

Learning Tasks & Objectives

GENERAL ANATOMY

PRINCIPLES & CLINICAL APPLICATIONS

1. Anatomical terms & structures. Principles of regions
2. Principles of bones, joints & muscles
3. Principles of skin & viscera
4. Principles of nervous system & nerves
5. Principles of vascular systems & vessels
6. Principles of imaging (projectional & sectional)

Learning resources:

ANATOMEDIA ONLINE (see anatomedia.com)
Eizenberg N, Briggs C, Barker P & Grkovic I (2019)

BOOK: General Anatomy: Principles & Applications
Eizenberg N, Briggs C, Adams C & Ahern G (2008) McGraw-Hill

GENERAL ANATOMY 1

Anatomical terms & structures. Principles of regions

Topics:	GENERAL ANATOMY Book	ANATOMEDIA ONLINE General Anatomy screens
Anatomical terms	Chapter 1 pp 5-8	INTRO on MAIN MENU
Introductions 'The human body' Body systems & organ structure Body regions & organ position Human development & variation	Intro to Part 1 Intro to Part 2 Intro to Part 3 Intro to Part 4	SYSTEMS 00 (Introductions) REGIONS 00 (Introductions)
The body Human form & structure Body growth & development Human variation	Chapters 2-3 pp 9-21 Chapter 18 pp197-202 Chapters 19-22 pp203-225	REGIONS 01-07 REGIONS 08-09 REGIONS 10-26
Body regions Arrangement of regions. Landmarks Body compartments & fascial planes Body walls & cavities Neurovascular pathways	Chapter 13 pp169-174 Chapter 14 pp175-179 Chapter 15 pp180-183 Chapter 16 pp 184-188 Chapter 17 pp189-193	REGIONS 27-36 REGIONS 37-41 REGIONS 42-43 REGIONS 44-45 REGIONS 46-48

Prime objectives are to comprehend:

1. **The anatomical position**
2. **Anatomical planes** (sagittal, coronal & transverse)
3. **Terms of relationship. Terms of comparison. Terms of movement**
4. **The 4 types of tissues** (epithelial, connective, nervous, muscular)
5. **Combinations of tissues into organs** (anatomical structures)
6. **Embryonic derivation from 3 germ layers** (ectoderm, mesoderm, endoderm)
7. **Potentials and limitations during development are determined by the germ layer** (noting only mesoderm-derived structures are intrinsically vascular)
8. **Classification of organs into organ systems** (noting structure mirrors function)
9. **Subdivision of the body into regions**
10. **Arrangement of anatomical structures into compartments and layers.**
11. **Unpaired regions and midline of body**
12. **Paired regions and bilateral symmetry**
13. **Flexor and extensor regions**
14. **Coronal morphological plane**
15. **Boundaries of regions** (bony & soft tissue). **Apertures between regions**
16. **Compartments** (with boundaries and contents)
17. **Layers** (superficial, intermediate & deep)
18. **Flexor and extensor compartments**
19. **Flexible and rigid compartments**
20. **Compartment syndrome** (noting order of structures affected & effects)
21. **Mobile fascial planes** (noting significance regarding potential paths of direct spread)
22. **Neurovascular bundles & fascial sheath** (noting peripheral position of vein & lymphatics)
23. **Fixed fascial planes** (conduits for vessels & nerves to pass from deep to superficial)
24. **Body walls and parietal structures**
25. **Serous sacs with body cavities**
26. **Visceral herniation and prolapse**
27. **Course of superficial veins** (& cutaneous nerves) along axial borders of limbs
28. **Course through a region** (noting position of arteries relative to joints)
29. **Relations within a region** (to the boundaries and to the other contents)
30. **Neurovascular endangerment** (by severance, entrapment or external compression).

