

**COURSE DATA****Data Subject**

|                      |   |
|----------------------|---|
| <b>Code</b>          | 34712                                       |
| <b>Name</b>          | Pharmacology, anaesthesia and resuscitation |
| <b>Cycle</b>         | Grade                                       |
| <b>ECTS Credits</b>  | 9.0   |
| <b>Academic year</b> | 2021 - 2022                                 |

**Study (s)**

| <b>Degree</b>              | <b>Center</b>                      | <b>Acad. year</b> | <b>Period</b> |
|----------------------------|------------------------------------|-------------------|---------------|
| 1206 - Degree in Dentistry | Faculty of Medicine and Odontology | 2                 | Annual        |

**Subject-matter**

| <b>Degree</b>              | <b>Subject-matter</b>                          | <b>Character</b> |
|----------------------------|--|------------------|
| 1206 - Degree in Dentistry | 15 - Pharmacology, anaesthesia and reanimation | Obligatory       |

**Coordination**

| <b>Name</b>                    | <b>Department</b>  |
|--------------------------------|--------------------|
| GALLEGO GARCIA, JUAN           | 40 - Surgery       |
| MARTINEZ CUESTA, MARIA ANGELES | 135 - Pharmacology |
| RUBIO GOMIS, MARIA ELENA       | 135 - Pharmacology |

**SUMMARY**

Students enrolled in **Basic Pharmacology** are expected to learn and understand the general principles of pharmacology; the pharmacokinetic phases that make it possible for a chemical molecule (drug) to reach a bio phase in an adequate concentration so that, once there, it can interact with another molecule (receptor) through pharmacodynamic mechanisms to obtain the desired pharmacologic effect, and often other non-desired ones as ADR.

Besides, Basic Pharmacology includes the Study of the pharmacologic groups that had been classified onto the following categories according to their repercussion or usage within the odontologic practice:



1. Drugs used or prescribed by the dentist.
2. Drugs prescribed to the patient by the physician for his or her specific pathology, but that also influence directly on the dental treatment.
3. Drugs commonly prescribed to the patient by the physician for its specific pathology and that can cause mouth reactions or interact in an adverse way with the drugs prescribed by the dentist.
4. Abuse drugs

Pharmacologic groups included in the categories number 1 and 2 must be studied in detail. Their study should include the observation of their action mechanism, pharmacokinetics and pharmacologic effects. As a counterpart for this, the emphasis put into the study of categories 3 and 4 must correspond to those actions and attributes that directly influence the dentist's practice.

Students enrolled in **Clinical Pharmacology** are expected to be capable of making a rational use of the drugs commonly prescribed by the dentist.

**Anesthesia and resuscitation** pretends that students become aware of a matter that will accompany them throughout their careers. As reference to: - The pre-anesthetic assessment. - Local and general anesthesia with its indications and complications. - How to treat postoperative pain.

## PREVIOUS KNOWLEDGE

### Relationship to other subjects of the same degree

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

### Other requirements

Se recomienda que para poder conseguir las competencias de la Farmacología Básica, los alumnos hayan superado las asignaturas de carácter básico de la rama de Ciencias de la Salud en especial la bioquímica, biología y fisiología humana.

Se recomienda que para poder conseguir las competencias generales y específicas de Farmacología clínica los alumnos hayan superado la Farmacología básica y deberían conocer y entender los aspectos científicos más relevantes de las asignaturas del Bloque III (Patología

## OUTCOMES

### 1206 - Degree in Dentistry

- Promover el aprendizaje de manera autónoma de nuevos conocimientos y técnicas, así como la motivación por la calidad.



