Evidence Based Medicine

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Definition

• conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients

• "the use of mathematical estimates of the risk of benefit and harm, derived from high-quality research on population samples, to inform clinical decision-making in the diagnosis, investigation or management of individual patients"
What is evidence-based medicine?

“Evidence-based medicine is the integration of best research evidence with clinical expertise and patient values” Sackett DL
WHY Evidence Based Medicine (EBM)?

- Best for Patients
- Protect Doctors (Medico-legal cases)
What Pushes Us ... ?

**Toward**
- Risk of patient harm
- Want to do better
- Avoid litigation
- Curiosity
- Prove colleagues wrong
- Anxiety
- Internet informed patient

**Away**
- Time
- We already know the answer
- Fatigue
- Access
- Inferiority complex-anxiety-afraid of admitting knowledge gaps
- Laziness
- Lack of support
- Previous failure at searching
- Lack of resources
- No one else does it
- Fear of change
The Five Steps of Evidence Based Practice

1. Asking Focused Questions: *translation of uncertainty to an answerable question*

2. Finding the Evidence: *systematic retrieval of best evidence available*

3. Critical Appraisal: *testing evidence for validity, clinical relevance, and applicability*

4. Making a Decision: *application of results in practice*

5. Evaluating Performance: *auditing evidence-based decisions*
EBM practice requires:

- Asking
- Acquiring
- Appraising
- Applying
- Assessing
Five steps in EBM

1. Formulate an answerable question
2. Track down the best evidence
3. Critically appraise the evidence for:
   – Validity
   – Impact (size of the benefit)
   – Applicability
4. Integrate with clinical expertise and patient values
5. Evaluate our effectiveness and efficiency
   – keep a record; improve the process
1. Asking Focused Questions: *translation of uncertainty to an answerable question*

• **Anatomy of a well articulated question**

1. the patient or problem being addressed
2. the intervention or exposure being considered
3. the comparison intervention or exposure, when relevant
4. the clinical outcomes of interest
2. Finding the Evidence: *systematic retrieval of best evidence available*

Look for secondary sources:

- **Guidelines:** UK National Library for Health, NICE, SIGN; US National Guidelines Clearinghouse; Canadian Medical Association; New Zealand Guidelines Group. Royal college of Obstetricians and Gynaecologists (www.rcog.org.uk), ACOG, وزارت بهداشت
- **CATs:** CAT Crawler
- **Evidence-Based Summaries:** Bandolier, Clinical Evidence
- **Structured Abstracts:** EBM Online, ACP Journal Club
- **Systematic Reviews:** Cochrane Library
- **To search several of the databases simultaneously you can use:** www.tripdatabase.com

Search for Primary Sources e.g. PubMED
وزارت بهداشت، درمان و آموزش پزشکی
http://www.behdasht.gov.ir
3. Critical Appraisal: testing evidence for validity, clinical relevance, and applicability

- Secondary sources e.g. RCOG guidelines
  - Appraisal has been performed with level of evidence clearly written next to each statement

- Primary sources e.g. Pubmed
  - Appraisal kits available on www.cebm.net, CATmaker is a computer-assisted critical appraisal tool
Classification of evidence levels

1++ High-quality meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a very low risk of bias

1+ Well-conducted meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a low risk of bias

1- Meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a high risk of bias

2++ High-quality systematic reviews of case-control or cohort studies or high-quality case-control or cohort studies with a very low risk of confounding, bias or chance and a high probability that the relationship is causal

2+ Well-conducted case-control or cohort studies with a low risk of confounding, bias or chance and a moderate probability that the relationship is causal

2- Case-control or cohort studies with a high risk of confounding, bias or chance and a significant risk that the relationship is not causal

3 Non-analytical studies; e.g. case reports, case series

4 Expert opinion

Grades of recommendations

A At least one meta-analysis, systematic reviews or randomised controlled trial rated as 1++ and directly applicable to the target population; or
A systematic review of randomised controlled trials or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population and demonstrating overall consistency of results

B A body of evidence including studies rated as 2++ directly applicable to the target population and demonstrating overall consistency of results; or
Extrapolated evidence from studies rated as 1++ or 1+

C A body of evidence including studies rated as 2+ directly applicable to the target population and demonstrating overall consistency of results; or
Extrapolated evidence from studies rated as 2++

D Evidence level 3 or 4; or
Extrapolated evidence from studies rated as 2+

Good practice point

Recommended best practice based on the clinical experience of the guideline development group
4. Making a Decision: application of results in practice

- Internal validity refers to the extent a study properly measures what it is meant to.

- External validity refers to the extent to which we can generalize the results of a trial to the population of interest
5. Evaluating Performance: auditing evidence-based decisions

• Auditing your process and/or results
Interested to learn more?

- [http://www.cebm.net/](http://www.cebm.net/)
- Centre for Evidence Based Medicine
Welcome to CEBM

Welcome to the web site of the Centre for Evidence-Based Medicine in Oxford in the UK.

Our broad aim is to develop, teach and promote evidence-based health care and provide support and resources to doctors and health care professionals to help maintain the highest standards of medicine.

Learn more about EBM and the CEBM.

Current Courses & Workshops

We offer a range of courses to clinicians and other healthcare professionals seeking to develop their EBM skills.

