

FIRST

Catalogue of Learning Objectives for the catch-up course

Basics in Medicine and Pharmacology for graduates from the sciences

Anatomy

For the following tissues and anatomical structures the student should

- be able to recognize and identify histological specimen,
- understand the structure–function-relationship of the cells, tissues and organs involved.

Tissues: different types of epithelium, nervous tissue (neurons, glia, nerve), muscle (somatic, striated), blood vessel, lymph node, bone marrow, blood smear.

Organs: lung, heart, gastro-intestinal tract, pancreas, liver, spleen, kidney and urinary tract.

Neuroanatomy: Cellular and subcellular structure of the neuroapparatus (neurons, glia, dendrites and synapses
Anatomical correlates of functional neuronal units: e.g. cortex, visual cortex, prefrontal cortex, putamen, amygdala, striatum, thalamus, Broca, Wernicke. Neurophysiology: long-term potentiation, conditioning, concepts of learning and memory.

General Medicine

Basic Aims:

For the following diseases the student should be able to

- connect the clinical picture to a diagnosis and name potential differential diagnoses.
- design a basic diagnostic program to support the diagnosis and evaluate significant results from these procedures, e.g. normal laboratory values and the disease specific deviations.
- derive the clinical picture from a pathogenic process based on a sound understanding of the pathophysiology and pathobiochemistry involved.
- propose animal models for the analysis of pathomechanisms as well as of efficacy and toxicity of therapies.
- propose standard therapies and explain their mechanism of action and major unwanted side effects.

Diseases:

Hematological diseases:

- Hematological diseases:
- Anemia
- MDS
- Leukemias
- Lymphomas
- Platelet and Coagulation disorders

The female reproductive system:

- The student should have a basic understanding of the biology of reproduction and the development of the fetus.
- Female cancers of the
 - > Breast
 - > Cervix
 - > Uterus
 - > Ovaries

Gastrointestinal diseases:

- Helicobacter pylori infection
- Gastritis, ulcer
- Malabsorption
- Inflammatory bowel disease
- Pancreatitis
- Liver cirrhosis
- Cancers of the pancreas, liver intestinal tract.

Infectious diseases:

The student should understand the criteria used for the classification of viruses and bacteria.

- Bacterial infections with
 - > Pneumococci
 - > Staphylococci
 - > Streptococci
- Bacterial diarrheas
- Tuberculosis
- Viral infections with
 - > CMV
 - > EBV
 - > HSV
- Major childhood infections
- AIDS
- Hepatitis A,B,C

Metabolic disorders, endocrinology:

- The student should have a basic knowledge of the central control of endocrine function.
- Hypo-/hyperthyroidism
- Hypertension and the kidney
- Diabetes
- Metabolic syndrome

Rheumatology:

- The student should understand the pathophysiology, genetic background, clinical appearance and diversity of arthritis

Renal diseases:

- The student should have a basic understanding of renal physiology and tubular function.
- Glomerulonephritis
- Renal failure

Cardiovascular diseases:

- Hypertension
- Cardiac arrhythmias
- Ischaemic heart disease
- Heart failure

Respiratory diseases:

- Asthma
- Emphysema
- Cystic fibrosis
- Lung cancer

Neurological disease

- Posttraumatic and post-apoplectic deficiencies of speech, understanding and motor activity
- Molecular basis of addiction and dependency
- Schizophrenia and depression
- Brain tumors

Pharmacology

(This extraction of Teaching Objectives is based on the textbook „Pharmacology – Rang and Dales, Sixth Ed. 2007 (StudentConsult.com on the web.) For the details of the lectures planned please refer to the respective content of the Chapters of this textbook. HHR)

General Pharmacology

The student should obtain a basic understanding of the general principles and molecular aspects of drug action, i.e. drug targets, receptors; and signaling systems. Absorption, drug distribution, elimination and pharmacokinetics. (Rang 6e – Pharmacology: Section 1 General Principles; Ch. 1 to 8)

Specific Pharmacology

For the following groups of drugs the student should be able to name major representative drugs with their target disease, mode of action and side effects.

- Cholinergic and Adrenergic Transmission & Drugs affecting the Heart, and the Respiratory System. (Rang 6e – Pharmacology: Section 2 Chemical Mediators, Ch. 9-12; Section 3 Drugs affecting major organ systems, Ch. 18 and 23)
- Drugs affecting the Vasculature System, the Kidney, and Haemostasis and thrombosis. (Rang 6e – Pharmacology: Section 3 Drugs affecting major organ systems, Ch. 19-22, and 24)
- Chemical transmission and drug action in the central nervous system. (Rang 6e – Pharmacology: Section 4 The Nervous System, Ch. 32-43)
- Analgetics, Antiphlogistics and Pharmacological Therapy of Chronic Inflammation and Immune Diseases, Biopharmaceuticals. (Rang 6e – Pharmacology: Section 2 Chemical Mediators, Ch. 13-17; Section 6 Special Topics, Ch. 55)
- Drugs affecting the Gastrointestinal Tract, the endocrine pancreas, the control of blood glucose, Obesity, Lipid lowering drugs and Atherosclerosis. (Rang 6e – Pharmacology: Section 3 Drugs affecting major organ systems, Ch. 20, and 25-27)
- Drugs used in the treatment of infections and cancer. (Rang 6e – Pharmacology: Section 5, Ch. 45-51)

The 2-day ‘Case Histories’ tutorial at the end of the course, will train the students in

- designing a diagnostic programme from a clinical picture.
- deriving a diagnosis from the results of such a programme.
- designing the appropriate standard therapy.
- selecting promising novel therapeutic targets for a disease.
- the design of a research and development programme for a novel therapeutic compound.

Here, major diseases studied within FIRST will serve as examples.