UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Pharmacology

2425-2-I0301D008-I0301D031M

Aims

The course aims to provide students with a basic understanding of drug action in the context of dental hygiene.

Contents

During the course, students will acquire skills in the fundamental concepts of pharmacokinetics (the fate of drugs in the body) and pharmacodynamics (the molecular targets of drugs), as well as explore specific classes of drugs agreed upon at the beginning of the course. Topics such as drug-drug interactions, variability in drug response, and classification of adverse reactions will also be covered.

Detailed program

The course provides students with an overview of pharmacology, focusing on key aspects of general pharmacology and some mentions of specific classes of drugs agreed upon at the beginning of the course.

The first part of the course, after brief historical references on the development of pharmacology, will illustrate the **drug development** phases: students will learn to distinguish between preclinical and clinical phases, and understand the importance of pharmacovigilance.

In the section dedicated to **pharmacokinetics**, fundamental concepts of the discipline will be illustrated, with particular emphasis on the 4 phases of Absorption, Distribution, Metabolism, and Excretion (ADME). Topics such as different administration routes, absorption through cellular membranes, bioavailability, and first-pass effect will be covered. Drug distribution in the body will also be examined, considering influencing factors such as binding to plasma proteins and other factors that may affect it. Drug metabolism will be explored, including biotransformation

processes (Phase I and Phase II) with mention of the action of major liver enzymes, cytochromes P450. Finally, drug excretion will be analyzed, focusing on renal elimination mechanisms and the phenomenon of enterohepatic circulation, with brief mentions of secondary excretion routes.

In the **pharmacodynamics** section, focus will be on the effects of drugs on the body and the mechanisms through which these effects are mediated. Receptors and their classification will be introduced, distinguishing between membrane receptors (channel receptors, G protein-coupled receptors, enzymatic receptors) and intracellular receptors (hormone receptors), and drug-receptor interactions will be explored. Dose-response curves will be analyzed to understand the relationship between drug dose and biological effect. Regarding drug safety, therapeutic index and therapeutic window will be mentioned.

Variability in pharmacological response will also be touched upon, including factors influencing individual drug response. Finally, **adverse reactions** to drugs and their classification will be examined: hypersensitivity, idiosyncrasy, allergy.

Prerequisites

Knowledge of prerequisite courses indicated in the degree course regulations is required.

Teaching form

All classes will be held in person.

There will be 14 lessons, each lasting 2 hours, conducted partly in a lecture format and partly interactively.

Within the context of interactive sessions, the Wooclap platform will be utilized. This tool offers various functionalities such as polls, quizzes, and real-time discussions to make lessons more engaging and participatory for students, promoting active interaction during teaching sessions and enabling immediate feedback on their learning progress.

Additionally, audiovisual materials will be used to enhance understanding and retention of the topics covered. The integration of these tools aims to make the learning process more dynamic and accessible for students.

The lessons will be conducted in Italian, but some classroom videos will be presented in English.

Furthermore, we will examine how gender differences can influence drug response and side effects, aiming to raise awareness about gender disparities in dental hygiene practice.

Textbook and teaching resource

Regarding the teaching material, the following textbooks are recommended:

- "Farmacologia generale e speciale per le lauree sanitarie triennali" by Cella, Di Giulio, Gorio, and Scaglione (Published by Piccin).
- "Farmacologia generale" by Collino, Cicala, and Ialenti (Published by UTET).

Additionally, the teacher will provide supplementary material, including lecture slides.

Semester

The course will be delivered in the second year of the Degree Course, during the second semester.

Assessment method

The exam will include multiple-choice quizzes, along with open-ended questions requiring a brief elaboration on the topics covered during the lessons.

Office hours

The teacher will be available for in-person and online appointments.

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING