Faculty of Medicine in Rijeka

Curriculum
2023/2024

For course

Evidence Based Medicine

Study program:	**Medical Studies in English (R)** (elective) University integrated undergraduate and graduate study
Department:	**Department of Biomedical Informatics**
Course coordinator:	**izv. prof. dr. sc. Poropat Goran, dr. med.**
Year of study:	**3**
ECTS:	**1.5**
Incentive ECTS:	**0 (0.00%)**
Foreign language:	**Possibility of teaching in a foreign language**

Course information:

Medicina utemeljena na dokazima. Vrste znanstvenih istraživanja. Alati utemeljeni na dokazima (SOP, protokol, kliničke smjernice, algoritam). Klinička praksa utemeljena na dokazima (PICO model, traženje dokaza, kritička prosudba valjanosti dokaza, klinička primjena dokaza, evaluacija). Narav i pronalaženje medicinskih informacija u biomedicinskim bazama podataka UpToDate, Cochrane, Trip i Pubmed Clinical Queries. Pretraživanje medicinske literature u klasičnim bazama i onima utemeljenim na dokazima.

List of assigned reading:

- Evans I, Thornton H, Chalmers I, Glasziou P. Gdje su dokazi? Zagreb: Profil, 2014.

Knjiga je besplatno dostupna na URL: http://hr.testingtreatments.org/wp-content/uploads/2015/04/Gdje_su_dokazi.pdf

- Higgins J, Thomas J. Handbook for Systematic Reviews of Interventions. Version 6, 2019.

Knjiga je besplatno dostupna na URL: https://training.cochrane.org/handbook/current

Huić M, Marušić A. Medicina utemeljena na dokazima. U:Marušić M (ur). Uvod u znanstveni rad u medicini. Zagreb: Medicinska naklada, 2013.

List of optional reading:

Coiera E. Guide to health informatics. Boca Raton: Taylor & Francis Group, (3rd edition), 2015.

Kern J; Petrovečki M (ur.). Medicinska informatika. Zagreb: Medicinska naklada, 2009.

Curriculum:

Seminars list (with titles and explanation):

Basics of systematic search of the literature

The seminars "Basics of Systematic Search of the Literature" offer a comprehensive overview of the fundamental principles and techniques involved in conducting a systematic literature review. It covers topics such as defining research questions, selecting appropriate databases, devising search strategies, and managing search results. Emphasis is placed on the importance of thoroughness, transparency, and reproducibility in the search process to ensure the reliability and validity of the review findings. Key concepts such as Boolean operators, truncation, and database filters are explained, along with practical tips for organizing search results and evaluating the quality of retrieved studies. Overall, the seminar serves as a foundational guide for researchers seeking to navigate the vast landscape of scholarly literature effectively.

How geographic groups can support training, knowledge, translation and advocacy

Geographic groups play a pivotal role in supporting training, knowledge translation, and advocacy within specific regions or communities. These groups provide platforms for sharing expertise, resources, and best practices among members, facilitating continuous learning and professional development. Moreover, they serve as hubs for translating research findings into local contexts, tailoring interventions and policies to meet the unique needs of the population. Through advocacy efforts, geographic groups amplify voices, raise awareness, and influence policy decisions, driving positive change in healthcare delivery and outcomes. By fostering collaboration and solidarity, geographic groups empower individuals and organizations to collectively address health challenges and improve the well-being of communities.

Cochrane systematic review as a PhD – an example of international cooperation

After attending this lecture, participants will comprehend the process and benefits of conducting a Cochrane systematic review as part of a PhD program, particularly highlighting the collaborative nature of international research endeavors. Participants will gain insight into the steps involved in conducting a Cochrane systematic review, from protocol development to publication, and understand the unique challenges and opportunities associated with international cooperation in research. Through case studies and examples, participants will appreciate the importance of interdisciplinary collaboration, effective communication, and resource-sharing in producing high-quality evidence for healthcare decision-making. Additionally, participants will recognize the value of engaging with the Cochrane Collaboration and leveraging its global network of experts and resources to enhance the rigor and impact of their research. Overall, participants will be inspired and empowered to pursue collaborative research initiatives within the framework of Cochrane systematic reviews.