Title: How to Practice Evidence-Based Medicine
Duration: 3 days
Dates: 30th March - 1st April 2009
Venue: St Hugh's College, Oxford University
Download Application Form
Apply Online
More Information

Title: Teaching Evidence-Based Practice
Duration: 5 days

What's New

5th International Conference of Evidence-Based Health Care
This year's conference has been announced for Taormina (Italy).
More News

Journal Watch - research reviews
Evidence-Based Views - latest blog
PaT Plot - new EBM tool

CEBM in Action - Workshop Videos
Paul Glasziou - EBM in Practice
Carl Heneghan - Diagnostic Tests

EBM Journal
Evidence-based medicine is published by the BMJ bi-monthly. It alerts clinicians to the latest EBM advances.
Find out more

Journal Watch
MSc in Evidence-Based Health Care

The MSc in Evidence-Based Health Care is part of the Oxford International Programme in Evidence-Based Health Care, and is offered as a part-time course consisting of six taught modules and a dissertation.

This is a joint Programme with the Department of Primary Health Care and the Department for Continuing Education’s Continuing Professional Development Centre and a particular aim of the Programme is to strengthen the natural links with the CEBM.

A former MSc in EBHC student, Bradley Johnston, wrote to us when he heard that the Masters in EBHC was being restarted. He said:

“I enjoyed the learning environment immensely while in the MSc program. The teaching and learning philosophy (e.g., small group, self-directed, problem-based, interactive) fits very nicely with my own views and I hope to participate in this type of educational environment again very soon. I can’t think of a learning environment that would be more exciting than that of the EBHC MSc course.”

To find out more please visit the Department of Continuing Education at Oxford University.
EBM Powerpoint Presentations

Below are a list of Powerpoint presentations used in workshops at the CEBM. They are provided free, and you are free to use and modify these, but we ask you to please acknowledge the original author in your presentations.

2008

Systematic Reviews (1.2MB) Paul Glaziou
Evidence in Practice Projects (3.5MB) Carl Heneghan
The Role of Questions when Teaching EBP (6.1MB) Amanda Burls
Team-Based Learning (0.1MB) Dan Mayer
EBHC Community of Practice (1.1MB) Andrew Booth, Reader in Evidence Based Information Practice (Acknowledgements: Sara Mollinson, HealthMoW)
Best BETs from the BestBETs Group (1.1MB) Kevin Mackway-Jones (see also http://www.bestbets.org/home/people.php)
Best Evidence Medical Education in Geriatric Medicine (6.2MB) Suzan Abou-Raya, MDFaculty of Medicine, University of AlexandriaFellow, Harvard Medical School, Boston, MA
Beyond Kirkpatrick Bradford and Airecile NHS (0.5MB) Paul Stevenson
Clinically Integrated E-curriculum for Teaching EBM (1.3MB) Shakila Thangaratnam, Clinical lecturer in Obstetrics and Gynaecology and Clinical Epidemiology University of Birmingham. Part of the Training the Trainers Project
Diagnostic Reasoning (2.8MB) Carl Heneghan
Reaching for Knowledge in Unison Using Communities of Practice to Support Practice Change (2.6MB) Melanie Barwick, Ph.D., C.Psych, Community Health Systems Resource Group The Hospital for Sick Children University of Toronto
World Cafe Process (0.5MB) World Cafe Day 1 (see also http://www.theworldcafe.com/ and http://www.theworldcafe.com/what.htm)

2007 Diagnostics
Common mistakes in teaching EBM

• Teaching EBM fails:
  – When learning how to do research is emphasised over how to use it
  – When learning how to do statistics is emphasised over how to interpret them
  – When teaching EBM is limited to finding flaws in published research
Common mistakes in teaching EBM

• Teaching EBM fails:
  – When it humiliates learners for not already knowing the ‘right’ fact or answer
  – When it bullies learners to decide to act based on fear of others’ authority or power, rather than on authoritative evidence and rational argument
  – When the amount of teaching exceeds the available time or the learner’s attention
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Examples of EBM

• Use of LMWH + Aspirin for Antiphospholipid syndrome (outcome= live pregnancy rate)

• Use of Steroid up to 38 weeks and 6 days for elective c/section (Outcome=RDS & Brain Haemorrhage)

• Use of AB’x intraoperative and postoperative for 3rd and 4th degree perineal tear (outcome= infection and wound dehiscence)
Examples of Common NBM

- Bed rest to prevent early miscarriage
- Sexual intercourse to conceive after ovulation
- Diagnosing male factor subfertility in a normal semen analysis
- Progesterone to prevent miscarriage
- Varicocelectomy for increasing pregnancy rate
- Use of Clomiphene for unexplained subfertility
- Use of cerclage universally
- Lack of use of LMWH for thromboprophylaxis
- Screening for TORCH for recurrent miscarriage
- Use of OCP for resolution of an ovarian cyst
- Fluid management of pre-eclamptic patients
- Elective c/section before 39 weeks
- Smear test < 25 years old
- Change of due date frequently, even after IVF
- Frequent and inappropriate use of D&C after miscarriage
- Ovulation induction for unexplained fertility
- Delivering IUGR too early
Common reason for NBM

• From Mechanism to Conclusion (Wrong): this is how it works then the result should be what I think. e.g. ocp and cyst, PET and fluid overload

• From Results and Conclusions to Mechanism (Correct & EBM)
  – Does it work? : if so, then think about the mechanism, unless you want to do a research and you have to make a hypothesis.
Coping with the overload: three possible things you might try

A. Read guidelines & evidence-based abstraction journal (and cancel other journals)

B. Keep a logbook of your own clinical questions

C. Run a case-discussion journal club with your practice
Take home messages

- EBM should be the language of medicine
- EBM should be taught in medical schools and hospitals
- EMB should be taught to patients!
- Look for the answerable questions in secondary sources first (UK RCOG, NICE, ACOG, SOGC, RCOG for AUS and NZ
- Challenge colleagues by asking for evidence
- Explain to patients the evidences for treatments and investigations
Thank you