



The Quality Improvement Imperative

Presentation for ACHPE, Quito, Ecuador

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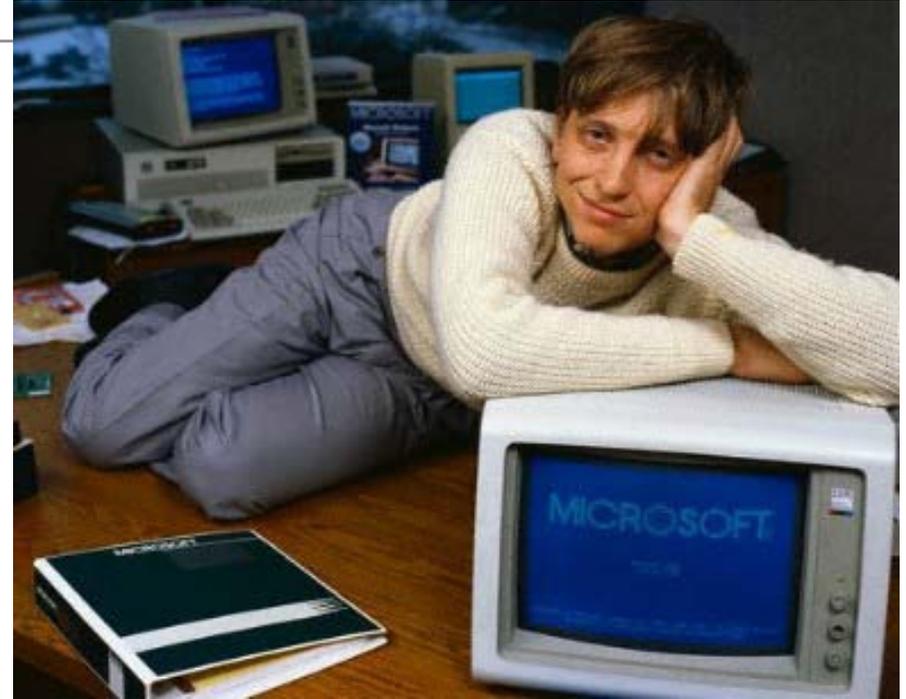
July, 2013

UC San Diego
HEALTH SCIENCES

“Excellence is best described as doing the right things right - selecting the most important things to be done and then accomplishing them 100% correctly.”

-Author Unknown

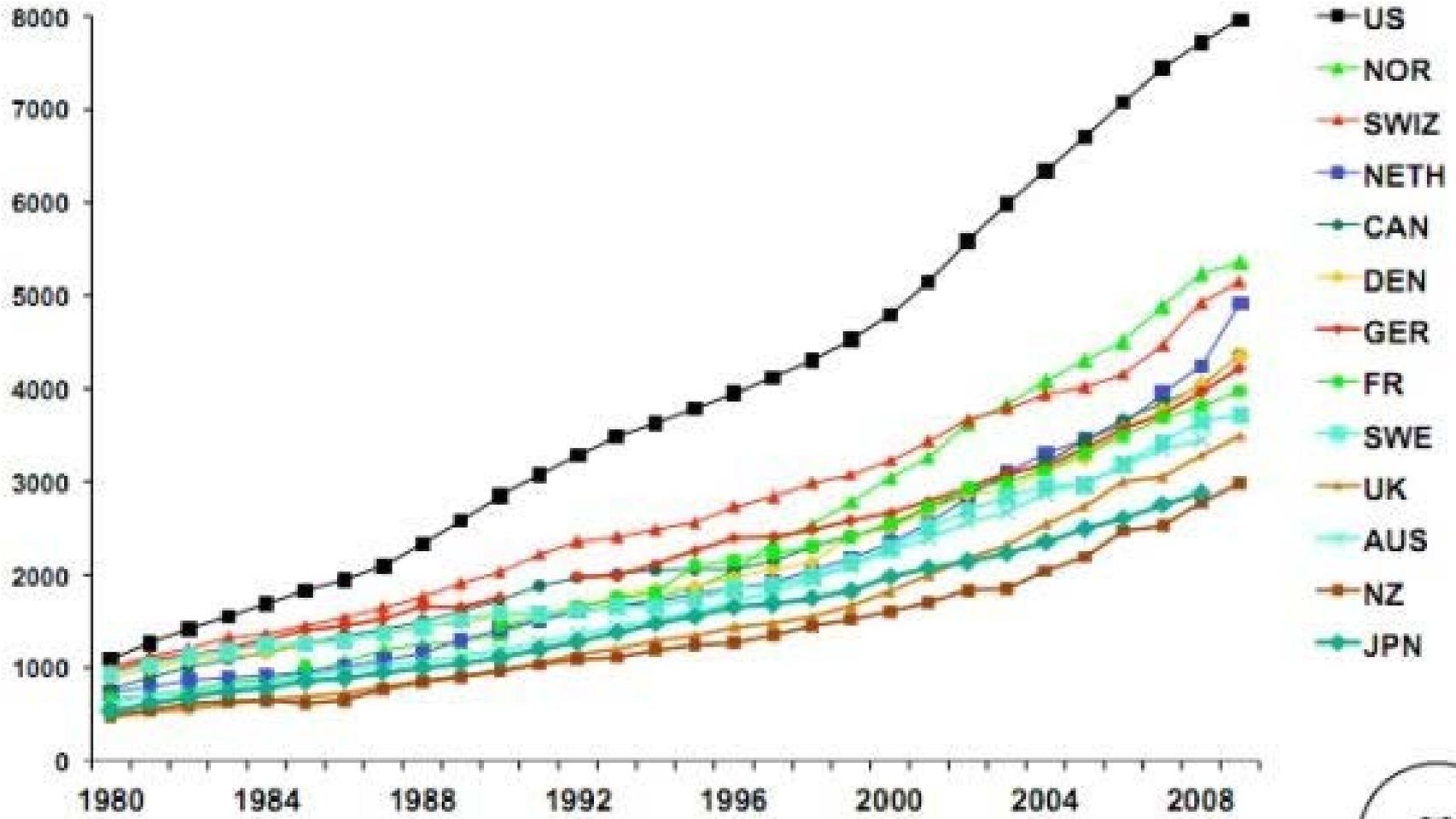
“It's fine to celebrate success but it is more important to heed the lessons of failure.”



