S. B. K. S. MEDICAL INSTITUTE & RESEARCH CENTRE

EVIDENCE BASED EDUCATION SYSTEM

EBM CURRICULUM

EVIDENCE BASED MEDICINE (EBM)

Preamble:

Evidence based medicine (EBM) simply means the need for judicious use of current, objective information in making decisions about the care of individual patients. The term was coined to encourage proficiency in judgments by individual clinicians based not only on "experience" but also on experience informed by results acquired in systematic approach. In other words, it is nothing but more scientific and sophisticated version of "Biostatistics and Epidemiology" of recent past.

In a way, EBM is not a new concept. Flexner, who in 1910, had set modern medical education on a scientifically sound footing, had also demanded that what was taught be predicted on hypothesis, experiment, analysis, refinement, refutation or validation of hypothesis, and, in aggregate, scientific method and scrutiny. And how can we forget Hippocrates – Father of modern medicine? Nearly 2500 years ago he made a clear distinction between the priesthood and the profession, and……. chose the latter.

However, it will still be prudent to consider EBM as a new paradigm in medical practice. EBM de-emphasizes intuition, unsystematic clinical experience, and pathophysiologic rationale as sufficient grounds for clinical decision – making, and stresses the examination of evidence from clinical research. EBM requires new skills of the physician, including efficient literature searching, and the application of formal rules of evidence in evaluating the clinical literature. The influence of EBM on clinical practice and Medical Education is increasing.

In summary, EBM requires skills to find and critically appraise medical literature to get and apply the best evidence to clinical decision – making.

Though all of us, either as students of medicine or as practitioners / teachers of medicine, have learnt or taught / practiced on basis of evidence, it was without our conscious knowledge. It is time now to do the same consciously. For this reason there is a need to sensitizing young medical students to the concept of evidence based medicine. This also calls for a short course on EBM in learning techniques throughout the period of undergraduate study with the hope that the future medical practice of these students will be based on EBM.

So long there has been no formal and structured course on teaching EBM to under graduate medical students, especially in India. However, there is an increasing trend worldwide to incorporate these sophisticated strategies into medical curricula for under graduate students. To meet this demand, a short but structured curriculum is prepared as under and kept in place.

EVIDENCE BASED MEDICINE CURRICULUM

Teaching Evidence Based Medicine to medical students is the key to increasing the uptake of evidence-based treatments and practices in medicine. Hence a formal curriculum on Evidence Based Medicine is designed for undergraduate Medical students. This proposed EBM curriculum is built upon adult learning principles which include peer teaching, hands on training, group discussion, integration of research, reasoning, independent learning etc. Problem-based and evidence based learning in a classroom environment with a predetermined teaching scenario is also an effective method for introducing the principles of evidence based health care. The course is designed to help students understand the fundamental knowledge of EBM, including research methodology, epidemiology, biostatistics, and acquire the skills of literature searching and critically appraising the scientific literature.

WHAT IS THE AIM OF THE COURSE?

> The aim is to facilitate a learning experience that will provide the knowledge & skills to develop, implement and disseminate among students so they can able to practice an evidence-based health care and able to do effective evidence based clinical practice.

THE COURSE SUPPORTS THE FOLLOWING OBJECTIVES:

1. The ability to evaluate critically new knowledge and to determine its relevance to the clinical problems and challenges presented by the individual patient.
2. The ability to interpret, assess, integrate, and apply data and information in the process of clinical problem solving, reasoning, and decision making
3. The ability to learn independently.