GENERAL ANATOMY 2

Principles of bones, joints & muscles

Topics:	GENERAL ANATOMY Book	ANATOMEDIA ONLINE General Anatomy screens
<p>Skeletal system Compact & spongy bone. Periosteum & bone marrow Types of bones & bony features. Cartilage Ossification. Primary & secondary centres Epiphyses & epiphysial lines. Long bone growth Neurovascular supply of a bone</p>	<p>Chapter 4 pp 25-35</p>	<p>SYSTEMS 61 SYSTEMS 01-02 SYSTEMS 03-04 SYSTEMS 05-06 SYSTEMS 07-08 SYSTEMS 09</p>
<p>Articular system Fibrous & cartilaginous joints. Synovial joint types Articular surfaces & cartilage. Fibrous capsule Synovial membrane & cavity. Ligaments Special structures of joints. Joint mobility & stability Neurovascular supply of a joint</p>	<p>Chapter 5 pp 36-49</p>	<p>SYSTEMS 62 SYSTEMS 10-11 SYSTEMS 12-13 SYSTEMS 14-15 SYSTEMS 16-17 SYSTEMS 18</p>
<p>Muscular system Muscle structure & attachments. Tendons Deep fascia & retinacula. Fascial septa & sheets Fibrous & synovial tendon sheaths Skeletal muscle form. Muscular contraction & actions Neurovascular supply & myotomes</p>	<p>Chapter 6 pp 50-65</p>	<p>SYSTEMS 63 SYSTEMS 19-20 SYSTEMS 21-22 SYSTEMS 23 SYSTEMS 24-25 SYSTEMS 26</p>

Prime objectives are to comprehend:

1. **Bone structure and bone marrow. Roles** (mechanical and haemopoietic)
2. **Bone types and bony features. Cartilage types and their sites**
3. **Centres of enchondral ossification** (primary and secondary)
4. **Parts of a developing long bone** (noting sites of growth in length). **Types of epiphyses** (noting sites)
5. **Neurovascular supply of bone** (noting the contrast with cartilage)
6. **Blood supply of a developing long bone** (noting sites & significance of 'end arteries')
7. **Fractures and epiphysial injuries** (noting their significance).
8. **Joint classification** (fibrous, cartilaginous & synovial). **Characteristics and types of synovial joints**
9. **Articular surfaces and articular cartilage**
10. **Fibrous capsule** (noting attachments relative to articular margin)
11. **Synovial cavity and synovial membrane** (noting roles of synovial fluid)
12. **Types of ligaments and special structures** (noting their roles)
13. **Factors responsible for stability** (noting trade-off between stability & mobility)
14. **Neurovascular supply of joint components** (noting if rich, poor or absent)
15. **Cartilage degeneration and injury** (noting implications regarding pain & on healing)
16. **Joint dislocation and ligament injuries** (noting implications regarding pain & on healing).
17. **Muscle types** (skeletal, smooth & cardiac)
18. **Skeletal muscle structure and attachments** (origins & insertions)
19. **Associated fibrous tissue** (noting sites of a tendon, aponeurosis or raphe)
20. **Deep fascia** (noting roles and sites where thickened or absent)
21. **Fascial septa, sheets & sheaths** (noting roles and sites). **Fibrous & synovial tendon sheaths**
22. **Skeletal muscle form** (noting length & orientation of fibres and cross-sectional area)
23. **Types of muscle contraction and actions** (prime mover, antagonist, fixator & synergist)
24. **Neurovascular supply of muscles** (in contrast to tendons & fascia)
25. **Neurovascular hilum** (noting motor point) **and motor units.**
26. **Myotomes** (contrasting pattern in trunk with limbs)
27. **Muscle and tendon injuries** (noting implications regarding pain & on healing).

GENERAL ANATOMY 3

Principles of skin & viscera

Topics:	GENERAL ANATOMY Book	ANATOMEDIA ONLINE General Anatomy screens
Integumental system Skin structure & tension lines Skin appendages & specialisations Subcutaneous tissue & fat Cutaneous nerve supply & overlap Neurosomes & referred pain Angiosomes & skin blood supply Lymphotomes & watershed areas	Chapter 7 pp 66-77	SYSTEMS 64 SYSTEMS 27 SYSTEMS 28 SYSTEMS 29 SYSTEMS 30 SYSTEMS 31 SYSTEMS 32 SYSTEMS 33
Visceral systems Hollow viscera Exocrine glands & ducts. Endocrine glands Paired & unpaired viscera Serous membrane and mesenteries Muscle coats & sphincters Mucous membrane & junction zones Hilum & vascular segments of solid viscera Neurovascular supply of viscera	Chapter 8 pp 82-102	SYSTEMS 65-68 SYSTEMS 34 SYSTEMS 35-36 SYSTEMS 37 SYSTEMS 38 SYSTEMS 39 SYSTEMS 40 SYSTEMS 41 SYSTEMS 42

