20th Workshop on Teaching Evidence-Based Practice
2014

Carl Heneghan  MA, MRCGP, DPhil
Director CEBM
University of Oxford
About the workshop
Small groups

- Check your group number
- Check your room
- Allocated a facilitator and a co-facilitator
- You will be in the same small group for the week
**Teaching Evidence-Based Practice**  
**10th-14th November 2014**

<table>
<thead>
<tr>
<th>Time</th>
<th>Monday Chair, Carl Heneghan</th>
<th>Tuesday Chair, Kamal Mahtani</th>
<th>Wednesday Chair, Kamal Mahtani</th>
<th>Thursday Chair, Carl Heneghan</th>
<th>Friday Chair, Carl Heneghan</th>
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<tbody>
<tr>
<td>8.30</td>
<td>Registration</td>
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<tr>
<td>(Mon 09:15) 9.00-10.30</td>
<td>Intro to EBM Teaching module (Carl Heneghan)</td>
<td>How to teach about RCTs (Kamal Mahtani)</td>
<td>How to teach Diagnostics (Annette Plueddemann) <strong>to cover MSc course and module design</strong></td>
<td>How to teach Stats (Rafael Perera/ Beth Shinkins)</td>
<td>EBM curriculum development and evaluation (Sharon Mican)</td>
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<td>10.30-11.00</td>
<td>Coffee</td>
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<td>11.00-12.30</td>
<td>Small Group Work 1 - Setting the agenda</td>
<td>Small Group Work 3</td>
<td>Small Group Work 5</td>
<td>Small Group Work 6 - Teaching Stats</td>
<td>Small Group <strong>(11.00-12.00)</strong></td>
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<td>12.30-13.30</td>
<td>Lunch</td>
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<tr>
<td>13.30-15.00</td>
<td>How to teach Searching Methods (Nia Roberts)</td>
<td>How to teach about SRs (David Nunan)</td>
<td>Styles of learning and teaching: orthodoxy and evidence (Adrian Stokes)</td>
<td>Small Group Work 7</td>
<td>Lunch</td>
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<td>15.00-15.30</td>
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<tr>
<td>15.30-17.00</td>
<td>Small Group Work 2</td>
<td>Small Group Work 4</td>
<td>Using online learning as a platform to Teach EBP (Adrian Stokes)</td>
<td>Individual Groups - Presentations discussion/feedback/evaluation</td>
<td>Safe journey home</td>
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<tr>
<td>17.00-18.00</td>
<td>Talk - Using the history of EBM to teach (Jeremy Howick)</td>
<td>Presentation Prep work (own time)</td>
<td>Presentation Prep work (own time)</td>
<td>Q&amp;A Session (Carl Heneghan &amp; Kamal Mahtani)</td>
<td>Safe journey home</td>
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<td>18.00</td>
<td>Drinks Reception in the Common Room</td>
<td>Guest Speaker Klim McPherson followed by dinner Kellogg college</td>
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Small group work 1. Setting the agenda  
Small group work 2 - 6. Developing teaching demonstrations  
Small group work 7. Teaching demonstrations in groups  

G1. Kamal Mahtani
Welcome to Teaching Evidence-Based Practice

Welcome to the Virtual Learning Environment (VLE) for this course. Introduce yourself on the forum and browse the site for useful information. Further details will be populated during and after the Oxford week.

Forums and announcements
- Announcements
- Forums

Pre-Oxford week: 3-7 November 2014
- About the module
- Tutors
- Tasks

Oxford week: 10-14 November 2014
- Timetable (print)
- Social events
- Module handouts, presentations and resources

Post-Oxford weeks
- Week beginning 17 November 2014
- Week beginning 1 December 2014
- Week beginning 15 December 2014

Quick links
- Bodleian libraries
- SOLO
- Eduroam
- Single Sign On (SSO)
- Virtual Private Network (VPN)

Contact us
- Evidence-based health care and health research team
- Continuing Professional Development Centre

WebLearn help and tutorials
- Least you need to know guides

Information for students
- Further information, resources and guides available to Department for Continuing Education students can be found on the following sites:
Module handouts, presentations and resources

Please click here for the Teaching Evidence-Based Practice references in a word file (these can be copied and pasted into Google Scholar).

This page will be updated with teaching materials for individual sessions once they become available.
Social events

You are invited to join fellow students, tutors and staff at the following social events:

**Monday 10th November:**

5:00-6:00pm: Talk by [Dr Jeremy Howick](#), Research Fellow, Centre for Evidence-Based Medicine.