Average Health Care Spending per Capita, 1980–2009

Adjusted for differences in cost of living

Dollars

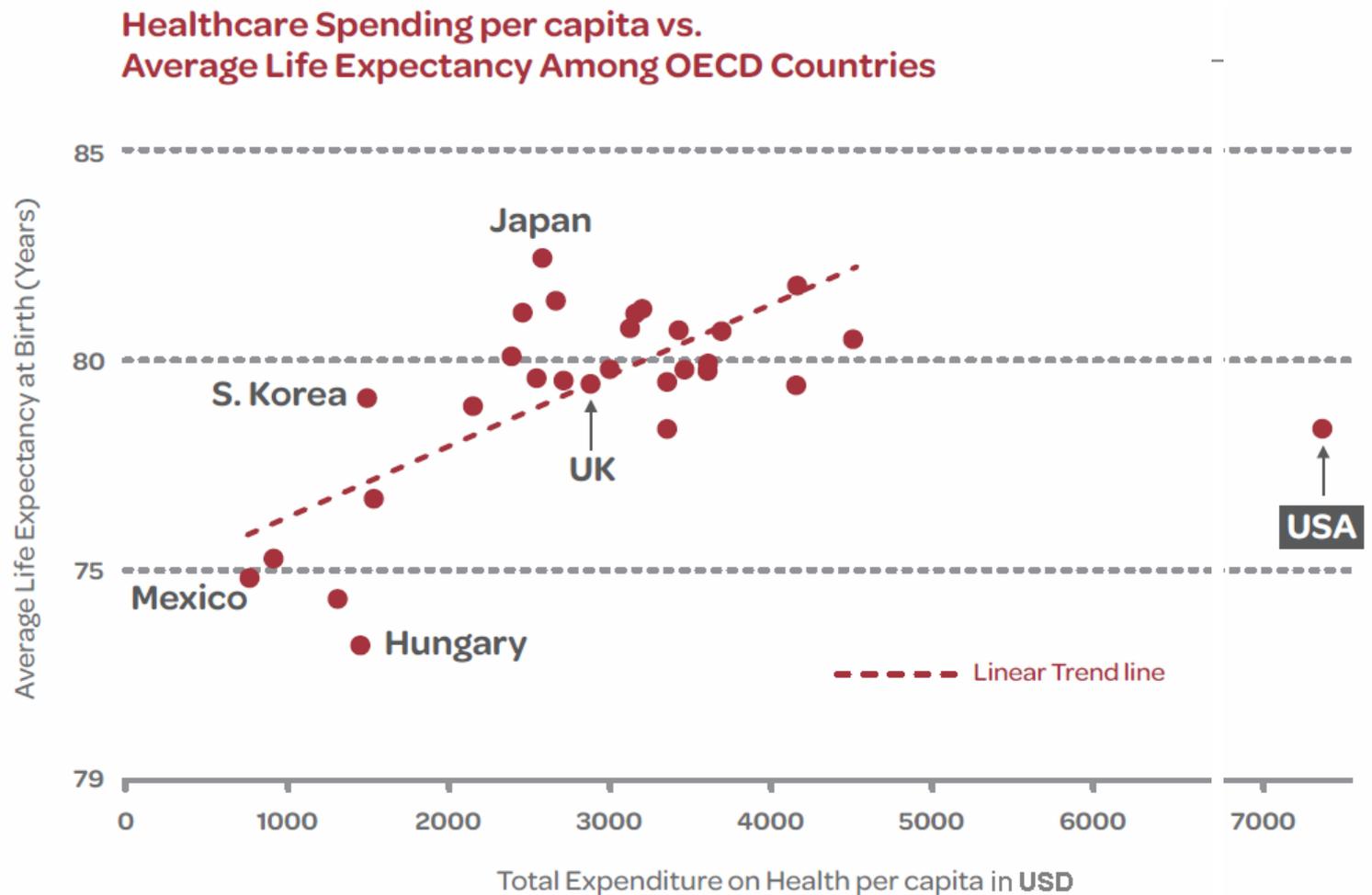


Source: OECD Health Data 2011 (June 2011).



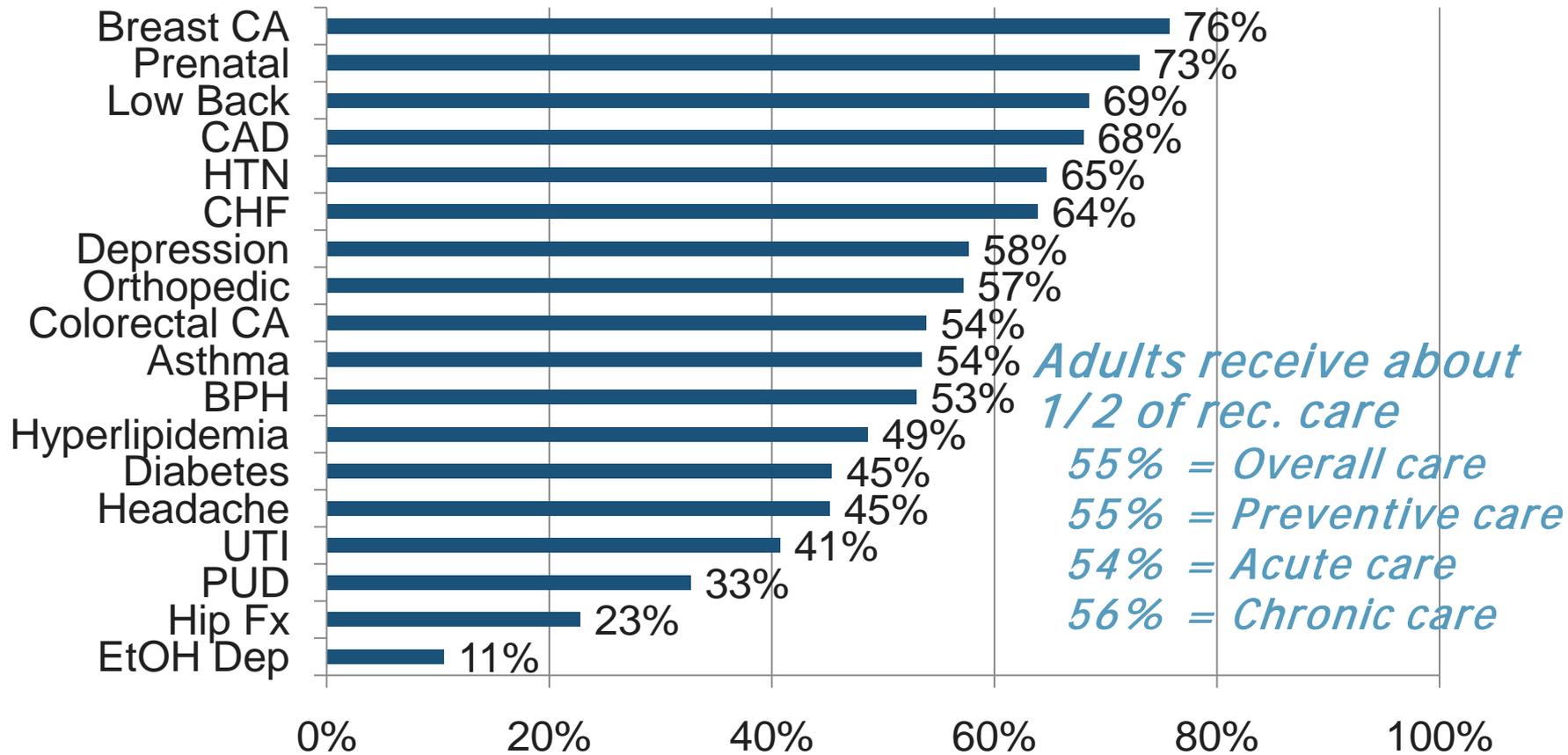
Commonwealth Fund, via Ezra Klein, et. al., Washington Post, Wonkblog

Old News, but...



Mary Meeker, USA, Inc., via Dan Munro, 2012 - The Year In Healthcare Charts,

Quality Shortfalls: Getting it Right 50% of the Time



Cost of Deficiencies in Quality and Safety

- Hospital-acquired infections: \$5 billion annually
 - CAUTI: \$44,043/hospital stay
 - CABS: \$103,027/hospital stay
 - VAP: \$135,795/hospital stay
- DVT/PE: \$50,937/hospital stay
- Surgical complications: Retained foreign objects: \$63,631/hospital stay
- Pressure ulcers stage III and IV: \$43,180/hospital stay
- Falls and trauma: \$33,894/hospital stay
- Wasted resources: duplication of medical tests 20%
 - 8 – 9% in Canada/UK



THE NEW YORKER

REPORTING & ESSAYS

ARTS & CULTURE

HUMOR

FICTION & POETRY

THE TALK OF THE TOWN

ONLINE ONLY

OCTOBER 18, 2009

THE NEW YORKER OUT LOUD

Rebecca Mead and Daniel
Zalewski talk about books for
children and young adults.



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The Book Bench: First ladies
love Dostoevsky.

Evan Osnos spies some
patriotic cigarettes.

ANNALS OF MEDICINE

THE COST CONUNDRUM

What a Texas town can teach us about health care.