Prime objectives are to comprehend:

1. **Skin structure and relaxed skin tension lines** (noting their significance)
2. **Roles of skin**
3. **Skin appendages and specialisations**
4. **Surface area of body** (noting significance in burns)
5. **Subcutaneous tissue and fat** (noting presence of superficial nerves & vessels)
6. **Cutaneous nerve fibre types**
7. **Neurosomes** (including dermatomes & peripheral cutaneous nerve supply)
8. **Overlap in nerve supply and sites of internervous lines** (noting significance)
9. **Axial borders and axial lines**
10. **Dermatome maps** (noting differing maps for different sensory modalities)
11. **Dermatomal distribution of rash in 'shingles'**
12. **Referred pain** (noting anatomical basis for sites of referral)
13. **Angiosomes** (noting significance for skin transplants)
14. **Lymphotomes** (& implications of watershed areas on spread of skin cancers).
15. **Organisation into respiratory, digestive, urogenital & endocrine systems**
16. **Tracts of hollow tubes with associated solid glands**
17. **Wall layers of a hollow viscus. Visceral obstruction**
18. **Exocrine glands (with ducts) and exocrine secretion**
19. **Endocrine glands and endocrine secretion**
20. **Paired and unpaired viscera** (noting implications for neurovascular supply)
21. **Serous membrane and mesenteries**
22. **Mobility and fixation trade-off** (noting vulnerability for torsion)
23. **Muscle coats** (and motility of a tubular viscus)
24. **Sphincters** (anatomical and functional)
25. **Mucous membrane and junction zones**
26. **Hilum and vascular segments of a solid viscus**
27. **Neurovascular supply of viscera**
28. **Visceral strangulation**

GENERAL ANATOMY 4

Principles of nervous system & nerves

Topics:	GENERAL ANATOMY Book	ANATOMEDIA ONLINE General Anatomy screens
Nervous system Nerve fibres & reflex arcs Brain & spinal cord structure Spinal nerves & fibre types Cranial nerves & fibre types Nerve ganglia. Sympathetic trunks & fibre paths Nerve plexuses. Nerve distribution & branches Vascular supply of a nerve	Chapter 9 pp 103-131	SYSTEMS 69 SYSTEMS 43 SYSTEMS 44 SYSTEMS 45 SYSTEMS 46 SYSTEMS 47-48 SYSTEMS 49-50 SYSTEMS 51

Prime objectives are to comprehend:

1. **Nervous System: Central (CNS) & Peripheral (PNS) components**
2. **Peripheral nervous system** (12 pairs of cranial & 31 pairs of spinal nerves)
3. **Autonomic (visceral) nervous system** (sympathetic, parasympathetic & enteric divisions)
4. **Nerve fibre structure** (including connective tissue sheaths) and roles
5. **Sensory or motor and somatic or visceral functional fibre types in spinal nerves**
6. **Additional** (special motor & special sensory) **functional fibre types in cranial nerves**
7. **Reflexes and components of a reflex arc**
8. **Central nervous system** (brain and spinal cord)
9. **Structure & function of grey matter and of white matter**
10. **Arrangement of grey matter & white matter** (contrasting brain with spinal cord)
11. **Grey matter nuclei in the brain** (particularly basal nuclei)
12. **White matter tracts** (projection, association & commissural fibres)
13. **Sites of descending & ascending fibres in spinal cord** (contrasting their functions)
14. **Upper & lower motor neurones**
15. **Spinal nerve roots** (anterior & posterior) and rami (anterior & posterior)
16. **Spinal nerves and their segmental distribution**
17. **Nerve ganglia** (sensory & motor) **and their locations**
18. **Sympathetic trunks and fibre paths** (noting sites of connections to spinal nerves)
19. **Nerve plexuses** (noting significance of anterior & posterior divisions to limbs)
20. **Peripheral nerve distribution and types of branches** (noting branching sequence)
21. **Protective somatic reflexes** (particularly reflex muscle spasm)
22. **Vasa nervorum & vessels to the CNS** (noting the 'blood brain barrier' & its significance)
23. **Nerve injuries** (noting grades & effects)
24. **Neurogenic pain** (including 'phantom pain').

