**INTERNATIONAL HIGHER SCHOOL OF MEDICINE**

**Department of Public Health**

# SYLLABUS
## Discipline Evidence-Based Medicine

2024-2025 academic year
for students of medical faculty
5th course, X semester, groups
1 credit (72 h, including auditorial 32 h, independent work – 40 h)


**Lecturer:** **Name: Dmitry Vishniakov, MD, PhD**
+996 551811018 phone (Whatsapp)
Email: vdv@ism.edu.kg
Zoom
https://us02web.zoom.us/j/82475104038?pwd=Nk9DUkcweWZuZm9DLzdMWUpPZkNtZz09

**Venue: Practical classes:** **Name: Dmitry Vishniakov, MD, PhD**
+996 551811018 phone (Whatsapp)
Email: vdv@ism.edu.kg


**Venue:** **Room 518**

The Syllabus is considered
at the meeting of the department of _____
Protocol № 1 dated 3.09 2024
Head of the department _____

**Course Objective:** is to prepare specialists having theoretical and practical knowledge in quality of diagnoses and treatments to make healthcare safer and more efficient.

After study of the discipline the student must:
**Knowledge:**
The main elements of EBM
The quality of evidence by type of study
The quality of evidence by type of stat analysis
Reasoning and causation
Steps for critical appraisal of scientific literature
**Skill:**

Evaluate quality of evidence

Conduct search for evidence

Perform critical appraisal of scientific literature

**Attitude:** The course of Evidence-Based Medicine (EBM) is highly interactive and student attendance, and participation is critical. The lecturer expects a respectful environment to discuss different positions. Active participation is promoted taking care do not be dominant. Attendance will be taken for each class. Absenteeism, tardiness, and lack of participation will be reflected in the student's grade. Please notify the instructor in advance if you will not be attending a class. EBM recognizes that many aspects of medical care depend on individual factors such as quality and value-of-life judgments, which are only partially subject to scientific methods. EBM, however, seeks to clarify those parts of medical practice that are in principle subject to scientific methods and to apply these methods to ensure the best prediction of outcomes in medical treatment, even as debate about which outcomes are desirable continues. Practicing evidence-based medicine requires clinical expertise, but also expertise in retrieving, interpreting, and applying the results of scientific studies and in communicating the risks and benefits of different courses of action to patients.

**Prerequisites:**

To successfully master the discipline, a student must complete a full course of

- fundamental clinical subjects,
- main clinical subjects
- epidemiology
- biostatistics

**Post requisites:**

The knowledge and skills gained in the discipline EBM are necessary for incorporating all clinical knowledge received during study in medical school for clinical reasoning, and continues postgraduate education.

**Thematic plan of Lectures**

| **Lecture topics** | **Hours** | **Date** |
|---|---|---|
| Introduction to EBM | 2 | 26.08.24 |
| Quality of evidence by type of study | 2 | 09.09.24 |
| Quality of evidence and steps of medical scientific research. Reasoning and causation. | 2 | 23.09.24 |
| Statistics: Quality of evidence. Category of recommendations | 2 | 07.10.24 |

| | | |
|---|---|---|
| Strength of evidence. Publication bias Cochrane systematic review. Category of recommendations | 2 | 21.10.24 |
| Application of evidence in practice. Evidence based guidelines. | 2 | 04.11.24 |
| **TOTAL** | **12** | |

**Thematic plan of practical lessons**

| **Practice topics** | **Hours** | **Date** |
|---|---|---|
| Introduction to EBM | 2 | tbd |
| Quality of evidence by type of study | 2 | tbd |
| Quality of evidence and steps of medical scientific research | 2 | tbd |
| Reasoning and causation. | 2 | tbd |
| Statistics 1. Quality of evidence. Category of recommendations | 2 | tbd |
| Statistics 2. Quality of evidence. Category of recommendations | 2 | tbd |
| Strength of evidence. Publication bias | 2 | tbd |
| Cochrane systematic review. Category of recommendations. Application of evidence in practice. Evidence based guidelines. | 2 | tbd |
| Critical evaluation of a scientific article | 2 | tbd |
| Evaluation of assessment a scientific article | 2 | tbd |
| **TOTAL** | **20** | |

## Individual and group tasks

Literature review - 20 hours Assignments – 20 hours
Total 40 hours

Written assignment for students (essay). Short paper (3000 words) critical review of scientific article, should include review of all parts of article: introduction, methods, results, and discussion

