



SUBJECT OUTLINE

1. Programme of study description

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| 1.1. | THE "CAROL DAVILA" UNIVERSITY OF MEDICINE AND PHARMACY |
| 1.2. | THE FACULTY OF MEDICINE / THE CLINICAL DEPARTMENT 14 |
| 1.3. | DISCIPLINE: CLINICAL TOXICOLOGY |
| 1.4. | DOMAIN OF STUDY: Healthcare – regulated sector within the EU |
| 1.5. | CYCLE OF STUDIES: BACHELOR'S DEGREE |
| 1.6. | PROGRAMME OF STUDY: MEDICINE |

2. Subject description

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| 2.1. | Name of the subject/compulsory subject/elective subject within the discipline: <ul style="list-style-type: none"> Clinical Toxicology Clinical Pharmacology | | | | | | |
| 2.2. | Location of the discipline: 8, EROILOR SANITARI STR, BUCHAREST | | | | | | |
| 2.3. | Course tenured coordinator: | | | | | | |
| 2.4. | Practicals/clinical rotations tenured coordinator: | | | | | | |
| 2.5. Year of study | * V ** IV | 2.6. Semester | I; II I; II | 2.7. Type of assessment | Oral examination | 2.8. Subject classification | compulsory |

3. Total estimated time (hours/semester of didactic activity) – teaching module

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| Number of hours per week | 4 | Out of which: course | 2 | Clinical rotation | 2 |
| Total number of hours from curriculum | 32 | Out of which: course | 16 | Clinical rotation | 16 |
| Distribution of allotted time | 8 week | course | 2 | clinical rotation | 2 |
| Study from textbooks, courses, bibliography, and student notes | | | | | 2 h |
| Additional library study, study on specialized online platforms and field study | | | | | 2 h |
| Preparing seminars / laboratories, assignments, reports, portfolios and essays | | | | | |
| Tutoring | | | | | |
| Examinations | | | | | |
| Other activities | | | | | |
| Total hours of individual study | | | | | |
| Number of credit points | | | | | |

3.Total estimated time (hours/semester of didactic activity) – teaching module Clinical Pharmacology

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| Number of hours per week | 14 | Out of which: course | 4 | Clinical rotation | 10 |
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| Total number of hours from curriculum | | Out of which: course | | Clinical rotation | |
| Distribution of allotted time | | | | | |
| Study from textbooks, courses, bibliography, and student notes | | | | | 2 h |
| Additional library study, study on specialized online platforms and field study | | | | | 2 h |
| Preparing seminars / laboratories, assignments, reports, portfolios and essays | | | | | |
| Tutoring | | | | | |
| Examinations | | | | | |
| Other activities | | | | | |
| Total hours of individual study | | | | | |
| Number of credit points | | | | | |

4. Prerequisites (where applicable)

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| 4.1. of curriculum | Fundamental knowledge of physiology, biochemistry, semiology, pharmacology, physiopathology |
| 4.2. of competencies | |

5. Requirements (where applicable)

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| 5.1. for delivering the course | Computer, video projector, textbook of clinical toxicology |
| 5.2. for delivering the clinical rotation | CLINICAL TOXICOLOGY ICU Toxicology -Emergency Clinical Hospital ER - Emergency Clinical Hospital CLINICAL PHARMACOLOGY Military Emergency Hospital "Dr. Carol Davila" |

