Universitat Autònoma de Barcelona

2020/2021

General Pharmacology

Code: 102930
ECTS Credits: 4

Degree	Type	Year	Semester
2502442 Medicine	OB	3	0

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

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Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Teachers

Josep Torrent Farnell
Caridad Pontes García
Eva Montané Esteva

Prerequisites

There are no previous requirements, but it is necessary to have enough knowledge in biochemistry and molecular biology.

Objectives and Contextualisation

The subject is programmed for the first semester of the third year of the Degree in Medicine, when knowledge of biology, physiology and histology has already been reached, and when the study of the bases of the pathology and the main syndromes begins; It also corresponds to the first contact with the clinic.

The training objectives of the subject are to show a general overview of the medicines available to treat the different symptoms, the large syndromes and specific diseases, their mechanism of action, the desired and undesired effects, as well as the possible interactions.

The knowledge of the pharmacological bases, together with that of the pathological bases of the disease, will provide the foundations to understand the process of reasoned selection of the drugs, during the clinical period.

The theoretical knowledge of the subject is complemented by practical knowledge acquired in clinical case resolution seminars from specific patient histories, whose resolution requires the use of one or more drugs with specific effects, or the withdrawal of some previous treatment.

Competences

- Be able to work in an international context.
- Communicate clearly, orally and in writing, with other professionals and the media.
- Demonstrate an understanding of the fundamentals of action, indications, efficacy and benefit-risk ratio of therapeutic interventions based on the available scientific evidence.
- Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.
- Maintain and sharpen one's professional competence, in particular by independently learning new material and techniques and by focusing on quality.
- Organise and plan time and workload in professional activity.
- Recognize the determinants of population health, both genetic and dependent on gender, lifestyle, and demographic, environmental, social, economic, psychological and cultural factors.

Learning Outcomes

1. Apply the scientific method to the alternative medicines.
2. Be able to work in an international context.
3. Communicate clearly, orally and in writing, with other professionals and the media.
4. Define the concept of drug interaction and know the main mechanisms of interactions between drugs and between drugs and other substances (food, toxic habits, medicinal plants) and diagnostic tests.
5. Define the concept of pharmacodynamics, action, effect, bioassay, dose-response and mathematical models governing the action of drugs.
6. Define the concepts of pharmacology and clinical pharmacology and know their divisions.
7. Describe the concepts of drug, medication, narcotic and toxic.
8. Describe the different routes of medication administration.
9. Describe the main features of the pharmacology of the different body systems (cardiovascular, respiratory, gastrointestinal, kidney, blood, endocrine and metabolism).
10. Describe the main mechanisms of toxicity involved in adverse reactions to drugs.
11. Determine the importance of self-medication.
12. Differentiate the composition of analgesic, antineoplastic, antimicrobial and anti-inflammatory drugs.
13. Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.
14. Identify the main sources of information on medication, therapeutics and clinical pharmacology: primary, secondary and tertiary.
15. Identify the medication registration process and the legal regulation of medication.
16. Maintain and sharpen one's professional competence, in particular by independently learning new material and techniques and by focusing on quality.
17. Organise and plan time and workload in professional activity.

Content

Introduction to Pharmacology. Processes of absorption, distribution, metabolism and excretion of drugs. General pharmacokinetics. Mechanism of action of drugs and mathematical aspects of pharmacodynamics. Adverse reactions, pharmacological toxicity and pharmacological interactions. Biological drugs, gene therapy and cell therapy. Pharmacology of the autonomic nervous system, agonists and adrenergic antagonists. Cholinergic agonists and antagonists. Pharmacology of the motor plate and membrane excitability. Pharmacology of inflammation and cellular mediators. Anti-inflammatories and antirheumatics. Pharmacology of the central nervous system. Opioid analgesics Pharmacology of drug abuse and dependence. Vascular and circulation pharmacology. Cardiac pharmacology. Respiratory pharmacology. Pharmacology of motility and gastrointestinal secretion. Pharmacology of blood. Renal and plasma water pharmacology. Introduction to the pharmacology of the endocrine system: pharmacology of the adrenal cortex and sex hormones. Pharmacology of the thyroid, calcium metabolism and pancreatic secretion. Lipid-lowering drugs Pharmacology of neoplastic growth. Basic principles of chemotherapy.

