**The Anatomical Society Core Anatomy Syllabus for Undergraduate Pharmacy Students**

The recommended core anatomy syllabus for Pharmacy is outlined below and comprises of 49 learning outcomes. Following the outcomes, some suggestions for clinical relevance are provided that indicate conditions, procedures or clinical context relevant to the practice of pharmacists or that an MPharm student would encounter. This contextual information is provided in order to help educators signpost the clinical relevance of the anatomy to students.

**The Anatomical Society and the expert Delphi panel of pharmacists and pharmacy educators recommends that the following learning outcomes should be achieved by all students upon graduation, in order to demonstrate a basic level of competence in the anatomical sciences:**

**Anatomical Terminology**

1. Describe the following anatomical terms relative to the (A) anatomical position: medial, lateral, proximal, distal, superior, inferior, deep, superficial, palmar, plantar, anterior, ventral, posterior, dorsal, cephalic and cranial; and (B) the planes: axial, transverse, horizontal, sagittal and coronal.
2. Describe the basic terms used to describe movement: flexion/ extension, abduction/ adduction, medial/lateral rotation.
3. Describe the anatomical differences between a neonate, child and adult.

**Cardiovascular system**

1. Describe the major arterial pulse points including femoral, carotid, brachial and radial.
2. Describe the origin, course and main branches of the left and right coronary arteries and discuss the functional consequences of their obstruction.
3. Describe the major anatomical features including the inflow and outflow vessels of each chamber of the heart and explain their functional significance.
4. Describe the structure and position of the atrio-ventricular, pulmonary and aortic valves and describe their function in the prevention of reflux of blood during the cardiac cycle.
5. Describe the anatomical course of the spread of electrical excitation through the chambers of the heart.
6. Describe the major branches of the aorta and the structures they supply.
7. Describe the major tributaries of the vena cavae and the structures they drain.
8. Describe the main arteries and veins of the upper limb.
9. Describe the main arteries and veins of the lower limb.
10. Describe the major branches of the common, internal and external carotid arteries, and the tributaries of the internal and external jugular veins.
11. Describe the blood supply and venous drainage of the brain and explain the functional deficits which may occur.

**Digestive system**

1. Describe the four quadrants of the abdomen.
2. Describe the anatomy, histology and function of the different structures of the gastro-intestinal tract: oesophagus, stomach, duodenum, ileum, jejunum, colon, rectum, and anal canal.
3. Describe the major features of the oral cavity and its epithelial lining in relation to swallowing and drug delivery.
4. Describe the position and functional anatomy of the liver, portal venous system, gallbladder, and biliary tree.
5. Describe the blood supply and venous drainage of the rectum and anal canal.
6. Describe the position and functional anatomy of the spleen.
7. Describe the parotid, submandibular and sublingual glands and their role in saliva production.

**Nervous & sensory system**

1. Describe the nervous system and explain the terms: visceral, autonomic, somatic, central and peripheral nervous systems.
2. Describe the structure and divisions of the brain including: regions of grey and white matter, the cerebral hemispheres (frontal, parietal, occipital and temporal lobes) limbic system, thalamus, hypothalamus, midbrain, pons, medulla oblongata, basal ganglia and cerebellum.
3. Describe the major special functions of the cerebral cortex (motor, somatosensory, visual, auditory, memory and behavioural).
4. Describe the functions of the cranial nerves specifically including: optic, trigeminal, facial and vagus.
5. Describe the meninges, ventricles, blood-brain barrier and the role of cerebrospinal fluid.
6. Describe the function of the thalamus, hypothalamus, pituitary gland, basal ganglia and cerebellum.
7. Describe the principal components of the limbic (hypothalamus, fornix, mammillary bodies), aminergic and cholinergic systems.
8. Describe the anatomy of the eyelid, conjunctiva and lacrimal gland regarding maintenance of corneal integrity.
9. Describe the paranasal sinuses, nasal septum and the epithelial lining of the nasal cavity.
10. Describe the anatomy of the ear including the tympanic membrane, ossicles, external auditory meatus and neurovascular supply.

1. Describe the sympathetic chain and splanchnic nerves, and their role in referred pain.
2. Describe the regions and functions of the vertebral column, spinal cord and meninges in relation to common spinal conditions and drug administration.
3. Describe the anatomy of a typical spinal nerve, its main motor and somatosensory (cutaneous) branches and sympathetic components.

**Respiratory system**

1. Describe the muscles involved in ventilation and the role of the phrenic nerve.
2. Describe the anatomy of the lungs and pleura including their neurovascular supply, lymphatic drainage and the pulmonary circulation.
3. Describe the anatomy of the bronchial tree and bronchopulmonary segments.

