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FACULTY OF MEDICINE

Approved:
Dean:



(Prof. Dr. Yoto Trifonov Yotov, MD, PhD)

SYLLABUS

IN

CLINICAL LABORATORY

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|---|---|
| Specialty | MEDICINE |
| Educational - qualification degree | master |
| Organizational form of education | full-time |
| Auditorial activity (Lectures/Seminars) | 60 (30/30) |
| Extra-auditorial activity | 30 |
| ECTS- credits | 3 |
| Discipline type | compulsory |
| Semester/s of education | eight |
| Semester of examination | eight |
| Developer(s) of the Syllabus: | Prof. Dr. Yana Bocheva, MD, PhD Assoc. Prof. Dr. Daniela Gerova. MD, PhD |

Varna, 2024

ANNOTATION

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| Aims of the course | Acquisition of an optimal level of knowledge in the discipline "Clinical Laboratory" with the aim of effective selection and professional interpretation of laboratory results as the basis of clinical practice based on evidence-based medicine. |
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| Outcomes for students at the end of the course: | |
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| Knowledge | <ul style="list-style-type: none"> ○ To know and eliminate errors in preanalytical stage and the possible interference (pharmaceutical, diagnostic and therapeutic procedures) on the results of clinical laboratory analysis. ○ To know how to create the correct combination of laboratory parameters for the specific disease and patient, taking into account the diagnostic specificity and sensitivity of the laboratory parameters. ○ To introduce the analytical methods, knowing their advantages and disadvantages. ○ To create skills for correct and complete interpretation of the results of clinical laboratory analysis, knowledge of their diagnostic reliability, the correlation between parameters in different diseases, allowing the selection of the most informative combination of indicators. ○ To introduce and develop practical skills to perform basic clinical laboratory activities (analysis of urine, microscope smears of peripheral blood, bone marrow, CSF, etc.) ○ To introduce novel laboratory markers- screening, diagnostic and research |
| Skills | <ul style="list-style-type: none"> ○ to know and strive to comply with the requirements of the pre-analytical preparation of the patient and the sample, in order to obtain the most reliable result ○ to reach an optimal level of awareness of errors in the pre-analytical, analytical and post-analytical stages of laboratory research in order to eliminate them as a factor in making a medical decision in clinical practice ○ to create skills and sense for full use of the possibilities of clinical-laboratory diagnostics for correct selection of parameters, with justified consideration of the economic aspects of laboratory activity ○ to know the specifics and advantages of analytical methods and to form a critical and objective attitude towards the possibilities of the laboratory method ○ to reach a level of professional skill for correct and complete interpretation of laboratory results, knowledge of the diagnostic reliability of laboratory methods, the correlation of parameters in different diseases with a view to selecting the most informative constellation of laboratory parameters in the individual clinical situation ○ for training and acquiring specific practical skills needed in clinical practice - urinalysis, microscopy of blood smears, analysis of cerebrospinal fluid, taking capillary blood for the study of peripheral glucose with a glucometer and glucoanalyzer, as well as for blood gas analysis |
| Competences | <p>1.Patient Care that is compassionate, appropriate, and effective for treating health problems and promoting health.</p> <ul style="list-style-type: none"> ○ to appoint and perform laboratory tests suitable for the patient and relevant to his state of health ○ to know the indications for the appointment of laboratory tests |

- to consult the patient and family members about the usefulness of laboratory tests
- to collect important and accurate information about the patient in order to assess whether he is properly prepared for the laboratory examination in order to prevent some of the errors in the pre-analytical stage
- to understand the impact of the procedure of taking biological material on the patient
- to perform procedures in a manner that provides maximum patient comfort
- to competently perform all medical procedures required within the framework of clinical laboratory activity
- to understand the impact of the procedure of taking biological material on the patient
- to perform procedures in a manner that provides maximum patient comfort
- to competently perform all medical procedures required within the framework of clinical laboratory activity

2. Medical Knowledge about established and evolving biomedical, clinical, and related (eg, epidemiological and social-behavioral) sciences and the application of this knowledge to patient care.

- to understand the impact of the procedure of taking biological material on the patient
- to perform procedures in a manner that provides maximum patient comfort
- to competently perform all medical procedures required within the framework of clinical laboratory activity
- to acquire new scientific and clinical knowledge
- to apply a research and analytical approach to solving clinical and scientific problems
- to apply medical and scientific knowledge in clinical situations
- to be able to transfer the accumulated knowledge in the field of clinical-laboratory activity to their colleagues.

3. Practice-Based Learning and Improvement that involves investigation and evaluation of their own patient care, appraisal, and assimilation of scientific evidence, and improvements in patient care.

