



Technology Support for Evidence-Based Medicine

notes from the reactor panel

Health TechNet Meeting
Friday, April 21st, 2006
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QuadraMed Corporation, Reston, VA

The attached notes and slides were prepared to complement a presentation by IBM's Michael Boroch [boroch@us.ibm.com], and facilitated discussion involving leading healthcare provider organizations and healthcare consulting organizations with major presence in the Washington, DC area.

Thanks to Jim Oakes (joakes@hcicllc.com), Suniti Ponkshe (sponkshe@us.ibm.com), and David Main (david.main@pillsburylls.com) for the invitation to contribute and their long-standing professional commitment to the development of the healthcare delivery community throughout the world.

Michael Boroch's presentation material, "Information Based Medicine – White Paper" and other materials will be posted on <http://www.healthtechnet.org/>.

The attached speakers notes and some slides were assembled after the presentation to create a coherent document summarizing the major points shared.

Predicting The Future

The trouble with weather forecasting is that it's right too often for us to ignore it and wrong too often for us to rely on it.

- Patrick Young

The opening point of the dialogue was that healthcare, like most other professions, is an exercise in predicting and preparing for the future. Various recognizable situations may have specialized tools and techniques with known characteristics that are applied in this 'predict the future' setting. So, a person with a mini-stroke (TIA) may go on to have a full, large stroke. That's a prediction issue. They may avoid that by having a carotid endarterectomy or a radiologic, intravascular procedure, and/or with drugs. That's a question of the relevance of tools and techniques issue.

Evidence bearing on the diagnostic and therapeutic options exists, yet, there is always uncertainty regarding how applicable is it to this situation, to this specific person.

Can EBM improve the current healthcare delivery system's performance of delivering the right care? More simply, can we do better at minimizing under-use, overuse and misuse of care and interventions?

What's the relevance of EBM?

1. Is anything necessary?
Is healthcare delivery broken in some way?

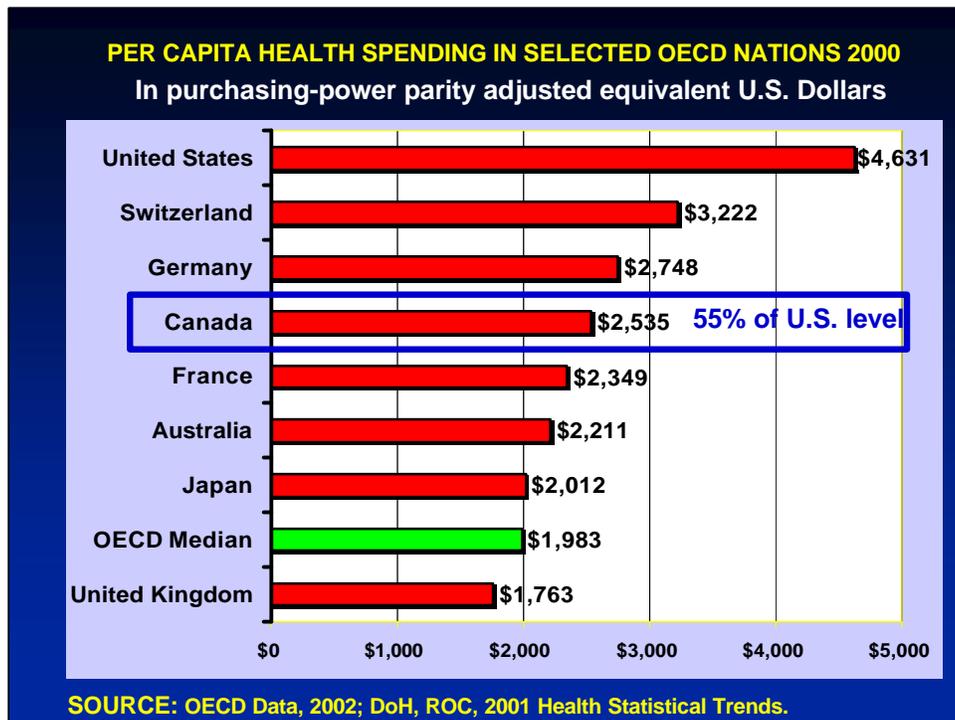
2. Are there credible sources of relevant knowledge to address most uncertainty?