by Atul Gawande

JUNE 1, 2009

TEXT SIZE: A | A | A

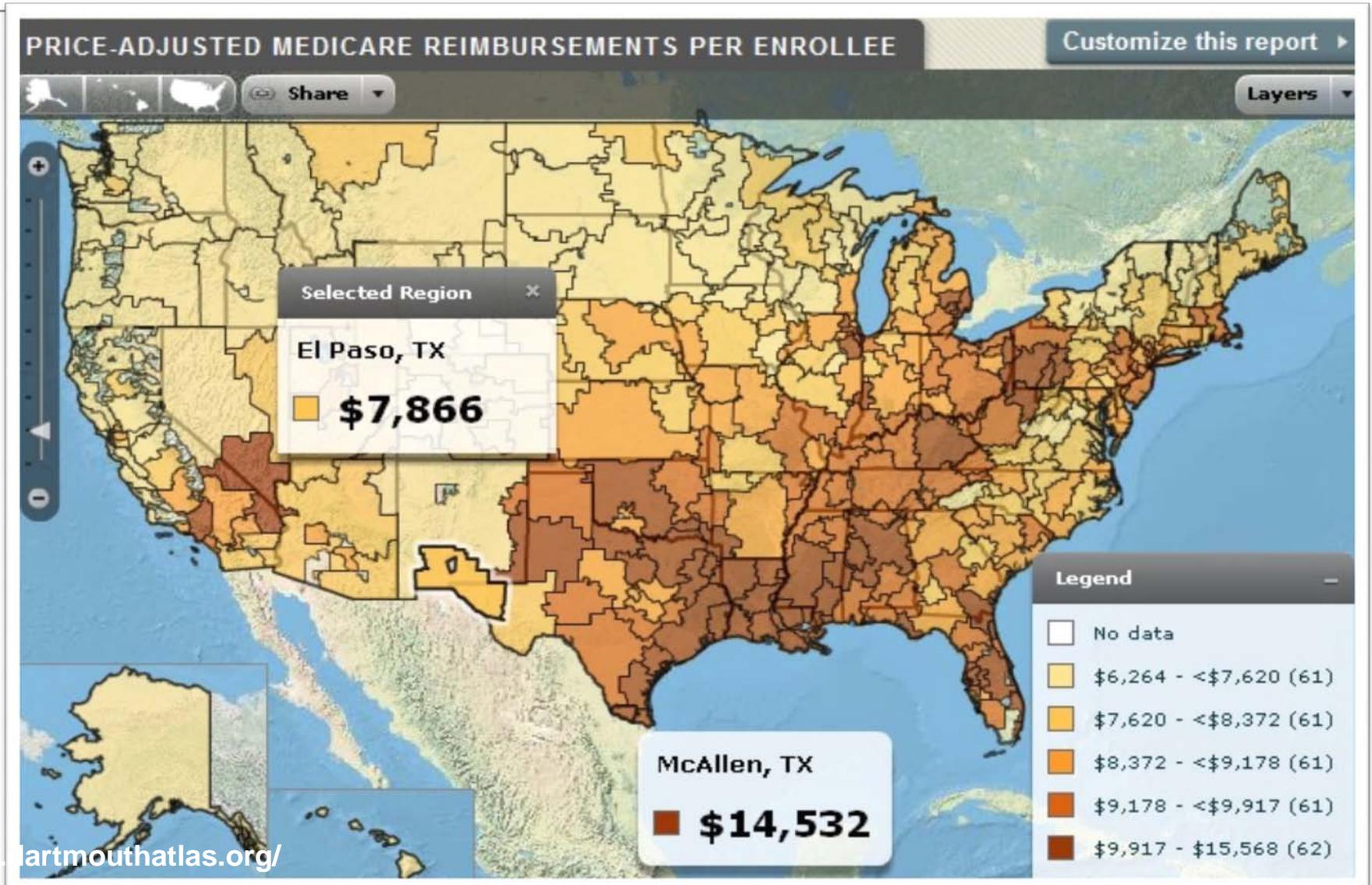
PRINT | E-MAIL | FEEDS | SINGLE PAGE

It is spring in McAllen, Texas. The morning sun is warm. The streets are lined with palm trees and pickup trucks. McAllen is in Hidalgo County, which has the lowest household income in the country, but it's a border town, and a thriving foreign-trade zone has kept the unemployment rate below ten per cent. McAllen calls itself the Square Dance Capital of the World. "Lonesome Dove" was set around here.

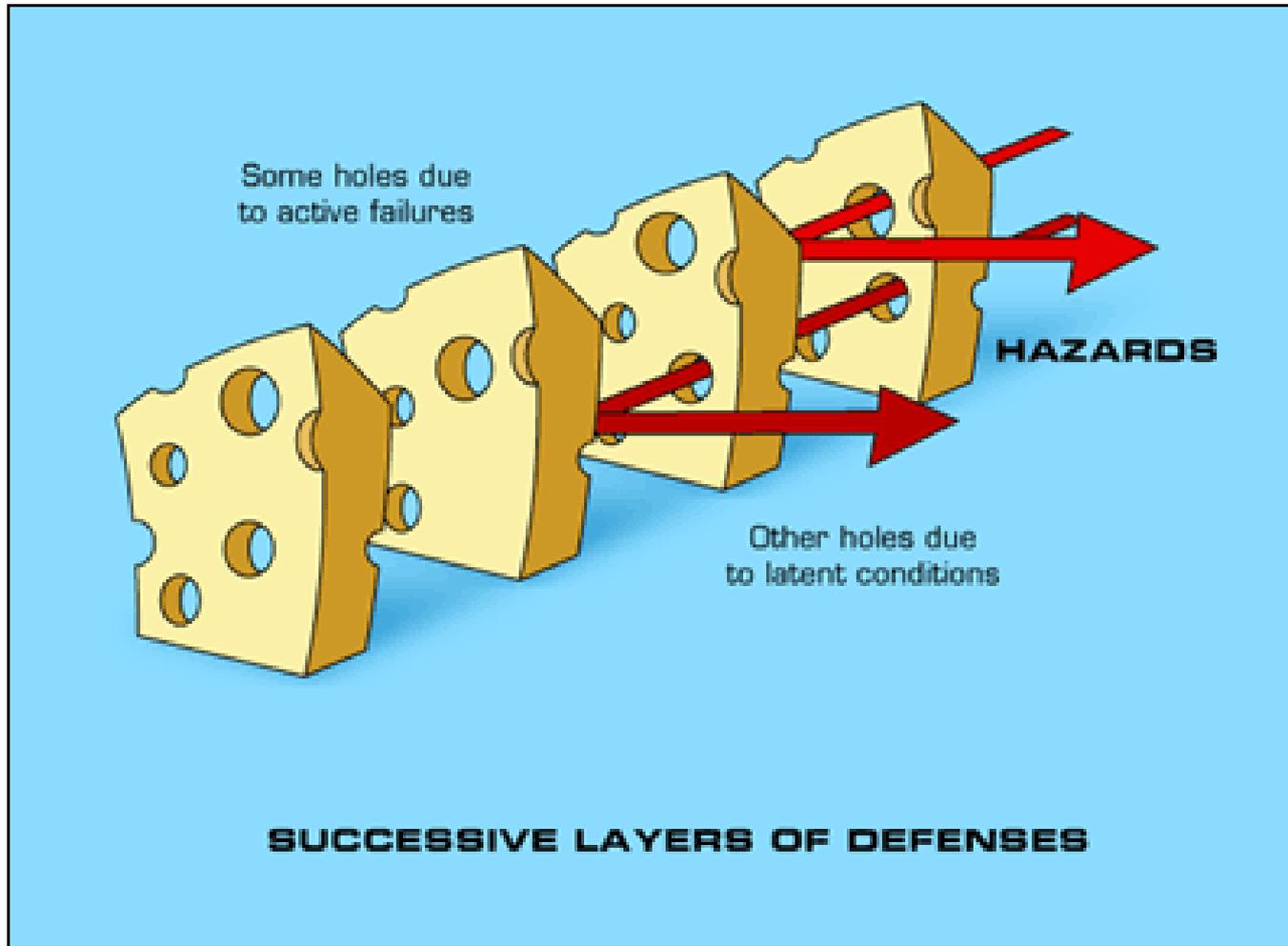
McAllen has another distinction, too: it is one of the most expensive health-care markets in the country.