"Using historical examples to teach key concepts in EBHC"

**Using cognitive bias to help students learn to reduce study bias**

**Overall Objective**

To understand how and why using examples increases the chances that students will learn and retain EBHC concepts (and minimize the chances they will fall asleep!). The secondary objective is to understand the 'availability heuristic' or 'availability bias'.

**Key Point: using (cognitive) bias to reduce (study) bias**

Humans are cognitively biased: if they can think of examples, they are likely to remember them (and assign irrationally high probabilities to the likelihood of events like those in their examples, which is called the 'availability bias').

6:00pm: Drinks Reception in the Common Room Bar, Rewley House.

**Wednesday 12th November:**

6:30-7:30pm: Talk by [Prof Kilm McPherson](#), Visiting Professor of Public Health Epidemiology, Nuffield Department of Obstetrics & Gynaecology, University of Oxford.

"Why Hysterectomy? What is it for and for whom? Fitting it into EBM!"

Prof McPherson will summarise variations in the use of hysterectomy within and between countries, and discuss the evidence base justifying it.

To be held in the Mawby Room, Kellogg College

7:30pm: Course Dinner, Kellogg College

*Sign-up for the dinner by using the "Sign-up" tool before Monday 3 November 2014*

Dinner Menu:
Teaching Evidence-Based Practice Workshop

November 10th – 14th 2014
Ryley House, Wellington Square, Oxford

The Teaching Evidence-Based Practice module is designed for all health care professionals, who have some knowledge of critical appraisal and experience in practicing evidence-based health care, and who want to explore issues around teaching. Students will learn in small groups and be facilitated to practice and develop their skills in teaching evidence-based practice. Participants will also learn educational strategies to develop a curriculum and design evaluation.

You should consider attending if you:
Photocopying
Objectives for the Week

• Your objectives – review
• Discuss with neighbours
Objectives for the week

• What Makes a Good Teacher?

Areas for improvement

• What should you teach within a EBM class?
  Therapy, Diagnosis, Prognosis, Harm etc

• What makes an EBM course?

Type of courses

• What is involved in an EBM curriculum?

Curriculum for whom
What is evidence-based medicine?

“Evidence-based medicine is the integration of research evidence with clinical expertise and patient values.”
EBM practice requires:

• Asking
• Acquiring
• Appraising
• Applying
• Assessing
Why are you here?

Evidence Based Practice

And

To Teach
Try the following exercise.

Sit back, close your eyes,
Try the following exercise.

Sit back, close your eyes, and bring to mind the best teachers you ever had.

Try to remember what they were like—how they looked, talked and acted, what their classrooms and/or offices were like, how they made you feel as their student.

When you're satisfied that you've gotten a good picture of who these people were, open your eyes.
Educator and philosopher Parker Palmer:

Good teaching isn't about technique. I've asked students around the country to describe their good teachers to me.
Educator and philosopher Parker Palmer:

Some of them describe people who lecture all the time, some of them describe people who do little other than facilitate group process, and others describe everything in between.
Educator and philosopher Parker Palmer:

But all of them describe people who have some sort of connective capacity, who connect themselves to their students, their students to each other, and everyone to the subject being studied.
What Makes a Good Teacher of EBM?

1. Enthusiastic, energetic, excited
2. Highly knowledgeable in their area
3. Maintains that knowledge base
4. Lifelong reflective learner
5. Changes and influences practice
What Makes a Good Teacher?

1. Enthusiastic, energetic, excited
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

<table>
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<tr>
<th>Study</th>
<th>Year</th>
<th>No of patients</th>
<th>Odds ratio 95% confidence interval</th>
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<td>1 Everett</td>
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<td>11 Alexander</td>
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Overall
I'm Sorry Rod Jackson

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no description available

1,24 / 2,27

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What Makes a Good Teacher?

2. Highly knowledgeable in their area of expertise
Understanding evidence-based medicine in 4 days. Lesson 1: Clinical significance is all about risk

Ami Banerjee
Last edited 17th March 2010

It is often hard to figure out the findings of health research because of jargon and the numbers. However, I reckon most of that research can be understood by anybody with 4 simple concepts. I am going to cover one of these concepts each day using stories from this week’s press relating to health to show how often these numbers appear in the press. Hopefully these 4 keys will allow more people to open the door and to question the numbers we read about in health research.

