COURSE DATA

Data Subject	
Code	34465
Name	General pharmacology of organs and systems
Cycle	Grade
ECTS Credits	4.5
Academic year	2023 - 2024

Study (s)

Degree	Center	Acad. year	Period
1204 - Degree in Medicine	Faculty of Medicine and Odontology	3	First term

Subject-matter

Degree	Subject-matter	Character
1204 - Degree in Medicine	11 - Diagnostic and therapeutic procedures	Obligatory

Coordination

Name	Department
CALATAYUD ROMERO, FRANCISCA SARA	135 - Pharmacology

SUMMARY

Pharmacology is the science in which properties and effects of drugs and their interaction with living beings are studied. It is a branch of medicine focused on its therapeutic, preventive and diagnostic usage for the human being.

The objective of this subject is the development of knowledge, working capacity and communicative skills in the area of analysis of the updated information in all different aspects of pharmacological therapeutics. The incorporation of new information and communication technologies and literature search will contribute to such objectives. Among the formative activities, we can find the following: aspects related to knowledge on forms of drug administration for humans, parameters which are useful to study the temporary evolution of drugs in the organism, studies on mechanisms of action of drugs and pharmacological interactions, as well as the interpretation of the most representative pharmacological effects, and special seminars aimed at studying important pharmacological issues.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

In order to course this subject, it is advisable that the student passes the knowledge of human anatomy, biology, biochemistry and physiology.

COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

1204 - Degree in Medicine

- Establish the diagnosis, prognosis and treatment, applying principles based on the bestinformation available and on conditions of clinical safety.
- Indicate the most accurate therapy in acute and chronic processes prevailing, as well as for terminally ill patients.
- Acquire properclinical experience in hospitals, health care centres and other health institutions, under supervision, as well as basic knowledge of clinical management focused on the patient and the correct use of tests, medicines and other resources available in the health care system.
- Know how to use the sources of clinical and biomedical information available, and value them critically in order to obtain, organise, interpret and communicate scientific and sanitary information.
- Know how to use IT in clinical, therapeutic and preventive activities, and those of research.
- Keep and use medical records which contain information about the patient for later analysis, preserving the confidentiality of personal data.
- In the professional practise, take a point of view which is critical, creative, constructive and research-oriented.
- Understand the importance and the limitations of scientific thinking in the study, prevention and management of diseases.
- Be able to formulate hypothesis, gather information and evaluate it critically in order to solve problems by following the scientific method.
- Establish a good interpersonal communication which may allow professionals show empathy and talk to the patients efficiently,as well as to their relatives, the media and other professionals.
- Organizar y planificar adecuadamente la carga de trabajo y el tiempo en las actividades profesionales.
- Capacidad para trabajar en equipo y para relacionarse con otras personas del mismo o distinto ámbito profesional.

- Criticism and self-criticism skills.
- Capacity for communicating with professional circles from other domains.
- Acknowledge diversity and multiculturality.
- Consideration of ethics as a fundamental value in the professional practise.
- Working capacity to function in an international context.
- Knows the main groups of drugs, doses, routes of administration and pharmacokinetics. Interactions and adverse effects.
- Knows pharmacology of various organs and systems.
- Knows how to use medicines properly. Analgesic, antineoplastic, antimicrobial and anti-inflammatory drugs.
- Understands the characteristics of surgical haemorrhage and thromboembolic prophylaxis.
- Compiles medical prescriptions correctly, adapted to the patient?s situation and legal requirements.

LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

- To know the scientific bases in which the pharmacological therapeutics is settled.

- To understand the pharmacokinetic aspects of a drug or pharmacological group, which indicate the influence of the human organism on it.

- To reason the influence of the drugs on the organism.

- To understand the bases of the drugs action over the physiopathology of the del human being.

- To know the interference possibilities with drugs over the functions and mediators of the organism and their possible therapeutic impact.

- To know the effects of the drugs or pharmacological groups on the different organs and systems of the human being.

- To reason what effects of a determined drug will have a hypothetical therapeutic application and which ones will be interpreted as adverse reactions, according to the patient.

- To know the bases of possible interactions among different drugs in the organism with the objective of their prevision in the medical practice.

DESCRIPTION OF CONTENTS

1. THEORETICAL THEMATIC UNITS

1. Introduction to pharmacology. History. Terminology. Basic concepts.
2. Pharmacokinetics. LADME processes. Influence of specific circumstances (disease, age and gender).
3. Pharmacodynamics. Mechanism of drug action. Possibilities of drug interaction. Adverse reactions. Influence of specific circumstances (disease, age and gender).
4. Pharmacology of the peripheral nervous system Pharmacological modulation of the cholinergic and adrenergic systems (agonists, antagonists and indirect modulators).
5. Pharmacology of the central nervous system Antidepressants. Anxiolytics and sedatives. Antiepileptic and anticonvulsant drugs. Antipsychotics. Pharmacology of Parkinson's disease and other neurodegenerative disorders.
6. Pharmacology of opioids and anaesthetics.
7. Pharmacology of NSAIDs. Glucocorticoids. Antihistaminic drugs.
8. Pharmacology of the immune response.
9. Pharmacology of the cardiovascular and renal system Pharmacology of heart failure (digitalis and other positive inotropic drugs, vasodilators, beta-blockers, diuretics). Calcium antagonists. Antiarrhythmic agents. Antihypertensive drugs. Antianginal agents. Vascular insufficiency.
10. Pharmacology of the hematopoietic system and coagulation.
11. Pharmacology of metabolic and lipid disorders (dyslipidaemia, obesity, hyperuricemia, gout, pharmacology of calcium and phosphorus).
12. Pharmacology of the respiratory system.
13. Pharmacology of the digestive system Anti-secretory agents. Pharmacology of the mucosal ulceration (inflammatory bowel disease). Drugs affecting gastrointestinal motility (antidiarrheal, laxative, prokinetic, spasmolytic and antiemetic agents). Hepatobiliary pharmacology.
14. Pharmacology of the endocrine system Pancreas. Thyroid gland. Gonads. Hypothalamic-pituitary axis.

