1-day workshop on Evidence-Based Practice
November 26th 2010

Dr Carl Heneghan
Clinical Reader, University of Oxford
Director CEBM
Developing Evidence-Based Practice?

Carl Heneghan  MA, MRCGP
Centre for Evidence Based Medicine
University of Oxford
<table>
<thead>
<tr>
<th>Start</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:15</td>
<td><strong>Plenary:</strong> What is Evidence-based practice  (Carl Heneghan)</td>
</tr>
<tr>
<td>10:00</td>
<td><strong>Group Tutorial:</strong> Asking well-formulated questions</td>
</tr>
<tr>
<td>10:55</td>
<td><strong>Morning Tea</strong></td>
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<tr>
<td>11:15</td>
<td><strong>Plenary:</strong> Finding the best evidence (searching basics) - <strong>Nia Roberts</strong></td>
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<tr>
<td>11:30</td>
<td><strong>Lab Tutorial:</strong> Cochrane and PubMed Searching (hands-on)</td>
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<tr>
<td>1:00</td>
<td><strong>Lunch</strong></td>
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<td>1:45</td>
<td><strong>Plenary:</strong> Rapid Critical Appraisal of intervention studies (Carl Heneghan)</td>
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<tr>
<td>2:30</td>
<td><strong>Small Group Tutorial:</strong> Followed by group work critical Appraisal of intervention studies  (Ami Banerjee and Carl Heneghan )</td>
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<td>3:30</td>
<td><strong>Afternoon Tea</strong></td>
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<td>3:45</td>
<td><strong>Small Group Tutorial:</strong> Critical Appraisal of intervention studies  (Ami Banerjee and Carl Heneghan )</td>
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<td>4:30</td>
<td>Where to from here? / Evaluation / Close</td>
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Welcome to the CEBM Resource Centre

Our resource centre contains information and practical resources to help you practice and teach evidence-based medicine including FREE CEBM powerpoint presentations from our workshops and courses, online resources and the EBM discussion group where you can exchange information with others working with evidence-based medicine.

PowerPoint Presentations

The CEBM offers free copies of powerpoint slides from past workshops, training courses and conferences. We just ask that you credit us at the CEBM when you use them! Choose one of these favourites or click here to see our complete archive.

How do we nurture Evidence-Based Practice (3MB) Paul Glasziou
Interpreting diagnostic tests (1.2MB) Carl Heneghan
Introduction to teaching evidence-based health care (380kB) Sharon Straus
Evidence in Practice Projects (3.5MB) Carl Heneghan
Making Evidence More Accessible Using Pictures (1.8MB) Rod Jackson

EBM Directory

This is a list of useful sites with an EBM focus. They are grouped into the following categories:

Evidence-based health care
Email discussion lists
Non-english language EBHC sites
Journal clubs and CAT help cafes

EBM Discussion Group

Join the evidence-based healthcare discussion group, an important forum for exchange of ideas, advice and resources.

What's New

The PAUL GLASZIO FILES
a series of interviews with proponents of evidence-based medicine and evidence-based practice from around the world
More Information

Workshop on Evidence-Based Practice 1 day Workshop
27th November 2009
More Information

CEBM Workshop Videos

Paul Glasziou
EBM in Practice
Carl Heneghan
Diagnostic Tests
I am here because?

• I wanted 3 days of work
• Formulate an answerable questions
The aim of today

1. To understand what is EBP
2. To recognize questions
3. To develop focussed clinical questions
4. To find answers to your clinical questions
5. To assess the validity of an RCT
6. To assess the benefits and harms
What is Evidence-Based Medicine?