Recommended reading for the discipline:

1. **Basic:**

A. Aschengrau, G. R. Seage III "Epidemiology in public health" 4 editions 2020 (available in the library)
C. Vivek Jain "Preventive and social medicine"-6 edition Mumbai, India, 2015
https://thelifesaversblog.files.wordpress.com/2015/11/review-of-preventive-and-social-medicine-sixth-edition.pdf

D. Kesmodel U.K."Information bias in epidemiological studies with a specialfocus on obstetrics and gynecology" Acta Obstetricia et Gynecologica Scandinavica97(2018) 417–423417 https://obgyn.onlinelibrary.wiley.com/doi/epdf/10.1111/aogs.13330
Kesmodel U.K. "Cross-sectional studies - what are they good for?" Acta Obstet Gynecol Scand . 2018 Apr;97(4):388-393. doi: 10.1111/aogs.13331 https://obgyn.onlinelibrary.wiley.com/doi/10.1111/aogs.13331
Bhide A., Shah P.S. "A simplified guide to randomized controlled trials" Acta Obstet Gynecol Scand . 2018 Apr;97(4):380-387. doi: 10.1111/aogs.13309. https://obgyn.onlinelibrary.wiley.com/doi/10.1111/aogs.13309
E. Centers for Disease Control and Prevention. Interim guidance on infection control precautions for patients with suspected severe acute respiratory syndrome (SARS) and close contacts in households. Available from: http://www.cdc.gov/ncidod/sars/icclosecontacts.htm

2. **Additional:**

A. T. C. Timmreck. "An introduction to epidemiology" 3 edition 2008 (available in the library)
C. Saira Afzal "Community medicine and Public Health"- Paramount books. Karachi, Pakistan, 2017 Can be downloaded at https://www.researchgate.net/publication/316503664_Textbook_of_Community_Medicine_and_Public_Health_Chapter_18_-_Tuberculosis_and_its_Control_in_the_Context_of_Pakistan
D. Remington PL, Hall WN, Davis IH, Herald A, Gunn RA. Airborne transmission of measles in a physician's office. JAMA 1985;253:1575–7.
https://pubmed.ncbi.nlm.nih.gov/3974036/
Murphy TV, Gargiullo PM, Massoudi MS, et al. Intussusception among infants given an oral rotavirus vaccine. N Eng J Med 2001 https://pubmed.ncbi.nlm.nih.gov/11207352/
Fraser DW, Tsai TR, Orenstein W, Parkin WE, Beecham HJ, Sharrar RG, et al. Legionnaires' disease: description of an epidemic of pneumonia. New Engl J Med 1977; https://pubmed.ncbi.nlm.nih.gov/335244/
E. General epidemiology with the basics of evidence-based medicine. Tutorial. Brazhnikov A.Yu., Briko N.I., Kiryanova E.V. et al. / ed. IN AND. Pokrovsky. 2nd ed., - M.: GEOTAR-Media, 2017. - 496 p https://www.rosmedlib.ru/book/ISBN9785970442555.html
Centers for Disease Control and Prevention. Interim guidance on infection control precautions for patients with suspected severe acute respiratory syndrome (SARS) and close contacts in households. Available from: http://www.cdc.gov/ncidod/sars/icclosecontacts.htm.

**Textbooks available in the library collection:**

A. Aschengrau, G. R. Seage III "Epidemiology in public health" 4 editions 2020 (available in the library)
T. C. Timmreck. "An introduction to epidemiology" 3 edition (available in the library)

**Grading policy and procedures for all types of work**

For the period of studying the discipline, the student gains points for the relevant parameters (per unit):
current score - 40 points
independent work - 20 points
control score (final assessment of knowledge per unit) - 40 points
Maximum score - 100 (40+20+40)