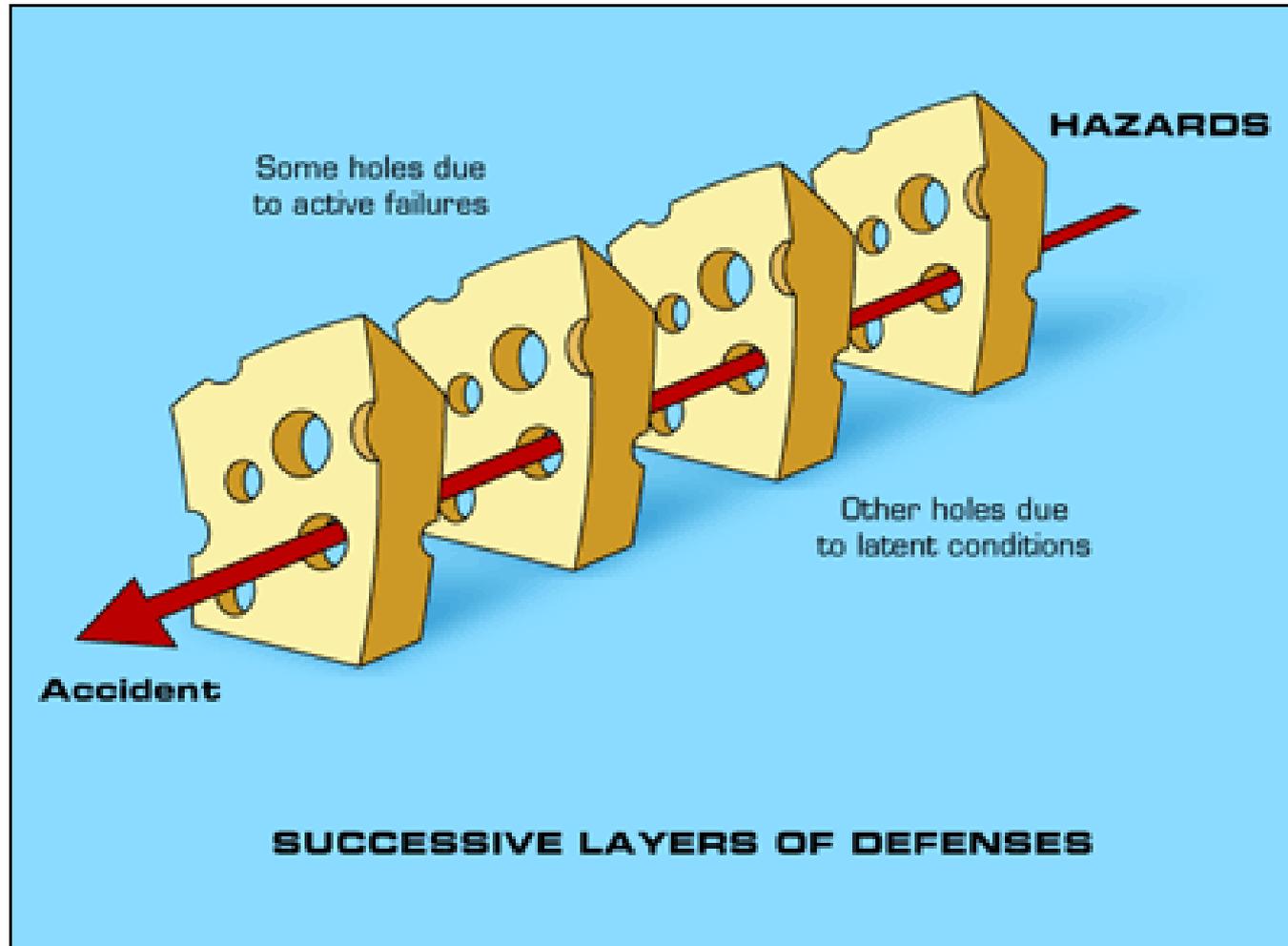
Medicare Utilization



Holes Do not Line Up = Near Miss



Holes Line Up = Harm



Most Harm in Hospitals is Hidden

- Voluntary reporting or coding-based processes for detecting harm are inferior to Global Trigger Tool process

ERRORS & ADVERSE EVENTS

By David C. Classen, Roger Resar, Frances Griffin, Frank Federico, Terri Frankel, Nancy Kimmel, John C. Whittington, Allan Frankel, Andrew Seger, and Brent C. James

'Global Trigger Tool' Shows That Adverse Events In Hospitals May Be Ten Times Greater Than Previously Measured

DOI: 10.1377/hlthaff.2011.0190
HEALTH AFFAIRS 30,
NO. 4 (2011): 581-589
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The People to People Health
Foundation, Inc.

ABSTRACT Identification and measurement of adverse medical events is central to patient safety, forming a foundation for accountability, prioritizing problems to work on, generating ideas for safer care, and testing which interventions work. We compared three methods to detect adverse events in hospitalized patients, using the same patient sample set from three leading hospitals. We found that the adverse event detection

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Roger Resar is a senior fellow at the Institute for Healthcare Improvement, in Cambridge, Massachusetts.

Communication heuristics

- Speakers overestimate effectiveness
- Egocentric heuristic – assumption of same information

Quality Improvement is...

- Focus on processes of care
- Reduced variation by shifting entire practice
- A change in the *design* of care

Quality Improvement is NOT...

- Forcing people to work harder / faster / safer
- Traditional QA or peer review
- Creating order sets or protocols without monitoring use or effect

Process Reliability

“Reliability is failure-free operation over time.”

David Garvin
Harvard Business School

“When our processes are unreliable, biology protects us from catastrophe most of the time.”

Roger Resar, MD
Mayo Clinic

Reasons for Reliability Gap

- Over-dependence on vigilance and hard work
- Benchmarking to the mean (mediocrity)
- **Permissive clinical autonomy**
- Inadequate use of human factors knowledge and reliability science

Roger Resar, MD

The Evolving Culture of Medicine

- 20th Century Characteristics
 - Autonomy
 - Solo practice
 - Continuous learning
 - Infallibility
 - Individual Knowledge
- 21st Century Characteristics
 - Teamwork & systems
 - Group practice
 - Continuous improvement
 - Multidisciplinary problem solving
 - Dynamic innovation with rapid change

Why don't we do better?

- Competing Priorities
- National Policies / Incentives / Initiatives / Accreditation not all in place
- Lack of awareness or buy in of guidelines
- Underestimation of problems / overestimating current quality
- Measurement Issues
- Translating guidelines into everyday practice is difficult
- Medical training failures (QI and systems re-design)
- Failure to use a good QI framework

Cost of QI Interventions

- If not successful, there is waste of resources and funding
 - Publication bias: successful QI projects are published => appears simple to accomplish
 - Many projects
 - 1) Can't prove results
 - 2) Results are not worth the time and effort
 - 3) Results are not sustainable

Change is Difficult:

Failure Rates are High

- 80% of major change initiatives fail to realize intended objectives
- Need a framework that addresses ALL the common failures in the process and hits all the basics.

Essential Elements (the basics)

Successful Quality Improvement Efforts

- Institutional support – buy in
- Teams and Culture of Improvement
- Understand Current Process
- Willingness to Redesign process
- Defined goals, best practice defined in protocol
- Metrics – reliable, practical, rapid feedback
- Reliable Interventions / strategies
 - Hard wired, sustainable and spreadable
- Ongoing informed improvement
- Educational programs

Gaining Institutional Support and Making the Business Case

- Educate administration about the scope of the problem
 - Morbidity and mortality
 - Costs
- Present evidence for effective prevention strategies
- Discuss impact of this “opportunity for improvement”
 - Roadmap for improvement is available
 - Regulatory / public reporting measures for tracking progress

Define Patient Population

- Population Considerations:
 - Age range
 - Location(s)
 - Elective/ Urgent/ Emergent
 - Diagnosis
 - Procedure codes

- Consider narrow scope to start
 - Expand later

Establish Roles/ Responsibilities

- Executive Sponsor
- Clinical Service Leaders
- Core Team Members/ Key Stakeholders
- Clinical Consultants
- Analytic Staff
- EHR Staff
- Financial Liaison

Front line expertise is key

Be willing to redesign

Some designs don't make any sense.....

Even if they've been there a long time.





TRADITION

JUST BECAUSE YOU'VE ALWAYS DONE IT THAT WAY
DOESN'T MEAN IT'S NOT INCREDIBLY STUPID.

Guidelines vs Protocols

- Guidelines
 - General statements and overviews
- Protocols
 - More detailed, defines local best practice
 - Provide specific instructions for individual clinical decisions
 - Algorithmic

Protocol

- Local Standards of best practice
- Written out
- Include operational definitions
- Must have enough detail to be measurable and make judgments re: Is this case meeting our standard of care/

Operational Definitions and Standards

Required for Measurement and Intervention Design

“We will provide prophylaxis to all patients at risk for VTE until they are ambulatory or discharged from hospital.”

What is the definition of “at risk for VTE”?

What is the definition of “ambulatory”?

What prophylaxis options are acceptable?

What are contraindications and ‘leeway’ times?

Operational Definitions

- Are clear and unambiguous
- Specifies the measurement method, procedures and equipment when appropriate
- Defines specific criteria for the data to be collected
- Always ask “How might somebody be confused by this definition?”

Hierarchy of Reliability

Level	Reliability Strategies	Predicted Prophylaxis Rate
1	No protocol* (“State of Nature”)	40%
2	Decision support exists but not linked to order writing, or prompts within orders but no decision support	50%
3	Protocol well-integrated (into orders at point-of-care)	65 – 85%
4	Protocol enhanced (by complementary QI and high reliability strategies)	90%
5	Oversights identified and addressed in real time	95+%

Protocol Key Principles

1. Keep protocol simple to access and use
2. Don't interrupt the workflow
3. Design reliability into the new process
4. Monitor use of your protocol
5. Allow for variation from the protocol based on patient characteristics (rather than providers)
 - improve protocol based on feedback and justifiable variation
6. Fail faster (pilot small scale w/ongoing feedback & refinement before wider implementation)

When your order set is used, is it effective?

