THE UNIVERSITY AMBROSIANA
Faculty of Medicine
International Graduate Medical Education

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ES608/708: MEDICAL EDUCATION SCIENCES Free Online Pilot Course[1]
Title: Evidence Based Medicine Evaluation
Instructor – Self-Directed

Course Outline, Assignments, Readings, and Resources

COURSE DESCRIPTION:
This course focuses on the study of the quality of resarch and evaluation in evidence based medicine (EBM). The theoretical basis in readings and applied approaches will be explored and utilized in assignments and the final paper.

COURSE DELIVERY: Asynchronous Distance – learners complete at their own pace.

MARKING SCHEME:

Assignments	70%
Final Exam	30%
Total	100%

Note: While this course if free to all, save your work in the event that you want to formally enroll in IGME and use this course for credit.[2] If you choose to enroll and are accepted, the following instructions will apply to the work completed in this free online course:

1. All assignments, papers and/or exams MUST be uploaded to the Course Work section of the course on the portal to receive marks.
2. Individual's name needs to be in the file name of the uploaded assignment along with the course number and assignment number. Use the standard format: "student last name_course number_assignment number".
3. It is the individual's responsibility to ask for additional assistance or time extensions to complete the work as required.
4. In this Pilot course you will be required to complete the readings and the related assignments in the order that these are presented.
5. Each assignment should be less than 5 double-spaced pages (excluding references).
6. The final paper should be less than 10 double-spaced pages (excluding references).

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[1] This is a pilot course for prospective learners registering after September 1, 2016 to apply to the DME/MSc programs. While current IGME students may complete this course, they are not eligible to apply it to their existing program for credit.

Assignment 1: Become familiar with each of the websites in the Readings and Resources section and write a one sentence description of each. (10%)

Assignment 2: In an MS Excel table, rank order the videos according to their degree of clarity and helpfulness from least to most helpful. (10%)

Assignment 3: Define medical education. Conduct a brief literature review to identify the theories and models underpinning undergraduate health and medical education. Describe how you would discover what was the best approach to teaching undergraduate health and medical education. (10%)

Assignment 4: Using instructions in Assignment 3 as a guide, repeat focusing on continuing professional education. (10%)

Assignment 5: Compare and contrast the evidence in support of undergraduate health and medical education and continuing professional education. As well, identify the most common methods used to examine and license medical (and health profession) graduates. (10%)

Assignment 6: Find and read the two papers listed below, then judge whether or not you would include these two papers in a meta-analysis. (10%)
1. Krumholz HM, Amatruda J, Smith GL, Mattera JA, Roumanis SA, Radford MJ, Crombie P, Vaccarino V. Randomized trial of an education and support intervention to prevent readmission of patients with heart failure. J Am Coll Cardiol. 2002 Jan 2; 39(1):83-89.
2. Cline CM, Israelsson BYA, Willenheimer RB, Broms K, Erhardt LR. Cost effective management programme for heart failure reduces hospitalisation. Heart. 1998 Nov; 80(5):442-446.

Assignment 7: One but not both of the papers from Assignment 6 were included in the meta-analyses listed below. Do you think that both papers should have been included or none? Explain your answer. (5%)
- Gwadry-Sridhar FH, Flintoft V, Lee DS, Lee H, Guyatt GH. A systematic review and meta-analysis of studies comparing readmission rates and mortality rates in patients with heart failure. Arch Intern Med. 2004 Nov 22; 164(21):2315-2320. doi:10.1001/archinte.164.21.2315.

Assignment 8: Examine the email string bewteen EMB experts found in **Appendix 1** and comment on how far EBM has evolved in the last two decades. Explain your answer. (5%)

Final Paper: Review in detail the materials associated with the link under a "Novel Approach to Clinical Effect Evaluation and Objective Skills Clinical Exam" and complete the following as your final paper (30%):
1. Define an Objective Structured Clinical Examination (OSCE).
2. Either download and use TRACT (if you have an iPad) or use a spreadsheet to construct patient profiles and six visits including your narrative for each visit and the visit comorbidities (with treatments), life events and symptom changes for each of two patients in two treatment groups (one patient in each group) for any disease of your choice.
3. You are a preceptor (Chief Resident) and have five students with you for one month on an internal medicine unit. How would you use TRACT to measure the student's achievement of their learning objectives?
4. Describe how TRACT could be used in the field as an every-day OSCE? How might this influence the existing examination and licensing standards?