“Evidence-based medicine is the integration of best research evidence with clinical expertise and patient values”
“Just in Time” learning
The EBM Alternative Approach

- Shift focus to current patient problems
  (“just in time” education)
  - Relevant to YOUR practice
  - Memorable
  - Up to date
- Learn to obtain best current answers

Dave Sackett

www.cebm.net
Would any of you have agreed to participate in a placebo controlled trial of prophylactic antibiotics for colorectal surgery after 1975?
Reduction of perioperative deaths by antibiotic prophylaxis for colorectal surgery.
Would you ever have put babies to sleep on their tummies?
DR. BENJAMIN SPOCK

BABY AND CHILD CARE

The most widely recommended handbook for parents ever published—Authoritative, illustrated, indexed

Over 19,000,000 copies sold
### Comparison: Prone vs non-prone sleeping position

**Outcome:** 01 SIDS

<table>
<thead>
<tr>
<th>Study</th>
<th>Treatment n/N</th>
<th>Control n/N</th>
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<th>OR (95%CI Random)</th>
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<td>Brooke 1997</td>
<td>13 / 146</td>
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<td>Hauck 2003</td>
<td>149 / 260</td>
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<td><strong>Total(95%CI)</strong></td>
<td>2741 / 4239</td>
<td>3671 / 11369</td>
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Test for heterogeneity chi-square=183.52 df=24 p=0.00001
Test for overall effect z=9.85 p=0.00001
Sicily statement on evidence-based practice

Martin Dawes, William Summerskill, Paul Glasziou, Antonio Cartabellotta, Janet Martin, Kevork Hopayan, Franz Porzorski, Amanda Burls and James Osborne

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8 Department Public Health and Epidemiology, University of Birmingham, Birmingham UK
9 United Bristol Healthcare Trust, Bristol, UK

**Debate**

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Volume 5

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The initial focus of critical appraisal was to be created on the generation of evidence within patient care. In particular, the unrealistic expectation that evidence should be tracked and critically appraised for all knowledge gaps led to early recognition of practical limitations and disenfranchising amongst some practitioners [31]. The growing awareness of the need for good evidence also led to awareness of the possible traps of rapid critical appraisal. For example, problems such as inadequate randomization or publication bias, may cause a dramatic overestimation of therapeutic effectiveness [32]. In response, pre-searched, pre-appraised resources, such as the systematic reviews of the Cochrane Collaboration [33], the evidence synopses of Clinical Evidence [34] and secondary publications such as Evidence Based Medicine [35] have been developed [36], though these currently only cover a small proportion of clinical questions.

Process of Evidence Based Practice

The five steps of EBP were first described in 1992 [37] and most steps have now been subjected to trials of teaching effectiveness (indicated by references)

1. Translation of uncertainty to an answerable question [38]
2. Systematic retrieval of best evidence available [39]
3. Critical appraisal of evidence for validity, clinical relevance, and applicability [40]
4. Application of results in practice [41]
5. Evaluation of performance [42]

This five-step model forms the basis for both clinical practice and teaching EBP, as Rosenbaum and Donald observed, "an immediate attraction of evidence-based medicine is that it integrates medical education with clinical practice" [43].

Curricula outline of minimum standard educational requirements

Different practitioners at different levels of responsibility within evidence-based organisations will require different skills for EBP and different types of evidence. It is a minimum requirement that all practitioners understand the principles of EBP, implement evidence-based policies, and have a critical attitude to their own practice and to evidence. Without these skills and attitudes, health care professionals will find it difficult to provide 'best practice'. Teachers, commissioners, and those in positions of leadership will require appraisal skills that come with higher training and continued use [44].

The wider knowledge and use of these skills will help health professionals meet some of Hurd's list of desired educational outcomes [45] in being able to:

- distinguish evidence from propaganda (advertisement)
The 5 steps of EBM

1. Formulate an answerable question
2. Track down the best evidence
3. Critically appraise the evidence for validity, clinical relevance and applicability
4. Individualize, based clinical expertise and patient concerns
5. Evaluate your own performance
Getting Evidence in to Practice
How do you “do” EBP?

• What Evidence based practice do you do/help with?