2. THEORETICAL THEMATIC UNITS (continuation)

15. Anti-infective pharmacology (I): antibacterials.
16. Anti-infective pharmacology (II): antifungal. Antiparasites. Antivirals. Antiseptics.
17. Antineoplastic pharmacology.

3. SEMINARS

1. Integrated study of the pharmacological possibilities against the CNS disorders.
2. Integrated study of the pharmacological possibilities against the inflammatory and/or immune disorders.
3. Integrated study of the pharmacological possibilities against the Cardiovascular System disorders.
4. Integrated study of the pharmacological possibilities against metabolic disorders.
5. Integrated study of the sexual hormones pharmacology.
6. Pharmacological possibilities against viral infections.
7. Pharmacological possibilities against parasitizing infections.

4. LABORATORY PRACTICES

1. Analysis of the plasma level curve and main pharmacokinetic parameters.
2. Analysis of different posologic patterns. Pharmacokinetic assessment of the more representative pharmacological groups.
3. Administration ways and pharmaceutical ways.
4. Study of the Doses-Response curve. Drug-receptor interaction.
5. Analysis and assessment of the drugs that modulate the VNS transmission.
6. Analysis and assessment of the drugs that modulate the transmission of other cell mediators.
7. Analysis and assessment of the drugs that modulate the CNS transmission.
8. Analysis and assessment of the drugs that modulate the pain and the inflammatory response.
9. Analysis and assessment of the drugs that modulate the immune response.
10. Analysis and assessment of the drugs that modulate the contractility and the cardiac rhythm.
11. Analysis and assessment of the drugs that modulate the vascular tone and blood volume regulation.
12. Analysis and assessment of the drugs that modulate the metabolic disorders.
13. Analysis and assessment of the drugs that modulate the digestive functions.
14. Analysis and assessment of the antibacterial drugs.
15. Analysis and assessment of the antineoplastic drugs.

WORKLOAD

ACTIVITY	Hours	% To be attended
Laboratory practices	30,00	100
Theory classes	19,00	100
Seminars	7,00	100
Development of group work	10,00	0
Development of individual work	6,25	0
Study and independent work	15,00	0
Readings supplementary material	5,00	0
Preparation of evaluation activities	15,00	0
Preparation of practical classes and problem	5,00	0
TOTAL	**112,25**	

TEACHING METHODOLOGY

- **Theoretical Lessons** (17 Thematic Units). The theoretical content will be taught of the different parts of the subject that can be complemented by audiovisual media, adapted for the subject.

- **Seminar** Practical Lessons (7 Thematic Units) about different theoretical aspects related with the use of drugs in the medical practice.

- **Laboratory Practical** Lessons (15 Thematic Units). These units are attending and with reduced groups, taught in the teaching laboratory where, individually, different experimental situations are recreated, which visualize the effects of the different pharmacological groups over different organs and tissues (pharmaco-dynamics). Likewise, different kinetic problems are studied, which appear during the application of the pharmacological treatments (pharmaco-kinetics). Other aspect which is taught in the practical lessons is the study of the action of different pharmacological treatments that are applied to different concrete clinical situations (clinical indication).

The gender perspective and the Sustainable Development Goals (SDGs) will be incorporated into the development goals (SDGs) into teaching, whenever possible.

EVALUATION

The mark comes from the sum of the qualifications obtained in the theory and practical evaluations, which represent 50% of the final mark each, and must be approved in an independent manner.

Theoretical examination: It will be carried with a written test covering all the contents of the program and aimed at evaluating the acquired knowledge. This exam will consist of 50 test questions with four possible answers: each question answered correctly will count 1 point, each erroneous answer will subtract 0.25 points, the blank answers will not score and a score equal to or greater than 25 points will be required to pass the exam.

Practical evaluation: Attendance at practices is compulsory. The evaluation will be carried out through the continuous evaluation of the student's participation in different activities, which will define a 20% of the final mark, and by means of a written exam that will include clinical cases and / or pharmacological problems and which will define the remaining 30% of the final mark.

Attendance to practical sessions is mandatory. Unjustified non-attendance to more than 20% of the sessions will make it impossible to pass the course.

Students are reminded of the importance of carrying out evaluation surveys on all the teaching staff of the degree subjects.

REFERENCES

Basic

- Goodmann and Gilman (2017). The Pharmacological Basis of Therapeutics. 13th ed. McGraw-Hill Education/Medical.

- Rang y Dale (2020). Farmacología. 9ª ed. Elsevier.
- Katzung, B.G. (2021). Basic and 15th Clinical Pharmacology ed. McGraw-Hill LANGE
- Rang y Dale (2020). Farmacología. 9ª ed. Elsevier.
- Velázquez. (2017). Farmacología Básica y Clínica 19ª ed. Madrid. Editorial Médica Panamericana.

Additional

- Florez J. (2013). Farmacología Humana, 6ª ed., Elsevier-Masson
- Golan DE. (2017) Principios de farmacología. Bases fisiopatológicas del tratamiento farmacológico. 4ª ed. Lippincott Castellano
- Dipiro JT. Pharmacotherapy. A pathophysiologic approach. 10th ed. McGraw-Hill Education/Medical.
- Recursos-e Salut: ClilnicaKey Sudent. Elsevier (Scopus, ScienceDirect). uv-es.libguides.com/RecursosSalut/BibliotecaSalut