

Section 1: General principles

1. Biochemistry and cell biology

Genetics

Nucleotides

DNA

RNA

Features of the genetic code

Structure of genes

Transcription

Translation

Hardy–Weinberg genetics

The cell and extracellular compartment

Membranes and transport

Cellular organelles and function

Membrane receptors and signal transduction

Cytoskeleton

Connective tissue

Enzymes

Enzymes and biological energy

Enzyme kinetics

Metabolism

Amino acids

Carbohydrates

Proteins

Lipids

2. Immunology

Principles of immunology

Concepts of immunity

Anatomy of the immune system

Cells and molecules of the immune system

Inflammation

Tolerance

Pathology

Hypersensitivity

Immunodeficiency

Autoimmunity

HLA associations

3. Microbiology

Bacteria

Bacterial structures

Bacterial classification

Infections – Gram-negative bacteria

Infections – Gram-positive bacteria
Infections – Tuberculosis
Fungi
Infections – Fungi
Parasites
Infections – Malaria
Infections – Other protozoa
Infections – Helminths
Infections – Ectoparasites
Viruses
Infections – Human herpesvirus
Infections – Other DNA viruses
Infections – Hepatitis viruses
Infections – Human immunodeficiency virus
Infections – Other RNA viruses
Infections – Prions
Antimicrobials
Antibiotics
Antifungals
Antiprotozoals
Other antiparasitics
Antiretrovirals
Other antivirals

4. Pharmacology

What is pharmacology?
Pharmacodynamics
Agonists
Antagonists
Pharmacokinetics
Drug absorption
Drug distribution
Drug metabolism
Drug excretion
Mathematic aspects of pharmacokinetics
Toxicology

Section 2: Organ systems

5. Gastrointestinal

Embryology
Normal gastrointestinal embryology
Ventral wall defects
Congenital pancreatic defects
Anatomy

Oesophagus
Stomach
Pancreas
Liver and biliary system
Spleen
Small intestine
Large intestine
Rectum and anal canal
Femoral and inguinal regions
Histology
Gastrointestinal tract layers
Gastric histology
Intestinal histology
Physiology
Secretion
Summary of regulatory gastrointestinal substances
Pathology
Oral
Oesophageal
Gastric
Intestinal
Liver
Gallbladder and biliary tract
Pancreas
Pharmacology
Acid suppressors and antacids
Antiemetics
Laxatives
Other gastrointestinal drugs

6. Cardiovascular
Embryology
Development of the heart
Development of the vasculature
Anatomy
Structure of the heart
Circulation
Innervation of the heart
Histology
Layers of the heart
Evolution of cellular changes in myocardial infarction
Physiology
Heart muscle
Electrical excitation and conduction

The cardiac cycle
Vascular physiology
Control of the circulation
Pathology
Congenital heart disease
Hypertension
Hyperlipidemia
Atherosclerosis
Deep vein thrombosis
Nonthrombotic emboli
Peripheral vascular disease
Aortic aneurysm
Aortic dissection
Valvular disease
Coronary artery disease
Arrhythmia
Cardiomyopathies
Heart failure (HF)
Shock
Cardiac tamponade
Infective endocarditis
Rheumatic fever
Acute pericarditis
Myocarditis
Pharmacology
Antihypertensive drugs
Antianginal therapy
Statins
Orlistat
Antiarrhythmic drugs
Common drug-induced cardiovascular reactions

7. The endocrine system
Embryology
Pituitary gland development
Thyroid gland development
Anatomy
Hypothalamus
Pituitary gland
Thyroid gland
Adrenal gland
Histology
Adrenal gland
Thyroid gland

Pancreatic endocrine cells
Physiology
General principles
Hormone synthesis and actions
Calcium homeostasis
Appetite regulation
The stress response
Pathology
Syndrome of inappropriate antidiuretic hormone secretion
Primary polydipsia and diabetes insipidus
Hypopituitarism
Hyperpituitarism
Cushing's syndrome
Thyroid dysfunction
Thyroid cancer
Parathyroid dysfunction
Adrenocortical insufficiency
Hyperaldosteronism
Diabetes mellitus
Neuroendocrine tumours
Pharmacology
Hypoglycaemic medications
Corticosteroids
Thyroid medications
Hypothalamic/pituitary medications
Drug-induced endocrine reactions

8. Haematology and oncology
Embryology
Blood groups
Embryological haematopoiesis
Foetal erythrocytes and haemoglobin
Anatomy
The lymphatic system
Primary lymphoid tissues
Secondary lymphoid tissues
Histology
The constituents of blood
Bone marrow histology
Physiology
Haematopoiesis
Erythrocytes (red blood cells)
Blood products and transfusion
Haemostasis

Lymphoid system
Cell cycle
Mutations and DNA repair
Lab tests
Pathology
Anaemias
Coagulation disorders
Haematological malignancies
Multiple myeloma and related conditions
Transfusion reactions
Pharmacology
Coagulation
Cancer therapy
Drug-induced haematological reactions

9. Musculoskeletal, skin and connective tissue

Anatomy
Skeletal components
Joints
Connective tissue
Tendons and ligaments
Upper extremities
Lower extremities
Histology
Cellular composition of the bone
Skeletal muscle fibres
Dermatological histology
Hair follicle
Physiology
Motor neurone action potential
Skeletal muscle contraction
Vascular smooth muscle contraction and relaxation
Muscle growth and repair
Bone development
Bone profile interpretation
Pathology
Overuse injuries of the elbow
Shoulder pathology
Wrist and hand pathology
Brachial plexus lesions
Knee pathology
Ankle fractures and sprains
Hip fractures
Common paediatric fractures