• What other EBP do you know of?
JASPA*
(Journal associated score of personal angst)

J: Are you ambivalent about renewing your JOURNAL subscriptions?
A: Do you feel ANGER towards prolific authors?
S: Do you ever use journals to help you SLEEP?
P: Are you surrounded by PILES of PERIODICALS?
A: Do you feel ANXIOUS when journals arrive?

YOUR SCORE? (0 TO 5)

0 (liar)
1-3 (normal range)
>3 (sick; at risk for polythenia gravis and related conditions)

* Modified from: BMJ 1995;311:1666-1668
Median minutes/week spent reading about my patients:

Self-reports at 17 Grand Rounds:

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<thead>
<tr>
<th>Category</th>
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<td>Medical Students</td>
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<td>House Officers (PGY1)</td>
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<td>SHOs (PGY2-4)</td>
<td>20</td>
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<tr>
<td>Registrars</td>
<td>45</td>
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<tr>
<td>Sr. Registrars</td>
<td>30</td>
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<tr>
<td>Consultants</td>
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<tr>
<td>Grad. Post 1975</td>
<td>45</td>
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<tr>
<td>Grad. Pre 1975</td>
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Size of Medical Knowledge

- NLM MetaThesaurus
  - 875,255 concepts
  - 2.14 million concept names
- Diagnosis Pro
  - 11,000 diseases
  - 30,000 abnormalities (symptoms, signs, lab, X-ray,)
  - 3,200 drugs (cf FDAs 18,283 products)

To cover the vast field of medicine in four years is an impossible task.
- William Olser
How many randomized trials are published each year
Changes in the past 12 months
A Survey of 43 EBM practitioners at 2009 EBM practice workshop

Changes in the last 12 months
Most “interesting” research is wrong, but clinicians not skilled in appraisal

- Flawed studies
  - Hormone Replacement Therapy
  - Beta-carotene and cancer
  - MMR and autism
  - Folate and CHD
- Data mining
  - Genes for anything
- Small early studies

Ioannidis J. Why Most Published Research Findings Are False. PLoS 2005
But we are (currently) poorly equipped to tell good from bad research

• BMJ study of 607 reviewers
  • 14 deliberate errors inserted

• Detection rates
  • On average <3 of 9 major errors detected
  • Poor Randomisation (by name or day) - 47%
  • Not intention-to-treat analysis - 22%
  • Poor response rate - 41%

Schroter S et al, accepted for Clinical Trials
How do you currently keep up to date?

- What resources do you use
- What educational activities do you take part in
Managing Information

“Push” and “Pull” methods

- **“Push”** - alerts us to new information
  - “Just in Case” learning
    - Use ONLY for important, new, valid research

- **“Pull”** – access information when needed
  - “Just in Time” learning
    - Use whenever questions arise
    - EBM Steps: Question; search; appraise; apply
“Just in Time” learning: Intern’s information needs

- Setting: 64 residents at 2 New Haven hospitals
- Method: Interviewed after 401 consultations
- Questions
  - Asked 280 questions (2 per 3 patients)
  - Pursued an answer for 80 questions (29%)
  - Not pursued because
    - Lack of time
    - Forgot the question
- Sources of answers
  - Textbooks (31%), articles (21%), consultants (17%)

Green, Am J Med 2000
Patient ID: 
Date: 22/7

PICO: R on undisplaced # of vertebra.

Reference: Injury 2002; 80(6)" (Ask see old SR on "limb injury, AFF"
R 66 V A M Avery long

Clinical Bottom lines:
Immediate mobilisation was better

Notes: 
 undisplaced # needs anti-R
displaced should be seen by orthopaedic
Keeping up to Date by “Just in Time” Education

- Shift focus to your current problems
  - Relevant to YOUR practice
  - More memorable (and practice changed)
  - Up to date

- But Four Barriers
  - Admitting we don’t know
  - Skills in obtaining current best evidence
  - Evidence Resources at the point of care
  - Time
Coping with the overload: things you might consider
Your Clinical Questions

- Write down one recent patient problem
- What was the critical question?
- Did you answer it? If so, how?
A recent patient of mine in practice
Effects of SSRIs on sexual function: a critical review.