**Urinary system**

1. Describe the position and functional anatomy of the kidneys and ureters.
2. Describe the anatomy and function of the bladder and urethra (male and female), including the sphincters and mechanism of micturition.

**Reproductive system**

1. Describe the anatomy and function of the female pelvic organs and external genitalia including their innervation, lymphatics, arterial supply and venous drainage.
2. Describe the anatomy and function of the male pelvic organs and external genitalia including their innervation, lymphatics, arterial supply and venous drainage.

**Integumentary system**

1. Describe the anatomy and function of the skin.

**Endocrine**

1. Describe the position and functional anatomy of the adrenal glands.
2. Describe the position and functional anatomy of the pancreas.
3. Describe the position and anatomy of the thyroid and parathyroid glands.

**Musculoskeletal system**

1. Describe the major bones and joints that make up the skeleton.
2. Describe the anatomy of the gluteal region and the course of the sciatic nerve.

**Lymphatic system & regional anatomy**

1. Describe the anatomical arrangement of the lymphoid tissue in the body and the potential routes for the spread of infection and malignant disease.
2. Describe the anatomy of the breast in relation to lactation and malignant disease.

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| **Outcome** | **Clinical context/condition/ procedure/system** |
| **Anatomical terminology** | |
| 1 | Frequently used when describing relationships and injuries |
| 2 | Important for understanding and describing joint movement and related injuries (musculoskeletal system) |
| 3 | Important for drug dose calculations and choice of administration route in different patient populations |
| **Cardiovascular system** | |
| 4 | Blood pressure measurements |
| 5 | Ischaemic heart disease, myocardial infarction (Cardiovascular system) |
| 6 | Patent fossa ovale |
| 7 | Mitral valve failure |
| 8 | ECG |
| 9 | Aortic aneurysm, coarctation of the aorta |
| 10 | Thrombus |
| 11 | Trauma, venepuncture |
| 12 | Trauma, varicose veins, diabetic foot |
| 13 | Central lines |
| 14 | Stroke, hemorrhage, headache, migraine |
| **Digestive system** | |
| 15 | Abdominal pain location |
| 16 | Ulcerative colitis, disease, peptic ulcers, drug absorption and delivery |
| 17 | Oral absorption of drugs, ulcers, dental pain/ trauma |
| 18 | Drug metabolism, gall stones, hepatitis, portal hypertension, alcoholic liver cirrhosis, fatty & hepatic liver disease |
| 19 | Haemorrhoids, suppositories |
| 20 | Splenomegaly |
| 21 | Drug absorption and excretion |
| **Nervous & sensory system** | |
| 22 | Links to physiology, origin of pain (nervous system) |
| 23 | Stroke, epilepsy |
| 24 | Motorneurone disease |
| 25 | Bell’s palsy, trigeminal neuralgia |
| 26 | Meningitis, encephalitis, drug distribution |
| 27 | Parkinsons, pituitary tumour |
| 28 | Schizophrenia, dementia, drug /substance abuse |
| 29 | Drug delivery, conjunctivitis , |
| 30 | Drug delivery, hayfever, sinusitis |
| 31 | Ear infection, vertigo |
| 32 | Referred pain |
| 33 | Stenosis, lumbar puncture, epidural, back pain |
| 34 | Herniated disc, nerve root impinge,ent |
| **Respiratory system** | |
| 35 | Asthma |
| 36 | Asthma, COPD, Pneumothorax |
| 37 | Lung cancer, smoking cessation |
| **Urinary system** | |
| 38 | Kidney failure, dialysis, drug excretion, kidney stones |
| 39 | Overactive bladder, incontinence, cystitis |
| **Reproductive system** | |
| 40 | IVF, contraception & emergency hormonal contraception, STIs |
| 41 | IVF, contraception, STIs |
| **Integumentary system** | |
| 42 | Cellulitis, burns, topical medication |
| **Endocrine system** | |
| 43 | Adrenocarcimoma, anaphylaxis |
| 44 | Diabetes, pancreatitis |
| 45 | Hypothyroidism/ Goitre/ Calcium Metabolism |
| **Musculoskeletal system** | |
| 46 | Frozen shoulder, tennis elbow, ankle sprain, knee pain, carpal tunnel syndrome, hip replacement |
| 47 | Intramuscular injection, shingles pain |
| **Lymphatic system & regional anatomy** | |
| 48 | Drug delivery in Cancer, Hodgkins disease |
| 49 | Mastitis, breast cancer, lactation |

Contextual information to accompany each outcome to aid their integration into the curriculum.

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