GENERAL ANATOMY 5

Principles of vascular systems & vessels

Topics:	GENERAL ANATOMY Book	ANATOMEDIA ONLINE General Anatomy screens
Arterial system Arteries & branches Anastomoses End arteries Neurovascular supply of a vessel	Chapter 10 pp132-145	SYSTEMS 70 SYSTEMS 52 SYSTEMS 53 SYSTEMS 54 SYSTEMS 60
Venous system Veins & tributaries Venous valves & venae comitantes Venous sinuses & communications	Chapter 11 pp146-156	SYSTEMS 71 SYSTEMS 55 SYSTEMS 56 SYSTEMS 57
Lymphatic & haemopoietic system Lymph vessels. Lymph return Lymph nodes. Lymphoid organs & tissues	Chapter 12 pp157-165	SYSTEMS 72 SYSTEMS 58 SYSTEMS 59

Prime objectives are to comprehend:

1. **Arterial systems** (pulmonary and systemic)
2. **Artery structure** (lumen & layers of arterial wall) **& arterioles** (noting their role)
3. **Arterial tree and types of arterial branches**
4. **Sites of capillaries or sinusoids and of structures which are avascular**
5. **Arterial flow** (noting where a pulse can be palpated) **and arterial blood pressure**
6. **Types of haemorrhage** (noting first aid management)
7. **Arterial anastomoses** (true & potential) **and AV anastomoses**
8. **End arteries** (anatomical & functional) **noting sites**
9. **Arterial occlusion** (intraluminal, intramural & external) **and effects**
10. **Vasomotor nerve supply** (controlling vascular tone) **and vasa vasorum**
11. **Venous systems** (pulmonary, systemic & portal)
12. **Vein structure and venous valves** (noting role and sites)
13. **Venous tributaries and venae comitantes** (noting role & sites)
14. **Venous flow** (noting mechanism of vascular, muscular & thoracic pumps)
15. **Venous sinuses and communications** (particularly via venous plexuses)
16. **Thrombosis, venous embolism** (noting the significance of a calf DVT) **& arterial embolism**
17. **Varicose veins and venous valve incompetence**
18. **Significance of venous spread** (of tumours & infection)
19. **Components of lymphatic system and of haemopoietic system**
20. **Roles of lymphatic system** (fluid return and defense)
21. **Lymph vessel structure** (noting blind origin of capillaries & presence of valves in lymphatics)
22. **Sites of lymph capillary plexuses. Tissues without lymph capillaries**
23. **Lymph trunks and lymph ducts**
24. **Lymph return & mechanisms of lymph flow** (vascular, muscular & thoracic pumps)
25. **Major direct path of lymph to venous system** (noting sites of entry of lymph ducts)
26. **Potential sites of lympho-venous communications** (particularly via lymph nodes)
27. **Lymph node structure**
28. **Sites of major palpable lymph nodes** (noting drainage from superficial to deep groups)
29. **Lymph drainage** (noting quadrants of body drained by thoracic duct)
30. **Stages & significance of lymphatic spread** (of tumours & infection)
31. **Factors complicating direction of spread**
32. **Lymphoid organs and sites of lymphoid tissue aggregates**

GENERAL ANATOMY 6

Principles of imaging (projectional & sectional)