Rosen RC, Lane RM, Menza M.

Department of Psychiatry, University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School, Piscataway 08854, USA.

Sexual problems are highly prevalent in both men and women and are affected by, among other factors, mood state, interpersonal functioning, and psychotropic medications. The incidence of antidepressant-induced sexual dysfunction is difficult to estimate because of the potentially confounding effects of the illness itself, social and interpersonal comorbidities, medication effects, and design and assessment problems in most studies. Estimates of sexual dysfunction vary from a small percentage to more than 80%. This article reviews current evidence regarding sexual side effects of selective serotonin reuptake inhibitors (SSRIs). Among the sexual side effects most commonly associated with SSRIs are delayed ejaculation and absent or delayed orgasm. Sexual desire (libido) and arousal difficulties are also frequently reported, although the specific association of these disorders to SSRI use has not been consistently shown. The effects of SSRIs on sexual functioning seem strongly dose-related and may vary among the group according to serotonin and dopamine reuptake mechanisms, induction of prolactin release, anticholinergic effects, inhibition of nitric oxide synthetase, and propensity for accumulation over time. A variety of strategies have been reported in the management of SSRI-induced sexual dysfunction, including waiting for tolerance to develop, dosage reduction, drug holidays, substitution of another antidepressant drug, and various augmentation strategies with 5-hydroxytryptamine-2 (5-HT2), 5-HT3, and alpha2 adrenergic receptor antagonists, 5-HT1A and dopamine receptor agonists, and phosphodiesterase (PDE5) enzyme inhibitors. Sexual side effects of SSRIs should not be viewed as entirely negative; some studies have shown improved control of premature ejaculation in men. The impacts of sexual side effects of SSRIs on treatment compliance and on patients' quality of life are important clinical considerations.
The Barriers to EBP

- Attitude of question & inquiry
- Know-how in finding, appraising, and applying evidence
- Information Resources on tap
- Lack of Time
Conclusions

1. The information problem is bad and getting worse
2. All health care workers should be equipped to deal with the information problem
3. The mission is difficult but not impossible!
Take a break for two minutes
Page 21 in your books
Angela is a new patient who recently moved to the area to be closer to her son and his family.

She is 69 years old and has a history of congestive heart failure brought on by a recent myocardial infarctions.

She has been hospitalized twice within the last 6 months for worsening of heart failure and has a venous leg ulcer.

At the present time she reports she is extremely diligent about taking her medications (lisinopril and aspirin) and wants desperately to stay out of the hospital. She is mobile and lives alone with several cats but reprots sometimes she forgets certain things.

She also tells you she is a bit hard of hearing, has a slight cough, is an ex-smoker of 20 cigs a day for 40 years. Her BP today is 170/90, her ankles are slightly swollen and her ulcer is painful and her pulse is 80 and slightly irregular.

What are your questions?
‘Background’ Questions

• About the disorder, test, treatment, etc.

a. Root* + Verb: “What causes …”
b. Condition: “… SARS?”

• * Who, What, Where, When, Why, How
‘Foreground’ Questions

- About patient care decisions and actions

4 (or 3) components:

a. **P**atient, problem, or population

b. **I**ntervention, exposure, or maneuver

c. **C**omparison (if relevant)

