

**Evidence-based Medicine**

Code: 102875  
ECTS Credits: 3

Degree	Type	Year	Semester
2502442 Medicine	OT	3	0
2502442 Medicine	OT	4	0
2502442 Medicine	OT	5	0
2502442 Medicine	OT	6	0

**Contact**

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**Use of Languages**

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: No  
Some groups entirely in Spanish: Yes

**Teachers**

Gerard Urrutia Cuchi

**Prerequisites**

There are no prerequisites, but English reading skills (scientific literature) and internet access are necessary.

**Objectives and Contextualisation**

Evidence-based medicine (EBM) aims at accelerating and improving the clinical use of the best available scientific evidence from relevant clinical research (ideally patient-focused high-quality studies). EBM therefore requires the ability to integrate individual clinical experience with the best external scientific evidence available, in order to offer high-quality patient care by suggesting the most effective treatment based on the resources and means available in our setting.

For many years -and still nowadays in some areas-, Medicine -as well as other healthcare disciplines- has used theories about the mechanisms of action of many of the interventions without duly contrasting the hypotheses on which these theories are based by means of appropriate studies; assuming that the explanations offered by the theory are as scientific as the evidence of its effectiveness. Conversely, EBM considers that the rationality or biological efficacy of an intervention does not constitute enough evidence of its clinical efficacy. This efficacy must instead be measured by rigorous studies evaluating clinical outcomes directly on patients.

For EBM practice, medical professionals need to acquire skills to detect the problem presented by their patient, transform uncertainties into well-structured clinical questions, locate the best scientific evidence available that will allow them to solve this problem, assess its importance and validity, and to know how to apply the research results into clinical practice, considering the specificities of each case or situation.

The objective of this course is to present the principles and tools of EBM, training medical students in the basic skills to find and critically apply scientific evidence warranting their action, in order to achieve the best possible clinical outcomes for each patient.

## Competences

### Medicine

- Communicate clearly, orally and in writing, with other professionals and the media.
- Critically assess and use clinical and biomedical information sources to obtain, organise, interpret and present information on science and health.
- Demonstrate a sufficient command of English, both oral and written, for effective scientific and professional communication.
- Demonstrate understanding of basic statistical methodologies used in biomedical and clinical studies and use the analytic tools of modern computational technology.
- Demonstrate understanding of the importance and the limitations of scientific thought to the study, prevention and management of diseases.
- Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
- Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.
- Maintain and sharpen one's professional competence, in particular by independently learning new material and techniques and by focusing on quality.
- Obtain and use epidemiological data and assess trends and risks for decision-making on health.
- Recognise the role of complexity, uncertainty and probability in decision-making in medical practice.
- Use information and communication technologies in professional practice.

## Learning Outcomes

1. Choose and interpret statistical techniques and results in accordance with the epidemiological hypotheses and designs used.
2. Choose the experimental or observational technique to develop a working hypotheses.
3. Choose the most suitable type of study to respond to the hypotheses formulated.
4. Communicate clearly, orally and in writing, with other professionals and the media.
5. Correctly apply statistical techniques to obtain reference values and compare them to the results of analytic tests on patients.
6. Critically evaluate the main sections of a clinical research project.
7. Critically interpret medical literature.
8. Critique original or review scientific papers.
9. Critique scientific papers on bioinformatics.
10. Demonstrate a sufficient command of English, both oral and written, for effective scientific and professional communication.
11. Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
12. Describe the main biomedical bibliographic databases and filter the information provided.
13. Design and draw up a basic research protocol.
14. Design and understand basic epidemiological research studies in public health.
15. Establish a research question, a working hypotheses and objectives.
16. Evaluate the appropriate scientific methodology for a biomedical paper.
17. Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.

18. Identify good scientific practice and scientific fraud.
19. Identify sources of information on analytic tests for patients and professionals and critically evaluate their content.
20. Identify the bioethical aspects of research in humans and the Helsinki Declaration.
21. Maintain and sharpen one's professional competence, in particular by independently learning new material and techniques and by focusing on quality.
22. Manage the principles of medicine based on (the best) evidence.
23. Present research results.
24. Use information and communication technologies in professional practice.

## Content

### Introductory session (on-site)

- What is Evidence-Based Medicine?
- Why is EBM necessary?
- Barriers and limitations
- Information needs and study design
- The process of EBM
- Useful resources for EBM practice

### Electronic modules

#### (To be developed within 8 weeks)

- Module 1: Introduction
- Module 2: What is EBM?
- Module 3: What is not EBM?
- Module 4: Formulating clinical questions
- Module 5: Searching the best evidence
- Module 6: Critically assessing the evidence
- Module 7: Applying scientific information
- Module 8: Saving and finding the information
- Module 9: Epilogue

### Final session

Student presentation of the final essay.

