

## Curriculum for Evidence Based Medicine for MBBS II phase Graduates

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### Introduction:

**Problem statement and need assessment:** Health care system is complex and challenging with ever expanding newer technologies, researches and treatment protocols, leaving back lacuna of dilemma to whether accept the newer method in clinical practice or not. Traditionally, professors taught the graduates and the same information has been passed down through several generations, but hardly with any modification. This kind of instruction may be helpful in learning basics of medicine but is not sufficient to meet the multifaceted needs of the patients, especially in the present era where patients have right to know what is been done to them and why.

Keeping up with recent advances in medicine and being able to manage patients is a challenge. Each day, we are un-dated with information about new techniques, tests, procedures, materials or products. Our aspiration to keep up to date is frequently tinged with doubt about the claims of superiority of these new treatments or products.<sup>1, 2, 3</sup> In the quest to address this problem “New approach to teaching the practice of Medicine” has emerged which is described as “paradigm shift” and called “Evidence- based Medicine” (EBM) and was first discussed in 1992.<sup>4</sup> The paradigm was meant to replace an “authoritarian (Opinion-based)” attitude in Health-care with an “authoritarian (evidence-based)” one.<sup>4,5</sup> EBM is a process of making decisions by incorporating best known evidence with clinical expertise and patient values.<sup>1</sup> (Figure-1)



**Figure 1 Integration of Evidence based dentistry**

Evidence-based practice is a process of lifelong self-directed learning, providing health care to patients, creates the need for important information about etiology, diagnosis, prognosis, treatment, and other clinical and health care issues. Teaching evidence-based medicine to medical students is the key toward increasing the uptake of evidence-based treatments and practices in medicine.

The current medical undergraduate curriculum of health profession in India and most of the world is based on past knowledge accumulated for years. The scientific relevance of the mostly outdated information has never been questioned. The students passively absorb this

available knowledge and apply it in their future professional life. There is no active learning on their part, by way of positive enquiry and critical analysis of the curriculum imposed on them. This has an undesirable impact on their competency as health professionals and the quality of the health care imparted by them. To make matters worse, the sources of information in their professional career include likeminded co-practitioners and pharmaceutical companies with vested interests. There is an urgent need to implement EBM in the curriculum to make the students competent and updated. The students will be empowered with practice of EBM which would ensure quality health care in the long run. With the advancement in the information technology and computer sciences this is the right time to introduce EBM.

**Ideal Approach:** Introduction of EBM curriculum to medical undergraduates at II phase level as they will be entering the clinical postings. Teaching learning methodologies should encourage for updating knowledge and self-directed learning with critical thinking. Students should be exposed to real world situation and made to apply EBM skills in a stepwise manner. Program should emphasis on professionalism.

The gap between current and ideal approach: The present MBBS curriculum stagnant for many years and is not based on EBM. Teaching and learning occurs passively which is by itself a big hurdle in health care system. EBM in curriculum of MBBS can fill up the gap between current and ideal approaches. Early introduction of EBM in the undergraduate medical curriculum, in the form of a short course, using various modes of instruction, enhances the competence of critical thinking and also influences change in attitude towards EBM positively in medical students.<sup>6</sup>

Advantages of EBM is that it effectively utilizes the resources like research evidence in clinical practice which helps in monitoring and development of clinical performance.<sup>1</sup> However implementing EBM is associated with many barriers which could be critical for success of the program. These can be at all level like students, faculty and organization.<sup>7</sup>

#### **Following are Steps in Evidence based medicine (EBM)**<sup>2,3,7,8,9</sup>

1. Converting information needs /problems into clinical questions so they can be answered by the PICO process. The process starts with a patient question or problem. A “well-built” question should include four parts, referred as PICO that identify the Patient Problem or Population (P), Intervention (I), Comparison (C), and Outcome(s) (O).
2. Conducting a focused computerized search with appropriate method to find the best external evidence which is suitable to answer the question precisely.
3. Next step is critically appraising the evidence for its validity and usefulness (clinical applicability). This helps in understanding what is been found and its relevance to patient, and the PICO question.
4. The fourth step is to determine whether results are potentially beneficial or harmful. This is achieved by looking at whether there is an association between specific

treatments and outcomes or exposures, the strength of this association, and the condition of interest, i.e., patient problem or question.

