



BODY ARCHITECTURE SYLLABUS

GENERAL INFORMATION

Academic year: 2022-2023

First year, second semester

Mandatory

Language: English

Disciplines: Anatomy, Radiology

Credits: 10 Anatomy, 1 Radiology

Associated credits of professionalizing activities*: 1 Radiology, 1 Internal Medicine, 1 Orthopedics

*The introductory professionalizing activity of the second semester of the first year is associated to the course of Body Architecture for organizational and evaluation purposes.

Faculty

Coordinator: Isabella Barajon

Isabella Barajon, Cristina D'Agostino,



In the second part of the course, a clinically oriented approach is used to describe the regional anatomy of the human body: the boundaries and compartments of the body regions will be analyzed as well as the organization of the organs they contain, their relationships, vascularization, and innervation. Special attention will be given to surface anatomy and its relevance for the physical examination. The content of this part of the course builds on the knowledge acquired in the course of Building Bodies and is fundamental for most of the courses of the following years.

The general learning goal of the neuroanatomy module is to provide students, starting from a phylogenetic and developmental perspective, with a basic understanding of the structural organization of the human central nervous system (macroscopic anatomy and interna34.71 602.02 Tm0 g0 G[



Slides used during the lectures and made available to students are a teaching support. They do not include everything the student needs to know and therefore they are not intended as a substitute of the syllabus or of the textbooks.

TEACHING METHODS

the main purpose of lectures is to transfer knowledge to students by guiding them through the most relevant subjects of the disciplines included in the course of Body Architecture. Students are expected to participate to lectures in a proactive manner and to take notes as part of the learning process.

All lectures will be held synchronously.

the general purpose of these practicals is to activate and solidify knowledge acquired during lectures and independent study, in a collaborative learning setting.

The class will be divided into 4 groups and each group will be divided in 4 subgroups.

During the activity, students will be asked to recall, identify, recognize, describe, and apply anatomical knowledge following a guideline and/or working on small clinical scenarios/questions. During the practical classes there will always be a tutor but the activity is not supposed to be a lecture and is based on a positive proactive attitude, effort, and work of students that encourages and supports learning.

Besides the practical classes, the activities of the course intended as collaborative are Problem Based Learning (PBL), and Priority Presenting Problem Portfolio Activities.

the purpose of these activities is to introduce students to the basic elements of the physical examination and the technique of blood sampling based on the anatomical knowledge and the use of checklists. These activities will be tutored by clinicians



Questions may include: Multiple choice questions with one or more than one correct answer, True and False questions, Drag and drop onto a background image, Drag and drop into text, Matching, Select missing words, Short answers.

A multiple choice question that has more than one correct answer will be considered valid only if all the correct answers have been identified.

Evaluation: each question, 0.375 points.

To pass the test you need to answer correctly to at least 48 questions (grade 18/30).

80 correct answers: grade 30

81 or 82 correct answers: grade 30 e lode

A minimum of 11 correct answers in Part I, a minimum of 23 correct answers in Part II, and a minimum of 7 correct answers in part III is required.

Part 2. Evaluation of the performance of students on the checklists of the physical examinations and blood sampling.

Content: students will be asked to observe images or short videos with segments of the physical examinations (thorax, heart, abdomen, orthopedic) and blood sampling and to show their understanding and knowledge, by being able to:

- 1) recognize which part of a checklist is shown in the video or image
- 2) correlate a specific maneuver to its anatomical substrate
- 3) chose a specific maneuver/part of a checklist

Assessing tool: short answers, MCQs, true or false, ordering, matching

Evaluation: pass or fail.

To pass, at list 70% of the items of the evaluation need to be answered correctly

Measures for students that have not attended 75% of the teaching activities

Besides the evaluation specified above, these students will have to undergo to an additional evaluation to pass the exam: 2 open written questions and an oral exam



Clinically Oriented Anatomy



- Integrate the knowledge of histology into the macroscopic structure of bones, joints and muscles considered as organs composed by different tissues and with their own vascularization and innervation.
- Illustrate how the various bones and muscles contribute to the general framework and construction of human body
- Describe the anatomical bases of bone, joint and muscle functions
- Describe how joints can link bones and together with muscles permit and/or limit their reciprocal movements
- Describe the connective tissues integrated with bones, joints and muscles.
- Illustrate how to perform a systematic description of bones and muscles
- Illustrate the general principles of biomechanics
- Describe the biomechanical characteristics of the different tissues of the muscular-skeletal system
- Illustrate the biomechanical bases of support and movement

PPP portfolio: Trauma

Topic 3: The integumentary system

Learning goals:

- Define and describe the skin, its appendages and their regional characteristics
- Illustrate the anatomical bases of skin function

PPP portfolio: Rush

Topic 2: The integumentary system



bone, thyroid and cricoid cartilages, lateral mass of the atlas and the spine of C7. Demonstrate the



- Describe the course and major branches of the maxillary artery, including the course and intracranial relations of the middle meningeal artery and its significance in extradural haemorrhage.
- Describe the anatomy of the sensory and motor components of the trigeminal nerve, including how their integrity is tested clinically.
- Describe the functional anatomy of the auricle, external auditory meatus, tympanic membrane,



- Demonstrate the origin, course and major branches of the common, internal and external carotid arteries and locate the carotid pulse.
- Describe the courses of the accessory, vagus and phrenic nerves in the neck.
- Describe the anatomy of the major structures passing between the neck, and the thorax and the upper limb. Describe the courses and important relationships of the subclavian arteries and veins.
- Describe the anatomy of the motor and sensory nerves to the head and neck and apply this knowledge to a neurological assessment of the cranial and upper cervical spinal nerves.
- Describe the sympathetic innervation of the head and neck including the features and main causes of Horner's syndrome.
- Demonstrate the positions of the external and internal jugular veins and the surface landmarks that are used when inserting a central venous line.
- Describe the anatomy of the major groups of lymph nodes in the head and neck and the potential routes for the spread of infection and malignant disease.
- Interpret standard diagnostic images, e.g. CT, MRI, X-ray and ultrasound of the head and neck, and be able to recognise common abnormalities.

PPP portfolio: Trauma

Topic



- Summarise the anatomy of the bronchial tree and bronchopulmonary segments and explain their functional and clinical significance.
- Describe the blood supply, innervation and venous and lymphatic drainage of the lungs. Describe the structures in the hilum of the lung and their relationships to each other and to the mediastinum.
- Demonstrate the surface markings of the heart and great vessels, the margins of the pleura and the lobes and fissures of the lungs and explain their clinical relevance.
- Demonstrate the arrangement of the fibrous and serous layers of the pericardium and relate it to conditions such as cardiac tamponade and pericarditis.
- Describe the origin, course and main branches of the left and right coronary arteries and discuss the functional consequences of their obstruction in conditions such as ischaemic heart disease.
- Identify the major anatomical features of each chamber of the heart and explain their functional significance.
- Demonstrate the surface markings of the heart and the position and site of auscultation of its four major valves.
- Describe the course of the ascending aorta, the arch of the aorta and the descending thoracic aorta. Name their major branches and the structures they supply.
- Describe the origins, courses and relationships of the brachiocephalic veins, inferior and superior venae cavae and the azygos venous system.
- Describe the origin, course and distribution of the vagus and phrenic nerves.
- Describe the distribution and function of the sympathetic chains and thoracic splanchnic nerves. Explain the mechanism of referred pain from T1-5 sympathetic afferents to the chest wall and relate it to the thoracic viscera.
- Describe the course, major relations and neurovascular supply of the oesophagus within the thorax.
- Describe the course and major relations of the thoracic duct. Explain the lymph drainage within the thorax and its clinical significance.
- Describe the anatomy of the breast including its neurovascular supply. Explain the lymphatic drainage of the breast and its clinical relevance to metastatic spread.
- Identify major thoracic structures on standard diagnostic images e.g. CT, MRI, X-ray and ultrasound.

PPP portfolio: Chest pain, Trauma

Topic 4: Abdomen, pelvis and perineum

Abdomen learning goals:

Overview. Students should understand the musculature of the abdominal walls and the structure of the inguinal canal. They should be able to explain the three dimensional arrangement of the



viscera within the abdominal and the pelvic cavities. They should be able to understand the arrangement of the peritoneum, the greater and lesser sacs and the mesenteries. They should be familiar with the anatomy of the gastrointestinal tract in the abdomen (stomach, duodenum, jejunum, ileum, caecum and colon) and the hepatobiliary system (liver, gallbladder), endocrine system (suprarenal glands and the endocrine components of the pancreas) and the urinary system (kidneys and ureters) and haematopoietic organs (spleen). They should be able to describe the arterial supply, venous and lymphatic drainage and innervation of the abdominal viscera and the abdominal wall.