6. Acquired specific competencies

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| Professional competencies (expressed through knowledge and skills) | <p>At the end of the course the student must:</p> <p>Clinical Toxicology:</p> <ul style="list-style-type: none"> • to describe the mechanisms of general acute toxicity by types of poisoning; • to know the parameters of acute toxicity, phase I and phase II reactions; receptors and specific interactions with toxicodynamic receptors; • to know the information related to general stabilization measures in acute intoxications; • to have notions about measures to increase the elimination of a toxic substance • to know the main antidotes and antidote mechanisms with great specificity; • to know and describe the main toxidromes; • to master notions about acute intoxications with psychotropic substances, alcohols and glycols, metals, |
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| | <p>opiates;</p> <ul style="list-style-type: none"> • to know the main measures of supporting therapy and monitoring in toxicological intensive care units <p>Clinical Pharmacology:</p> <ul style="list-style-type: none"> • diagnosis • the pharmacotherapeutic classes used for the respective pathology • expected adverse reactions • anticipating drug interactions • the choice of rational treatment in the treatment of a pathology in the case of its association with other comorbidities |
| Transversal competencies (of role, of professional and personal development) | <ul style="list-style-type: none"> • To demonstrate concern for professional improvement by training clinical thinking skills; • To demonstrate involvement in scientific activities, such as the elaboration of specialized articles and studies; • To participate in projects having a scientific character, compatible with the requirements of integration in European education; • Upon completion of the course, the student must have the following communication skills: <ul style="list-style-type: none"> ● Regarding professional behavior <ul style="list-style-type: none"> ○ to demonstrate a professional attitude towards the patient and the working team ○ to coordinate the activity in the Toxicology ICU, in close collaboration with the average staff ○ establish and maintain a safe work environment, considering the risks of contamination or injury with specific instruments ○ to know the importance of continuous medical education in order to develop their professional capacities based on current scientific data ● Regarding ethical behavior <ul style="list-style-type: none"> ○ to apply the ethical principles related to medical practice ○ to respect patients' rights ○ to give priority to those treatment options |



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| | <p>that meet the patient's individual needs</p> <ul style="list-style-type: none"> ○ to respect patients and colleagues without discrimination ○ to comply with the legal, administrative procedures and directions of conduct in medical practice ● Regarding ability to communicate and relate <ul style="list-style-type: none"> ○ acquire and use medical vocabulary correctly ○ to communicate with the patient and his/her relatives ○ to interrelate with doctors of other specialties ○ to maintain a constructive, stress-free working atmosphere |
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7. Subject learning objectives (based on the scale of acquired specific competencies)

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| 7.1. General learning objective | <p>CLINICAL TOXICOLOGY Acquiring notions and knowledge necessary to establish etiopathogenesis and diagnosis of acute intoxications.</p> <ul style="list-style-type: none"> - the acquisition of notions and knowledge, skills, behaviors, attitudes, abilities and values necessary for medical practice in the field of clinic and intensive therapy. - acquiring the values of medical and human ethics, the ethical norms of caring for intoxicated patients and the methods of relating to patients and their families. - making correlations between the notions of the Clinical Toxicology course and the previous medical experience - the assessment of student performance must be based on the periodic and final assessment of the level of knowledge and skills - knowing the objectives of the course in order to assume their responsibilities. <p>CLINICAL PHARMACOLOGY</p> <ul style="list-style-type: none"> - The choice of rational treatments based on the principle of synergism in beneficial effects and antagonism in adverse reactions - Studying therapeutic guidelines and protocols - Anticipation of adverse effects and drug interactions and their treatment |
| 7.2. Specific learning objectives | <p>Upon completion of the course, the student will be able to:</p> <ul style="list-style-type: none"> - understand, define and know the mechanisms of acute toxicity; - know the clinical-paraclinical aspects in acute intoxications; - acquire notions about the therapeutic methods used in acute intoxications; - has knowledge of toxicological analytical laboratory methods; - acquire notions related to antidotes and antidote mechanisms; |

8. Content

| 8.1. Course | Teaching methods | Observations |
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| Course 1: General notions; quantitative parameters of toxicity; metabolism of toxins | Course presented orally with power-point slides | 2 h |
| Course 2: Medical approach in acute | Course presented orally with power-point | 2 h |



