Guidelines and Performance Measures: how do we apply evidence to the individual patient

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Less Errors- Better Outcomes

Quality Defects Occur at Alarming Rates

Is the problem variation in care? Not applying best practices?

CDC 2009-5, from Brown & O'Connor, NEJM, June 10, 2010
McAllen, Texas

How can we apply the evidence to improve an individual patient’s care?

- Risk Assessment
- Efficacy and Effectiveness
- Dissemination of Information
- Adoption of Practices
- Guidelines
- Application to the individual patient
- Performance Measures

Rate of complications (%)

What we do when we assess risk

Revised Cardiac Risk Index

- High risk surgery
  - Intraperitoneal, intrathoracic or suprainguinal vascular procedures
- Ischemic heart disease
- H/O CHF
- H/O Cerebrovascular disease
- Insulin therapy for DM
- Preop Cr>2.0mg/dl

Lee et al. Circulation 1999;100:1043

How we apply the elements of risk assessment

- Clinical judgement
- Clinical findings
- Prior experience
- Reading of the literature

Understanding the evidence

RCT

- Efficacy
  - Works under ideal conditions
  - Confounders minimized
- Effectiveness
  - Works in real world
  - Confounders important

Bisoprolol in high risk vascular patients

- Placebo
- Bisoprolol

Poldermans et al. NEJM 1999;341:1789
Adjusted Odds Ratio for In-Hospital Death Associated with Perioperative Beta-Blocker Therapy

- Propensity-Matched Cohort
  - RCRI score 0: 1.43 (1.29–1.58)
  - RCRI score 1: 1.13 (0.99–1.30)
  - RCRI score 2: 0.90 (0.75–1.08)
  - RCRI score 3: 0.71 (0.56–0.91)
  - RCRI score ≥4: 0.57 (0.42–0.76)

Devereaux et al. Lancet 2008

What happens in the real world


POISE

Chart Title
Metoprolol Placebo

<table>
<thead>
<tr>
<th>%</th>
<th>Metoprolol</th>
<th>Placebo</th>
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</thead>
<tbody>
<tr>
<td>Nonfatal MI</td>
<td>3.6</td>
<td>5.1</td>
</tr>
<tr>
<td>CV death</td>
<td>1.8</td>
<td>1.4</td>
</tr>
<tr>
<td>Mortality</td>
<td>3.1</td>
<td>2.3</td>
</tr>
<tr>
<td>Stroke</td>
<td>1</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Devereaux et al. Lancet 2008

Should we always adopt the results of randomized trials
"The evidence-based medicine practiced at Intermountain hospital in Utah trades doctors’ intuition for protocols in three-ring binders. It also seems to be saving lives."

-- David Leonhardt,
The New York Times Magazine, 11.8.09

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**THE THEORY OF EVIDENCE-BASED CARE**

**PROBLEM**
For any given diagnosis, a doctor can consider a number of ways to treat a patient. But how does a doctor know which treatment to use?

**SOLUTION**
Committees of doctors and others track treatments and their outcomes by medical specialty, developing treatment protocols based on the data.

**RESULT**
A doctor may choose to ignore the protocol. But patient care should improve as doctors see evidence for the most successful treatments.

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**Speed of adoption**

![Graph showing the speed of adoption of thrombolysis therapy.]

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**Increasing the speed of adoption**


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**Antman et al. JAMA 1992**

Increasing the speed of adoption
How can we apply the evidence to improve an individual patient’s care?

Risk Assessment
Efficacy and Effectiveness
Dissemination of Information
Adoption of Practices
Guidelines
Application to the individual patient
Performance Measures

Importance of Patient Preferences

- Standard Gamble
  - Of 24 patients, 19 (79%) preferred home care to hospital care for mild symptoms, and 12 of 22 patients (55%) preferred home care to hospital care for moderate symptoms.

Lehmann et al. Anesth Analg 1999

Implementation of complex guidelines

Intermediate risk surgery
Vascular surgery
Intermediate risk surgery

Proceed with planned surgery with HR control (Class IIa, LOE B)
or consider noninvasive testing (Class IIb, LOE B) if it will change management
How can we apply the evidence to improve an individual patient’s care?

Risk Assessment
Efficacy and Effectiveness
Dissemination of Information
Adoption of Practices
Guidelines
Application to the individual patient
Driving improved care

Do we make a difference: Anesthesiologist #7

Do we adoption best evidence?