- Demonstrate the bony and cartilaginous landmarks visible or palpable on abdominal examination and explain their clinical significance.
- Demonstrate the surface projections of the abdominal organs onto the four quadrants and nine descriptive regions of the abdomen.
- Describe the anatomy, innervation and functions of the muscles of the anterior, lateral and posterior abdominal walls. Discuss their functional relationship with the thoracic and pelvic diaphragms and their roles in posture, ventilation and voiding of abdominal/pelvic/thoracic contents.
- Describe the anatomy of the inguinal ligament and inguinal canal in the male and female. Explain the contents of the canal and how inguinal hernias develop, including the anatomy and clinical presentation of such hernias.
- Describe the relationship between the femoral canal and the inguinal ligament and the anatomy of femoral hernias.



- Describe the regions and positions of the small and large intestine and their vascular, lymphatic and nerve supply. Describe the anatomical variations in the position of the appendix and explain their significance in relation to appendicitis.
- Describe the position and functional anatomy of the liver, its lobes, segments and their key anatomical relations. Explain the peritoneal reflections of the liver and its movement during ventilation. Summarise the functional anatomy of the portal vein, the portal venous system, porto systemic anastomoses and their significance in portal hypertension.
- Describe the position, functional anatomy and vasculature of the gall bladder and biliary tree; explain their relations in the abdomen and the clinical significance of inflammation of the biliary system and biliary (gall) stones.
- Describe the position and form of the pancreas and its relations to other abdominal organs. Discuss the significance of these relations to pancreatitis and biliary stone disease.
- Describe the position and functional anatomy of the kidneys and ureters. Demonstrate their relations to other abdominal and pelvic structures. Discuss the clinical significance of renal and ureteric anatomy in relation to urinary stones.
- Describe the position and relations of the suprarenal (adrenal) glands and their functional anatomy.
- Describe the anatomy of the spleen, including its position, blood supply, surface markings, relations and peritoneal attachments. Explain the significance of these relations in trauma, chronic infection and haematopoietic disorders.
- Describe the origins, courses and major branches of the abdominal aorta, coeliac axis, superior and inferior mesenteric, renal and gonadal arteries. Describe the clinical significance of the blood supply to the abdomen for example in relation to abdominal aneurysm repair. Describe the origin and course of the inferior vena cava and its major tributaries.
- Describe the anatomy of the lymph nodes draining the abdominal viscera and their significance in relation to metastatic spread.
- Interpret standard diagnostic images, eq0.0000088410176>401020103(n)5(od) EMC /Span AMCID 9Lang



be able to describe the arterial supply, venous and lymphatic drainage and innervation of the pelvic organs and perineum.

- Describe the skeletal and ligamentous components of the pelvis, the anatomy of the pelvic inlet and outlet and recognize their normal orientation. Explain sexual differences in pelvic skeletal anatomy.
- Demonstrate the palpable anatomical landmarks of the ilium, ischium and pubis.
- Describe the anatomy and functional importance of the pelvic diaphragm, its midline raphe, perineal body, attachment points and the structures passing through it in males and females. Describe the clinical significance of the pelvic diaphragm, e.g. in relation to continence, prolapse and episiotomy.
- Describe the anatomy of the bladder, its base and ureteric openings and its relationship to the overlying peritoneum. Explain how the position of the bladder changes with filling and during pregnancy.
- Describe the anatomy of the urethra; explain the anatomy of its different parts in males and females in relation to continence and catheterization.
- Describe the innervation of the bladder, its sphincters and the mechanism of micturition.
- Describe the anatomy of the scrotum, testis and epididymis and their normal features on clinical examination. Explain the significance of the vascular supply of the testis in relation to torsion and varicocele and the lymphatic drainage in relation to tumor spread.
- Describe the structure and course of the spermatic cord and ductus (vas) deferens.
- Describe the anatomy and relations of the prostate gland and seminal vesicles. Describe the normal form of the prostate when examined per rectum and how this changes in relation to hypertrophy and malignancy.
- Describe the anatomy and relations of the ovary, uterine tubes, uterus, cervix and vagina, including their peritoneal coverings. Describe the changes that occur in the uterus and cervix with pregnancy.
- Describe the origin, course and relations of the ovarian, uterine, vaginal and testicular arteries.
- Describe the anatomy and neurovascular supply of the penis, scrotum, the clitoris, vulva and vagina. Explain the anatomy of the urogenital diaphragm and perineal 'pouches'.
- Describe the origin, course and distribution of the pudendal nerves and the sites of pudendal nerve block.
- Describe the innervation of and mechanisms involved in the erection of cavernous tissue in males and females and in emission and ejaculation in the male.



- Describe the anatomy, relations and peritoneal coverings of the sigmoid colon, rectum and anal canal. Explain the functional anatomy of puborectalis, the anal sphincters and their role in faecal continence.
- Describe the blood supply and venous drainage of the distal bowel; the supply from superior rectal (from inferior mesenteric), middle rectal (from internal iliac) and inferior rectal arteries (from internal pudendal to anal canal only), and porto systemic venous anastomoses. Explain the clinical significance of the blood supply and venous drainage of the distal bowel, e.g. in continence, haemorrhoids and anal fissures.