THE EBM COURSE IS A STEP TO ACHIEVE THE FOLLOWING COMPETENCIES:

A. Knowledge

1. Define basic statistics, epidemiologic concepts, and study designs
2. Locate high quality medical information resources and know how to use them

B. Skills

1. Use computers and PDAs effectively to find answers to clinical questions at the point-of care
2. Complete an effective MEDLINE search of intermediate complexity
3. Assess the quality of a study
4. Critically evaluates the medical literature and weighs competing evidence
5. Balance evidence, clinical expertise, and patient preferences in medical decision-making

C. Attitude

1. Believe in the value of life-long learning
2. Value evidence in making medical decisions over opinion

EDUCATIONAL OBJECTIVES OF THE COURSE:

At the completion of EBM teaching, students will be able to:

1. Define evidence-based medicine, and describe the EBM process.
2. Value evidence in making medical decisions over opinion and the practice of life-long learning.
3. Distinguish between different scales of measurement; define mean, median, mode, variance, range, and probability.
4. Define epidemiologic concepts of incidence, prevalence, rate etc.
5. Recognize differences in study design for both observational and experimental studies including randomized controlled trials, community intervention trials, cohort studies, case-control, cross-sectional, case series, community surveys, systematic reviews, and meta-analyses.
6. Discuss the strengths and weaknesses of each and the application of appropriate statistics for each study type.
7. Recognize the value of a literature search strategy and define MeSH. Translate strategy into a MEDLINE search of moderate complexity using MeSH and limits appropriately.
8. Define principles of statistics used in cohort and case-control studies including odds ratio, relative risk, and absolute risk. Define and recognize types of bias found in these studies.
9. Explain the difference between statistical significance and clinical significance
10. Understand the use of and define markers to evaluate the strength of evidence, including absolute and relative risk reduction, number needed to treat, and confidence intervals. Differentiate between disease and patient oriented evidence.
11. Understand the application of statistical and study-design concepts in evaluating clinical trials.
12. Describe and define characteristics of randomized controlled trials such as randomization, blinding, concealed allocation, intention-to-treat analysis and explain how these characteristics reduce bias.
13. Describe how the EBM process is used and applied in a medical setting. Distinguish between narrative review articles, systematic reviews, and meta-analysis and

understand issues in using them such as publication bias, forest plots, and heterogeneity.

14. Identify clinical issues where assessment of the evidence would be helpful.
15. Search out and critically appraise relevant medical literature so as to find the best evidence for the given clinical situation and interpret his findings and develop an implementation strategy.
16. Concisely present the evidence on a clinical issue.
17. Describe the limitations of EBM.

CONDUCT OF THE COURSE:

The EBM course will be conducted through lectures, assignments, small groups and Practical classes. Lectures will help students to understand basic knowledge. Lectures will be taken by experts in epidemiology, biostatistics, human research and trained teachers for EBM.

ASSIGNMENTS:
Assignments are given to students to enhance critical thinking skills and promote independent learning.

PRACTICAL:
Practical is planned in the four years on a one to one interaction basis along with hands on training in small groups which will enhance student's skill and interest in EBM. Faculty will facilitate small groups teaching. They will take attendance and evaluate student knowledge, participation, listening, and preparation.

PEER TEACHING:
Students will be assigned a micro-topic and allowed to teach the other students about the assigned topic. Teacher will be observer during this exercise.

ROLE PLAY:
During their clinical posting in clinical subjects, case will be selected for role play and the facilitator will follow all the steps of evidence based decision making and will take shared decision (in final MBBS).

EVIDENCE GENERATING COMMUNITY HEALTH PROJECT
The EviGenCHIP enables UGs to gather skills in developing new and innovative approaches to solve community health problems by generating evidences.

CLINICAL QUERIES

Course Contents:

1st MBBS

SYLLABUS FOR FIRST M.B.B.S.

Aims:

1) Understand concept of Evidence Based Medicine.
2) Able to formulate a question on aspirations of patients (mock clinical situations)
3) Understand the concept and manner of library & internet search.

Theory classes **15 hrs**

1.1.1 EBM:

- 1.1.1.1 Definition
- 1.1.1.2 History
- 1.1.1.3 Concept of EBM
- 1.1.1.3 Advantages of EBM.
- 1.1.1.4 EBM vs Opinion,
- 1.1.1.5 Gap between research and practice
- 1.1.1.6 Introduction to Levels of evidence.