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| intoxications | slides | |
| Course 3: Diagnosis of acute intoxications | Course presented orally with power-point slides | 2 h |
| Course 4: Acute intoxications – benzodiazepines, barbiturates, antidepressants, antipsychotics, opiates | Course presented orally with power-point slides | 2 h |
| Course 5: Acute intoxications with alcohols, hydrocarbons and solvents | Course presented orally with power-point slides | 2 h |
| Course 6: Non-drug poisoning course - cyanide, carbon monoxide, heavy metals | Course presented orally with power-point slides | 2 h |
| Course 7: Poisoning with paracetamol, salicylates, organophosphorus compounds, ammonia | Course presented orally with power-point slides | 2 h |
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| 8.2. Clinical rotation | Teaching methods | Observations |
| CR 1: introduction to clinical toxicology; visit to the clinical department; the distribution of student groups to each teaching staff | Study carried out in the intensive care unit and the analytical toxicology laboratory | |
| CR 2: basic life support - demonstration training session - stabilization of intoxicated patients; basic therapeutic maneuvers necessary to stabilize vital functions | Study carried out in the intensive care unit and the analytical toxicology laboratory | |
| CR 3: analytical diagnosis - working session in the Analytical Toxicology Laboratory; demonstrative performance of an analytical examination - processing of a biological sample for analytical examination; gas-chromatographic examination coupled with mass spectrometry; other methods of analytical diagnosis | Study carried out in the intensive care unit and the analytical toxicology laboratory | |
| CR 4: evaluation of the intoxicated patient; evaluation of a state of coma; correlation of clinical aspects with analytical toxicological examination; anamnestic and clinical evaluation of patients addicted to drugs of abuse | Study carried out in the intensive care unit and the analytical toxicology laboratory | |
| CR 5: evaluation of patients intoxicated with alcohol (ethyl alcohol, ethylene glycol, methanol); | Study carried out in the intensive care unit and the analytical toxicology laboratory | |
| CR 6: evaluation of patients poisoned with carbon monoxide; clinical and paraclinical evaluation of posthypoxic encephalopathy | Study carried out in the intensive care unit and the analytical toxicology laboratory | |



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| CR 7: clinical and paraclinical evaluation of patients intoxicated with organo-phosphorus and carbamic anticholinesterases; | Study carried out in the intensive care unit and the analytical toxicology laboratory | |
| CR 8: evaluation of practical and theoretical knowledge | | |
| Bibliography for course and clinical rotation - 2006 - „ <i>Diagnosis and treatment in acute poisoning</i> ”, authors: Victor A. Voicu, Radu Macovei, Liviu Miclea. - 2012 - " <i>Clinical Toxicology Guide</i> ", publishing house Brumar Timișoara. authors: Victor A. Voicu, Radu Macovei, Liviu Miclea; colaboratori - Mihail Silviu Tudosie; Bogdan Opriță; Mihai Ionică. | | |

CLINICAL PHARMACOLOGY

| Content | Observations |
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| 1. Course The course includes three modules: clinical pharmacology of the cardiovascular system, clinical pharmacology of the respiratory system and clinical pharmacology of the digestive system and is held for each series during the main module. 1. Clinical pharmacology of the cardiovascular system - semester 1 <ul style="list-style-type: none"> • Course 1 – Introductory concepts of Clinical Pharmacology • Course 2 – Clinical Pharmacology of Hypertension • Course 3 – Clinical Pharmacology of cardiac arrhythmias, angina pectoris and heart failure 2. Clinical pharmacology of the respiratory system <ul style="list-style-type: none"> • Course - Clinical Pharmacology of Bronchial Asthma 3. Clinical pharmacology of the digestive system <ul style="list-style-type: none"> • Course – Clinical pharmacology of gastric and duodenal ulcers, Antiemetics, Antidiarrheals, Prokinetics, Bile acids, Laxatives and purgatives, Clinical pharmacology of inflammatory bowel disease | 4 h/week |
| 2. Seminar (if the case) <ul style="list-style-type: none"> • <u>Clinical pharmacology of the cardiovascular system</u> 1. Introductory notions of clinical pharmacology Defining the concept of rational treatment - based on the four principles of evidence-based medicine: safety, effectiveness, appropriateness of the proposed purpose and cost The role of the clinical pharmacologist in clinical and research activity Clinical trial concepts: phase 1, phase 2, phase 3 and phase 4 (post-marketing evaluation) Defining and exemplifying the notions of primary outcomes and surrogate outcomes pursued in clinical research 2. Clinical pharmacology of arterial hypertension Choice of diuretics, centrally acting antihypertensives, beta-blockers, calcium channel blockers, vasodilators, converting enzyme inhibitors Clinical cases Treatment of hypertension in the context of associated pathologies: angina pectoris, arrhythmias, diabetes mellitus, peripheral ischemia Discussion of the Guide developed by the American Heart Association and the European Society of Cardiology Clinical cases 3. Clinical pharmacology of arrhythmias. Exemplification of recommended and prohibited associations. Side effects Drug interactions | 10h/week |