d. Clinical **O**utcomes (including time horizon)
Background & Foreground

Figure 1.1 Background and foreground questions.
<table>
<thead>
<tr>
<th>Patient or Problem</th>
<th>Intervention</th>
<th>Comparison intervention</th>
<th>Outcomes</th>
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<tbody>
<tr>
<td>Describe a group of patients similar to your own</td>
<td>What intervention are you considering</td>
<td>What is the main alternative to the intervention</td>
<td>What do you hope to accomplish with the intervention</td>
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<tr>
<td>“In elderly patients with congestive heart failure …”</td>
<td>…does treatment with spironolactone…</td>
<td>…when compared with standard therapy alone…</td>
<td>…lead to a decrease in hospitalization”</td>
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</table>
Jean is a 55 year old woman who quite often crosses the Atlantic to visit her elderly mother. She tends to get swollen legs on these flights and is worried about her risk of developing deep vein thrombosis (DVT), because she has read quite a bit about this in the newspapers lately. She asks you if she would wear elastic stockings on her next trip to reduce her risk of this.
Jeff, a smoker of more than 30 years, has come to see you about something unrelated. You ask him if he is interested in stopping smoking. He tells you he has tried to quit smoking unsuccessfully in the past. A friend of his, however, successfully quit with acupuncture. Should he try it? Other interventions you know about are nicotine replacement therapy and antidepressants.
At a routine immunisation visit, Lisa, the mother of a six-month-old tells you that her baby suffered a nasty local reaction after her previous immunisation. Lisa is very concerned that the same thing may happen again this time. Recently, a colleague told you that needle length can affect local reactions to immunisation in young children but you can’t remember the precise details.
Example 2, page 28

Susan is expecting her first baby in two months. She has been reading about the potential benefits and harms of giving newborn babies vitamin K injections. She is alarmed by reports that vitamin K injections in newborn babies may cause childhood leukaemia. She asks you if this is true and, if so, what the risk for her baby will be.

PICO

Aetiology and risk factors
Example 1, page 29

Julie is pregnant for the second time. She had her first baby when she was 33 and had amniocentesis to find out if the baby had Down Syndrome. The test was negative but it was not a good experience, because she did not get the result until she was 18 weeks pregnant. She is now 35 and 1 month pregnant, and asks if she can have a test that would give her an earlier result. The local hospital offers serum biochemistry plus nuchal translucency ultrasound screening as a first trimester test for Down syndrome. You wonder if this combination of tests is as reliable as a conventional amniocentesis.
Mr Thomas, who is 58 years old, has correctly diagnosed his inguinal lump as a hernia. He visits you for confirmation of his diagnosis and information about the consequences. You mention the possibility of strangulation, and the man asks ‘How likely is that?’ You reply ‘pretty unlikely’ (which is as much as you know at the time) but say that you will try to find out more precisely.
Your Clinical Questions

- Write down one recent patient problem
- What is the PICO of the problem?
Questions

- Recognize: your questions
- Select: which questions to pursue
- Guide: how to ask and answer
- Assess: how well & what to improve
### What Pushes Us … ?

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<tr>
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<tr>
<td>• curiosity</td>
<td>• Time</td>
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<tr>
<td>• Prove colleagues wrong</td>
<td>• We already know the answer</td>
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<tr>
<td>• Keeps coming up</td>
<td>• Fatigue</td>
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<tr>
<td>• Risk of patient harm</td>
<td>• Access</td>
</tr>
<tr>
<td>• Want to do better</td>
<td>• Inferiority complex-anxiety-afraid of admitting knowledge gaps</td>
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<tr>
<td>• Anxiety</td>
<td>• Cynical</td>
</tr>
<tr>
<td>• Avoid litigation</td>
<td>• Laziness</td>
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<tr>
<td>• Internet informed patient</td>
<td>• Lack of support</td>
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<td></td>
<td>• Previous failure at searching</td>
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<td>• Lack of resources</td>
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<td>• No one else does it</td>
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<td>• Fear of change</td>
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The Real ‘Three R’s’ of Learning

• Resilient

• Reflective

• Resourceful
FAQ: How Long ... ?

- Proficient? Quickly
- Mastery? Lifetime

- Human expertise takes >10,000 hours, >10 years
  → Deliberate practice
Any questions?