- Inter-observer agreement?
- Easy to use?
- Leads to protocol driven choices in actual practice?
- Does it make it easier to do the right thing, harder to do the wrong thing?
- Objective and Subjective data helpful to assess this

High Reliability Design Solutions for Interventions

- Standardize
- Make preferred action the default
- Prompts and guidance at point of care
- Scheduling of important tasks
- Redundant responsibility and mechanisms to double check the most important

.....or delegate to another group that will do it more reliably
Special Teams

Error Reduction Strategy	
Forcing functions and constraints	High Leverage  Low Leverage
Automation and computerization	
Standardization and protocols	
Checklists and double check systems	
Rules and policies	
Education / Information	

Table 1. Rank Order of Error Reduction Strategies.³ Source: ISMP. Reprinted with permission.

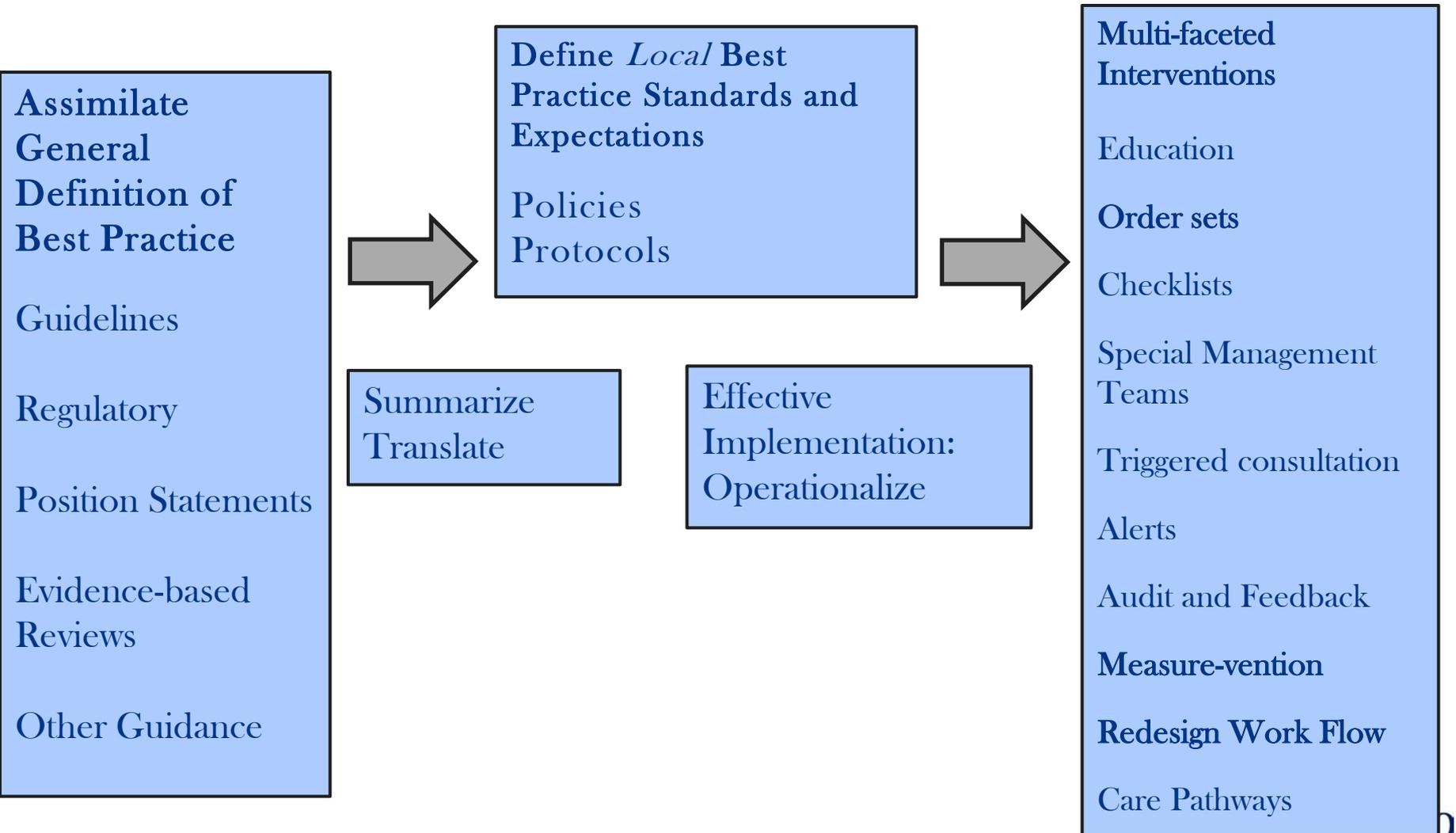
Standardization



Sustainability and Transferability

- Sustainability
 - Maintaining the success of savings over time
 - Improvement and savings often diminished and not reported after two years
- Transferability
 - Improvement at one site cannot always be translated to another site
 - Variable expertise
 - Different resources and support structures
 - Diverse cultures

Framework for Effective Implementation- No Single Intervention Will Do It!





‘The essence of knowledge is, having it, to apply it’

Confucius

Hypoglycemia Risk Factors - Different Flavors

Inherent

Low BMI / cachexia / Advanced Malignancy / Age
Liver / Kidney disease / CHF

Iatrogenic

Insulin / oral agents

Some risk with appropriate use.

Risk magnified with inappropriate use or failure to react / anticipate preventable problems.

Overly aggressive targets, inappropriate prescribing

Improved Glycemic Control AND
Reduced Hypoglycemia possible.

Iatrogenic Hypoglycemia

Etiologic factor	% of hypoglycemia cases
Reduction in enteral intake	40
Insulin adjustment	6.1
Steroid withdrawal	0.4
Unclear	43
“Diverse causes”	10.4
Medication error	none

Poor hypoglycemia management and follow up was the rule

- < 50% with documented euglycemia within 2 hours of low
- Average time to documented resolution was 4 hrs, 3mins
- (median 2 hrs, 25mins)

Table 2. Final Multivariate Logistic Analysis Pseudo $R^2 = 66\%$, $P < 0.0001$

	Odds Ratio	P value	95% Confidence Interval
Age	1.01	0.881	0.94–1.07
Sex	0.34	0.222	0.06–1.91
Congestive heart failure	6.35	0.111	0.65–61.47
Chronic kidney disease	5.16	0.131	0.61–43.30
Nutritional interruption/ discordance	12.09	0.032	1.23–118.05
Prior hypoglycemic day	31.18	0.004	2.91–333.67
Insulin as outpatient	15.57	0.026	1.39–174.80

Unexpected interruption of Nutrition and Prior Hypoglycemic Day – Top Predictors
 Basal – Bolus errors: Creeping glargine (Lantus™) dose violating 50:50 rule

Management:

We did not follow our own protocol.

Poor or absent documentation, prolonged time to resolution.

Frequent failure to prevent recurrent hypoglycemia.

Glucose

Index Snapshot Vitals **Glucose** I/O All Results Since Admit

Report: **Glucose**

Hover over any graph point to see the associated value.

