

Pharmacology (POP) – FOM1

FM-106 40 course hours

Updated January 2019

The Principles of Pharmacology course introduces and applies basic concepts of pharmacology and toxicology. By emphasizing general principles, the PoP course provides an intellectual framework for students to apply in the interpretation and organization of all drug information introduced in subsequent courses. Students complete CITI training to learn the principles of human subjects research as part of the course.

The course is divided into two blocks. Block 1 topics include pharmacodynamics, pharmacokinetics and drug metabolism. This section of the course will cover drug development, general principles of drug action, basic aspects of drug metabolism and considerations for drug dosing. Block 2 includes toxicology and drugs affecting the autonomic nervous system. The PoP course links closely to students' premedical training in general and organic chemistry and builds on material from prior medical school courses such as Building Working Cells and Tissues, and Development, Structure and Function. Selected key concepts or objectives include:

After the completion of the POP course, the MS1 will be able to:

- Demonstrate an understanding of the processes involved in drug discovery, development, marketing approval, marketing practices and their influence on prescribing (Physician as a Scientist and Professional)
- Demonstrate an understanding of the general principles of pharmacodynamics, describing the effects of drugs interacting with their receptors and start to apply these to clinical decision-making (Physician as a Scientist)
- Demonstrate an understanding of the general principles of pharmacokinetics, describing how the drug is absorbed, distributed, metabolized, and eliminated from the body and start to apply these to clinical decision-making (Physician as a Scientist)
- Demonstrate an understanding of the mechanisms of drug metabolism and the mechanisms for potential drug-drug interaction and start to apply these to clinical decision-making (Physician as a Scientist)
- Calculate pharmacokinetic parameters of a drug based upon route of administration, frequency of dosing, size of dose (Physician as a Scientist)
- Demonstrate an understanding of the function of peripheral neuroeffector systems, neurotransmitters and receptor subtypes involved, and the similarities and differences between the major neuroeffector systems (Physician as a Scientist)
- Demonstrate an ability to predict both the direct responses to administration of drugs that activate or inhibit each of the major peripheral neuroeffector systems and the resulting reflex changes in physiologic function (Physician as a Scientist)
- Demonstrate an understanding of the mechanism(s) of action, therapeutic indication(s), adverse effects, and potential drug interactions of specific classes of drugs used for their ability to mimic or inhibit each branch of the peripheral nervous system (Physician as a Scientist and Clinical Problem Solver)
- Demonstrate an understanding of the basic diagnosis and management of patients with acute and/or chronic drug toxicities (Physician as a Scientist and Clinical Problem Solver)
- Demonstrate an understanding of the need to use human subjects in clinical trials, the ethical and legal issues involved in using human subjects and the need for obtaining informed consent,

the rights of an individual to exercise free-will whether or not to volunteer for a clinical research study, the identification and protection of special populations of subjects, and the responsibilities to protect human subjects (Physician as a Scientist, Patient Advocate, and Professional)

- Demonstrate an understanding of basic clinical pharmacology, the need to adjust in the dosing of medications based upon the individual patient's health, age, physiology, etc. and basic principles of medication law including writing prescriptions and medication orders (Physician as a Scientist and Clinical Problem Solver)
- Demonstrate ability to be life-long learners through completing self-assessment exercises and utilizing appropriate resources to meet learning needs (Physician as a Professional)
- Demonstrate ability to utilize electronic resources in gathering data related to pharmaceuticals and in clinical decision-making (Physician as a Scientist, Clinical Problem Solver, and Professional)

POP is assessed using two exams that allow students to demonstrate understanding of knowledge and principles, participating in “flipped” classrooms, and completing online exercises.

Course co-leaders

Mark Dershwitz, MD, PhD