Teaching Evidence-Based Health Care: What, Why, and How

W. Scott Richardson, M.D.
GRU/UGA Partnership, Athens
Three Owl Learning Institute
Conflicts, etc.

- I have no financial ties with industry that pose a conflict of interest regarding the content of this presentation
- I will not be discussing “off label” uses of any medications or devices
- Image copyrights are retained by their original creators, publishers, etc.
Today’s Aims

- EBM, EBP, EBHC: what, why bother
- Consider how to teach EBHC
- Consider how to map to curriculum
Show of Hands ...

Knowing what you know now, **would you** want your health system to **routinely** provide polyvalent pneumococcal vaccine (Pneumovax®) to ‘high risk’ and elderly persons to prevent pneumococcal pneumonia and pneumonia-related death?

What should we teach novice clinicians about how and how well it works?
What is Evidence-Based ... 

• Conscientious, explicit and judicious use of the current best evidence from clinical care research in ... 

• **Practice:** ... the care of persons

• **Healthcare:** ... the care of peoples

• **Education:** ... learning & teaching
Knowledge for Clinical Decisions

Clinical Expertise

Clinical Decisions & Actions
Knowledge for Clinical Decisions

- Clinical Expertise
- Particular Circumstances
- Patients’ Perspectives
- Professional Values, Ethics
- Human Biology
- Clinical Care Research
- Health Systems

Clinical Decisions & Actions
Americans Believe Health Care Should Be Based On Best Research

Do you believe that the health care services you receive should be based on the best and most recent research available?

Source: National Survey, 2005
Charlton Research Company for Research!America
Why EBHC? (a)

- Much clinical care research published
- Changed over 60 y
- Only tiny fraction valid, important, & applicable to care
- Need it frequently
- ‘Usual’ sources of it don’t work well …
‘Usual Sources’ Work Poorly (a)

• Overwhelming in number and scope (biomedical publications)

• Ineffective (traditional CME)
Why EBHC? (b)

• With time, as our unanswered questions accumulate, our ignorance of current best care grows, and our clinical competence begins to shrivel, turning us into …

• And, too little time
Clinical Experience vs. Quality of Care

• Systematic review, 62 evaluations
  – 12 ‘Knowledge’ – negative association between experience & knowledge: 12
  – 24 ‘Diagnosis, Screening, Prevention’ – negative association: 15 of 24
  – 19 ‘Therapy’ – negative association: 14
  – 7 ‘Outcomes’ – negative association: 4

• Choudhry Ann Int Med 2005; 142: 260
Accompanying Editorial

• “We cannot maintain competence passively through accumulating experience. We must actively cultivate competence throughout a professional career.”

• “We can still customize care to each patient’s needs – evidence-based standards are best starting point for flexible, patient-centered approaches.”
‘Usual Sources’ Work Poorly (b)

- Out of date (textbooks)
- Often wrong (experts)
Pneumovax: Why Do It?

- Early studies (observational) showed use associated with lower infections
  - Biologic plausibility
  - Surrogate outcomes
  - Analogies (polio, small pox, flu)
  - Cherished beliefs

- Low unit costs (vs. aggregate cost)
  - Measurable
  - Experts say to do it
  - Practice guidelines
  - Manufacturers
  - CDCP
  - JCAHO
Pneumovax: Evidence?

• 3 Trials in healthy ‘low risk’ persons
  – N ~ 21, 000; (high attack rates)
  – Reduces pneumonia, death, bacteremia

• 10 Trials in older & ‘high risk’ persons
  – N ~ 24, 000, developed & developing
  – No reduction in poor clinical outcomes

• 3 Systematic Reviews of these trials
  – No RCT evidence Pneumovax is effective in elderly or ‘high risk’ patients
How could experts be wrong?

- Asked to opine early
- **Strong opinions**
- Cognitive overload: little time, much info
- Involved in research so not without bias
- Conflicts of interest
- Other human frailties, e.g. ego

- Confuse preliminary evidence ("it should work") with definitive evidence ("it does work, and it’s worth doing")
- Focus on how, not how well, it works
- Don’t use explicit, systematic methods to review evidence
Use of E-b Rx vs. Outcomes?

- Systematic Review, 34 studies, CV diseases
- Death rates are lower among patients who receive evidence-based treatments at optimal doses, compared with patients who are not given these treatments or who do not take these drugs at target levels.
- Decrease in observed mortality is proportional to the number of appropriate therapies received (of all possible indicated).
EBHC: Back to Why

• We can’t make well-informed decisions without information

• Not all information is created equal

• Misinformation can be worse than no information

• Better information → better informed decisions → better outcomes
Today’s Aims

- EBP/EBHC: what it is, why bother
- Consider how to teach EBHC
- Consider how to map to curriculum
Evidence varies in risk for bias, error

**Principles of evidence-based practice**

Evidence alone does not decide – combine with other knowledge and values
Getting Started

• Learn basic skills, e.g. course, books
• Access evidence resources
• Practice, practice, practice
• Build allies
• Teach in 3 modes
1 Role Modeling

- Practice EBP, and be seen to do so
- Learners see use of evidence as part of good patient care
- Also see who, what, when, where, & how
- Teach by doing, learn by doing
2 Weaving

- Add evidence to mix of knowledge taught for clinical topics
- Learners see using evidence as part of good clinical learning
- Make decisions and judgments explicit
- Teach ‘vinaigrettes’
Fluid Movement

ICF (2/3)

Intracellular space

Interstitial space (3/4)

Osmotic

Hydrostatic

Oncotic

ECF (1/3)

Intravascular space (1/4)

“Third Spacing”

Hydrostatic

Oncotic

- gut lumen
- intra-alveolar
- intrapleural
- intraperitoneal
- others
3 Targeting

- Target specific EBP skills to coach e.g. asking questions
- Learners build skills to learn this way
- Focus on learning needs
- From ‘one slice’ to ‘whole pie’
Likelihood Ratio Nomogram

- On left side, select pretest probability
- Draw straight line through center at LR
- Continue straight line to right side, read off posttest probability
Teach EBM: 10 Successes

• Real decisions
• Actual L needs
• Active + Passive
• ‘New’ to ‘old’
• Involves everyone
• Attends to all 4:
  – Affective, Cognitive
  – Conative, Motor

• Matches & exploits particular situation
• Prepared + Opportunistic
• Explicit judgments
• Builds skills for lifelong learning, e.g. multi-staged
Teach EBM: 10 Failures

- Do > use research
- Do > use statistics
- Only flaws
- Substitute, not add
- Disconnected from learning needs
- Teach > time
- Teach too fast

- Full closure/session
- Humiliates learners for not yet knowing
- Bullies learners to decide act based on authority, power rather than evidence & rational argument
Putting it together ...

- Mix 3 modes to fit teaching context
  - ‘Role model’
  - ‘Weave’
  - ‘Target’
- Maximize successes
- Avoid failures
Today’s Aims

• EBP/EBHC: what it is, why bother

• Consider how to teach EBHC

• Consider how to map to curriculum
Evidence alone does not decide – combine with other knowledge and values.

Evidence varies in risk of bias, error.

Principles of evidence-based practice.

- Ask
- Acquire
- Appraise
- Apply
- Act & Assess
- Patient dilemma
Questions?
Thank You!