3. Do healthcare providers adopt locally or nationally published knowledge?

4. Is there a ground zero, i.e. compelling 'new' combination of technology and mandates?



Point: There are several distinct, basic issues that are often blurred when EBM is discussed. People tend to jump to the one they have the most emotional experience with. It's critical in dialogue to map out what the issues are and separate the factors clearly.



From the Agenda: **1. Is anything necessary? Is healthcare delivery broken in some way?**

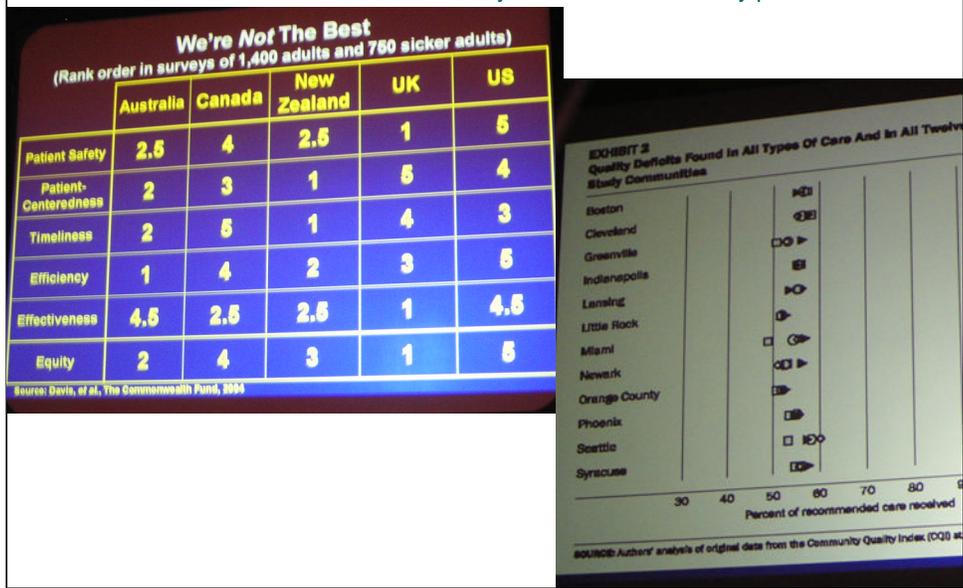
Most policy makers and healthcare economic experts agree: The USA spends more per-capita on healthcare than of the other leading western countries.

There is a presumption that this means that US healthcare is the best in the world.

Is that the case?

Don Berwick and the IHI shared this information at a recent AHA meeting

The United States is not the best country for healthcare delivery performance



Don Berwick, at the 2004 AHA Leadership Summit gave a plenary presentation with these slides. The summary point he made: “We’re not the best”. In six major indicators, Patient Safety through Equity, shown above, the US on a one to five scale, one being the best, rated 4 or 5 on almost every indicator. This data came from Davis in a report from the Commonwealth Fund, available today on the Internet.

He went on, on the next slide, to review several articles from a study by Beth McGlynn et al. On a huge number of objective measures, the US healthcare system has a high defect rate. On this slide, a stratification by major metropolitan areas across the US shows that the defect rate is ubiquitous.



100k
lives

The latest large study...

- McGlynn, et al: The quality of health care delivered to adults in the United States. NEJM 2003; 348: 2635-2645 (June 26, 2003)
 - 439 indicators of clinical quality of care
 - 30 acute and chronic conditions, plus prevention
 - Medical records for 6712 patients
 - Participants received 54.9% of scientifically indicated care (Acute: 53.5%; Chronic: 56.1%; Preventive: 54.9%)

Conclusion: The "Defect Rate" in the technical quality of American health care is approximately

45%

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This slide provides the specifics and reference information.



REALLY?

- “We are already doing the six changes.”
– **REALLY?**
- “Our care for (heart attacks, surgical sites, central lines, ventilator patients, medication reconciliation) is highly reliable.”
– **REALLY?**
- “Our nurses are empowered to act when they get worried, and to get support immediately and without criticism.”
– **REALLY?**
- “We are connected to the Campaign community, and learning from it every day.”
– **REALLY?**
- “We are saving lives now that we would not have before.”
– **REALLY?**

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The reaction from healthcare provider organizations has been largely stereotypical, from the IHI’s stated perspective. Provider organizations almost always say “we deliver great care, reliably.” So, here’s where EBM comes in. The IHI (www.ihl.org) through it’s Hundred Thousand Lives Campaign listed “six changes” where adherence to EBM is known to promote better care. The “Really” slide above articulates a framework to move from Cynicism & Rhetoric, to documentable adherence to EBM (EBM could be read ‘best practices’).

Materials from:

Donald M. Berwick, MD, MPP

Institute for Healthcare Improvement

1st Annual Summit on Redesigning Hospital Care

San Diego, CA: June 9, 2005

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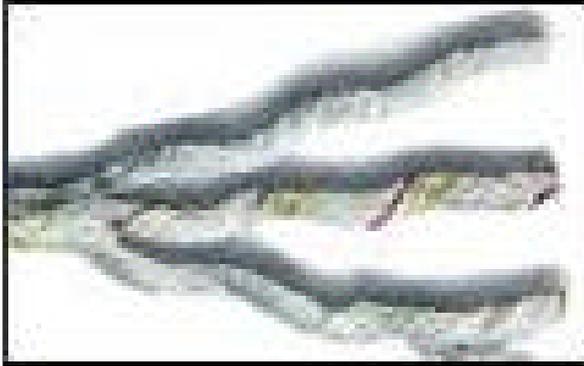
3. Do healthcare providers adopt locally or nationally published knowledge?

4. Is there a ground zero, i.e. compelling 'new' combination of technology and mandates?



The information above points to the answer to question 1: Yes, the US healthcare system can probably be better, or less expensive per capita, or both.

What's necessary to implement EBM?



Doing

The Right

Reimbursed
Work

What's necessary to implement EBM? A simple way to take this apart is to tease out the critical challenges. They are:

- 1) "Doing" – some way to operational-ize the processes so that the rights things are done.
- 2) "The Right" – some way to establish what's "Right" and embedding that into our processes.
- 3) "Reimbursed Work" – some way to insure that the human behavioral side of the necessary change is adequately addressed.

Each of these three challenges is the subject of many books and the charters of many organizations. These were discussed during our HealthTechNet meeting with executives and former executives of major payers including CMS, as well as provider organizations, consultants and vendors.

The net was that solutions providers and home grown initiatives have demonstrated successfully being able to address the "Doing" part. This translates to process automation hardware, software, implementation services and consulting services. It is difficult and/or impossible to achieve significant improvements without automation. "Providers can't simply row faster or harder."

Sources of truth, addressing applying "The Right" knowledge and relevant inference engines exist and are proven. It's an evolving field. The bulk of IBM/Michael Boroch's presentation on "Information Based Medicine" described some of the challenges and leading work that IBM is doing with partners like the Mayo Clinic, delivering the right information to patients and care providers in a timely fashion. Over the last decade, commercial and academically funded organizations have developed vehicles to fund and deliver contextually-appropriate expert knowledge. Several of those were discussed during the meeting.

Lastly, the linkage to payment, dubbed "Reimbursed Work" has been discussed extensively at HealthTechNet before. For example, in September of 2004, Bon Secours Health System formally presented their Performance Improvement / P4P (Pay for Performance) work at HealthTechNet.