- Comprender las ciencias biomédicas básicas en las que se fundamenta la Odontología para asegurar una correcta asistencia buco-dentaria.
- Comprender los fundamentos de acción, indicaciones y eficacia de los fármacos y otras intervenciones terapéuticas, conociendo sus contraindicaciones, interacciones, efectos sistémicos e interacciones sobre otros órganos, basándose en la evidencia científica disponible.
- Conocer, valorar críticamente y saber utilizar las fuentes de información clínica y biomédica para obtener, organizar, interpretar y comunicar la información científica y sanitaria.
- Conocer del método científico y tener capacidad crítica para valorar los conocimientos establecidos y la información novedosa. Ser capaz de formular hipótesis, recolectar y valorar de forma crítica la información para la resolución de problemas, siguiendo el método científico.
- Conocer los procesos generales de enfermar, curar y reparar, entre los que se incluyen la infección, la inflamación, la hemorragia y la coagulación, la cicatrización, los traumatismos y las alteraciones del sistema inmune, la degeneración, la neoplasia, las alteraciones metabólicas y los desordenes genéticos.
- Conocer la farmacología general y clínica en la práctica odontológica.
- Conocer las ciencias biomédicas en las que se fundamenta la Odontología para asegurar una correcta asistencia buco-dentaria. Entre estas ciencias deben incluirse contenidos apropiados de:  
Embriología, anatomía, histología y fisiología del cuerpo humano.  
Genética, Bioquímica, Biología celular y molecular  
Microbiología e inmunología
- Conocer el método científico y tener capacidad crítica para valorar los conocimientos establecidos y la información novedosa.
- Conocer los procesos generales de enfermar, curar y reparar, entre los que se incluyen la infección, la inflamación, la hemorragia y la coagulación, la cicatrización, los traumatismos y las alteraciones del sistema inmune, la degeneración, la neoplasia, las alteraciones metabólicas y los desordenes genéticos.
- Conocer la farmacología general y clínica en la práctica odontológica.
- Conocer las bases farmacológicas de las distintas técnicas anestésicas tanto locales como generales, así como el papel de la sedación y la anestesia general en el manejo del paciente odontológico.
- Prescripción apropiada de fármacos, conociendo sus contraindicaciones, interacciones, efectos sistémicos y repercusiones sobre otros órganos.

## LEARNING OUTCOMES

**Basic Pharmacology**'s aim is to provide the students with the fundamental knowledge about Pharmacokinetics and mainly on the drugs mechanism of action, as the basics to understand and read the facts that will be subsequently laid out in Clinical Pharmacology.



Concerning **Clinical Pharmacology**, students are expected to end this course having successfully met requirements such as:

Being able to achieve the most adequate prescription for the patient both from a formal point of view and based on the best evidence.

Being able to examine, evaluate and diagnose a pharmacologic interaction.

Being able to suspect, evaluate and diagnose an adverse reaction to a drug.

Being able to take the necessary precautions to avoid, correct, treat or minimize the adverse consequences of a pharmacologic interaction or drugs adverse reaction

**Anesthesia's** aim is to acquire the knowledge and skill of the various techniques used in dentistry as well as identify and resolve any complications that might arise from them

## DESCRIPTION OF CONTENTS

### 1. Basic Pharmacology

#### A. General principles:

1. Pharmacokinetics: Absorption processes, distribution, biotransformation and excretion.
2. Pharmacodynamics: Drugs action field, nature and kinds of pharmacologic receptors, translation and amplifying mechanisms, agonist and antagonist and dose-response relationship.
3. Concept and general mechanisms of the adverse reactions and interactions.
4. The process and mechanisms involved in the neurotransmission, specially adrenergic and cholinergic, as basis for the drugs action.

#### B. Drugs in the categories 1 and 2:

1. Adrenergic Agonists.
2. Analgesics, non-steroid anti-inflammatories.
3. Opiate analgesics.
4. Steroid Anti-inflammatories.
5. Benzodiazepines.
6. Drugs that modify the hemostasis.
7. Antibacterial drugs.
8. Antifungal drugs.
9. Antiviral drugs.





## **2. Basic Pharmacology (continuous)**

C. Drugs in the categories 3 and 4:

1. Antiseptics and disinfectants.
2. Anticonvulsants and antiparkinsonians.
3. Antidepressives.
4. Anxiolytics and non-benzodiazepine hypnotics
5. Autacoids: anti-cholinergic drugs, anti-histaminic H1 and drugs that modify the serotonin.
6. Abuse drugs. General principles of dependence and oral repercussion of the main abuse drugs.
7. Gastrointestinal pharmacology: Antiemetics; inhibitors of the acid gastric secretion; laxatives and antidiarrheals
8. Sexual hormones pharmacology: anabolics, contraceptives.
9. Pancreas and thyroids pharmacology: Insulin and hypoglycemiants; anti-thyroidal.
10. Drugs that act over the respiratory system: anti-asthmatics and antitussives.
11. Drugs active over the cardiovascular system: Inhibitors of the angiotensin convertor system and angiotensin antagonists; beta-adrenergic antagonists; calcium channels blockers; diuretics; nitrates; antiarrhythmics.
12. Drugs active over the phosphorus-calcium metabolism.
13. Immunomodulators.
14. Neuroleptics
15. Anti-neoplastic Chemotherapy: General principles and oral problems related to the usage of these drugs.