Adverse effects in Cochrane systematic reviews

Participants will have a comprehensive understanding of the importance of systematically assessing and reporting adverse effects in Cochrane systematic reviews. They will be able to identify the methodological challenges and considerations involved in capturing and synthesizing data on adverse effects, including issues related to study design, reporting biases, and heterogeneity of adverse event definitions. Participants will gain insight into strategies for enhancing the rigor and transparency of adverse effects assessment, such as employing standardized frameworks and tools for data extraction and analysis. By the end of the lecture, participants will be equipped with the knowledge and skills necessary to critically appraise and interpret adverse effects data in Cochrane systematic reviews, ultimately contributing to more informed clinical decision-making and patient safety.

What is bias and how to assess it?

Participants will have a comprehensive understanding of bias in research and its implications for the validity and reliability of study findings. They will be able to identify common types of bias, including selection bias, performance bias, detection bias, and attrition bias, and understand how these biases can influence study results. Participants will gain proficiency in assessing bias using various tools and approaches, including risk of bias assessment tools specific to different study designs. Moreover, participants will learn strategies for minimizing bias during study design, conduct, and analysis. By the end of the lecture, participants will be equipped with the knowledge and skills necessary to critically appraise research studies for bias and ensure the integrity of evidence-based practice.

Practicals list (with titles and explanation):

Development of a basic search strategy

In practical exercises focusing on the development of a basic search strategy in literature search, participants engage in hands-on activities to learn essential skills for effectively navigating research databases and retrieving relevant literature. These exercises typically involve:

Defining Research Questions: Participants learn to articulate clear and focused research questions or topics that will guide their literature search.

Identifying Keywords: Participants identify key terms and concepts related to their research questions, considering synonyms, variations, and related terms to broaden or narrow their search as needed.

Selecting Databases: Participants explore various academic databases relevant to their field of study and select appropriate ones for their search based on content coverage and accessibility.

Constructing Search Strings: Using Boolean operators (AND, OR, NOT), participants combine keywords and phrases into search strings to create comprehensive yet targeted queries.

Refining Search Strategies: Participants refine their search strategies through iterative processes, adjusting keywords, operators, and database filters to improve the relevance and precision of search results.

Managing Search Results: Participants learn techniques for managing and organizing search results, including citation management tools, folders, and tagging systems.

Evaluating Search Performance: Participants assess the effectiveness of their search strategies by evaluating the relevance, coverage, and quality of retrieved literature against predefined criteria.

By actively participating in these practical exercises, participants gain practical experience in developing systematic search strategies and enhance their ability to conduct thorough and efficient literature searches for research purposes.

Adjustment of the main search strategy - task for independent work

In practical exercises focusing on the development of a basic search strategy in literature search, participants engage in hands-on activities to learn essential skills for effectively navigating research databases and retrieving relevant literature. These exercises typically involve:

Defining Research Questions: Participants learn to articulate clear and focused research questions or topics that will guide their literature search.

Identifying Keywords: Participants identify key terms and concepts related to their research questions, considering synonyms, variations, and related terms to broaden or narrow their search as needed.

Selecting Databases: Participants explore various academic databases relevant to their field of study and select appropriate ones for their search based on content coverage and accessibility.

Constructing Search Strings: Using Boolean operators (AND, OR, NOT), participants combine keywords and phrases into search strings to create comprehensive yet targeted queries.

Refining Search Strategies: Participants refine their search strategies through iterative processes, adjusting keywords, operators, and database filters to improve the relevance and precision of search results.

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Lectures list (with titles and explanation):

Cochrane’s Strategy 2024 – 2027

From 2024 to 2027, the Cochrane Collaboration's strategy focuses on advancing evidence synthesis and dissemination to address global health challenges effectively. Key elements of the strategy include:

Strengthening Methodological Rigor: Emphasizing rigorous research synthesis methods to ensure the reliability and credibility of Cochrane reviews. This involves refining protocols, enhancing risk of bias assessment, and promoting transparent reporting standards.

Enhancing Collaboration and Diversity: Encouraging greater participation from diverse stakeholders, including researchers, policymakers, patients, and healthcare professionals, to enrich the evidence base and promote inclusivity in decision-making processes.

Increasing Accessibility and Impact: Improving the accessibility of Cochrane evidence by expanding translation efforts, enhancing user-friendly dissemination platforms, and fostering partnerships with knowledge translation organizations to maximize the impact of Cochrane reviews on clinical practice and policy development.

Prioritizing Global Health Needs: Addressing priority health topics and emerging health threats through targeted research synthesis initiatives, including rapid reviews and living systematic reviews, to provide timely and relevant evidence to inform public health responses.

Promoting Equity and Transparency: Prioritizing equity considerations in evidence synthesis and dissemination efforts, including addressing disparities in health outcomes and ensuring transparency in conflicts of interest disclosure and decision-making processes.

By pursuing these strategic objectives, the Cochrane Collaboration aims to uphold its mission of producing high-quality, relevant, and accessible evidence to inform healthcare decision-making worldwide, ultimately contributing to improved health outcomes and health equity for all.

What is Cochrane and what does Cochrane Croatia do?

Cochrane is a globally renowned independent organization dedicated to producing and disseminating high-quality, evidence-based healthcare information. Established in 1993, Cochrane collaborates with researchers, healthcare professionals, patients, and policymakers to conduct systematic reviews of healthcare interventions. By synthesizing the best available evidence from research studies, Cochrane aims to inform healthcare decisions and improve patient outcomes.

Cochrane Croatia, as a part of this international network, focuses on activities within Croatia to promote evidence-based healthcare. Its primary functions include conducting systematic reviews tailored to the Croatian context, assessing the effectiveness and safety of various healthcare interventions. Cochrane Croatia also plays a crucial role in disseminating review findings through academic publications, conferences, and online platforms, ensuring that healthcare professionals, policymakers, and patients have access to reliable evidence.

Furthermore, Cochrane Croatia engages in capacity-building initiatives to support researchers, healthcare professionals, and students in conducting high-quality systematic reviews and implementing evidence-based practice. Through advocacy efforts and collaborations with stakeholders in the healthcare sector, Cochrane Croatia promotes the integration of research evidence into clinical practice and healthcare policy, thereby contributing to the advancement of evidence-based healthcare in Croatia.

Why is it important to perform randomized controlled trials?

Randomized controlled trials (RCTs) are crucial in medical research for several reasons. Firstly, they provide the most robust evidence for evaluating the efficacy and safety of healthcare interventions. By randomly assigning participants to different treatment groups, RCTs minimize bias and confounding factors, ensuring that any observed differences in outcomes are more likely attributable to the intervention being studied.

Secondly, RCTs allow for causal inference, enabling researchers to establish a cause-and-effect relationship between the intervention and its effects on health outcomes. This is essential for informing clinical decision-making and healthcare policy.

Moreover, RCTs uphold the ethical principle of beneficence by ensuring that participants receive interventions that have been rigorously evaluated for their effectiveness and safety.

Overall, RCTs serve as the gold standard for generating high-quality evidence in healthcare, playing a pivotal role in advancing medical knowledge and improving patient care.

What is a Cochrane systematic review? How to read and understand it?

A Cochrane systematic review is a comprehensive and rigorous synthesis of the available evidence on a specific healthcare intervention or topic. Conducted by following standardized methods outlined by the Cochrane Collaboration, these reviews aim to provide reliable, transparent, and unbiased summaries of the best available evidence.