LESSON 1: CLINICAL SIGNIFICANCE IS ALL ABOUT RISK

For over 2000 years, two principles have formed the basis of medical practice: “primum non nocere” (first do no harm) and “succurrere” (do good). If we want to measure “the good” or “the harm” associated with a treatment or an exposure, we have to know how it changes the chance or risk of a disease compared to another treatment or exposure. Chance or risk is usually expressed as a percentage, and tells us about the number of people who develop a disease out of a population.

In absolute terms, this change is simply the difference between the risk associated with the first, or control, treatment and the risk associated with the new treatment. This difference is sometimes called the absolute risk difference. In relative terms, this same change can be expressed as the risk associated with the new treatment divided by the risk associated with the control treatment, known as the relative risk.

In this week’s British Medical Journal, Dutch researchers looked at whether 15 minutes of immobilisation increased the chance of successful pregnancy after in vitro fertilisation. They found that the chance of successful implantation was 3% higher if the woman was immobilised for 15 minutes compared to not immobilised. This is a 3% absolute risk difference. In relative terms, the immobilisation increased the chance of success by 32% (3%/97% = 3.1%).
New brain scan to diagnose autism

By Jane Hughes
Health correspondent, BBC News

A brain scan that detects autism in adults could mean much more straightforward diagnosis of the condition, scientists say.

Experts at King's College London said the scan - tested on 40 people - identified tiny but crucial signs of autism, only detectable by computer.

Current methods of diagnosis can be lengthy and expensive.

But some experts say further research will be needed before the new technique can be widely used.

Autism Spectrum Disorder affects an estimated 1 in every 100 adults in the UK, most of them men. It varies from mild to very severe, and people with the condition can find the world appears chaotic and hard to understand.

Conventional diagnosis involves a team of experts who analyse behaviour and make a complex series of assessments.

The Medical Research Council study looked at 20 non-autistic adults and 20 with autism. It used a brain scan to look at activity in specific areas of the brain.
Autism can be diagnosed with brain scan – study

Study shows 90% success rate in detecting adult males with ASD, and researchers hope the simple technique will rapidly identify children at risk

A simple 15-minute brain scan could help doctors diagnose people with autism by identifying structural differences in their brains. Scientists say the scans would speed up what is currently a long and emotional diagnostic procedure and allow the identification of at-risk children more rapidly.

"We know already that people with autism have differences in brain anatomy and some regions are just bigger and smaller or just different in shape," said Christine Ecker of King's College Institute of Psychiatry in London. "Our technique can use this information to identify someone with autism."

Autistic spectrum disorder (ASD) is a lifelong condition caused by abnormalities in the development of the brain that affects around half a million people in the UK. The vast majority of these are male, and diagnosis usually involves a lengthy process of interviews and personal accounts from family and friends close to the patient.

Medical researchers at the IoP compared the brain scans of 20 adults with autism to those of 20 age and gender-matched controls to determine whether the condition could be detected in adult males. The scans were then given to a group of doctors who were asked whether they would have diagnosed the adult males with ASD if they had been given a full diagnostic procedure.
yup can't find it

bengoldacre, [+], Wed 11 Aug 12:41 via Direct Message

it's clearly low PPV. MRC press release overstated it in my view
http://www.mrc.ac.uk/Newspublications/News/MRC007083

bengoldacre, [+], Wed 11 Aug 12:39 via Direct Message

bengoldacre: Hey, I can't find this autism study which is supposed to be online at
http://bit.ly/bPNtzu needs de-bunking

cebmblog, [+], Wed 11 Aug 12:35 via Direct Message

Hi Carl, I'm off on holiday tomorrow - but
autism and brain scan test: the real predictive value

Carl Heneghan
Posted 11th August 2010 @ 05:27pm

A brain scan that detects autism in adults could mean much more straightforward diagnosis of the condition, scientists say. Reported the BBC, Sky the Guardian and many more.

I had great difficulty getting hold of this paper, it wasn't published online at the time of the press release. I managed to get a copy via Ben Goldacre at Bad Science and Evidence Matters who sent me the full text. Given this problem in getting the paper, it is highly likely no one who released the story has actually read the paper.

The news all report the headline 'The researchers detected autism with over 90% accuracy, the Journal of Neuroscience reports.'

Sounds impressive, but this is one of the most obvious mistakes to make in interpreting a diagnostic test result. Never mind this is not the correct study type.