## **3. Clinical Pharmacology**

A. General principles of Clinical Pharmacology:

1. The concept of Clinical Pharmacology and its relation with the therapeutic.
2. Legal regulation of the making, commercialization, prescription and dispensation of the drugs.
3. Information sources about drugs. General rules for the making of therapeutic guides.
4. Guidelines for the administration and monitoring of drugs through plasmatic levels.
6. Drugs-surveillance, adverse reactions to drugs or pharmacologic interactions.
7. Factors that modify drugs-response. Maternal-fetal, Pediatric and Geriatric clinical Pharmacology. Special situations in Odontologic therapeutics.
8. Pharmacologic Anamnesis, patient instruction and therapeutic adherence.
9. Drug-induced Oral cavity diseases.

B and C. Special Clinical Pharmacology:

1. Selection and usage of local anesthetics. Classification. Pharmacokinetics: Metabolization and influence of the vasoconstrictors. Adverse reactions. Selection of drugs for specific situations.
2. Pharmacologic treatment of fear and anxiety. Selection of anxiolytics, Antidepressives and tranquilizers.
3. Treatment of the pain and the swelling. Selection and usage of analgesics,



NSIDs and Glucocorticoids. Contributive treatments.

4. Antibiotics in dental infection. Selection criteria and drugs usage.

5. Antifungals in odontology. Selection criteria and usage.

6. Antivirals in odontology. Selection criteria and usage.

7. Drugs used in urgent and odontologic emergency situations.

#### **4. Anesthesia and Reanimation**

##### **1.- Theoretical contents**

- Scientific foundations of Anesthesiology, Reanimation and Pain Therapeutics:
- Clinical evaluation of the subsidiary patient in any anesthetic procedure.
- Monitoring in Anesthesia. Requirements, possibilities and methodology.
- Local and regional anesthesia. Classification and possibilities.
- Accidents and complications in local and regional anesthesia. Diagnosis and treatment.
- General anesthesia. Structural elements. Classification and probabilities.
- Accidents and complications in general anesthesia. Diagnosis and treatment.
- Sedation in dental clinic. Concept, purposes, possibilities, monitoring, possible complications and its handling.
- Pain: Concept, classification and handling possibilities.

##### **2.- Practical contents**

- The survival chain.
- Handling of the aerial via.
- Ventilation assistance.
- Access to the bloodstream.
- Materials in local and regional anesthesia.
- Materials in General Anesthesia.
- Basic and advanced CPR.
- Boarding of specific pain clinical problems

**WORKLOAD**

| ACTIVITY                                     | Hours         | % To be attended |
|--|---------------|------------------|
| Theory classes                               | 50,00         | 100              |
| Classroom practices                          | 25,00         | 100              |
| Laboratory practices                         | 15,00         | 100              |
| Development of group work                    | 18,00         | 0                |
| Development of individual work               | 9,00          | 0                |
| Study and independent work                   | 44,00         | 0                |
| Readings supplementary material              | 10,00         | 0                |
| Preparation of evaluation activities         | 22,00         | 0                |
| Preparation of practical classes and problem | 32,00         | 0                |
| <b>TOTAL</b>                                 | <b>225,00</b> |                  |

**TEACHING METHODOLOGY****BÁSIC PHARMACOLOGY**

The course is set out on theoretical and practical classes. Within the practical classes, seminars and laboratory practices will be included. Seminars will be composed by a group of 40 students and laboratory practices will be composed by 15.

The part of the course that will verse on general principles (module A) will be composed by theoretical classes (8 hs. Maximum) and practical classes (5 practices.)

The part of the course that will verse on drugs in the categories 1 and 2 (Module B) will be composed by theoretical classes (10 hs. Maximum).

The part of the course that verses on drugs in the categories 3 and 4 (module C) will consist on the elaboration of seminars on each pharmacologic group (5-8 seminars).

It is suggested that the teacher provides the students with reference files (index) on the pharmacologic groups seen in this module C, in order to help them prepare the seminar. The aim is that the seminar provides the basic information on pharmacology (action mechanism and derivative actions) together with the possible relevancies in odontology: ADR, interaction, etc. In addition to this, a question pool will be made and all the students will have to be familiar with it after assisting to the seminars.

The methodology and hours allocated to each part of the programme may slightly vary throughout the course according to students' requirements and evolution of this new methodology. However, the total amount of global, practical and theoretical hours established by the new curriculum will be fully completed.