Distributive blocks
A. General aspects of Pharmacology. Definitions. Search for new medicines and methods to study the effects of medications.
B. Principles of pharmacokinetics and pharmacodynamics. Interactions and adverse reactions.

C. Special pharmacology: of the nervous system, of inflammation, of immunity, of cell growth, of the cardiocirculatory system, of the internal environment, metabolism and hormones, of the digestive system and pharmacology of antimicrobials. Pharmacology of drugs.

Course summary
Master classes:
Introduction to Pharmacology. Processes of drug absorption and distribution
Processes of metabolism and drug excretion
Mechanism of action of drugs and mathematical aspects of pharmacodynamics
Pharmacology of the autonomic nervous system: adrenergic, antiadrenergic, cholinergic and anticholinergic drugs
Pharmacology of the motor plate and the excitability of the membrane
Pharmacology of cellular mediators
Generalities of CNS neurotransmission. Amino acid transmission
Classification of drugs that act on CNS. Anticonvulsants
Pharmacology of dopaminergic pathways: antipsychotics and abnormal movements
Pharmacology of catecholaminergic pathways: antidepressants, psychostimulants and hallucinogens
Cholinergic and other pathways (cannabinoids, NO, nicotine, pharmacology of peptide transmission)
Vascular and circulation pharmacology
Cardiac pharmacology
Respiratory pharmacology
Renal pharmacology
Pharmacology of motility and gastrointestinal secretion
Pharmacology of the endocrine system: corticoids, thyroid, calcium metabolism and pancreatic secretion
Pharmacology of antibacterials I
Pharmacology of antibacterials II
Pharmacology of antibacterials III: antiviral and antifungal. Antiparasitic

SCC 120 'Seminars:
Pharmacokinetics: concepts and parameters
Adverse reactions and toxicity
Pharmacological history
Pharmaceutical forms
Drugs
Hematology
Renal
Sex hormones
Pharmacology of neoplastic growth
Diabetes

60 'SCC Seminars:
Pharmacokinetics: interactions
Development of medicines
Respiratory
Biological drugs
Dyslipidemia

Methodology

This Guide describes the framework, contents, methodology and general rules of the subject, in accordance with the current curriculum. The final organization of the subject in relation to the number and size of the groups, distribution in the calendar and dates of examinations, specific evaluation criteria and review of exams, will be specified in each of the Hospital Teaching Units (UUDDHH), which they will explain it through their web pages and the first day of class of each subject, through the professors responsible for the subject in the UUDDHH.

For the 2017-2018 academic year, the professors appointed by the Department as responsible for the subject at the Faculty level and the UUDDHH are:

Department responsible: Pharmacology, Therapeutics and Toxicology

Head of the Faculty: Josep Mª Castel Llobet

Responsible UUDDHH

UD Vall d'Hebron: Mª Antonieta Agustí Escasany

UD Germans Trias i Pujol: Eva Montané

UD Sant Pau: Josep Torrent Farnell

UD Parc Taulí: Caridad Pontes

Methodology

Master classes: TE typology (registration group)

Seminars of clinical cases: SCC typology (groups of 10): 5 1-hour seminars

Problem solving and presentation of SCC projects (groups of 10): 10 2-hour seminars

General Pharmacology training activities include master classes and clinical case resolution seminars. Both activities complement each other and allow to acquire, at the same time, knowledge about fundamental aspects of Pharmacology and practice in the identification of problems in a specific patient that require, either the use of a medicine that produces a desired effect, or the withdrawal of a treatment that the patient is taking and that causes a harmful effect.

All the lectures have a duration of 60 minutes (50 minutes exposition + 10 minutes of interaction and questions' resolutions). On the other hand, clinical case seminars last from 60 minutes to 120minutes, depending on the complexity of the case and the group of medicines to which it corresponds.

The case seminars are based on a clinical history that the student will receive in advance. The resolution of the clinical problem raised in the story will require an individual reflection and sharing to identify what happens to the patient, what pharmacological effects could help to improve the symptomatology and discover which drugs modify these effects. Some of the cases correspond to adverse reactions caused by one or more drugs that require the withdrawal of the causal drug, or due to problems of calculation and dose adjustment. Finally, in some cases the preparation of a pharmacological anamnesis and its subsequent analysis will be requested.