EBM Stakes / Challenges

Power / Control,
Authority



Too Complex
(24 strands)



There are deep economic, cultural and personal factors at stake with evolving toward EBM.

We discussed “Infobia” – 1) fear (on the part of doctors) that new technology will make them look inept or stupid, and 2) fear that it will shift the balance of power to their detriment.

Here’s the more elaborate description from Dr. Jeff Rose, a prominent leader and author:

Faced with new computer technology, many physicians -- and other users of technology -- suffer from "infobia." Jeff Rose, MD, defines infobia as the fear of appearing incompetent using information technology and the fear of the potential harmful effects information may have on position, prestige or job security. Thus, if you tell a clinical group that a new computer system will measure their productivity and issue reports to the entire medical staff, for example, "it's not going in," Rose said. (excerpted from http://www.findarticles.com/p/articles/mi_m0DUD/is_n8_v19/ai_20930542/print)

On the economic side, there’s a tension between 1) truth, 2) uncertainty, and 3) economic theory (including deception /guile associated with disequilibrium of information). The next slide on Aspirin illustrates the point.



April 24, 2006

PAGE ONE

Critical Dose
**Aspirin Dispute
Is Fueled by Funds
Of Industry Rivals**

A Cheap Remedy for Clotting
Used by Millions of Patients
Is Undermined by Research

Bayer's Friends Fight Back

By DAVID ARMSTRONG
April 24, 2006; Page A1

Battling Clots

Companies making or developing drugs to
prevent clotting:

DRUG	COMPANY
Aspirin	Bayer AG and McNeil PPC Inc.
Plavix	Bristol-Myers Squibb Co. and Sanofi-Aventis
Integrilin	Schering-Plough Corp.
Prasugrel	Eli Lilly & Co. and Daiichi Sankyo Co.
Cangrelor	Medicines Co.

Over the past four years, medical publications have become full of talk about "aspirin resistance" -- suggesting that millions who take an aspirin a day to prevent heart attacks are wasting their effort. If that is true, widespread testing might be needed to detect the condition and doctors might have to turn to aspirin substitutes costing \$4 a day.

The gist of this article is that there is “evidence” that chronic aspirin therapy lowers the risk of bad cardiovascular events in several large classes of the population from several large studies.

The article goes on to describe the emergence of data that there may be a previously unknown problem with a commercially available cure. The problem is patients who don't benefit from aspirin, and the cure is aspirin substitutes costing not pennies but \$4/day. Daily, for the rest of each candidate patients' life. The researchers developing the 'evidence' promoting or discouraging the cost/benefit and applicability of aspirin generally all have commercial conflicts of interest.

The data on “aspirin resistance” are weak (one misclassified patient and the study loses statistical significance); the business implications are in the billions of dollars.

Combine that with the American societal values of pluralism, consumption-oriented consumerism with related marketing such as direct-to-consumer, the whole notion of EBM becomes objectively much more challenging.

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Question 2. Despite these limitations, there are broken areas of healthcare delivery with proven, credible and relevant knowledge bases to improve or fix them. We made reference to this in the slide 7:

The IHI (www.ihl.org) through it's Hundred Thousand Lives Campaign listed "six changes" where adherence to EBM is known to promote better care.

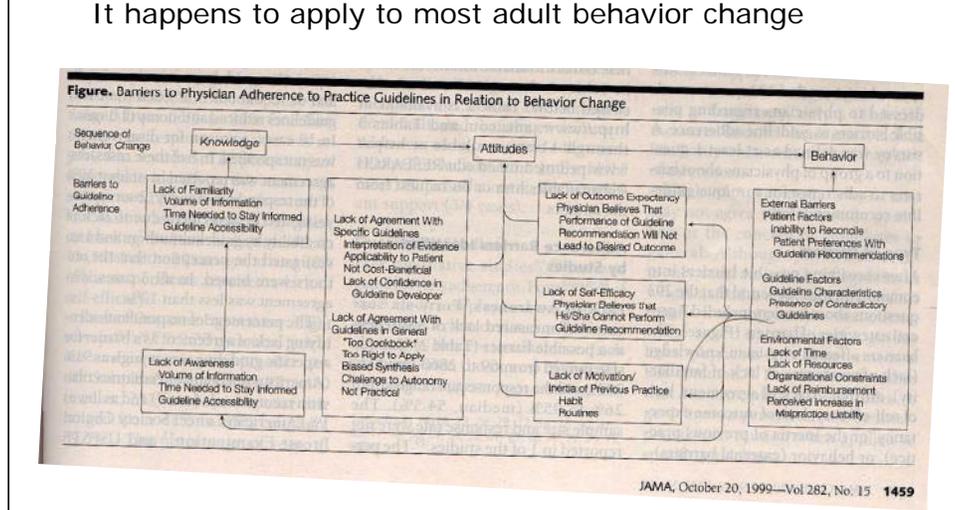
We'll see those in a moment.

Question three: What about the issues related to barriers to adoption?

What about the issues related to barriers to adoption?

Here's a good summary.

It happens to apply to most adult behavior change



This is self-referenced.

In dialogue, we noted that employed physicians in training, i.e. residents, have often been receptive of EBM as well as process automation. There are pre-conditions that apply to all physicians, such as, the systems have to work, be reasonably straight-forward, and be reliable. Historically, only a handful of technologically-deployed EBM initiatives have met this criteria.

For example, if it took an average of 30 seconds to get a dial tone at the beginning of a phone call, would the telephone have been widely adopted? Several leading EMRs have 20-40 second log on times. Doctors accessing such systems several dozen times a day would conclude that these systems don't work. In 2006, these issues are less frequent than in the pre-Internet penetration days, but they're not gone.

“Doing”

“Knit” EBM into existing fabric of care delivery

- In-Patient World, CMS P4P and JCAHO mandates
 - Discharge Summary Documentation (at TODC)
 - Discharge Ordering
 - eSignature
 - Medication Reconciliation Process

- Ambulatory / Out-Patient
 - eRx
 - Super Bill
 - Chronic Care / Dz Management System

Once we obtain agreement on a few things worth doing (e.g. CMS’s 7th scope of work), as the right thing to do, and tied to reimbursement, we move to the question of “how do we operationalize” the knowledge into the process.

Shown on this slide are two care settings (In-patient and ambulatory) where specific listed process steps are being automated. These are logical places to embed EBM so that the relevant actions can be made to occur as a by-product of delivering care in otherwise familiar workflow models.

Institute for Healthcare Improve...

100k lives Campaign

SOME IS NOT A NUMBER. SOON IS NOT A TIME.

Proven Interventions

The 100,000 Lives Campaign aims to enlist thousands of hospitals across the country in a commitment to implement changes in care that have been proven to prevent avoidable deaths. We are starting with these six interventions:

- Deploy Rapid Response Teams
- Deliver Reliable, Evidence-Based Care for Acute Myocardial Infarction
- Prevent Adverse Drug Events (ADEs)
- Prevent Central Line Infections
- Prevent Surgical Site Infections
- Prevent Ventilator-Associated Pneumonia

In addition to these six interventions, IHI will continuously seek and add others that have been shown to save lives.

[MORE >](#)

Seven Components of AMI Care

The seven care components in the ACC clinical guidelines and measured by JCAHO and CMS:

- Early administration of aspirin
- Aspirin at discharge
- Early administration of beta-blocker
- Beta-blocker at discharge
- ACE-inhibitor or angiotensin receptor blockers (ARB) at discharge for patients with systolic dysfunction
- Timely initiation of reperfusion (thrombolysis or percutaneous intervention)
- Smoking cessation counseling

Views In Workflow

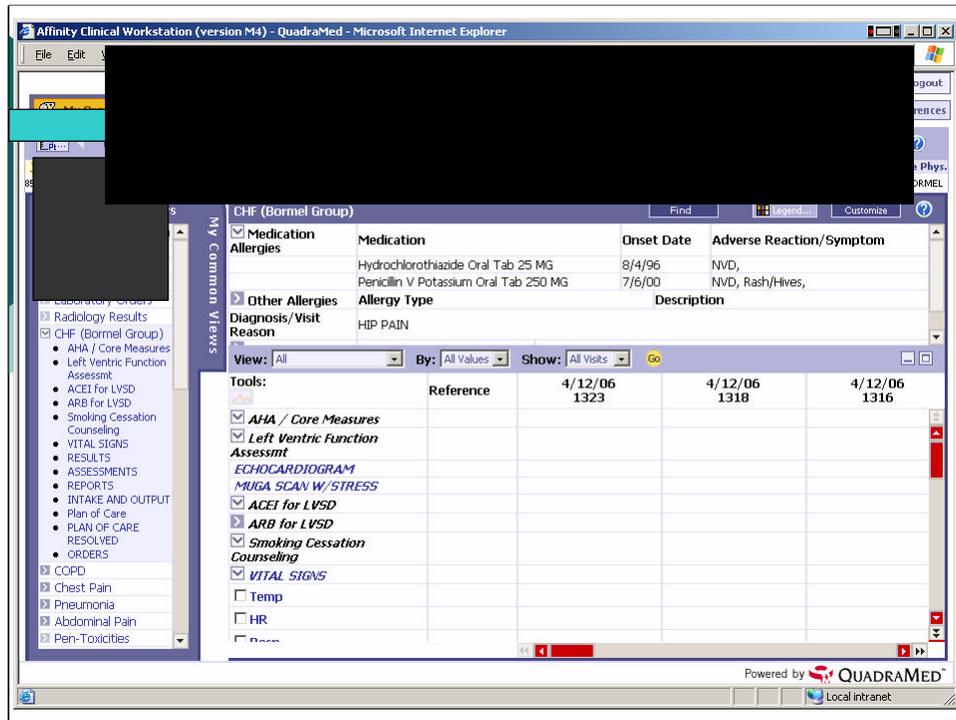
Order Sets In Workflow

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Returning briefly to Don Berwick and the IHI, we've previously mentioned (in the "Really?") slide that there are six interventions proven to save lives. These are the focus of the "100k lives Campaign."

Looking at a specific one, Acute Myocardial Infarction, or AMI care as an example, there are two straightforward ways to incorporate EBM. One is using the EBM to define "views." Views insure that the provider can easily look at those issues which the best providers will always want to look at.

Similarly, the second, "Order Sets" constitute the interventions that a provider practicing EBM would want to consider. By posting them on the computer screen at the relevant time for a provider to recognize them, the likelihood of knowing what to view and order is increased. Interestingly, the work of using the computer (clicking and other navigation work) can be reduced. This creates a speed and ease-of-use benefit as a by-product of recognizing the providers EBM-related information need and addressing it.



Screen showing congestive heart failure view, incorporating EBM.

Comparable screens have demonstrated that EBM can be used to address patient safety with medication prescribing, dispensing and administration.

ORDER AND PROGRESS NOTES


Congestive Heart Failure
Routine Order
 Physician Orders - 78 Page 1 of 2 (revised 12/05)

DATE	PHYSICIAN ORDER AND DIET	DATE	PROGRESS REPORT
	1. Admit to _____ <input type="checkbox"/> Telemetry <input type="checkbox"/> Stepdown		NOTE PROGRESS OF CASE COMPLICATIONS, CONSULTATION, CHANGES IN DIAGNOSIS, ETC.
	2. DX: CHF		
	Other Dx:		
	3. Condition:		
	4. Vitals: Per ICU/Stepdown protocol or q 4 hours.		
	5. Allergies:		
	6. Activity:		
	7. I's/O's, daily weights		
	8. Bedside commode or foley		
	9. Call if:		
	Resp. > 36 or < 6		
	BP > 180 or < 100		
	HR > 140 or < 56		
	K+ < 3.0 or > 5.8		

This is how organizations have tried to deploy EBM in the past: paper-based forms and 'row harder' process change proposals.

Internet Explorer window: IHS - Hospital Compare - Quality Measure Tables - Microsoft Internet Explorer

Heart Failure Care Quality Measures - Higher Percentages Are Better (some of the recommended care given to patients if appropriate*)

Quality Measure Click on a measure name to compare all hospitals in a graph	PERCENTAGE FOR
Percent of Heart Failure Patients Given ACE Inhibitor or ARB for Left Ventricular Systolic Dysfunction (LVSD) if appropriate*	87% of 30 patients
Percent of Heart Failure Patients Given Assessment of Left Ventricular Function (LVF) if appropriate*	81% of 243 patients
Percent of Heart Failure Patients Given Discharge Instructions if appropriate*	74% of 225 patients
Percent of Heart Failure Patients Given Smoking Cessation Advice/Counseling if appropriate*	88% of 73 patients

* The percentage includes only patients whose history and condition indicate the treatment is appropriate. Talk to your health care provider if you have questions about your treatment.

Note: Use the information in Hospital Compare with the other information you gather about hospitals as you decide where to get hospital services. You may want to contact your health care provider, your State Survey Agency or your state Quality Improvement Organization (QIO) for more information. If you have a complaint about the quality of the medical care you or a loved one received at a hospital, first contact the hospital's patient advocate. Or, contact your state QIO. If you have other complaints about a health care facility, contact your State Survey Agency. Their phone numbers can be found at [medicare.gov/Helpful Contacts](#). Additional information about hospitals may be found on the state websites.

Shown here is the government's website, hospitalcompare.gov, for a real hospital.

Patients Given Beta Blocker at Arrival	14	1	86%	84%	100%	77%
Patients Given Smoking Cessation Advice/Counseling	2	1	100%	75%	100%	78%
Patients Given Thrombolytic Medication Within 30 Minutes Of Arrival	0	3		31%	80%	31%
Patients Given PCI Within 120 Minutes Of Arrival	0			61%	88%	55%
Measure: Heart Failure						
Condition	Number of Patients	Hospital Footnotes	Hospital Score	National Average	Nat 90th Percentile	State Average
Patients Given Assessment of Left Ventricular Function (LVF)	243		81%	79%	97%	72%
Patients Given ACE Inhibitors or ARB for Left Ventricular Systolic Dysfunction (LVSD)	30		87%	79%	100%	73%
Patients Given Discharge Instructions	225		74%	48%	86%	56%
Patients Given Smoking Cessation Advice/Counseling	73		88%	68%	100%	78%
Measure: Pneumonia						
Condition	Number of Patients	Hospital Footnotes	Hospital Score	National Average	Nat 90th Percentile	State Average
Patients Given Oxygenation Assessment	126		93%	98%	100%	98%
Patients Assessed and Given Pneumococcal Vaccination	58		43%	51%	83%	50%

Shown here is the same hospital's data, enhanced with other benchmark data, by a leading commercial resource, AHD.com (American Hospital Directory).

This shows the extent of attainable EBM performance, including nationally, by state, and by 'best performing' 90th Percentile hospitals. These criteria are being used in several P4P programs by commercial and CMS payers.

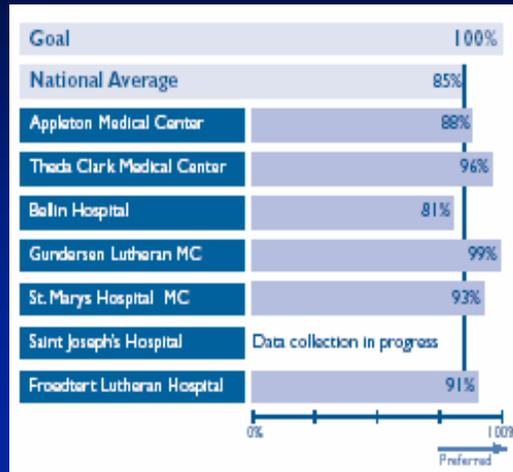
Between view, order sets, and documentation initiatives (not discussed here), organizations are driving EBM into healthcare practice in multiple care delivery settings.