**Goal:** The goal of this integrated EBM curriculum is to make, undergraduate medical students understand basic knowledge, skills and attitude required in evidence based medicine by using the effective teaching learning strategy that fosters many of the essential concepts such as critical thinking, communication, leadership, professionalism, problem solving skills and inculcating behavior for lifelong learner.

**Objectives:** By the end of the course students should be able to

- I. Cognitive: Define the term evidence-based practice and identify the key steps of evidence-based practice. Discuss key strategies for disseminating evidence. Development of student's ability to use research evidence in clinical decision making and become a lifelong learner.
- II. Psychomotor skills: Formulate a searchable question with minimum 90% accuracy. Demonstrate the competency in searching the literature efficiently with minimum 90% accuracy as per the prescribed methodology. Appraising the literature critically with minimum 80% accuracy as per check list. Applying the result to clinical practice or to the patient with minimum 90% accuracy.
- III. Attitude:
  - 1) Appreciate the importance of EBM and thoughtful action in day to day life
  - 2) Awareness about the change in the medicine and research every day

**Education methodology and Implementation:** The EBM course is planned to introduce in the curriculum of medical undergraduates at the beginning of second phase when they enter clinical posting. Total number of student would be 100 per batch and the course duration will be of 1 year. Blue printing of the course syllabus is done in multiple consultation with members of university board of studies, subject experts, external advisory board and institutional administrators.

**Course content:** The content area is carefully plotted to cover the desired objectives in whole length and breadth with special concern not to cross the content area. The syllabus contains history and introduction to EBM, global scenario and need for EBM, steps of EBM and how to critically appraise before executing in clinical practice.

**Educational methodologies:** The training program incorporates multiple teaching methods like lectures, interactive discussion sessions, demonstration, case based learning, timely feedback, real life problem exposure, role modeling and peer evaluation. The curriculum emphasizes student centered and self directed learning. The interested faculty members will be motivated and trained to manage at various levels of the curriculum. We require one curriculum coordinator, 2 subject experts and 4 facilitators. The course will be for 50 hours duration comprising 6 hours of lecture, 4 hours of interactive sessions, 16 hours of case based learning (CBL), 4 hours of demonstration and 20 hours of clinical postings.

Lecture classes will be taken in the beginning of the course to cover topics like history and introduction to EBM, global scenario and need for EBM, steps of EBM and how to critically appraise before executing in clinical practice. Lecture classes will be for 45 minutes, twice weekly for the first month. At the end of each lecture 15 minutes will be allotted for discussion. This session would meet the cognitive objectives of the course. For case based learning the batch will be divided into 4 large groups of 25 each which will further be divided into 5 small groups comprising of five students each. All large groups will have one facilitator. Students will be provided with the study materials in the form of articles, notes, charts and handouts before the CBL classes and students should come prepared to the class. Duration of each class will be one hour.

During demonstration classes instructor demonstrates the methods of EBM with PICO sheets to students by computer application. The students are demonstrated in large groups and asked to perform in small groups. This is efficient educational method for demonstrating skills and procedures. This will be carried out in four sessions, each lasting for one hour. After going through various learning sessions students will be posted to clinics. In this session 10 varieties of standardized patients will be used where they are trained to play the roles of patients with specific problems. This allows learners to try new techniques, make mistakes and repeat the performance until it is achieved. This also improves basic communication skills and physical diagnosis skills, professionalism and ethics. The standardized patients reveal their problem and students search for the best evidence for treatment. In this session different case will be given to each group and they will discuss the case find out the evidence and present the case. Other group students will give feedback and there will be discussion on the case. Facilitators will observe each student directly, give timely feedback and encourage them to critically appraise themselves.

**Assessment:** The program is intended to assess students throughout the course. At the end of each EBM session, the student receives feedback on the performance from the faculty and peers. Faculty members assess students on their attendance, appropriate use of information, selection of evidence, application of PICO and critical appraisal on Likert five point scale.

Two formative and one summative exam will be conducted at regular intervals. Students are expected to achieve the required objectives. Assessment will be objective type using check list prepared by subject experts. The overall course grade is based on individual assessment. These assessment grades are considered to determine the internal assessment grade points for the EBM course, based on the following scale Grades: A 81-100, B 61-80, C 50-60, D <50 (fail) . Passing the exams is essential to go into next phase. At the completion of training program students feedback will be taken through validated questionnaires to evaluate the effectiveness of using EBM, later students are allowed in clinical posting where they will be applying the theoretical and practical knowledge during clinical postings and also in their practice.