What has happened is the sensitivity has been taken for the positive predictive value, which is what you want to know: if I have a positive test result, how likely am I to have autism?

This is not the same as the sensitivity. The sensitivity of a test is the proportion of people who actually have the condition (in this case autism) who test positive. It tells you how good the test is at finding people who have the condition. The positive predictive value is how likely it is that someone who tests positive actually has the condition. It is possible for the positive predictive value to be worse than the sensitivity.

The Goldacre et al study looks at the ISEAR test, which is described as being 'widely validated' for autism. The National Institute for Health and Clinical Excellence (NICE) uses this test, so clearly, there is clinical evidence of its efficacy. How, then, can the authors get a diagnostic accuracy of 90%? It's not possible. It's impossible to get more people testing positive than have autism. The only way they can achieve such a result is by misinterpreting the data.
My email: alokjha@guardian.co.uk

alokjha, [+] Wed 11 Aug 19:32 via Direct Message

By tomo early afternoon if you can manage? Would be for our sci blog. Worth getting in touch w author of study to raise your concerns too?

alokjha, [+] Wed 11 Aug 19:31 via Direct Message

alokjha: yes no problem when do you want it for

cembrblog, [+] Wed 11 Aug 19:28 via Direct Message
Why autism can't be diagnosed with brain scans

Using brain scans to detect autism would be a huge expensive waste of money, says Carl Heneghan

The BBC, the Guardian and Reuters this week widely reported British researchers published in the Journal of Neuroscience have developed a brain scan which can detect autism in adults with 90% accuracy.

Dr Christine Ecker, the lead author, showed her imaging technique was able to detect which people in her group had autism. "If we get a new case, we will also hopefully be 90% accurate," she said.

Pretty simple then, you turn up, have the test, and you have a 90% chance of finding out whether you have autism.

Well, you couldn't be any further from the truth.

To determine if a test is accurate, it might appear reasonable to recruit a disease positive group and a disease free group which is what happened in the brain scan study. An example of how this strategy raises false hopes is the story of carcino-embryonic antigen (CEA) which was...
What Makes a Good Teacher?

3. Maintains that knowledge base
What should you teach within an EBM class?

Therapy, Diagnosis, Prognosis, Harm etc

A one-hour session on therapy should include:

1.
2.
3.
Highly knowledgeable and up to date in their subject area, but do not pretend to know it all, willing to learn from pupils and from others
Calculating the number needed to treat for trials where the outcome is time to an event

Douglas G Altman, professor of statistics in medicine (d.altman@icrf.icnet.uk)\textsuperscript{a}, Per Kragh Andersen, professor of biostatistics\textsuperscript{b}

Correspondence to: Correspondence to: D G Altman

Accepted 5 July 1999

The number of patients who need to be treated to prevent one additional event (number needed to treat; NNT) has become a widely used measure of treatment benefit derived from the results of randomised controlled trials with a binary outcome.\textsuperscript{1,2} We show how to obtain a number needed to treat for studies where the primary outcome is the time to an event. We consider primarily the situation where there is no access to raw data, for example, when reviewing a published study, and also how to proceed when given the raw data.

Summary points

The number needed to treat is the number of patients who need to be treated to prevent one additional adverse outcome

This number (with confidence interval) is a clinically useful way to report the results of controlled trials
GPs are increasingly called upon to make or guide patients with choices about medical interventions, but there is gathering evidence that clinicians’ understanding of risk is poor and, correspondingly, that their ability to communicate risk is deficient. In this article we aim to improve health professionals’ understanding of risk reporting and clarify common misunderstandings in interpreting risk, odds, relative risk (RR), and odds ratios (ORs).

example, the odds that a single throw of a dice will produce a six are one to five, or 1/5 — in multiple throws of a dice, there will be one six for every five other throws.

In health, odds are the number of people who experience an event, divided by the number of those who do not; the odds of a woman developing breast cancer are 1/7, which is 0.14. However, saying that 0.14 women develop breast cancer for every one that does not, makes little intuitive sense. Indeed, odds are much easier to understand

COMPARING OUTCOMES OF STUDIES USING ODDS RATIOS
In prospective studies, and observational studies, participants are followed up to determine which is more prone to occur.
but do not pretend to know it all, willing to learn from pupils and from others

**Understanding the Birthday Paradox**

**23 people.** In a room of just 23 people there’s a 50-50 chance of two people having the same birthday. In a room of 75 there’s a 99.9% chance of two people matching.