Note that the top line of this slide shows "Patients Given Beta Blocker at Arrival" was 86% at this hospital and 77% for this state.

The next slide shows the value of collaboratives to create visibility (competitive spirit), as well as technique sharing to drive EBM into the culture and community.

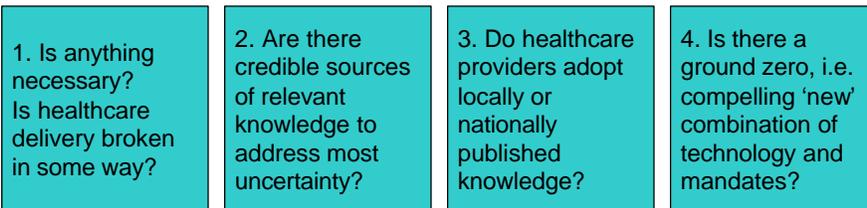
WISCONSIN COLLABORATIVE FOR HEALTHCARE QUALITY

Acute Myocardial Infarction (Heart Attack) – Beta-Blocker Medication at Arrival



Following from the note on the previous slide, drawn from the IHI, this slide shows the results of the Wisconsin Collaborative, changing system behavior to drive EBM into care delivery.

What's the relevance of EBM?



The last several slides have demonstrated that there is a recent or “new” compelling combination of technologic capability and payer mandates driving a conservative bit of EBM into our healthcare system.

There isn't seamless integration of information into every step of the care delivery process for all care settings and patients, but there's progress toward a respectable start.

Once we are informing care with best evidence, will all providers get comparable results? The next slide cites an article that suggests not. Of 117 CF centers using identical guidelines, results varied widely.

As the slide states, a doctor's *focus, aggressiveness and inventiveness*, produces better results, beyond EBM alone. That's been true but largely unstudied for most healthcare providers for many decades.

While Evidence-based Medicine guidelines are important, they are not enough. A doctor's *focus, aggressiveness and inventiveness*, produces better results, beyond EBM alone.

ANNALS OF MEDICINE

THE BELL CURVE

What happens when patients find out how good their doctors really are?

BY ATUL GAWANDE

Every illness is a story, and Annie Page's began with the kinds of small, unexceptional details that mean nothing until seen in hindsight. Like the fact that, when she was a baby, her father sometimes called her Little Potato Chip, because her skin tasted salty when he kissed her. Or that Annie's mother noticed that her breathing was sometimes a little wheezy, though the pediatrician heard nothing through his stethoscope.

The detail that finally mattered was Annie's size. For a while, Annie's fine-boned petiteness seemed to be just a fam-

lection pad of dry filter paper is taped over it to absorb the sweat for half an hour. A technician then measures the concentration of chloride in the pad.

Over the phone, the doctor told Honor that her daughter's chloride level was far higher than normal. Honor is a hospital pharmacist, and she had come across children with abnormal results like this. "All I knew was that it meant she was going to die," she said quietly when I visited the Pages' home, in the Cincinnati suburb of Loveland. The test showed that Annie had cystic fibrosis.

cystic fibrosis in the "Nelson Textbook of Pediatrics"—the bible of the specialty—was written by one of the hospital's pediatricians. The Pages called and were given an appointment for the next morning.

"We were there for hours, meeting with all the different members of the team," Honor recalled. "They took Annie's blood pressure, measured her oxygen saturation, did some other tests. Then they put us in a room, and the pediatrician sat down with us. He was very kind, but frank, too. He said, 'Do you under-

■ Issue of 2004-12-06

http://www.newyorker.com/printables/fact/041206fa_fact

Thank You!!

Questions??

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