

## Introduction to Evidence-Based Practice

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### Plan

- What is EBP?
- Why the interest in EBP?
- What helps to practice EBM?
- How to practice EBM?
- Ways of incorporating evidence into practice
- What is evidence?
- Evidence pipeline
- Limitations/criticism of EBP

### What is EBP?

“Evidence-Based Practice requires that decisions about health care are based on the best available, current, valid and relevant evidence. These decisions should be made by those receiving care, informed by the tacit and explicit knowledge of those providing care, within the context of available resources”

*Sicily statement on evidence-based practice*

BUT...

- "An average of about **17 years** is required for new knowledge generated by randomized controlled trials to be incorporated into practice."  
*J Am Med Inform Assoc. 2004 Sep-Oct; 11(5): 368-376.*
- In 1971 MEDLINE featured 239 indexed journals. In 2006, that number has grown to **5,000**. MEDLINE now includes **16 million records**
- **7,287 articles** are published monthly in this set of journals  
*J Med Libr Assoc. 2004 October; 92(4): 429-437.*
- **1/3 of research** eventually refuted/attenuated  
*JAMA 2005 Jul 13;294(2):218-28.*
- **10% of new drugs** are withdrawn or relabeled  
*JAMA 2002 May 1;287(17):2215-20.*

### **Contradicted and initially stronger effects in highly cited clinical research** *JAMA 2005 Jul 13;294(2):218-28.*

- All original clinical research studies published in 3 major general clinical journals or high-impact-factor specialty journals in 1990-2003 and cited more than 1000 times in the literature were examined
- Of 49 highly cited original clinical research studies, 45 claimed that the intervention was effective. Of these, 7 (16%) were contradicted by subsequent studies, 7 others (16%) had found effects that were stronger than those of subsequent studies, 20 (44%) were replicated, and 11 (24%) remained largely unchallenged
- Controversies are most common with highly cited nonrandomized studies, but even the most highly cited randomized trials may be challenged and refuted over time, especially small ones.

## Timing of new black box warnings and withdrawals for prescription medications

*JAMA 2002 May 1;287(17):2215-20*

- Examination of the Physicians' Desk Reference for all new chemical entities approved by the US Food and Drug Administration between 1975 and 1999, and all drugs withdrawn from the market between 1975 and 2000
- A total of 548 new chemical entities were approved in 1975-1999; 56 (10.2%) acquired a new black box warning or were withdrawn. Forty-five drugs (8.2%) acquired 1 or more black box warnings and 16 (2.9%) were withdrawn from the market. In Kaplan-Meier analyses, the estimated probability of acquiring a new black box warning or being withdrawn from the market over 25 years was 20%
- In Kaplan-Meier analyses, half of these changes occurred within 7 years of drug introduction; half of the withdrawals occurred within 2 years.

## Why the interest in EBP?

- **Much geographic variations in treatment/surgical procedures, patient care, patient outcomes, cost of care** (that can't be explained by demographic and clinical characteristics)
- much of provided care is inappropriate
- many patients are not receiving beneficial services
- continually raising health care costs
- daily need for valid information about diagnosis, prognosis, therapy, and prevention
- traditional sources of information are inadequate, or overwhelming in volume, or too variable in validity for practical use
- the disparity between clinical skills and up-to-date knowledge
- lack of time for finding evidence

## What helps to practice EBM?

- development of strategies for efficiently tracking down and appraising evidence
- creation of systematic reviews of the effects of health care
- creation of evidence-based journals of secondary publications
- creation of information systems/decision support systems/answering services
- application of effective strategies for lifelong learning and for improving clinical performance

Branches of EBM

## EB policies:

- evidence-based guidelines/reports/systematic reviews
- coverage policies (evidence of effectiveness)
- disease management
- performance measures
- quality improvement
- regulations
- public policies

## EB individual decision making

## How to practice EBM? 5 steps

- 1) Converting the need for information into an answerable question
- 2) Finding the best evidence to answer that question

- 3) Critically appraising the evidence
- 4) Implementing (integrating evidence with your expertise, patients values and circumstances)
- 5) Evaluating effectiveness in steps 1-4

### **Ways of incorporating evidence into practice - in real world**

- “doing” mode (including step 1-4) - for conditions you encounter every day
- “using” mode (skipping step 3) - for conditions you encounter less often
- “replicating” mode (skipping steps 2 and 3) - for conditions your encounter very infrequently (medical students)

### **What is evidence for EBP?**

- Does it change physician’s behavior?
- Does it have impact on practice, better health care, patient satisfaction?
- Evidence from clinical research - a necessary but not sufficient condition for providing optimal care. Why?
- Many “Leaks” from research & practice

### **Limitations/criticism**

- Need to develop new skills in seeking and appraising evidence
- Need to develop and apply these skills within the time constraints of clinical practice
- Scientific evidence is strong and consistent for about 40% for the most prevalent medical conditions
- Physicians do a poor job of engaging patients in decision-making
- Lack of tools and incentives to practice evidence-based care

### **References**

- Eddy DM. Evidence-based medicine: a unified approach. *Health Affairs*. 2005 Jan-Feb;24(1):9-17
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- Evidence-Based Medicine. How to practice and teach EBM . 3d ed. 2005