Put down the calculator and pitchfork, I don’t speak heresy. The birthday paradox is strange, counter-intuitive, and **completely true.** It’s only a “paradox” because our brains can’t handle the compounding power of exponents. We expect probabilities to be linear and only consider the scenarios we’re involved in (both faulty assumptions, by the way).

Let’s see why the paradox happens and how it works.

**Problem 1: Exponents aren’t intuitive**

We’ve taught ourselves mathematics and statistics, but let’s not kid ourselves: it’s not natural.

Here’s an example: What’s the chance of getting 10 heads in a row when flipping a fair coin? Do you think it’s 1/1024, or do you think it’s 1/10?
What Makes a Good Teacher?

4. Lifelong reflective learner
What Makes a Good Teacher?

Good teachers are ‘classroom researchers’
Experiment with teaching strategies
What Makes a Good Teacher?

Keep what works

Discarding what doesn’t
The steps of practicing EBM
1. ask a focused question.
2. Track down the evidence
3. Critically appraise evidence for its validity, effect size, precision
4. apply the evidence in practice:
Effect of rosiglitazone on the frequency of diabetes in patients with impaired glucose tolerance or impaired fasting glucose: a randomised controlled trial

The DREAM (Diabetes REduction Assessment with ramipril and rosiglitazone Medication) Trial Investigators*

Summary

Background Rosiglitazone is a thiazolidinedione that reduces insulin resistance and might preserve insulin secretion. The aim of this study was to assess prospectively the drug's ability to prevent type 2 diabetes in individuals at high risk of developing the condition.

Methods 5269 adults aged 30 years or more with impaired fasting glucose or impaired glucose tolerance, or both, and no previous cardiovascular disease were recruited from 191 sites in 21 countries and randomly assigned to receive rosiglitazone (8 mg daily; n=2365) or placebo (2634) and followed for a median of 3 years. The primary outcome was a composite of incident diabetes or death. Analyses were done by intention to treat. This trial is registered at ClinicalTrials.gov, number NCT00095654.

Findings At the end of study, 59 individuals had dropped out from the rosiglitazone group and 46 from the placebo group. 306 (11.6%) individuals given rosiglitazone and 686 (26.0%) given placebo developed the composite primary outcome (hazard ratio 0.40, 95% CI 0.35–0.46; p<0.0001); 1330 (50.5%) individuals in the rosiglitazone group and 798 (30.3%) in the placebo group became normoglycaemic (1.71, 1.57–1.87; p<0.0001). Cardiovascular event rates were much the same in both groups, although 14 (0.5%) participants in the rosiglitazone group and two (0.1%) in the placebo group developed heart failure (p=0.01).

Interpretation Rosiglitazone at 8 mg daily for 3 years substantially reduces incident type 2 diabetes and increases the likelihood of regression to normoglycaemia in adults with impaired fasting glucose or impaired glucose tolerance, or both.
Over 10 years after the diabetes drug rosiglitazone was approved by regulators, and despite studies on tens of thousands of people, questions remain about its cardiovascular safety. An investigation by Deborah Cohen looks at why this happened.
What Makes a Good Teacher?

Keep what works

Discarding what doesn’t
“A 21st century clinician who cannot critically read a study is as unprepared as one who cannot take a blood pressure or examine the cardiovascular system.”

BMJ 2008:337:704-705
Reflection and Discussion

Do you reflect on your teaching?

As a result of this reflection do you alter your approach?

How much do you share good practice with colleagues?
What makes an EBM course?

3 day workshop with EBM novices

What would you hope to achieve?

Every session should have a purpose
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<th>Time</th>
<th>09:00 – 10:30</th>
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<th>12:30 – 13:30</th>
<th>13:30 – 15:00</th>
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<th>15:30 – 17:00</th>
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<tbody>
<tr>
<td><strong>Intro to EBP</strong></td>
<td>Break</td>
<td>Group Work</td>
<td>Lunch</td>
<td>Study Designs</td>
<td>Break</td>
<td>Search &amp; Computer lab</td>
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<td><strong>Carl</strong></td>
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<td>Carl</td>
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<td>Jeremy</td>
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<td><strong>Critical appraisal of RCTs</strong></td>
<td>Break</td>
<td>Group Work</td>
<td>Lunch</td>
<td>Systematic Reviews</td>
<td>Break</td>
<td>Group Work David</td>
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<td><strong>Appraising Diagnostic Studies</strong></td>
<td>Break</td>
<td>Group Work</td>
<td>Lunch</td>
<td>Ethical issues and Critical thinking in EBHC</td>
<td>Break</td>
<td>Summary and developing EBP</td>
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<td>Jeremy</td>
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<td>Carl</td>
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Robust methods are needed to investigate association between white rice consumption and type 2 diabetes.

Naqvi SA, Westwater-Wood S, Alarfaj G, Atherton H, Cachoeira C, El Khoury JM, McLane MA, Pollissard-Badroy L, Yashina L, Heneghan C.

Comment on
White rice consumption and risk of type 2 diabetes: meta-analysis and systematic review. [BMJ. 2012]

PMID: 22549067 [PubMed - indexed for MEDLINE]
What Makes a Good Teacher of EBM?

5. Changes and influences practice
What Makes a Good Teacher of EBM?

1. Enthusiastic, energetic, excited
2. Highly knowledgeable in their area
3. Maintains that knowledge base
4. Lifelong learner
5. Changes and influences practice
Sum up in one sentence

"promote the active engagement of the learner"
Get some strategies and ideas in order to have a successful teaching experience. These can be relevant for all grade levels and subject areas whether you teach in public schools, private schools, or even homeschool.
Objectives for the week

- What Makes a Good Teacher?
- Areas for improvement
- What should you teach within a EBM class? Therapy, Diagnosis, Prognosis, Harm etc
- What makes an EBM course?
- Type of courses
- What is involved in an EBM curriculum?
- Curriculum for whom
Evidence-Based Medicine curriculum (2013-2014)

The core teaching for evidence-based medicine occurs in the following areas:

- Year 1 & 2: Stats
- Year 2: Preclinical & FHS
- Year 4:
- Laboratory Medicine
- Surgery
- Year 5: Public Health – \( L \)
- Graduate Entry Year 1

Global Competencies for EBM:

The core competencies for Evidence-Based Medicine that may appear in many parts of the course include:

Principles and Basic Practices of Evidence Based Medicine

1. Describe and apply to a clinical case the basic principles of EBM.
2. Describe how EBM, clinical experience and individual patient issues interact.
3. Describe the limitations of EBM.
4. Describe the interaction of EBM and health care policies.

Question formulation

1. Describe how to formulate an answerable, searchable question.
2. Identify the type of clinical question (e.g. treatment, prognosis, aetiology).
3. Describe where and how to look for information to answer different types of clinical questions at the point of care (when answers are needed quickly).
4. Describe where and how to look for answers to different types of clinical questions when clinical decisions can wait.

Critical Appraisal

1. How to read a scientific paper - what are the component parts of a basic scientific paper **
2. Assess the primary literature - how to retrieve primary studies and how to design studies of effectiveness for basic sciences.
3. Distinguish relevant from irrelevant evidence.
4. Define and apply criteria to medical information to determine relevance when answering clinical
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### Competencies

#### Principles and Basic Practices of Evidence Based Medicine
1. Describe and apply to a clinical case the basic principles of EBM.
2. Describe how EBM, clinical experience and individual patient issues interact.
3. Describe the limitations of EBM.
4. Describe the interaction of EBM and healthcare policies.

#### Question formulation
1. Describe how to formulate an answerable, searchable question.
2. Identify the type of clinical question (e.g., treatment, prognosis, etiology).
3. Describe where and how to look for information to answer different types of clinical questions at the point of care (where answers are needed quickly).
4. Describe where and how to look for answers to different types of clinical questions when clinical decisions can wait.

#### Critical Appraisal
1. How to read a scientific paper - what are the component parts of a basic scientific paper?
3. Assess the primary literature - how to retrieve primary studies and how to design studies of effectiveness for basic sciences.
4. Distinguish relevant from irrelevant evidence.
5. Define and apply criteria to medical information to determine relevance when answering clinical questions.
6. Describe a hierarchical approach to levels of evidence specific to types of conclusions.
7. Identify the most valid study design for studies of therapy, prognosis, and diagnosis.
8. Determine methodological quality of evidence, assessing the following types of studies for validity (identify important threats to validity and identify critical flaws in study design).
9. Design a randomized controlled trial.
10. A diagnostic study.
11. A clinical prediction guide study.
Thank you

- Coffee
- Small groups