Glucose Management [06/08/11 0800 - 06/13/11 2359] in 8hr interval

Today

06/08/11 - 06/13/11

24 Hrs 8 Hrs 4 Hrs

Date: 06/08 06/09 06/10 06/11 06/12 06/13
8 Hrs: 08-16 16-00 00-08 08-16 16-00 00-08 08-16 16-00 00-08 08-16 16-00 00-08 08-16 16-00 00-08 08-16 16-00

Glucose (mg/dl)

POCT Glucose (mg/dl)
Glucose (mg/dL)

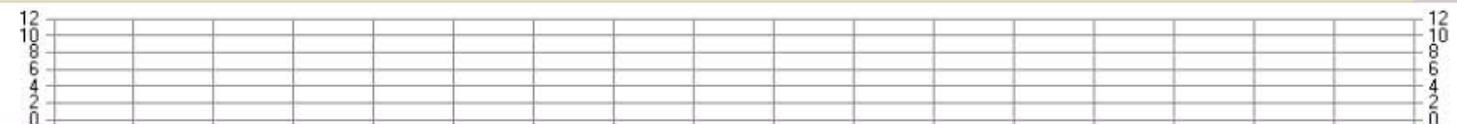


BG = 8

Glucose

POCT Glucose	110	378	122	110	128	204	173	166	194	248	151	177	234	197	150	197	234
Glucose			110			196											

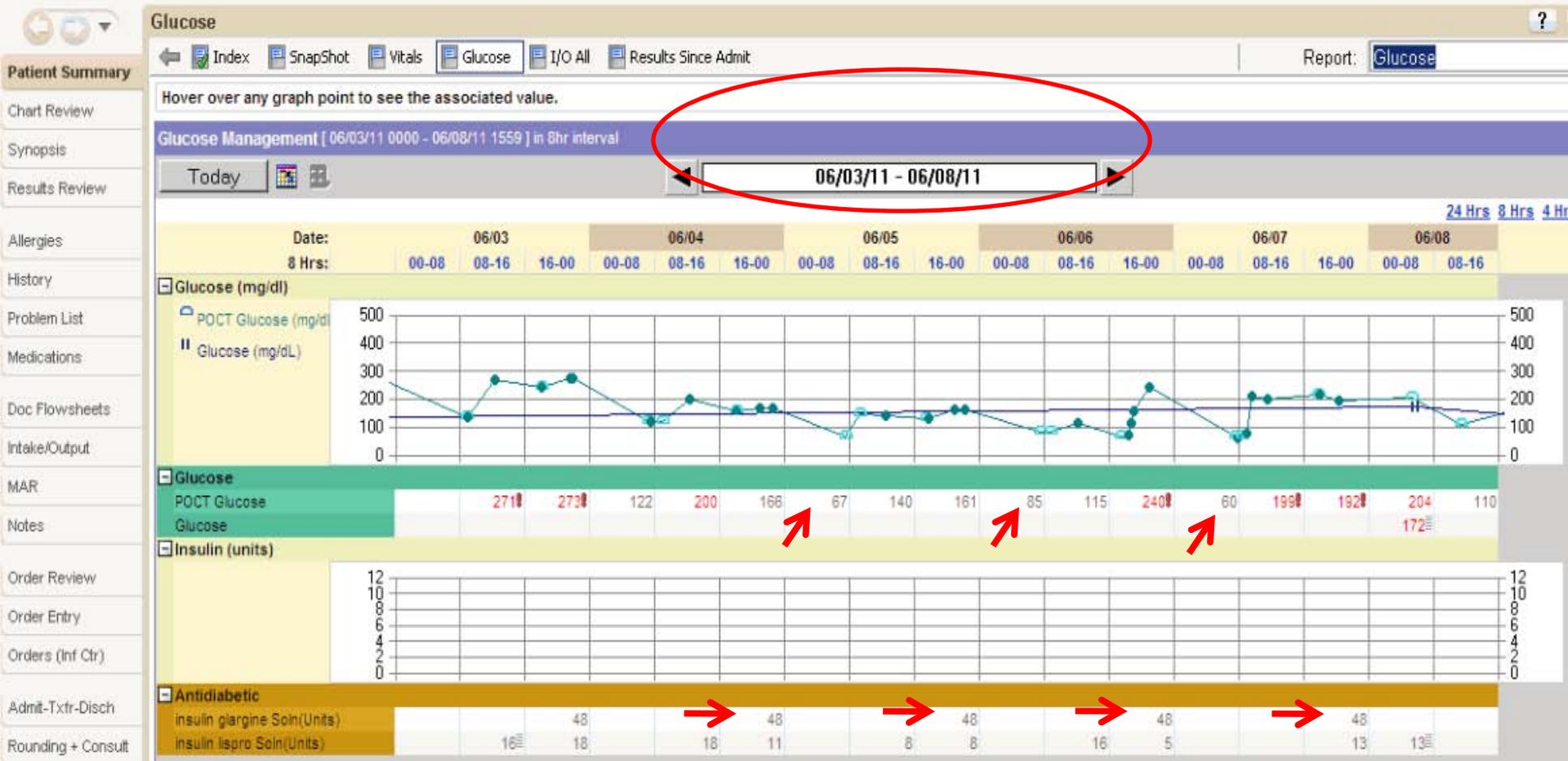
Insulin (units)



Antidiabetic

insulin glargine Soln(Units)	48	48		35				37				37					37
insulin ispro Soln(Units)	18	8	16	3	10	4	6	9	5	15	15	7	14	5			

Recurrent hypoglycemia on same insulin doses for several days preceding stroke code



Integrate Best Practice into protocols, order sets, documentation

- Actionable glycemic target
- Constant carbohydrate / dietary / consult
- A1c
- Education plan
- Hypoglycemia protocol
- Guidance for transitions (linked protocols)
- Coordinated monitoring / nutrition / insulin
- DC oral agents, insulin preferred
- Insulin regimens for different conditions
- Dosing guidance

Insulin Regimen - Patient Eating or Receiving Bolus Tube Feeds (Equivalent Lispro Dosing for Each Meal)

Glargine should be **50%** of the total daily insulin dose; the remaining 50% of the total daily insulin dose should be distributed among the three pre-meal lispro doses.

For insulin glargine: Enter a specific number of units **or** click one of the weight-based dosing buttons based on the following criteria:

- Patients who are very lean, very sensitive to insulin, or who are on hemodialysis - **0.15 Units/Kg**
- Patients with normal body habitus -- **0.2 Units/Kg**
- Patients who are overweight -- **0.25 Units/Kg**
- Patients who are obese, on corticosteroids, or who are known to be insulin-resistant -- **0.3 Units/Kg**

For insulin lispro: The dose of pre-meal lispro should be **one-third** of the insulin glargine dose.

For correctional insulin lispro: Use the SmartList in the administration instructions to select an appropriate correctional scale, based on the total daily dose of insulin. Every 24 hours, the amount of correctional insulin administered should be used as a guide to adjust the basal and nutritional insulin doses.

Glucose (POC)

[Routine, BEFORE MEALS & HS First occurrence Today at 1615 Until Specified](#)

insulin glargine (LANTUS) injection



Subcutaneous, EVERY MORNING, First Dose Today at 1145, Until Discontinued

Basal glargine insulin should still be administered even if the patient is temporarily NPO for a procedure, or if the patient has temporary interruption of nutrition.

Accept Cancel

Report: Lab Test Results

Component	Time Elapsed	Value	Range	Status	Comments
Glucose	6 hours (07/20/12 0520)	168 (H)	70 - 115 mg/dL	Final result	
Glyco Hgb (A1C)	2 days (07/17/12 1212)	12.4 (H)	4.8 - 5.9 %	Final result	A1C values may be understated when an abnormal hemoglobin is present.

Reference Links: 1. [Micromedex](#)

Dose: 10 Units 20 Units 0.15 Units/kg 0.2 Units/kg 0.25 Units/kg 0.3 Units/kg

Route: Subcutaneo **Subcutaneous**

Frequency: EVERY MORNING HS **QAM** Daily before lunch Q12H

For: Doses Hours Days

Starting: 07/20/2012 **Today** Tomorrow

First Dose: **Include Now** **As Scheduled**

First Dose: Today 1145 Until Discontinued

Scheduled Times: [Hide Schedule](#) [Adjust Schedule](#)

07/20/12	1145
07/21/12	0900
07/22/12	0900

Order has no end date or number of doses, so more times will be scheduled at a later date.

Priority:

For eating patient:
 Dosing guidance
 Basal / Bolus default
 Last glucose / A1c displayed
 Correction scale matches TDD

Hover over any graph point to see the associated value.

Glucose Management [06/05/12 0000 - 06/09/12 1559] in 8hr interval

Today Tuesday 0000 - Today 1559

[24 Hrs](#) [8 Hrs](#) [4 Hrs](#) [1 Hr](#) [All](#)

Date:	06/05			06/06			06/07			06/08			06/09	
8 Hrs:	00-08	08-16	16-00	00-08	08-16	16-00	00-08	08-16	16-00	00-08	08-16	16-00	00-08	08-16

Glucose (mg/dl)



Glucose

POCT Glucose	139	163	221!	183	200!	250!	210!	234!	319!	219!
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A1C and Serum Cr

Glyco Hgb (A1C)										
Creatinine										

Insulin (units)



Antidiabetic

insulin glargine Soln(Units)			12		12		20		15			
insulin lispro Soln(Units)		1	3		3	4		5	4	10	15	19

Diet

Diet Status		PO	PO		PO	PO		PO	PO			
Number of Items Taken		2.5	5		2	2		5	2.5	4	5	5
Number of Items on Tray		5	5		4	3		6	5	4	5	5
Diet Supplements		Glucern...	Glucern...		Glucern...	Glucern...						
Supplement - Intake (mL)		260 mL	260 mL		360 mL	180 mL						

Flow sheets: Useful from primary team AND for “ Measure-Vention”
 Triage report, investigation, and mitigation all within the EHR.