- to acquire specific practical skills necessary for laboratory practice - carrying out urinalysis, microscopy of blood smears, analysis of cerebrospinal fluid, taking capillary blood for peripheral glucose testing with a glucometer and glucoanalyzer, as well as for blood gas analysis
- to reach a level of professional skill for correct and complete interpretation of laboratory results, to know the diagnostic reliability of laboratory methods
- to know the correlation of parameters in different diseases with a view to selecting the most informative constellation of laboratory parameters in an individual clinical situation
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- to know the correlation of parameters in different diseases with a view to selecting the most informative constellation of laboratory parameters in an individual clinical situation

- to collect scientific evidence about the pathogenetic mechanisms of diseases and to realize how they lead to the discovery and implementation in medical practice of new laboratory parameters facilitating the diagnostic process
- to practice evidence-based medicine
- to use the accumulated knowledge to improve clinical-laboratory practice

4. Interpersonal and Communication Skills that result in effective information exchange and teaming with patients, their families, and other health professionals.

- to learn to work effectively as members of a particular health team by showing understanding to each member of the team and finding points of common ground between them to prevent possible conflicts in the workplace
- to be aware of the hierarchy in the organization of laboratory activity, the necessary competencies and skills at each hierarchical level in order to acquire the ability to lead a laboratory team..
- learn to create and maintain an empathetic relationship with patients and their families by affirming mutual respect between doctor and patient and promoting trust and cooperation between them..

5. Professionalism, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

- to learn to demonstrate professional behavior and responsibility
- to demonstrate humanism and cultural competence
- to maintain emotional, physical and mental health
- to strive for continuous personal and professional growth

6. Systems-Based Practice, as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.

- to learn to work effectively in different environments and health care delivery systems related to laboratory work
- to coordinate patient care within the health care system related to laboratory activity
- to analyze risk and benefit in patient and/or population care when appropriate
- to consider the costs of patient and/or population care in their practice when appropriate
- to advocate for quality patient care and optimal patient care systems
- to work in interprofessional teams to increase patient safety and improve the quality of patient care.
- to participate in the identification of system errors and the implementation of potential system solutions

Key competencies for lifelong learning, that the discipline develops:

Literacy competence

Literacy is the ability to identify, understand, express, create, and interpret concepts, feelings, facts and opinions in both oral and written forms, using visual, sound/audio and digital materials across disciplines and contexts. It implies the ability to communicate and connect effectively with others, in an appropriate and creative way.

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Multilingual competence

This competence defines the ability to use different languages appropriately and effectively for communication. It broadly shares the main skill dimensions of literacy: it is based on the ability to understand, express and interpret concepts, thoughts, feelings, facts and opinions in both oral and written form (listening, speaking, reading and writing) in an appropriate range of societal and cultural contexts according to one's wants or needs.

Mathematical competence and competence in science, technology, engineering

A. Mathematical competence is the ability to develop and apply mathematical thinking and insight in order to solve a range of problems in everyday situations. Building on a sound mastery of numeracy, the emphasis is on process and activity, as well as knowledge. Mathematical competence involves, to different degrees, the ability and willingness to use mathematical modes of thought and presentation (formulas, models, constructs, graphs, charts).

B. Competence in science refers to the ability and willingness to explain the natural world by making use of the body of knowledge and methodology employed, including observation and experimentation, in order to identify questions and to draw evidence-based conclusions. Competences in technology and engineering are applications of that knowledge and methodology in response to perceived human wants or needs. Competence in science, technology and engineering involves an understanding of the changes caused by human activity and responsibility as an individual citizen.

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Digital competence

Digital competence involves the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking.

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Personal, social and learning to learn competence

Personal, social and learning to learn competence is the ability to reflect upon oneself, effectively manage time and information, work with others in a constructive way, remain resilient and manage one's own learning and career. It includes the ability to cope with uncertainty and complexity, learn to learn, support one's physical and emotional well-being, to maintain physical and mental health, and to be able to lead a health-conscious, future-oriented life, empathize and manage conflict in an inclusive and supportive context.

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Citizenship competence

the ability to act as responsible citizens and to fully participate in civic and social life, based on an understanding of social, economic, legal and political concepts and structures, as well as global developments and sustainability.

Entrepreneurship competence

Entrepreneurship competence refers to the capacity to act upon opportunities and ideas, and to transform them into values for others. It is founded upon creativity, critical thinking and problem solving, taking initiative and perseverance and the ability to work collaboratively in order to plan and manage projects that are of cultural, social or financial value.

Cultural awareness and expression competence

Competence in cultural awareness and expression involves having an understanding of and respect for how ideas and meaning are creatively expressed and communicated in different cultures and

through a range of arts and other cultural forms. It involves being engaged in understanding, developing and expressing one's own ideas and sense of place or role in society in a variety of ways and contexts.

Methods of education

- lectures
- practical exercises in which the theoretical knowledge in the field of the Clinical Laboratory is deepened, laboratory results from real clinical cases are discussed, presentations are presented on laboratory research in various diseases with a view to selecting the most informative constellation of laboratory parameters, work with scientific literatures
- practicals and laboratory exercises in performing urinalysis, microscopy of blood smears, taking capillary blood for peripheral glucose testing with a glucometer and glucoanalyzer, as well as for blood gas analysis;

Links with other courses from the curriculum of the specialty

- theoretical disciplines – biochemistry, physiology and pathophysiology
- clinical disciplines – internal medicine, pediatrics, infectious diseases, surgery