1.1.2 Process of Evidence Based Decision Making (EBDM):

- 1.1.2.1 Steps and process of EBDM
- 1.1.2.2 Formation of PICO
- 1.1.2.3 Search and acquire evidence
- 1.1.2.4 (Introduction) available evidence
- 1.1.2.5 (Introduction) decision making.

1.1.3 Skills required for searching: -

- 1.1.3.1 Library
- 1.1.3.2 Online
- 1.1.3.3 Smartphone's, correspondence on email.
- 1.1.3.4 Library network

1.1.4 Searching for Evidence: - Search Engines

1.1.5 Medical databases

1.1.6 Sources of Evidence

- 1.1.6.1 Primary source of evidence

1.1.6.2 Secondary source of evidence

1.1.7 Introduction: - Evaluation of the Evidence

1.1.8 Reading of various articles and research papers from Journal

1.2 **Practical class: 8 hrs**
(Hands on training in small group will be provided in a Computer lab with internet connectivity). The following topics will be demonstrated and worked upon:

As a Workshop at Library:-
1.2.1 Role plays for basic searching strategies and searching protocol.

1.2.2 Use of PubMed

1.2.3 Use of EBSCO

1.2.4 Use of Google Scholar

1.2.5 Use of secondary sources of evidence

1.3 **Home Assignments**:-

1.3.1 Bibliography preparation

1.3.2 Formulating the Question on 10 topics (PICO)

1.4 **Project:-**

1.4.1 Application based project specifying PICO format search for 5 to 6 recent Evidences

2nd MBBS

SYLLABUS FOR SECOND M.B.B.S.

COURSE CONTENT:-

Aims:

1) Summarize past knowledge. Recapitulate formulating question.
2) Searching in details
3) Learn advanced search options and focus on peer reviewed articles.
4) Learn to research on basis of question formulated.
5) Understand the importance of controlled and standard trial basis.
6) Use case studies to learn searching methodology.

Theory classes **15 Hrs**

2.1.1 Summarize the 1st year knowledge

2.1.2 Various search engines (& Databases)

- 2.1.2.1 Google
- 2.1.2.2 Bing
- 2.1.2.3 Wikipedia
- 2.1.2.4 Pubmed
- 2.1.2.5 Cochrane library
- 2.1.2.6 Uptodate use

2.1.3 Search Filters use in Search Engines

2.1.4 Concept: - Evidence Pyramid of knowledge

2.1.5 Biostatistics use in EBM

2.1.6 Research Design

- 3.1.2.1 Importance of Research
- 3.1.2.2 Types of Research,
- 3.1.2.3 Choice of Research design

2.1.7 Levels of Evidence

2.1.8 Concept: - How to read Research paper (Evidence based journal Club)

2.2 **Practical class: 8 hrs**
(Hands on training in small group will be provided in a Computer lab with internet connectivity). The following topics will be demonstrated and worked upon:
2.2.1 Use of search engines and searching with use of advance searching limits.

- 2.2.1.1 Use of PubMed
- 2.2.1.2 Use of EBSCO
- 1.2.1.3 Use of Google Scholar
- 1.2.1.4 Use of secondary sources of evidence

2.3 Project:-

- 1.4.1 Application based project specifying PICO format search for 5 to 6 recent Evidences (in all databases, they have to rate the evidences)

3rd MBBS

SYLLABUS FOR THIRD M.B.B.S. – PART – I

COURSE CONTENT:-

Aims:

1) To consolidate searching methodology.
2) Various Research methods and application of same with small community based EviGenCHIP Cohort studies, RCT trials etc.

Theory classes **12 Hrs**

3.1.1 Biostatistics

- 3.1.1.1 Definition
- 3.1.1.2 Use for EBM
- 3.1.1.3 Measures of central tendency,
- 3.1.1.4 Hypothesis testing,
- 3.1.1.5 Odds ratio,
- 3.1.1.6 Relative risk,
- 3.1.1.7 Confidence interval,
- 3.1.1.8 Various statistical methods and its appropriate use
- 3.1.1.9 Bias and error.