Comments on different materials, including the book *Testing treatments*.

The competences that will be developed are:

CE1 Recognizing the essential elements of the medical profession as a result of an evolving, scientific and sociocultural process, including ethical principles, legal responsibilities, and patient-focused professional practice.

CE36. Obtaining and developing a medical record containing all relevant, structured and patient-focused information.

CE40. Preparing diagnosis and establishing a reasoned strategy of action, assessing the results of the anamnesis and the physical exam, as well as the subsequent results of the required complementary tests.

CE43 Indicating the most appropriate therapeutic intervention of the most prevalent acute and chronic processes, as well as for those patients at the end-of-life stage.

## Methodology

### GUIDED SESSIONS:

The course includes two on-site sessions, one at the beginning and one at the end of the course. The objective of the first session --besides presenting an overview of the course and its functioning- is to discuss with the students about the scientific and philosophical basis of EBM, the need for it and its main limitations or barriers. We will also share available resources and tools, potentially useful to develop and make the most of the course. The last session will consist of the final assessment by presenting and orally exposing a 'clinical case', where students will have applied the theory and practice learnt throughout the course. Active participation of all the students will be encouraged so that this session constitutes a learning experience that strengthens and enriches the knowledge acquired from discussing the practical cases.

### SELF-LEARNING SESSIONS:

The course includes an electronic course consisting of 8 modules, to teach the theory contents. Each module includes a single clinical scenario that evolves throughout the course, introducing the concepts that will be developed in depth in the theoretical body of the module. Some of the modules also include additional activities as well as an automatically assessed test, which must be passed to be able to move on to the next module. Students are expected to do at least one module per week to complete them within eight weeks.

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Contents communicated as oral lectures (Theory)	2	0.08	
Type: Supervised			
Virtual lessons (VIRT)	10	0.4	
Type: Autonomous			
Developing essays	20	0.8	

## Assessment

The competences of this course will be assessed with the automatically marked tests at the end of each module (25%). These tests will be virtually conducted and each module will have to be correctly answered to move onto the next.

The presentation of the final essay of the course represents 80% of the final mark. It consists of presenting a 'clinical case', and students will have to apply theory and practice acquired throughout the course.

Those students who do not present the final essay will be considered "Unassessable".

A second exam will be scheduled for those students who do not pass the assessment

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Attendance and active participation in class and in seminars	5%	2	0.08	14, 22
Conducting the electronic course	25%	2	0.08	5, 6, 16, 4, 8, 10, 11, 3, 15, 17, 21, 23, 1, 2, 22
Submitting reports	50%	2	0.08	6, 16, 4, 8, 10, 11, 12, 14, 3, 15, 17, 20, 18, 19, 7, 21, 23, 1, 22, 24
Submitting reports and specific essays	20%	2	0.08	5, 6, 16, 4, 8, 9, 10, 11, 12, 14, 13, 3, 15, 17, 20, 18, 19, 7, 21, 23, 1, 2, 22, 24

## Bibliography

1. Sackett DL, Straus SE, Richardson WS, Rosenberg W, Haynes RB. Medicina basada en la evidencia. Cómo practicar y enseñar la MBE. 2ª edición. Madrid: Ediciones Harcourt; 2001.
2. Straus SE, Richardson WS, Paul Glasziou, et al. Evidence-based Medicine: How to Practice and Teach EBM. Third Edition. Churchill Livingstone: Edinburgh, 2005.
3. The Evidence-Based Working Group. Guías para usuarios de literatura médica. Manual para la práctica clínica basada en la evidencia. Barcelona: Ars Medica, 2004.
4. Bonfill X. La medicina basada en la evidencia y la práctica clínica. En: Medicina Interna (ed. Rodés, Guàrdia), vol. 2a. ed. Ediciones Masson, pàg 13-16, 2004.
5. Bonfill X. Asistencia Sanitaria Basada en la Evidencia. Barcelona: Sanidad y Ediciones (SANED); 2000.
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7. Cabello J. Lectura crítica de la evidencia clínica. Barcelona: Elsevier, 2015.

8. Evans I, Thornton H, Chalmers I, Glasziou P. Els tractaments, a prova. F. INPECS, 2016.

9. Els tractaments, a prova. INPECS: Barcelona,2017.