The Affordable Care Act: A Framework & Resources for Measurement-Based Improvement

- HHS must “establish a national strategy to improve the delivery of healthcare services, patient health outcomes, and population health”
- The national strategy is to be shaped – and specified – with input from diverse healthcare leaders in the field of health and healthcare
- Coordination and alignment within the Federal government and across the public and private sectors is key to the ultimate success of the national strategy in transforming the US healthcare system
Integrated Framework for Performance Measurement

NQF Mission Statement

To improve the quality of American healthcare by
• setting national priorities and goals for performance improvement,
• endorsing national consensus standards for measuring and publicly reporting on performance, and
• promoting the attainment of national goals through education and outreach programs.

Evidence for Measure Focus

- Hierarchical preference for
  - Outcomes linked to evidence-based processes/structures
  - Outcomes of substantial importance with plausible process/structure relationships
  - Intermediate outcomes
  - Processes/structures

Risk-adjusted outcome

Observed= actual number of events
Expected= number of events expected for a give population with similar characteristics
Changes in National Performance
Baseline to Q4, 2007


Does P4P work?

- Once something is paid for
  - Must everyone receive the treatment?
  - Is it ethical to study such treatment further?
  - Will we advance treatment?
  - Unintended consequences
Who gets the incentive?

- Patient had an order for an antibiotic or the antibiotic has been given within one hour prior to the surgical incision (or start of procedure when no incision is required)
- Patient had been given prophylactic antibiotic within one hour prior to the surgical incision (or start of procedure when no incision is required)

Is it effective to reward?

- [Rewards] have effects that interfere with performance in ways that we are only beginning to understand
- Experiment
  - Children asked to remember which of two words was “right”
  - Correct answer: light comes on versus M&M
  - Children who received candy got fewer right than those who received nothing

Managing to a number

Unintended consequences

- Focus on preop antibiotic timing
  - Pay for one hour preop
- Antibiotics for pneumonia
  - Presentation to ER with SOB
Improvement in Composite Process Measures among Hospitals Engaged in Both Pay for Performance and Public Reporting and Those Engaged Only in Public Reporting


Results of P4P in England

NEJM 2009;362:368-78

SCIP-1 and Outcome

1,638,756 cases from > 3,500 hospitals analyzed.

Adjusted OR for passing measure in eligible patients

<table>
<thead>
<tr>
<th>Measure</th>
<th>Odds Ratio</th>
<th>C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-d mortality</td>
<td>0.56</td>
<td>0.61-0.67</td>
</tr>
<tr>
<td>30-d readmission</td>
<td>0.88</td>
<td>0.93-0.98</td>
</tr>
<tr>
<td>30-d SSI</td>
<td>0.83</td>
<td>0.89-0.95</td>
</tr>
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The Measurement Imperative

Not everything that counts can be counted, and not everything that can be counted counts

~ Albert Einstein

But…..

You can’t improve what you don’t measure

~ W. Edwards Deming
Culture Is Related To Clinical & Operational Outcomes

1. Medication errors
2. Back injuries
3. Patient satisfaction
4. Nurse turnover & absenteeism
5. AHRQ Patient Safety Indicators
6. Nurse satisfaction
7. Urinary tract infections
8. Needle sticks
9. Re-admissions
10. Malpractice claims ...and more.

Useful References for Culture-to-Outcomes Linkage:
- Hansen et al. (2011)
- Curry et al. (2011)
- Pettker et al. (2009)
- Singer et al. (2009)
- Vogus & Sutcliffe (2007)
- Mark et al. (2007)
- Naveh et al. (2006)
- Hofmann & Mark (2006)
- Katz-Navon et al. (2005)

Everyone in the organization can say “yes” to three questions every day

1. I am treated with dignity and respect by everyone I encounter every day. Everyone is accorded exactly the same high level of dignity and respect.
2. I am given the things I need; education, training, tools, encouragement, and protections from risk so that I can make a contribution to the work of the institution, THAT GIVES MEANING TO MY LIFE.
3. I am recognized for what I do.  
   
   Paul O’Neill


Michigan Keystone Initiative:
Teamwork Climate Across ICUs Predicts Infection

No BSI = 5 months or more with no Blood Stream Infection

Strongest predictor of clinical excellence: caregivers feel comfortable speaking up if they perceive a problem with patient care

Positive Deviance

- Positive deviance is the observation that in most settings a few at risk individuals follow uncommon, beneficial practices and consequently experience better outcomes than their neighbours who share similar risks.

Marsh et al. BMJ 2004
Summary

- We must continue to improve outcomes through discovery (research) and application of best evidence
- Understanding the elements of applying evidence is critical
  - Understand the prior probability of disease
  - Apply “best practice” to appropriate patients
- We must be willing to continually innovate and assess your processes and outcomes