To read and understand a Cochrane systematic review, it's essential to start with the review's structured format. Typically, Cochrane reviews include sections such as objectives, methods, search strategy, study selection criteria, results, and conclusions. Begin by reading the abstract to grasp the main findings and conclusions.

Next, carefully review the methods section to understand how the review was conducted, including details about the search strategy, study selection criteria, and assessment of risk of bias. Pay attention to the results section, which presents the synthesized evidence and findings of included studies.

Finally, consider the review's conclusions and implications for practice. Assess the certainty of the evidence and whether the findings are applicable to the clinical or research question at hand. It's also helpful to consult any supplementary materials or additional analyses provided by the authors to gain a comprehensive understanding of the review's findings and limitations.

Open, responsible and reproducible research

Open, responsible, and reproducible research practices are essential for ensuring the integrity and transparency of scientific inquiry. Open research involves freely sharing data, methods, and findings to facilitate collaboration and scrutiny within the scientific community. Responsible research emphasizes ethical conduct, adherence to research standards, and consideration of societal implications. Reproducible research ensures that findings can be independently verified and validated, enhancing confidence in scientific conclusions. Together, these principles promote trust, accountability, and innovation in research, ultimately advancing knowledge and benefiting society. By embracing openness, responsibility, and reproducibility, researchers uphold the core values of integrity and reliability in scientific endeavor, fostering a culture of excellence and progress

The architecture of diagnostic studies: from bench to bedside

Upon completion of this lecture, participants will understand the conceptual framework and methodological considerations involved in the design, implementation, and evaluation of diagnostic studies. They will gain insight into the translational journey of diagnostic research from laboratory settings ('bench') to clinical application ('bedside'). Specifically, participants will be able to critically evaluate the key components of diagnostic study design, including study population selection, choice of diagnostic tests, reference standards, and statistical analysis methods. Additionally, they will appreciate the importance of rigorous methodology, evidence synthesis, and clinical validation in ensuring the accuracy, reliability, and clinical utility of diagnostic tests. Overall, participants will be equipped with the knowledge and skills necessary to contribute to the advancement of diagnostic research and its translation into clinical practice.

Diagnostic test accuracy reviews: methodological challenges

After attending this lecture, participants will have a comprehensive understanding of the methodological complexities and challenges inherent in conducting diagnostic test accuracy reviews. They will be able to identify and critically evaluate the key methodological considerations involved in designing, conducting, and interpreting diagnostic accuracy studies, including issues related to study design, bias assessment, reference standard selection, and statistical analysis methods. Participants will also gain insight into strategies for addressing common challenges and limitations encountered in diagnostic test accuracy reviews, such as heterogeneity, spectrum bias, and reporting biases. By the end of the lecture, participants will be equipped with the knowledge and skills necessary to navigate methodological challenges effectively and produce high-quality, clinically relevant evidence to inform diagnostic decision-making

Risk of random error and sample size estimation in RCTs and systematic reviews

Upon completion of this lecture, participants will grasp the fundamental concepts of random error in randomized controlled trials (RCTs) and systematic reviews. They will understand the importance of sample size estimation in minimizing the risk of random error and ensuring the reliability of study findings. Participants will gain proficiency in techniques for estimating sample sizes based on desired levels of statistical power, effect size, and significance thresholds. Additionally, they will learn how to interpret and apply sample size calculations in the design and planning of RCTs and systematic reviews. By the end of the lecture, participants will be equipped with the knowledge and skills necessary to conduct methodologically robust studies with sufficient statistical power to detect meaningful effects and contribute to the advancement of evidence-based practice.

Student obligations:

Aktivno sudjelovanje na nastavi, izvršavanje zadataka i pisanje seminarskog rada.

Exam (exam taking, description of the written/oral/practical part of the exam, point distribution, grading criteria):

Student mora sakupiti najmanje 25 ocjenskih bodova tijekom nastave kako bi stekao pravo pristupa završnom ispitu.