**Grading system for student's achievements**

| Criteria for grading for the discipline | | | | |
|---|---|---|---|---|
| Maximum score | Intervals | | | |
| | "unsuccessful." | " satisfying ." | "Fine" | "Great" |
| Current control – 20 | 0-11 | 12-15 | 16-17 | 18-20 |
| | There are a few bugs and more than two errors in the assignment | There are a few bugs and two errors in the assignment | One or two shortcomings and (or) one mistake were made in the task | The task was completed in accordance with the model response |
| Independent work – 20 | 0-11 | 12-15 | 16-17 | 18-20 |
| | There are a few bugs and more than two errors in the assignment | There are a few bugs and two errors in the assignment | One or two shortcomings and (or) one mistake were made in the task | The task was completed in accordance with the model response |
| | 0-23 | 24-30 | 31-35 | 36-40 |

| | | | | |
|---|---|---|---|---|
| Control work (module) – 40 | There are a few bugs and more than two errors in the assignment | There are a few bugs and two errors in the assignment | One or two shortcomings and (or) one mistake were made in the task | The task was completed in accordance with the model response |

**Conduct Policy: (lateness, absence, behavior in the auditorium, late submission of work).**
- Punctuality and completion of tasks.
- Mandatory attendance of classes.
- Attending class in a clean medical uniform.
- Eliminating conversations on a cell phone in the classroom.
- Active participation in the learning process.
- Doing homework on time.
- Academic detention at the time specified by the teacher.

For violations of the Conduct Policy, the total points for discipline might be reduced to 1-5 points.

**Academic Ethics Policy.**
- Be tolerant, respect the opinions of others.
- Formulate objections in the correct form.
- Constructively support feedback in all classes.
- Plagiarism and other forms of dishonest work are unacceptable. Plagiarism includes the following: the absence of references when using printed and electronic materials, quotes, thoughts and works of other authors or students.
- Prompting and cheating during tests, exams, classes is unacceptable as well as passing an exam for another student, unauthorized copying of materials.

For violations of the Academic Ethics Policy, the total points for the discipline may be reduced to 1-5 points.

## Guidelines for the lessons of the discipline

Class#1. **Introduction to EBM**
**Lecture#1 – 2 hours.**
Definition and objectives of EBM.
Quality of evidence and factors that affected it
***Class #2***
***Practical study1 - 2 hours***
**Introduction to EBM**
Definition and objectives of EBM.
Quality of evidence and factors that affected it
Examples of EBM implementation
**Reference:**
A. Aschengrau, G. R. Seage III "Epidemiology in public health" 4 editions 2020. Chapter 1, p. 1-31, chapter 2 p. 34-36, chapter 5 p 99-116
T. C. Timmreck. "An introduction to epidemiology" 3 edition 2002. p.1-5, 71-95, 110-115, 203-229.
***Class # 3***
***Lecture#2 - 2 hours***
**Quality of evidence by type of study**
Quality of evidence in
- Descriptive epidemiology
- Cross-sectional study
- Case=control study
- Cohort study
- RCT
- Meta-analysis Systematic review

***Class #4 Practical study - 2 hours***
**Quality of evidence by type of study**
Quality of evidence in
- Descriptive epidemiology
- Cross-sectional study
- Case=control study
- Cohort study
- RCT
- Meta-analysis Systematic review.

Presentation of examples
**Reference:**

A. Aschengrau, G. R. Seage III "Epidemiology in public health" 4 editions 2020. Chapter 2 p. 33-40. chapter 5, p 116-150

T. C. Timmreck. "An introduction to epidemiology" 3 edition 2002 (available in the library).

K. Park "Preventive and social medicine"-Mumbai, India, 2015.

J. E. Park "Community medicine"- Karachi, Pakistan, 2010.

Richard Farmer, David Miller "Lecture notes on Epidemiology and Public Health Medicine"-USA, 2006.

General epidemiology with the basics of evidence-based medicine. Tutorial. Brazhnikov A.Yu., Briko N.I., Kiryanova E.V. et al. / ed. IN AND. Pokrovsky. 2nd ed., - M.: GEOTAR-Media, 2017. - 496 p.

Lecture material

***Class #5 Lecture #3 - 2 hours***

**Quality of evidence and steps of medical scientific research**

Steps of medical/epidemiological research

Quality of evidence and

- Study population and applicability
- Type of study and quality of evidence
- Stat analysis and quality of evidence
- Internal validity
- External validity
- Application

**Reference:**

1. A. Aschengrau, G. R. Seage III "Epidemiology in public health" 4 editions 2020. Chapter 2 p. 39-51, chapter 3 p 57-73.
2. T. C. Timmreck. "An introduction to epidemiology" 3 edition 2002 (available in the library).

