

# BARI ENGLISH MEDICAL CURRICULUM

## PHARMACOLOGY Program

V year – I and II semester (10 CFU)

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### General concepts:

Definition of drug, medical specialty, poison. Nature and origin of drugs. Symptomatic, causal, preventative and replacement treatments. Generic drugs. Biological drugs and biosimilars. Variability in drug response. Adverse Drug reactions. Tolerance, idiosyncrasy, allergic reactions. Pharmacogenetics. Treatment of intoxication. Drug-induced developmental toxicity. Preclinical and clinical drug development. Post-marketing surveillance. Drug prescription

### Pharmacokinetics:

**Routes** of administration.

**Absorption:** molecular mechanisms of drug diffusion and transport

**Distribution:** protein binding. Blood brain barrier. Fetomaternal placental unit. Tissue accumulation

**Metabolism:** hepatic biotransformation; pro-drugs; enzymatic induction and inhibition. CYP450 polymorphisms.

**Excretion:** renal, hepato-biliary, enterohepatic cycle, pulmonary elimination

**Clinical pharmacology:** bioavailability and bioequivalence. Compartmentalization. Distribution volume. Half-life. Clearance. Maintenance and loading doses

### Pharmacodynamics:

**Drug targets:** generalities on receptors, enzymes, carriers, pumps, ion channels. Membrane receptors (GPCR, ligand-activated ion receptors, voltage-activated ion channels). Intracellular receptors (nuclear and cytoplasmic receptors)

**Drug-receptor interactions:** agonists, partial agonists, antagonists (competitive or non competitive). Affinity, saturability, effectiveness, efficacy, potency. Definition of ED50; LD50; therapeutic index (TI). Definition of up-regulation/down-regulation, desensitization

### Specialty Pharmacology:

**Drugs of the cardiovascular system:** anti-hypertensive agents, positive inotropic drugs, anti-arrhythmics, anti-ischemic drugs, diuretics, anti-aggregants and anti-coagulants

**Drugs of the gastroenteric system:** gastroprotectors, anti-ulcerative drugs, anti-emetics, pro-kinetics, drugs to treat constipation and diarrhoea.

**Drugs of the respiratory system:** anti-asthmatic drugs – cough suppressants, expectorants, mucolytics

**Drugs of the endocrine system:** insulin and analogues – anti-diabetics – antidiabetic drugs – steroids and synthetic analogues – drugs of the bone metabolism

**Drugs to treat inflammation:** non-steroidal anti-inflammatory drugs – steroidal anti-inflammatory drugs – COXIB

**Drugs of the Central Nervous System:** anxiolytics - hypnotic sedatives – antidepressants – antipsychotics – antiepileptics - drugs for neurodegenerative diseases (Parkinson, Alzheimer, SMA, ALS, DMD) – opioids – antimigrainous - local anaesthetics – general anaesthesia - myorelaxants – neuromuscular blockers

**Chemotherapy:** antimicrobial agents – antifungal drugs – antivirals - antineoplastic agents (cytotoxic therapy, target therapy, endocrinotherapy) – immunomodulators - immunosuppressants