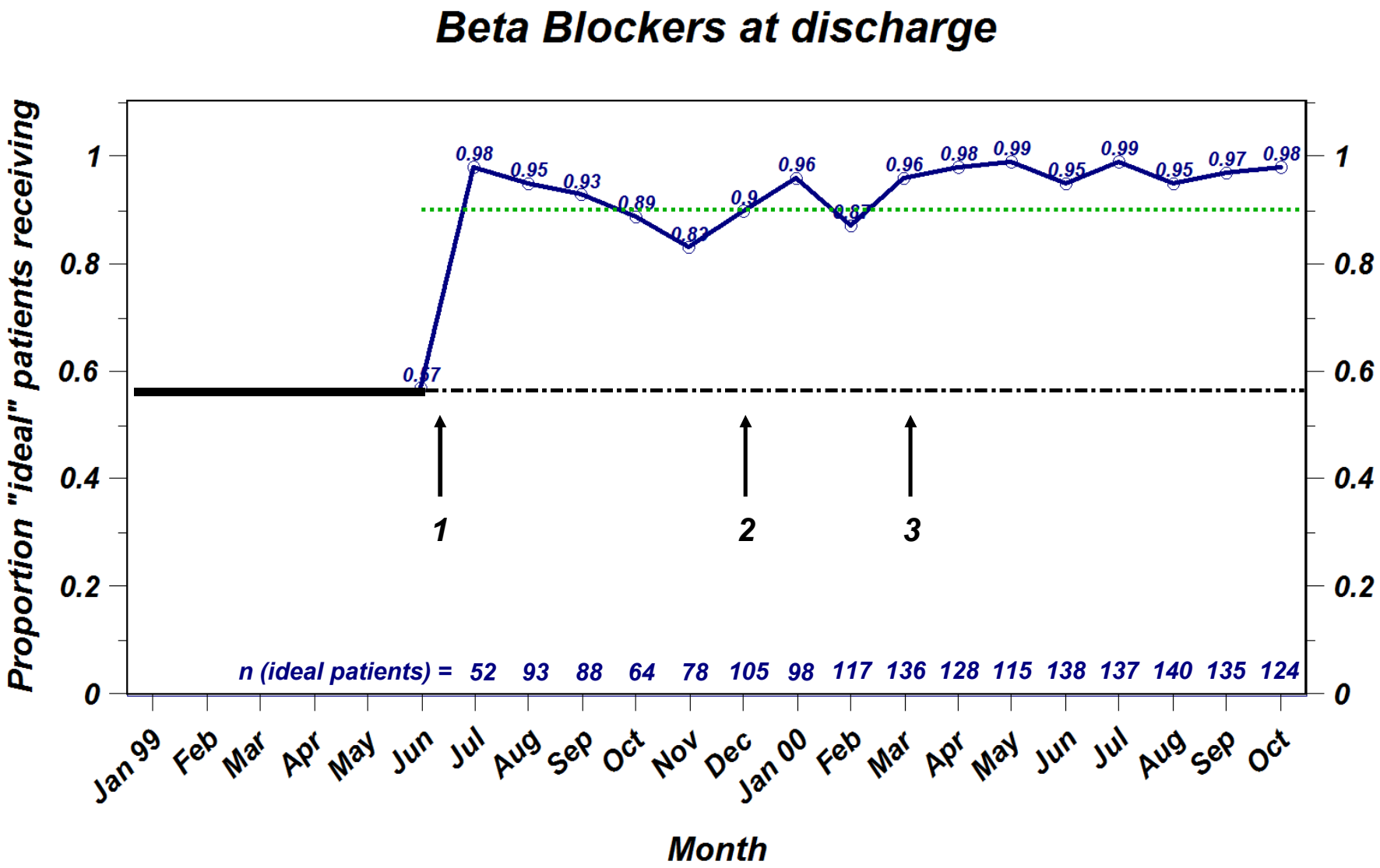
   The complexity of modern medicine exceeds the capacity of the unaided expert mind

   Dr. David Eddy, Stanford University School of Medicine

2. ***Continued reliance on human memory as the primary means of execution***

3. ***Lack of front-line transparency*** *(poor data)*

Beta blockers at discharge



Lappé J.M., et al. Improvements in 1-year cardiovascular clinical outcomes associated with a hospital-based discharge medication program. *Ann Int Med* 2004; 141(6):446-53 (21 Sep).

Cardiac discharge meds

	Before	After	National 2000
Beta blockers	57%	97%	41%
ACE / ARB inhibitors	63%	95%	62%
Statins	75%	91%	37%
Antiplatelet	42%	98%	70%
Warfarin (chronic AFib)	10%	92%	<10%

	Mortality at 1 year			Readmissions w/ in 1 year		
	Before	After		Before	After	
CHF (n = 19,083)	22.7%	17.8%	331	46.5%	38.5%	551
IHD (n = 43,841)	4.5%	3.5%	124	20.4%	17.7%	336
Total			455			887

Lappé J.M., et al. Improvements in 1-year cardiovascular clinical outcomes associated with a hospital-based discharge medication program. *Ann Int Med* 2004; 141(6):446-53 (21 Sep).