Society of Hospital Medicine:

<https://www.studydata.net/qgen/LoginSecure.php>



Data / Reporting for Glucometrics, Community, and More

Society of Hospital Medicine

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Support

Hospital Name	Hospital Type	City	State	Bedsizes	Cohort	Mentor
Baystate Medical Center	Academic Medical Center	Springfield	MA	660	10/10	Jeff Schnipper

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Start Month : (choose)

End Month : (choose)

Care Type :

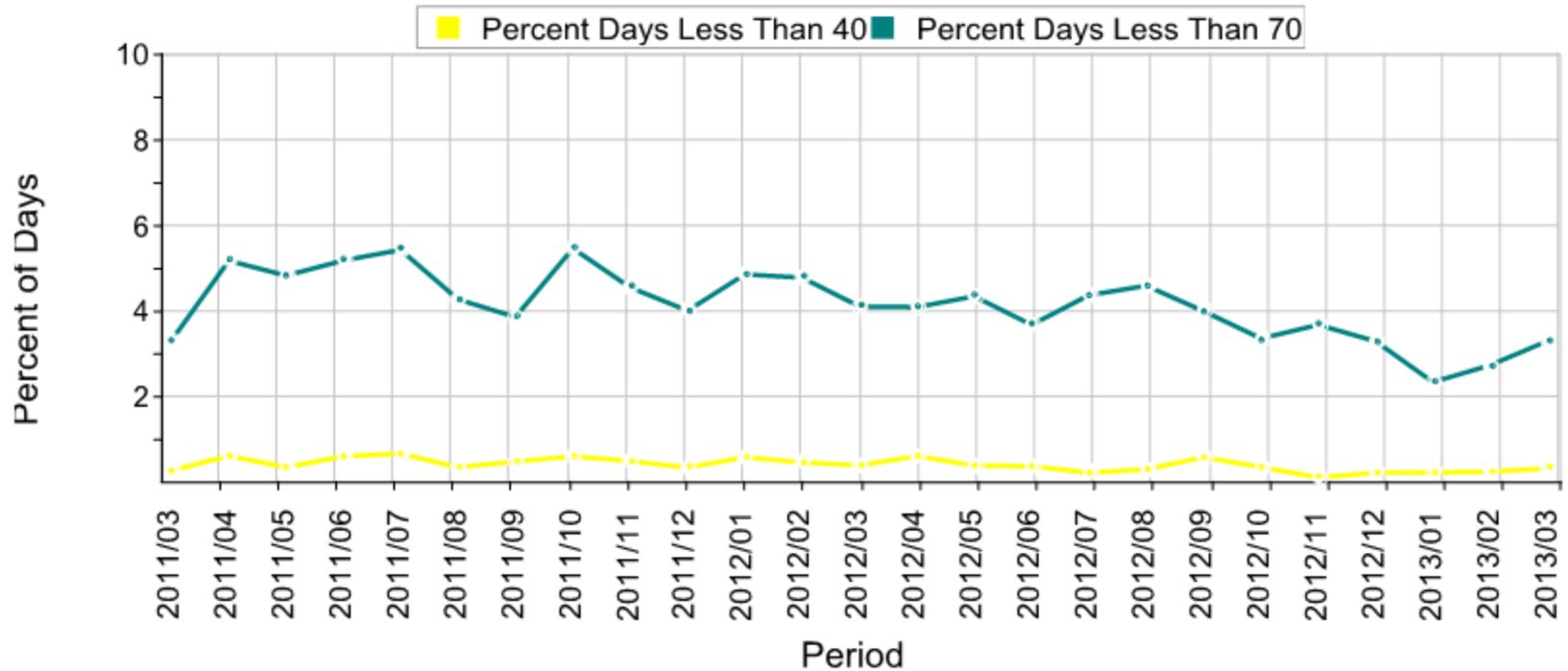
- Critical Care Inpatient
- Non-Critical Care Inpatient (Includes Telemetry)
- Other Care Type (ED / PACU / Holding Units / Endoscopy Areas, Outpatient Surgery, Dialysis, Rehab, SNF, etc.)

Unit Type :

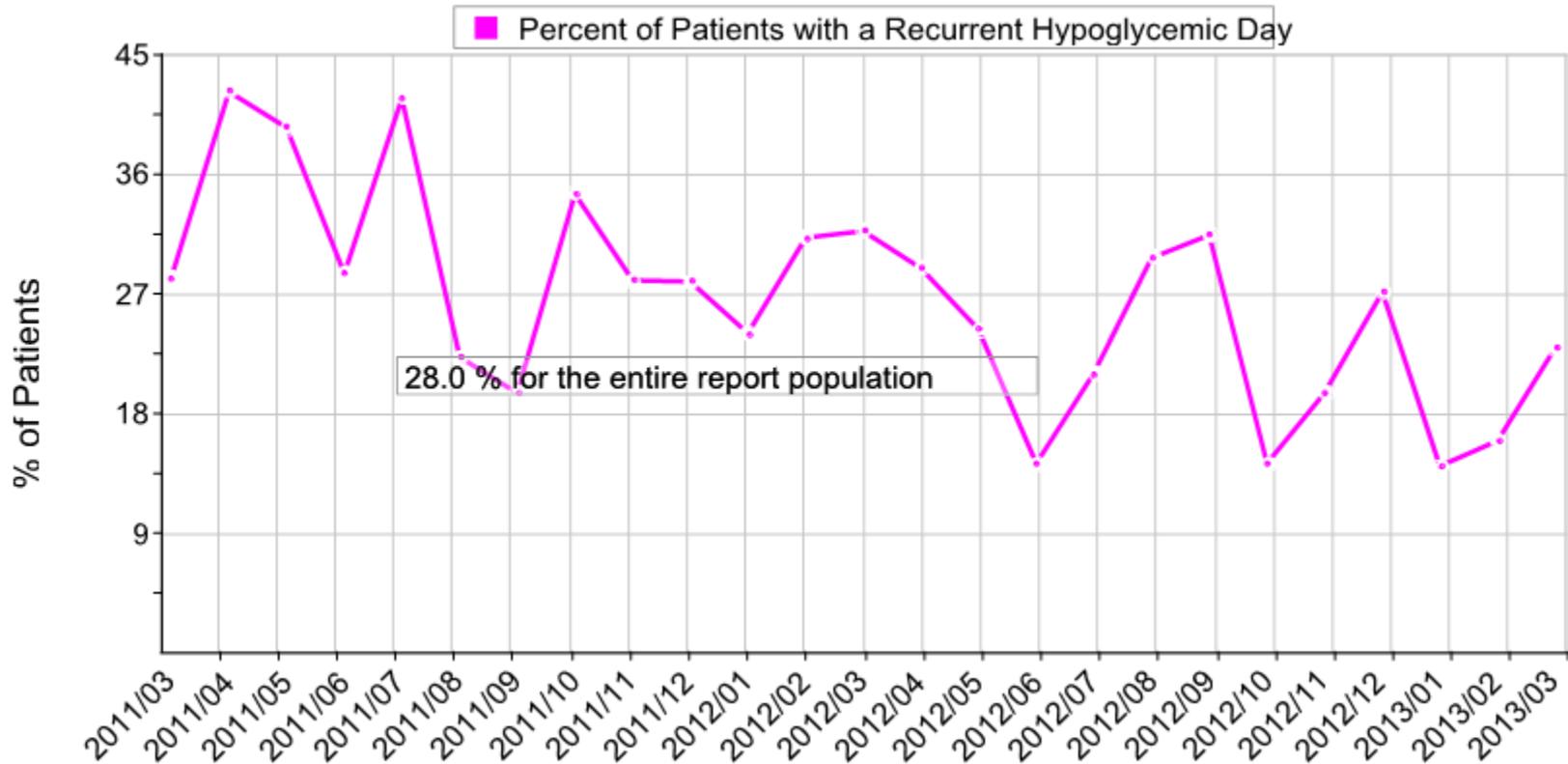
- Mixed Medical / Surgical (Includes Transplant)
- Medical (Includes Oncology and BMT Units)
- Surgical
- Psychiatry or Behavioral
- OB/GYN
- Orthopedics
- Pediatrics / Adolescent
- Other