READINGS AND RESOURCES

Orientation and Theory:
- http://www.powershow.com/view1/180dd8-ZDc1Z/Evidence-Based_Medicine_and_Critical_Appraisal_powerpoint_ppt_presentation
- https://www.youtube.com/watch?v=5Ezs1DPUKXA
- https://www.youtube.com/watch?v=Lp3pFjKoZl8
- https://www.youtube.com/watch?v=XCfZB5ZZyso
- https://www.youtube.com/watch?v=IfZ1yzPvUQ8
- ttps://www.youtube.com/watch?v=euBFZdli09Y

Critical Appraisal:
- http://joannabriggs.org/research/critical-appraisal-tools.html
- http://www.prisma-statement.org/

Effect Size Calculators:
- https://www.youtube.com/watch?v=tTgouKMz-eI
- https://www.google.ca/search?as_q=effect+size+calculator&as_epq=&as_oq=&as_eq=&as_nlo=&as_nhi=&lr=&cr=&as_qdr=all&as_sitesearch=&as_occt=any&safe=images&as_filetype=xls&as_rights=
- https://www.youtube.com/watch?v=UVK1P7HthzU
- http://internationalgme.org/Resources/Pubs/Meta-analysis%20Converting%20among%20effect%20sizes.pdf

Item Analysis:
- https://www.youtube.com/watch?v=87oTEZqLQEM
- https://www.youtube.com/watch?v=SrdbllMYq8M

Information Assessment Methods:

JAMA Evidence
- http://jamaevidence.mhmedical.com/

IAM - The Information Assessment Method
- http://www.mcgill.ca/iam/

Systematic Review and Meta-analysis:
Systematic Review Guides:
- https://www.youtube.com/watch?v=WB9pbHqUs5c
- http://beckerguides.wustl.edu/SystematicReviews

Systematic Review Databases:

Pretty Darn Quick Database:
- http://www.pdq-evidence.org/en/about_us/

Cochrane Database:
- http://www.cochrane.org/

Cochrane Task Exchange:
- http://taskexchange.cochrane.org/

Oxford Systematic Reviews:

- http://libguides.bodleian.ox.ac.uk/systematic-reviews

EBM Resources:
- https://becker.wustl.edu/classes-consulting/specialized-expertise/evidence-based
- http://www.uptodate.com/home
- http://www.dynamed.com/home/content/evidence-based-content/7-step-editorial-process
- http://harrell.library.psu.edu/c.php?g=344586&p=2321221
- https://www.youtube.com/watch?v=Ij8bPX8IINg

EQUATOR Checklists for Publication
- http://www.equator-network.org/

Conflict of interest in online point-of-care clinical support websites:
- http://jme.bmj.com/content/early/2014/02/03/medethics-2013-101625.abstract

Platinum Lite (for listening to Audio Digest):
- https://itunes.apple.com/US/app/id932493752?mt=8

York Centre for Reviews and Dissemination:
- http://www.crd.york.ac.uk/CRDWeb/

National Institute for Health and Care Excellence:
- https://www.nice.org.uk/guidance

Review:
- https://www.youtube.com/watch?v=DadRleW_pE4
- http://uk.cochrane.org/news/imperfections-evidence-based-medicine
- http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(16)31592-6.pdf

Novel Approach to Clinical Effect Evaluation and Objective Skills Clinical Exam:
- http://internationalgme.org/TRACT/IGME_TRACT_2015.htm

Sample Evidence Based Medicine discussion and references related to Clinical Practice Guidelines:

To be provocative, following are a few reasons why clinicians in general should be encouraged NOT to follow guidelines, the way many of them are presently written, especially when it comes to chronic disease state guidelines. Obviously, specific guidelines/checklists for things like surgery, etc. are very important, but not so much for many other conditions:

- No more than 10% of guideline recommendations are based on RCT data:
  JAMA 2009;301:831-41
  http://jama.jamanetwork.com/article.aspx?articleid=183453
  Arch Int Med 2011;171:18-22
  http://archinte.jamanetwork.com/article.aspx?articleid=226373
  BMC Med. 2015; 13: 244
  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4587677/

- Less than 0.5% of the words in guidelines for HTN, chol, glucose and osteoporosis relate to shared decision making or patient's values and preferences when in fact these conditions are all about shared decision making:

Can Fam Physician 2007;53:1326-27
http://www.cfp.ca/content/56/6/e206.full.pdf
https://youtu.be/DHDnqQ_mCBA
- HOWEVER - guidelines could be great if they....
   http://www.cfp.ca/content/61/10/857.full

Appendix 1: Below is a recent email string from the Evidence Based in sequential order:

1 - I've just been reading about the controversy around a potentially 'dodgy' trial and it got me thinking about the limitations of critical appraisal. This trial was deemed to have been fair and influenced numerous guidelines around the globe. Critical appraisal of articles relies on the notion that the article is a fair reflection of the trial. This appears to be an act of faith. While I'm not saying critical appraisal is not a worthwhile activity my concern is that people see a paper, appraise it and therefore assume that it means the study is fair/good. The reality is that after an appraisal what you can say is that the trial, as reported/represented in the article, appears to be fair/good. Does critical appraisal need a health warning?