Measures to overcome barriers: There is a likely resistance from the faculty members for the new integrated and innovative method because it demands more time and efforts in preparation. This can be overcome by conducting a faculty development meeting to explain the merits of EBM. For this extra work, some academic credit points can be given to the faculty members. A workshop will be conducted on EBM that will train the faculty in the application of EBM and in the formation of material to conduct EBM sessions.

There would be resistance from the students because EBM demands more work. This can be overcome by conducting an orientation program. The orientation program can be aimed at taking students into confidence, answering their questions, explaining the merits of the EBM and how it helps them in their future profession and make them lifelong learners. Extra time allotted for EBM, this can be overcome by rescheduling the timetable of the course. Regular reinforcement programs in the form of discussion classes, workshop and CME peer evaluation will be conducted to take care of decay of knowledge.

**Instructional concept:** Principles of Merrill<sup>10</sup>: This theory is useful for educators who wish to embrace the positive aspects of inquiry, exploration, and success of their students. This approach will result in the students learning, doing, and implementing a lesson topic into their practice.

**Activation:** Students are given pre-test and introductory class followed by CBL classes about evidence based medicine which describes about importance and application EBM. Through this session students are activated and learn deeply regarding EBM.

**Demonstration:** Demonstration is done by computer assisted learning and application. This helps students to search for best evidence, critically appraise and choose the correct diagnosis and treatment plan for the problem.

**Application:** Students apply Evidence based reasoning through journals, books, articles, PUB MED and Medline, PICO process will be applied during the exercise. The first step in developing a well-built question is to identify the patient problem or population [P] by describing either the patient's chief complaint or by generalizing the patient's condition to a larger population.

Second step is identifying the Intervention [I]. It is important to identify what you plan to do for that patient. This may include the use of a specific diagnostic test, treatment, adjunctive therapy, medication or the recommendation to the patient to use a product or procedure. The third step is the Comparison [C], which is the main alternative (intervention) and should be specific and limited to one alternative choice, usually the gold standard, in order to facilitate an effective computerized search. The final step of the PICO is the outcome [O]. This specifies the result(s) of what you plan to accomplish, improve, or affect, and it should be measurable. Evaluate and integrate best research outcomes with clinical expertise and patient values for evidence-based practice.

**Integration:** Students integrate this knowledge of EBM during their course and apply principles and benefits, outcomes of the applied evidence in their practice or patient.

**Evaluation:** To review our progress after one year of implementation the EBM curriculum is evaluated by feedback obtained from the students and also from curriculum director. It will be evaluated on the basis of Kirkpatrick evaluation model<sup>11</sup>. The four levels of Kirkpatrick's evaluation model essentially measure: reaction of student [Level- 1], what they thought and felt about the training on Likert satisfaction questionnaire scale. Level [ 2] learning - the resulting increase in knowledge or capability behavior - extent of behavior and capability improvement and implementation, Level[ 3]application- transfer of learning to the workplace application of new skills and Level [4] results - changes in organization, improvement in students learning and improvement in patients outcome.

**Curriculum maintenance:** The EBM curriculum needs to be paced with the needs of learners, faculty, institution, resources and patients. This curriculum is maintained by curriculum team which includes faculty, support staff and dean. This is accomplished by orientation, proper communication by memos, emails, newsletter, group meeting; faculty development program, team activities, recognition and celebration by rewards.

**Conclusion:** Evidence based medicine is the use of current best evidence in making decisions about the care of individual patients. Providing evidence based medicine makes practitioners question and think about what they are doing. Information needs to be assessed, and its validity determined. It is essential to establish the fundamentals of evidence based practice during the undergraduate curriculum when medical students are taught important information about diagnosis, prognosis, and treatment. The ultimate goal would be assisting medical students in learning the skills to practice evidence-based medicine so that they can provide their future patients with the best clinical evidence and judgment for optimal and cost-effective medical care. The principles of David Merrill of instructional designing theories guide teacher in implementing EBM to undergraduate students and program evaluation by Krick patrick evaluation model will help to maintain and improve the curriculum.

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