| <p>Clinical cases</p> <p>4. Pharmacology of angina pectoris</p> <p>Side effects</p> <p>Drug interactions</p> <p>Clinical cases</p> <p>5. Clinical pharmacology of heart failure</p> <p>Exemplification of the determining role of beta-blockers, diuretics and converting enzyme inhibitors.</p> <p>The role of digoxin in the treatment of heart failure</p> <p>Clinical cases</p> <ul style="list-style-type: none"> • <u>Clinical pharmacology of the respiratory system</u> <p>1. Clinical pharmacology of bronchial asthma</p> <p>Exemplification of emergency medication in the treatment of bronchial asthma</p> <p>Efficacy and safety of maintenance and intercritical treatment in bronchial asthma</p> <p>Clinical cases</p> <ul style="list-style-type: none"> • <u>Clinical pharmacology of the digestive system</u> <p>1. Clinical pharmacology of gastric and duodenal ulcers.</p> <p>The role of anti-infective treatment in the eradication of ulcer pathology</p> <p>Side effects and drug interactions of proton pump inhibitors and histamine receptor blockers</p> <p>Clinical cases</p> <p>2. Clinical pharmacology of emesis.</p> <p>Antiemetics - adverse reactions, drug interactions</p> <p>Clinical cases</p> <p>3. Clinical pharmacology of gastro-oesophageal reflux disease</p> <p>Prokinetics - efficiency, safety</p> <p>Inhibitors of acid secretion - adverse reactions</p> <p>Clinical cases</p> <p>4. Clinical pharmacology of constipation</p> <p>Safety and efficacy data of purgative laxatives</p> <p>Clinical cases</p> <p>5. Clinical pharmacology of inflammatory bowel disease</p> <p>Adverse reactions and drug interactions of non-steroidal anti-inflammatory drugs, corticosteroids, cytotoxics and biological response modifiers</p> <p>Clinical cases</p> | |
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| Type of activity | Teaching methods |
| Course | Each course is presented on video support, the information is the most current based on the latest clinical studies and guidelines approved by the European scientific community |
| Seminar | Clinical cases with increasing degree of difficulty. Their discussion is done interactively, with the choice of the most appropriate pharmacotherapeutic treatment. The prevention of possible adverse effects and drug interactions is discussed |

9. Corroboration of the subject content with the expectations of the representatives of the epistemic community, professional associations, and major employers in the field of the programme of study

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10. Assessment
Clinical Toxicology

| Type of activity | Assessment criteria | Assessment methods | Assessment weighting within the final grade |
|------------------|---------------------------------|--------------------|---|
| Course | Acquiring theoretical knowledge | Oral exam | 100% |



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| Clinical rotation | Assessment of practical knowledge | Practical evaluation of the patient | Accepted/rejected |
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Minimum performance standard

at least 50% of the questions related to the subjects on the exam note

Clinical Pharmacology

| Type of activity | Assessment criteria | Assessment methods | Assessment weighting within the final grade |
|-------------------------|-----------------------------------|-------------------------------------|--|
| Course | Acquiring theoretical knowledge | multiple choice written work | 100% |
| | | | |
| Seminar | Assessment of practical knowledge | Practical evaluation of the patient | Accepted/rejected |
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Date of filing

Signature of the course tenured coordinator

Signature of the seminar tenured coordinator

Date of approval in the Council of the Department:

Signature of the Head of the Department