40% reduction in hypoglycemia

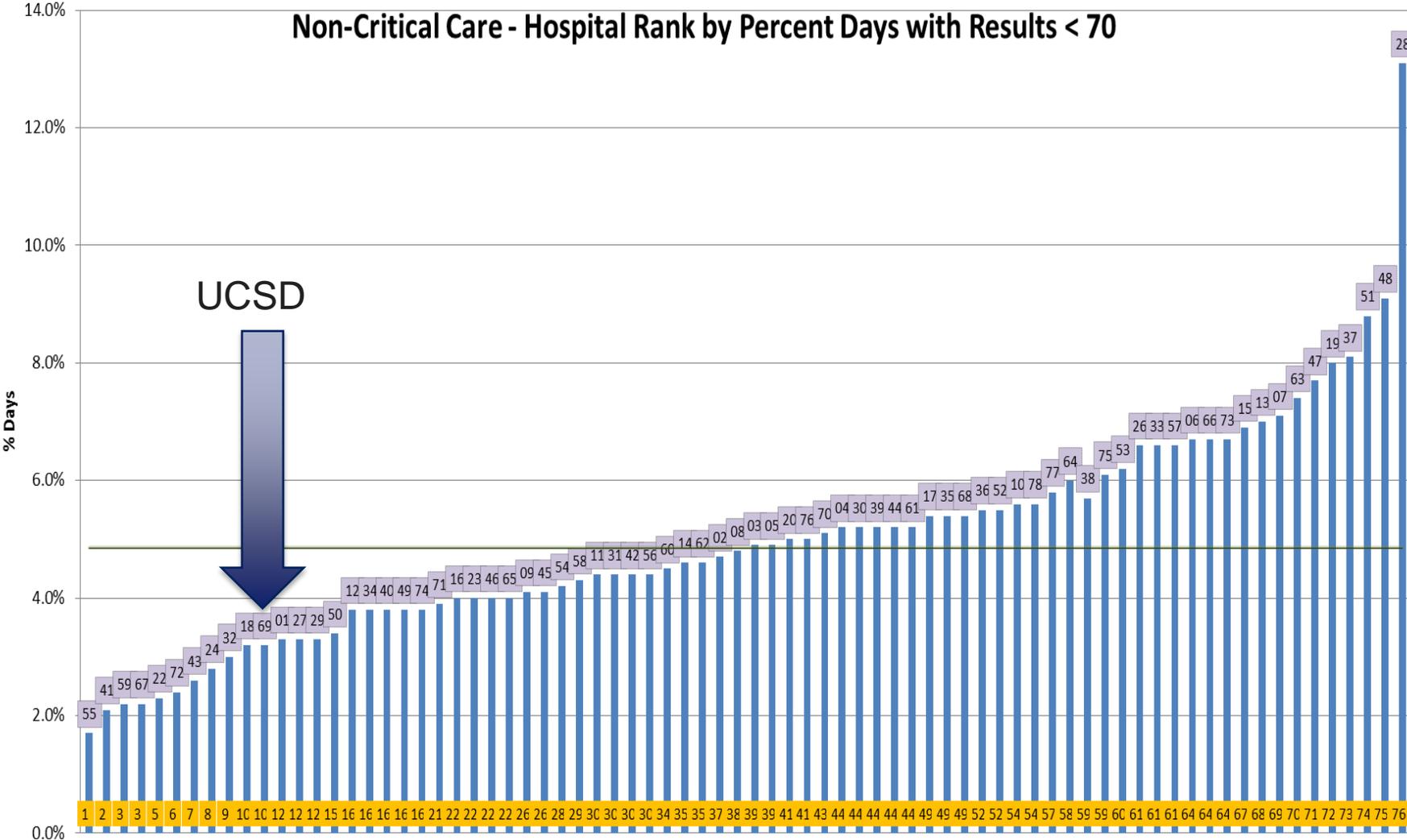
Patient-Day Glucometrics



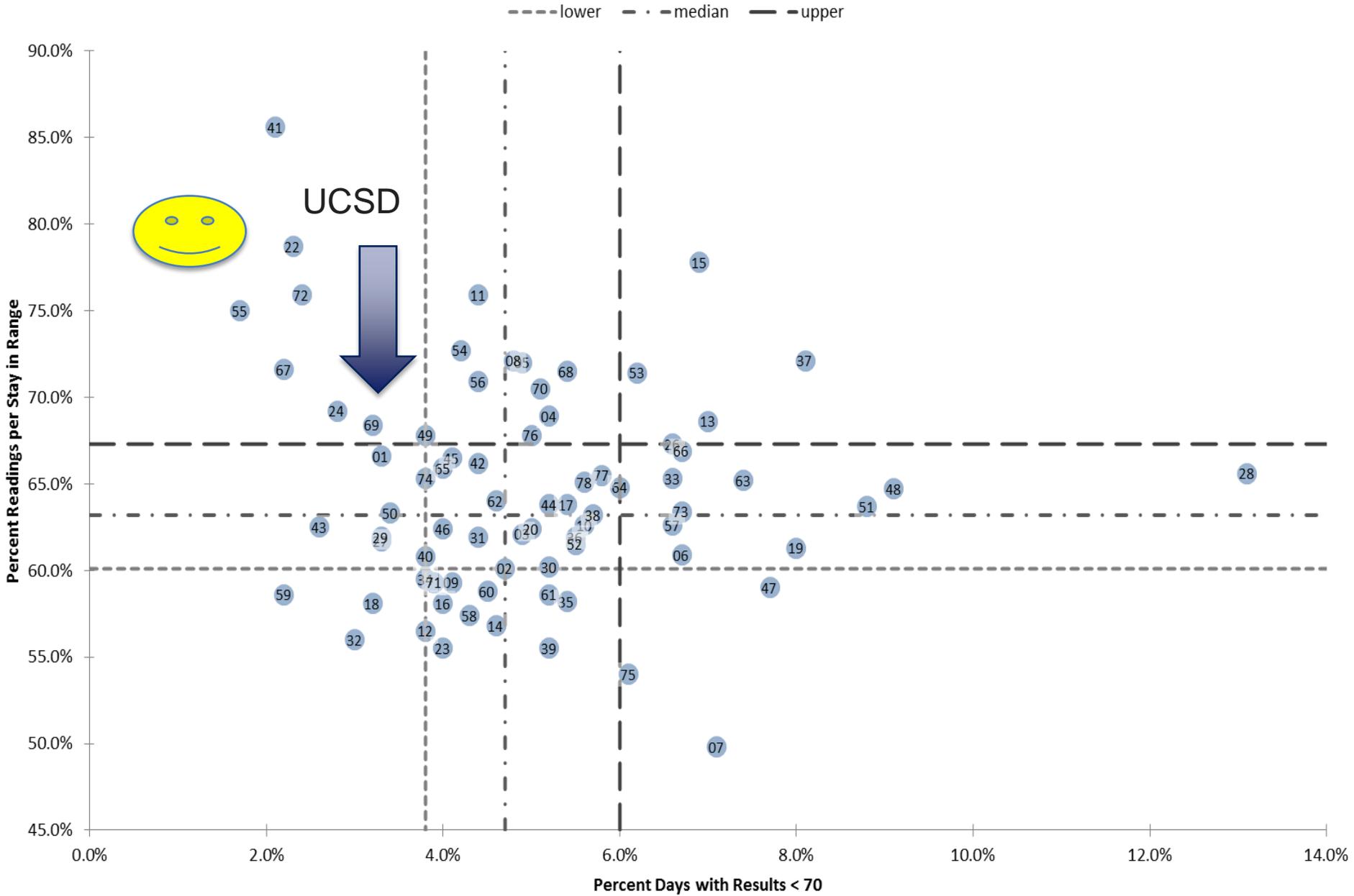
50% reduction in recurrent hypoglycemia



Non-Critical Care - Hospital Rank by Percent Days with Results < 70



Non-Critical Care



It is not the strongest who survive,
or the fastest.

It is the ones who can change the quickest.

Charles Darwin

Questions / Answers / Comments?

Thank you!