3.1.2 Review of Research Design

3.1.3 Observational studies (Definition, characteristics strength, weakness and related statistics in each of the following)

- 3.1.3.1 Cross sectional study,
- 3.1.3.2 Case control study
- 3.1.3.3 Cohort study

3.1.4 Experimental study: (Definition, characteristics, strength, weakness and related statistics)

- 3.1.4.1 Randomized controlled trials
- 3.1.4.2 Non-Randomized trials

3.1.5 Epidemiological concepts

- 3.1.5.1 Incidence
- 3.1.5.2 Prevalence

3.1.6 Amalgamate the correct study design with Statistical analysis.

3.1.7 Consumer Protection act, standardization protocols.

3.2 Workshop of EviGenChip

3.3 Project:-

- 3.3.1 EviGenChip

3rd MBBS Part-II

SYLLABUS FOR THIRD M.B.B.S. PART – II

COURSE CONTENT

Aims:

1) Review past knowledge.
2) Understand validity of Research material.
3) understanding clinical query

4.1 **Theory** **07 Hrs.**

4.1.1 Review of EBM

4.1.2 Evidence based treatment Protocols

- 4.1.2.1 Why it is Imp.

4.1.2.2 Standard protocols at International/national/local level and its applicability.
4.1.2.3 Proforma of Protocols

4.1.3 Short research project based on local treatment protocols

4.2 **Practical: 12 Hrs.**
4.2.1 Critical appraisal of –
4.2.1.1 Epidemiological study
4.2.1.2 Randomized controlled trials
4.2.1.3 Systematic review and Meta analysis

4.2.2 Clinical case management on evidence based system

4.3 Assignments:
4.3.1 Chart on Evaluation
4.3.2 Clinical Queries: - Identify clinical problems and prepare CATs (critically appraised topic)

5. Evaluation: Final exam conducted with university examination for each MBBS phase as a theory examination only.

5.1 Theory: 30 marks (1 Hour)

5.2 Scheme of Theory examination:
5.2.1 Three short essay questions of 05 mark each.
5.2.2 Fifteen MCQ of 01 marks each.

5.3 Assignments/Internal for 20 Marks is to be calculated from the assignment marks for each MBBS phase.

5.4 Guidelines for evaluation of assignments:
5.4.1 Marks will be given for each assignment and Each assignment will carry 20 marks.

5.4.2 Marking will be done as per Check list which will be preserved in the department.

5.4.3 Marks achieved by the student for each assignment will then be totaled. Percentage will then be calculated and as per the percentage marks out of 20 will be awarded.

5.4.4 The Project/Assignment marks (internal marks) will be submitted to the reforms committee/Dean office at the time of prelims exam with departmental subject marks.

5.5 **Grading system:**

5.5.1 The student is evaluated for a total of 50 marks (Theory 30 Marks+ Assignment 20 marks) and graded on a ten point scale as A to D.

Grade A+	41-50
Grade A	31-40
Grade B+	21-30
Grade B	11-20
Grade C	≤ 10

5.5.2 Marks may/will not be calculated for rank.

5.5.3 Student who excels with 'A' grade in all the four exams will be granted subject proficiency award.

Suggested Text-book: (few Books examples)

Sharon E. Straus, W. Scott Richardson, Paul Glaszion and R. Brian Haynes: Evidence Based Medicine: How to Practice and Teach EBM (Third Edition), Charchill Livingstone, 2005.

Suggested Website: (few website examples)

- http://www.cebm.net
- http://ebm.bmj.com
- http://researchguides.uic.edu/c.php?g=252338&p=1683347
- http://ktclearinghouse.ca/cebm/intro/whatisebm
- http://med.fsu.edu/index.cfm?page=medicalinformatics.ebmTutorial
- http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291756-5391
- http://www.ebm.med.ualberta.ca/
- http://www.dartmouth.edu/~biomed/resources.htmld/guides/ebm_resources.shtml
- http://community.cochrane.org/about-us/evidence-based-health-care
- http://www.ebmedicine.net/
- http://www.nyam.org/fellows-members/ebhc/
- http://ebm.mcmaster.ca/
- http://www.openclinical.org/ebm.html