Childhood hip conditions
Abnormal spine curvature
Temporomandibular disorders
Compartment syndrome
Bone disease
Primary bone tumours
Rheumatological disease
Connective tissue disorders
Common dermatological pathology
Pharmacology
Paracetamol
Osteoporosis
Antiinflammatory medication
Disease-modifying antirheumatic drugs
Immunosuppressant drugs
Biologics
Gout drugs
Drug-induced rheumatic effects

10. Neurology and special senses
Embryology
Neural tube development
Central and peripheral nervous system origins
Neural tube defects
Brain malformations
Anatomy
The central nervous system
Vasculature
Peripheral nervous system
The eye
The ear
Histology
Cellular composition of the nervous system
Physiology
The neuronal action potential
Synapses and neurotransmission
Neurotransmitters
The homunculus
The autonomic nervous system
The dopaminergic pathway
The direct and indirect pathways of the basal ganglia
Clinical reflexes
Cerebral perfusion
The ventricular system

Vomiting centre
Higher cortical functions
The vestibular system
The physiology of sight
Physiology of smell and taste
Aqueous humour pathway
Pupillary control
Pathology
Ischaemic strokes and transient ischaemic attacks
Cerebral oedema
Intracranial haemorrhage
Aphasia
Seizures
Trigeminal neuralgia
Movement disorders
Neurodegenerative disorders
Delirium
Idiopathic intracranial hypertension
Botulism
Brain tumours
Otological pathology
Vertigo
Ophthalmological pathology
Pharmacology
Epilepsy therapy
Triptans
Parkinson disease therapy
Neurodegenerative disease therapy
Anaesthetics
Skeletal muscle relaxants
Opioid analgesics
Capsaicin
Glaucoma therapy
Common drug-induced neurological reactions

11. Renal

Embryology
Embryonic stages of the kidney
Development of the functional unit of the kidney
Congenital abnormalities of the kidney
Anatomy
Gross structure of the kidneys
The nephron
Renal vasculature

Nerve supply to the renal tract
Ureters
Bladder
Urethra
Histology
Glomerulus
Physiology
Fluid balance
Glomerular filtration
Nephron transport physiology
Acid-base balance
Renin–angiotensin–aldosterone system
Electrolyte disturbances
Control of micturition
Casts in urine
Pathology
Renal tubular acidosis
Glomerular diseases
Kidney stones
Hydronephrosis
Benign prostatic hypertrophy
Prostate cancer
Urinary tract infections
Acute kidney injury
Acute interstitial nephritis
Acute tubular necrosis
Renal papillary necrosis
Renal cyst disorders
Renal cell carcinoma
Nephroblastoma
Renal failure
Pharmacology
Diuretics
Angiotensin-converting enzyme inhibitors
Angiotensin receptor blockers
BPH medications
Nephrotoxic agents
Drug-induced renal reactions

12. Reproductive system

Embryology
Early embryonic development
Embryological derivatives
Placenta

Twining
Genital embryology
Genetic mutations
Orofacial clefts
Anatomy
Bony pelvis
Male reproductive anatomy
Female reproductive anatomy
Gonadal supply and drainage
Histology
Female reproductive epithelial histology
Seminiferous tubules
Physiology
Gametogenesis
Follicular development and ovulation
The menstrual cycle
Hormone production and function
Pregnancy
Lactation
Menopause
Puberty and the Tanner stages of development
Diagnosing disorders by sex hormones
Diagnosing disorders by physical characteristics
Pathology
Female structural disease
Genitourinary trauma
Abnormal uterine bleeding
Pubertal disorders
Sex chromosome disorders
Aromatase deficiency
Androgen insensitivity syndrome
5-Alpha-reductase deficiency
Kallmann syndrome
Placental disorders
Uterine rupture
Postpartum haemorrhage
Ectopic pregnancy
Miscarriage
Hydatidiform mole
Hypertension in pregnancy
Vulval pathology
Cervical pathology
Primary ovarian insufficiency
Anovulation

Polycystic ovarian syndrome
Primary dysmenorrhoea
Ovarian cysts
Ovarian tumours
Uterine conditions
Breast pathology
Penile pathology
Testicular and scrotal pathology
Pharmacology
Contraceptives
HRT
Cancer treatment
Obstetric medications
Tocolytics
Gonadotropin-releasing hormone analogues
Androgenic hormones
Antiandrogens
Teratogens
Substance use in pregnancy: teratogenic effects
13 Respiratory
Embryology
Lung development
Respiratory system changes at normal delivery
Neonatal respiratory distress syndrome
Histology
Cells of the conducting airways
Cells of the respiratory airways
Anatomy
Upper respiratory tract
Lower respiratory tract
Lungs
Diaphragm
Physiology
Lung volumes and capacities
Control of breathing
Metabolic control
Mechanics of breathing
Principles of gas exchange
Carriage of oxygen by the blood
Carriage of carbon dioxide by the blood
Hypoxia and hypoxaemia
Pulmonary circulation
Challenges to normal respiration
Lung defences against infection

Respiratory examination
Pathology
Infectious pathology
Cancer
Obstructive lung disease
Interstitial lung disease
Exposure-related pathology
Acute respiratory pathologies
Methaemoglobinaemia
Sleep apnoea
Pulmonary hypertension
Atelectasis
Pleural effusions
Respiratory failure
Type 1 respiratory failure
Type 2 respiratory failure
Pharmacology
Pulmonary hypertension drugs
Asthma drugs
Carbocysteine
Antihistamines
Pseudoephedrine and phenylephrine
Oxygen therapy
Self-assessment
Single best answer (SBA) questions
SBA answers
Acronyms and abbreviations