2 - A while back we published "Evolution of evidence-based medicine to detect evidence mutations."
http://www.ncbi.nlm.nih.gov/pubmed/25572989 or http://jrs.sagepub.com/content/108/1/8.long

3 - The problem with critical appraisal is that relies on the quality of reporting, but as we showed in these two papers, the quality of reporting is not necessary equal to the quality of actual conduct:
http://www.ncbi.nlm.nih.gov/pubmed/22424985
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC313900/

Fair, or not fair, the underlying premise behind critical appraisal is indeed "if it was not reported, it was not done". The insistence on the quality of reporting is of obvious societal benefit (i.e. increase trust in clinical research, enables/improves conduct of meta-analyses, etc) but it can certainly unfairly characterized some, otherwise, well-done trials. While reporting clinical research is distinctly different from assessing the practice of medicine, it should be noted that the premise that if "it was not reported, it was not done", has also been widely accepted in the quality of improvement arena, which directly impacts the way how health care is financed. Not surprising, many physicians consider this unfair way to characterize their performance.

4 - My aim when reading a paper is "If I were to repeat this study in my own setting, what is the probability that I would get a similar result within a range acceptable to me that would prompt me to make the decision recommended by the authors (eg implementing a treatment or test)". In order that the probability of replication of the result within some range acceptable to me is high, the probability of non-replication due to chance must be low (ie N must be high enough), the probability of hidden or obvious bias must be low, the probability of poor or dishonest reporting must be low, the probability of a major effect of differences in the methods available to me and my type of patients must also be low. The probability of some confounding factor that I have not thought about yet must also be low!

Note that if my estimated probability of replication was 0.9 and I did repeat the study and could not replicate it, this might be because my repeat study was one of the 10% of my repeat studies with a 90% frequency of replication that failed to replicate a sound study in this instance. It might well be replicated by others in the long run. This is the sort of thing that I teach in the Oxford Handbook of Clinical Diagnosis! Please advise.

5 - Your logic reflects the EBM approach: the findings are closer to the "truth" if biases and random errors are taken into account. However, the assessment of the study's accuracy, often does not translate into (rational) actions. For example, it is often the case in oncology that well-some studies shows that certain treatment does not work. Then a lousy (reported) study "demonstrates" a different treatment apparently does improve important patients outcomes. Facing with with high confidence that "A" does not work, and low confidence that "B" apparently works, people uniformly opt for the latter. Is such a behavior rational? I would appreciate the response from any as many people as possible (I will collate the responses and share with the group)

6 - Well. I suppose that it is a matter of any port in a storm. If the situation was desperate then it understandable (in terms of Decision Analysis jargon) that if the utility of the dodgy drug effect is high then even if the probability of it working is low, it may be the best option at that time if the alternative is unlikely to work.

By the way I did not mention whether the probability of replication by chance was based on a single study or multiple studies (eg a formal meta-analysis or a subjective Bayesian approach). The reasoning applies to any of these situations of course. Do you know of another reference to the reasoning that I described in my previous post?

7 - I would suggest that discussion of critical appraisal really needs to consider the skill and practice in three key groups: Manuscript reviewers for biomedical journals (a proactive opportunity to question and improve what gets published, recognizing that skilled editors can't be expected to spot everything themselves alone), the intended immediate audience (a reactive opportunity, the research community), and third-party audiences (both a proactive opportunity, journalists, as well as a reactive opportunity, the general public and policy decision-makers).

All of these groups, working in concert, are our best insurance against research fraud persisting (e.g., the classic example of investigative journalist Brian Deer, not peer-review, discovering fraudulence in published research which had such a strong impact on vaccine uptake). All of these can do better in recognizing how presentation format helps or hinders critical appraisal and true understanding (see, for example, Gigerenzer et al., Psychological Science in the Public Interest 2007;8(2)), and advancing "balanced reporting" beyond just giving equal time to all sides regardless of what is fundamentally untruthful or clearly misleading. On the other hand, influence of popular media in today's news-as-entertainment world cannot be overlooked.

Discussion thus far seems to have focused on RCT and quality of initial scientific publication. Broad discussion might shed more light on why patients and consumers are confused about choices (rather than just willing to knowingly accept higher risk when in desperate nothing-to-lose type situations), and on what might be done to present EBM in a more convincing public format. See, for example, my viewpoint commentary "Buyer beware: health choices information broadcast to the public" in International Journal of Health Governance 2016;21(1) (http://www.emeraldinsight.com/doi/abs/10.1108/IJHG-12-2015-0035).

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9 - you said: My aim when reading a paper is If I were to repeat this study in my own setting, what is the probability that I would get a similar result within a range acceptable to me that would prompt me to make the decision recommended by the authors (eg implementing a treatment or test). However Mr. Doe's point is that you cannot answer that question based on the published report. Because the published report does not necessarily contain the information required to make the decision. A few
concrete examples have been given in this thread.

10 -As I recall , the access to the protocols allowed avoiding the "not-clear" basket category