Other notes (related to the course) important for students:

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COURSE HOURS 2023/2024

Evidence Based Medicine

Lectures (Place and time or group)	**Practicals** (Place and time or group)	**Seminars** (Place and time or group)
08.12.2023		

Cochrane's Strategy 2024 – 2027:
• Campus 027 (17:00 - 17:45) [439]
  ○ ebm
 	
What is Cochrane and what does Cochrane Croatia do?:
• Campus 027 (17:45 - 18:30) [439]
  ○ ebm
 	
Why is it important to perform randomized controlled trials?:
• Campus 027 (18:30 - 19:15) [146]
  ○ ebm
 	
What is a Cochrane systematic review? How to read and understand it?:
• Campus 027 (19:15 - 20:00) [439]
  ○ ebm
	Development of a basic search strategy:
	• Campus 027 (12:00 - 14:15) [439]
	  ○ ebm
	
	Adjustment of the main search strategy - task for independent work:
	• Campus 027 (15:30 - 17:00) [439]
	  ○ ebm
		Basics of systematic search of the literature:
		• Campus 027 (09:00 - 11:15) [439]
		  ○ ebm

prof. dr. sc. Hauser Goran, dr. med. [146] · izv. prof. dr. sc. Poropat Goran, dr. med. [439]		
09.12.2023		

Open, responsible and reproducible research:
• Campus 027 (09:30 - 10:15) [439]
  ○ ebm
 	
The architecture of diagnostic studies: from bench to bedside:
• Campus 027 (10:15 - 11:45) [439]
  ○ ebm
 	
Diagnostic test accuracy reviews: methodological challenges:
• Campus 027 (15:00 - 16:30) [439]
  ○ ebm
 	
Risk of random error and sample size estimation in RCTs and systematic reviews:
• Campus 027 (16:30 - 17:15) [439]
  ○ ebm
		How geographic groups can support training, knowledge, translation and advocacy:
		• Campus 027 (08:00 - 09:30) [439]
		  ○ ebm
		
		Cochrane systematic review as a PhD – an example of international cooperation:
		• Campus 027 (12:30 - 14:00) [286]
		  ○ ebm
		
		Adverse effects in Cochrane systematic reviews:
		• Campus 027 (17:15 - 18:00) [433]
		  ○ ebm
		
		What is bias and how to assess it?:
		• Campus 027 (18:00 - 19:30) [439]
		  ○ ebm

naslovni viši asistent Nadarević Tin, dr. med. [286] · izv. prof. dr. sc. Poropat Goran, dr. med. [439] · Vranić Luka, dr. med. [433]		

List of lectures, seminars and practicals:

LECTURES (TOPIC)	Number of hours	Location
Cochrane’s Strategy 2024 – 2027	1	Campus 027
What is Cochrane and what does Cochrane Croatia do?	1	Campus 027
Why is it important to perform randomized controlled trials?	1	Campus 027
What is a Cochrane systematic review? How to read and understand it?	1	Campus 027
Open, responsible and reproducible research	1	Campus 027
The architecture of diagnostic studies: from bench to bedside	2	Campus 027
Diagnostic test accuracy reviews: methodological challenges	2	Campus 027
Risk of random error and sample size estimation in RCTs and systematic reviews	1	Campus 027

PRACTICALS (TOPIC)	Number of hours	Location
Development of a basic search strategy	2	Campus 027
Adjustment of the main search strategy - task for independent work	3	Campus 027

SEMINARS (TOPIC)	Number of hours	Location
Basics of systematic search of the literature	3	Campus 027
How geographic groups can support training, knowledge, translation and advocacy	2	Campus 027
Cochrane systematic review as a PhD – an example of international cooperation	2	Campus 027
Adverse effects in Cochrane systematic reviews	1	Campus 027
What is bias and how to assess it?	2	Campus 027

EXAM DATES (final exam):