Topics:	GENERAL ANATOMY Book	ANATOMEDIA ONLINE General Anatomy screens
Introduction	Intro to Part 5	IMAGING 00 (Introductions)
Projectional imaging Plain radiograph production X-ray interactions with tissues Radiographic views Properties of plain radiographs Bones, joints & other structures on radiographs Contrast radiographs	Chapter 24 pp237-251	IMAGING 01 IMAGING 02 IMAGING 03 IMAGING 04 IMAGING 05-07 IMAGING 08-12
Sectional anatomy & imaging CT image production Tissue properties in CT. Properties of CT images Additional CT techniques MR image production Tissue properties in MR. Properties of MR images Special MR imaging	Chapter 25 pp252-259	IMAGING 13-15 IMAGING 16 IMAGING 17-18 IMAGING 19 IMAGING 20 IMAGING 21-22 IMAGING 23
Ultrasound image production Tissue properties in US. Properties of US images Doppler ultrasound images	Chapter 26 pp260-262	IMAGING 24 IMAGING 25-26 IMAGING 27
Endoscopic anatomy Looking within hollow viscera, body & joint cavities	Chapter 27 pp263-267	IMAGING 28-30

Prime objectives are to comprehend:

1. **Tissue radiodensities** (& the radiodensity spectrum)
2. **Radiological interfaces. Lines on a radiograph**
3. **Types of radiographic views** (projections)
4. **Visualisation of bones on images** (long, short, irregular, flat, pneumatic & accessory bones)
5. **Identifying ossification centres** (to determine skeletal age). **Visualising epiphysial plates** (& growth)
6. **The 'radiological joint space' and assessing bony articular surfaces**
7. **Identifying fat-soft tissue interfaces & air-soft tissue interfaces on images** (as well as distinguishing intraluminal air or gas)
8. **Tissue radiodensities relative to water of soft tissues** (slightly higher) **& bone** (much higher) **and of fat** (slightly lower) **& air** (much lower)
9. **Body slices in CT images** (creating pixels from voxels)
10. **'Windowing' in CT** (to limit the grey scale displayed to the range of interest)
11. **Use of oral contrast media** (to help distinguish hollow organs) **and intravenous contrast media** (to help distinguish vessels & vascular solid organs)
12. **Magnetisation of body with MRI** (rather than ionising radiation)
13. **Contraindications to MR imaging** (particularly implanted electronic devises and potentially mobile ferromagnetic material)
14. **Proton densities (T1 & T2) of tissues in MRI** (reflecting their different chemical composition)
15. **Appearances on T1-weighted images** (high fat content is bright) **and on T2-weighted images** (high water content is bright) **noting compact bone & air appear black on both**
16. **The advantage of distinguishing types of soft tissues from each other on MR images**
17. **The advantage of Ultrasound for real time sectional imaging without ionising radiation**
18. **Acoustic interfaces** (at junctions of tissues with different acoustic impedence)
19. **Echogenicity of different tissues and Ultrasound tissue scale** (fluid appears black, soft tissues are varying degrees of grey and fat is white)
20. **Utilising the 'Doppler effect'** (from rapidly moving objects in Doppler Ultrasound) **of flowing blood.**

Anatomical Terms and their Latin Equivalents. Systematic Anatomy of the Locomotor System. Trunk. Vertebral Column. Related content. General Anatomy Pocket Atlas of Human Anatomy. Founded by Heinz Feneis > General Anatomy. Bones Pocket Atlas of Human Anatomy. Founded by Heinz Feneis > Bones. Cardiovascular System Color Atlas of Human Anatomy. Volume 2 Internal Organs. > Cardiovascular System. Lower Limb Color Atlas of Human Anatomy, Vol. 1: Locomotor System > Lower Limb. See more ideas about Anatomy, Anatomy drawing and Anatomy reference. Leg Anatomy, Anatomy Poses, Anatomy Study, Anatomy Art, Human Body Drawing, Human Anatomy Drawing, Male Figure Drawing, Tutorial Draw, Anatomy Tutorial. Reference Manga Figure Drawing Reference Body Reference Anatomy Reference Tutorial Draw Anatomy Tutorial Human Anatomy Drawing Body Drawing Human Figure Drawing.