***Class #6 Practice #3 - 2 hours***

**Quality of evidence and steps of medical scientific research**

Steps of medical/epidemiological research

Quality of evidence and

- Study population and applicability
- Type of study and quality of evidence
- Stat analysis and quality of evidence
- Internal validity
- External validity
- Application

**Reference:**

1. A. Aschengrau, G. R. Seage III "Epidemiology in public health" 4 editions 2020. Chapter 2 p. 39-51, chapter 3 p 57-73.
2. T. C. Timmreck. "An introduction to epidemiology" 3 edition 2002 (available in the library).

**Class #7 Lecture#4 – 2 hours.**

**Reasoning and causation.**

Types of relationships between two factors

Association and confounding

Association and bias

Causation

Abbi Hill criteria

***Class #8 Practical study#4 - 2 hours***

**Reasoning and causation. -**

Types of relationships between two factors

Association and confounding

Association and bias

Causation

Abbi Hill criteria

**Reference:**

A. Aschengrau, G. R. Seage III "Epidemiology in public health" 4 editions 2020. Chapter

T. C. Timmreck. "An introduction to epidemiology" 3 edition 2002

p.6-25, 27-65.

Remington PL, Hall WN, Davis IH, Herald A, Gunn RA. Airborne transmission of measles in a physician's office. JAMA 1985;253:1575–7.

***Class # 9 lecture #5 - 2 hours***

**Statistics 1. Quality of evidence. Category of recommendations**

Quality of evidence and category of recommendations:

Confidence interval and p-value
t-test
Chi sq test
ANOVA test
Simple linear regression analysis

**Class #10 Practice#5 – 2 hours.**
**Statistics 1. Quality of evidence. Category of recommendations**
Quality of evidence and category of recommendations:
Confidence interval and p-value
t-test
Chi sq test
ANOVA test
Simple linear regression analysis
Reading results of the tests
Reference:

***Class #11 Lecture #6 - 2 hours***
**Statistics 2. Quality of evidence. Category of recommendations**
Quality of evidence and category of recommendations
- Multiple linear regression
- Logistic regression
- Survival analysis
- Artificial intelligence and deep learning

***Class# 12 Practical study#6 - 2 hours***
**Quality of evidence. Category of recommendations**
Quality of evidence and category of recommendations
- Multiple linear regression
- Logistic regression
- Survival analysis
- Artificial intelligence and deep learning

Reading results of the test and interpret them
Reference:
A. Aschengrau, G. R. Seage III "Epidemiology in public health" 4 editions 2020. Chapter 3, p 57-73
T. C. Timmreck. "An introduction to epidemiology" 3 edition 2002
P.197-417
**Class #13 Lecture#7 – 2 hours.**
**Cochrane systematic review. Category of recommendations**
Cochrane
Introduction
Systematic review and meta-analysis
Example

***Class # 14 Practical study#7 - 2 hours***
**Cochrane systematic review. Category of recommendations**
Cochrane
Introduction
Systematic review and meta-analysis
Examples
Reference:

**Class #15 Lecture#8 – 2 hours.**
**Application of evidence in practice. Evidence based guidelines**
Evidence-based guidelines
Examples
Critical appraisal of scientific publication

***Class # 16 Practical study#8 - 2 hours***
**Application of evidence in practice. Evidence based guidelines**
Evidence-based guidelines
Examples

Critical appraisal of scientific publication. Examples

**Methodological instructions for the implementation of independent work on the discipline**

The course of Evidence-Based Medicine (EBM) is highly interactive and student attendance, and participation is critical. Written assignment for students (essay). Short paper (3000 words) critical review of scientific article, should include review of all parts of article: introduction, methods, results, and discussion.

**Control questions:**

Definition and objectives of EBM.

Quality of evidence and factors that affect it

Quality of evidence in

-Descriptive epidemiology

-Cross-sectional study

-Case=control study

-Cohort study

-RCT

-Meta-analysis Systematic review

Steps of medical/epidemiological research

Quality of evidence and

-Study population and applicability

-Type of study and quality of evidence

-Stat analysis and quality of evidence

-Internal validity

-External validity

Types of relationships between two factors

Association and confounding

Association and bias

Causation

Abbi Hill criteria

Quality of evidence and category of recommendations:

-Confidence interval and p-value

-t-test

-Chi sq test

-ANOVA test

-Simple linear regression analysis

-Multiple linear regression

-Logistic regression

-Survival analysis

-Artificial intelligence and deep learning

Cochrane

Systematic review and meta-analysis