In the current exceptional circumstances, at the discretion of the teachers and also depending on the resources available and the public health situation, some of the theoretical classes, practicals and seminars organized by the Teaching Units may be taught either in person or virtually.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Clinical cases workshops	25	1	1, 3, 4, 5, 6, 7, 10, 8, 9, 11, 12, 13, 15, 14, 17
Theoretical lectures	20	0.8	4, 5, 6, 7, 10, 8, 9, 11, 13, 14
Type: Autonomous			
Personal study time	50	2	1, 3, 4, 5, 6, 7, 10, 8, 9, 11, 12, 13, 15, 14, 16, 17, 2

Assessment

1) Objective multiple-choice test (test) with 5 options and a single correct answer. Orientatively, there will be three questions for each master class and two questions for each seminar.

There will be a first part that will include the subject of the theoretical lessons 1 to 10 and of the SCC 1 to 6-8 (according to the teaching schedule of each UD). Students who obtain a grade equal to or greater than 5.0 out of 10.0 will be considered released from these subjects.

There will be a second partial that will include the subject of the theoretical lessons 11 to 20 and of the SCC 7-9 to 15 (according to the teaching schedule of each UD). Students who obtain a grade equal to or greater than 5.0 out of 10.0 will be considered released from these subjects.

There will be a final test of recovery that will include the subject of lessons 1 to 20 and SCC 1 to 15, and will be divided into two subtests.

Students who have released one of the partials, will only have to examine the subtest that includes the material not released. The recovery test will be considered successful if they obtain a grade equal to or higher than 5.0 out of 10.0.

For the students who have to examine each subject, the test will be considered passed as long as the average grade of the two subtests is equal to or greater than 5.0. ATTENTION: in order to calculate the average, it is necessary that the minimum grade of the two subtests be equal to or greater than 4.0.

Students who have released the partial and wish to upload a grade of the whole subject or one of the partial, may make the recovery test.

The final grade of the objective test has a weight of 70% of the final grade of General Pharmacology.

2) Evaluation of the preparation and exposure of clinical cases.

At the end of each clinical case seminar there will be a continuous evaluation of the practical knowledge and the participation of the student in the activity. This evaluation may be written or oral, based on questions or presentations made during the seminars, or at the end of the seminars (in this case, in the form of test questions added at the end of the partial or recovery tests). This evaluation will be valued between 0 and 10. The average of the result obtained in the different evaluations of the seminars will correspond to the overall mark of the seminars.

This qualification is worth 30% of the final grade of General Pharmacology.

When the student does not attend the scheduled partial tests or the synthesis test, it will be considered non-evaluable.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Practical cases and problem solving tests	30	3	0.12	1, 4, 5, 6, 7, 10, 8, 9, 11, 12, 15, 14
Written assessment by objective test	70	2	0.08	1, 3, 4, 5, 6, 7, 10, 8, 9, 11, 12, 13, 15, 14, 16, 17, 2

Bibliography

Specific bibliography

Flórez J. Farmacología Humana. 6ª ed. Masson, Barcelona, 2015.

Rang HP, Dale MM, Ritter JM, Flower R. Farmacología. 8a ed. Elsevier, Barcelona, 2016.

Wecker L (ed.) Brody's Human Pharmacology. Molecular to clinical. 6th ed. Mosby Elsevier, Philadelphia, 2018.

Reference bibliography

Brunton L, Lazo J, Parker K (Eds.). Goodman & Gilman's The Pharmacological Basis of Therapeutics, 13ed. Mc Graw Hill, New York, 2018.

Internet resources

Agencia Española de Medicamentos y Productos Sanitarios (http://www.aemps.es/): technical data sheet of medications approved in Spain.

Fundació Institut Català de Farmacologia (http://www.icf.uab.cat): Free access to *Butlleti Groc* Newsletter, reports on new medications and other publications.

Guia de la Bona Prescripció (https://www.icf.uab.cat/ca/download/enllac/assets/pdf/productes/llibres/gbpc.pdf): Practical manual for reasoned prescription.

Guía de la Prescripción Terapéutica (GPT) (http://www.imedicinas.com/GPTage/Open.php?cDAw)

Vademecum (http://www.vademecum.es/): commercial guide on medicines commercialized in Spain.