## **CLINICAL PHARMACOLOGY**

In **Clinical Pharmacology** students are expected to learn how to make a rational usage of the drugs usually prescribed by the dentist. For this purpose, the following activities are planned:

- A) Traditional theoretical classes to develop the contents corresponding to General clinical Pharmacology.
- B) Problem solving in order to learn how to select the most accurate drugs in the treatment of syndromes and symptoms of frequent appearance in odontology according to efficiency, safety and patient's peculiarities criteria.

Seminars in order to elaborate a guide on frequently used therapeutic drugs

## **ANESTHESIA AND REANIMATION**

In this matter ten traditional lectures and eight practical classes are proposed. The practical classes are conducted in two different ways: seminars for all students, and some with approximately 15 students per group.

## **EVALUATION**

### **BÁSIC PHARMACOLOGY**

The global grade on its 100% corresponding to Basic pharmacology will be obtained according to the following evaluation:

- 60%: Objective test (exam) on theoretical contents seen both in in-person classes and seminars.
- 20%: Objective test (exam) on the contents exposed and acquired in the laboratory practical classes)
- 20%: Continuous evaluation of the students on the making and defense of the seminars; participation, assistance and attitude in seminars and practices.

### **CLINICAL PHARMACOLOGY**

The evaluation on the specific learning of this Subject will be made according to the following criteria:





1. Objective final test: means the 55% of the global evaluation. It will consist on short questions and essay questions to evaluate the knowledge acquired by the student through theoretical classes and seminars.
2. Other evaluations: means the 45% of the global evaluation and must be passed before the final objective test. It is composed by: a) preparation and defense of the work done throughout the seminars (20% of the global evaluation); b) Involvement, assistance and attitude in the educational activities (5% of the global evaluation); c) evaluation on the skills and practical contents acquired through case resolution and problem solving (20% of the global evaluation).

## **ANESTHESIA AND REANIMATION**

In the anesthesia and reanimation module, the learning process will be evaluated according to the following criteria:

Objective final test. Represents the 60% of the global evaluation. It will be structured in order to successfully provide information on:

- What does the student know?
- How does the student know it?
- How does the student use what he/she knows?

In order to access this test, students must have completed the following evaluations: making and defense of work made in the seminars (20% of the final evaluation), assistance to educational in-presence activities and attitude of the student body (5% of the global evaluation) and evaluation on the practical skills developed in the workshops (15% of the global evaluation).

The final evaluation on all the contents of the course will be made according to participation in 1/3 of each one of the three parts (Basic pharmacology, Clinical pharmacology and Anesthesia). In order to pass the course, it is required to pass each one of its parts individually.

In order to access to an advance on the call of this subject, it is a requirement that the student has coursed with benefits all his/her practices.



## REFERENCES

### Basic

- Tripathi KD. Farmacológicas en odontología. Fundamentos. Panamericana Buenos Aires 2008
- Baños JE, Farré M. Principios de Farmacología Clínica. Barcelona. Masson. 2002
- Yagiela JA, Neidle SA, Dowd FJ. Pharmacology and therapeutics for dentistry. 6ª ed. Mosby. St Louis 2011
- Wilton Levine. Procedimientos en anestesia del Massachussts general hospital. 8ª ed. 2013

### Additional

- Florez J. Armijo JA, Medaivilla A. Farmacología Humana. 5ª ed. Elsevier España, S.L. Barcelona 2008.
- Requa Clark B. Applied Pharmacology for the dental hygienist. 4ª ed. Mosby. St Louis. 2000
- Clemente Muriel y José Luis Madrid. Estudio y tratamiento del dolor agudo y crónico. ELA. 1994

## ADDENDUM COVID-19

**This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council**

Siguiendo las recomendaciones del Ministerio, la Consellería y el Rectorado de nuestra Universidad, para el período de la "nueva normalidad", la organización de la docencia para el primer y segundo cuatrimestre del curso 2021-22, seguirá un modelo híbrido, donde tanto la docencia teórica como práctica se ajustará a los horarios aprobados por la CAT pero siguiendo un modelo de Presencialidad / No presencialidad en la medida en que las circunstancias sanitarias y la normativa lo permitan y teniendo en cuenta el aforo de las aulas y laboratorios docentes. Se procurará la máxima presencialidad posible y la modalidad no presencial se podrá realizar mediante videoconferencia cuando el número de estudiantes supere el coeficiente de ocupación requerido por las medidas sanitarias. De manera rotatoria y equilibrada los estudiantes que no puedan entrar en las aulas por las limitaciones de aforo asistirán a las clases de manera no presencial mediante la transmisión de las mismas de manera síncrona/asíncrona vía "on line".