- Describe the course of the main veins of the upper limb and contrast the functions of the deep and superficial veins. Identify the common sites of venous access and describe their key anatomical relations.
- Describe the anatomy of the brachial plexus from its origin in the neck to its terminal branches. Recognise brachial plexus injuries and explain their clinical presentation.
- Describe the origin, course and function of the axillary, radial, musculocutaneous, median and ulnar nerves in the upper limb.
- Name the major muscles and muscle groups that the axillary, radial, musculocutaneous, median and ulnar nerves supply, together with their sensory distribution. Predict the consequences of injury to these nerves and describe how to test their functional integrity.
- Describe the anatomy of the pectoral girdle, explain the movements of the pectoral girdle; identify the muscles and joints responsible for these movements. Name the main attachments and nerve supply of these muscles.
- Describe the factors that contribute to the movement and stability of the gleno humeral joint and explain the functional and clinical consequences of its dislocation.
- Describe the boundaries and contents of the axilla, including the major vessels and relevant parts of the brachial plexus.
- Describe the anatomy of the axillary lymph nodes and explain their importance in the lymphatic drainage of the breast and skin of the trunk and upper limb and in the spread of tumors.
- Describe the anatomy of the elbow joint. Demonstrate the movements of flexion and extension. Identify the muscles responsible for these movements. Name the main attachments and nerve supply of these muscles.
- Describe the anatomy of the radio ulnar joints. Explain the movements of supination and pronation; identify the muscles responsible for these movements, name the main attachments and describe the nerve supply of these muscles.
- Describe the anatomy of the wrist. Describe and demonstrate movements at the wrist joints and name and identify the muscle groups responsible for the movements. Describe the relative positions of the tendons, vessels and nerves in the region of the wrist in relation to injuries.
- Name and demonstrate the movements of the fingers and thumb. Describe the position, function and nerve supply of the muscles and tendons involved in these movements, differentiating between those in the forearm and those intrinsic to the hand.
- Describe the main types of grip (power, precision and hook) and the role of the muscles and nerves involved in executing them.
- Describe the position and function of the retinacula of the wrist and the tendon sheaths of the wrist and hand in order to explain carpal t



- Describe the anatomical basis of assessment of: cutaneous sensation in the dermatomes of the upper limb, motor function, tendon reflexes, and muscle power in the upper limb. (Discussed in Neuroanatomy Lectures)
- Describe the fascial compartments enclosing the major muscle groups of the upper limb; explain the functional and clinical importance of those compartments and their contents. Introduce the compartment syndrome.
- Interpret standard diagnostic images, e.g. CT, MRI, X-ray and ultrasound of the upper limb, and recognise common abnormalities.

Lower Limb Learning goals:

Overview. Students should be able to describe the innervation, arterial supply, venous and lymphatic drainage of the structures of the lower limb. They should be able to explain the factors that influence the stability of the joints of the lower limb. They should have a working knowledge of surface anatomy (including major pulse points e.g. femoral), dermatomes and peripheral nerve distribution, and the functions of major muscle groups and their innervation in order to perform clinical procedures such as a basic neurological examination of the lower limb and intramuscular injections. They should be aware of the organization of the deep fascia of the lower limb and its clinical relevance to compartment syndromes.

- Describe the osteology and surface landmarks of the pelvis, femur, tibia, fibula and foot. Demonstrate their palpable and imaging landmarks. Explain how the bones, joints and related structures are vulnerable to damage and what the consequences of such damage could be.
- Demonstrate the origin, course and branches of the major arteries that supply the gluteal region, hip, thigh, leg, ankle and foot. Explain the functional significance of anastomoses between branches of these arteries at the hip and knee.
- Demonstrate the locations at which the femoral, popliteal, posterior tibial and dorsalis pedis arterial pulses can be palpated.
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- Describe the structures responsible for stability of the hip joint.
- Describe the structures at risk from a fracture of the femoral neck or dislocation of the hip and explain the functional consequences of these injuries.
- Describe the boundaries and contents of the femoral triangle with particular regard to arterial blood sampling and catheter placement.
- Describe the anatomy and movements of the knee joint. Summarise the muscles responsible for these movements, their innervation and main attachments.
- Identify the factors responsible for maintaining the stability of the knee joint. Describe the locking mechanism that occurs in full extension. Explain the anatomical basis of tests that assess the integrity of the cruciate ligaments.
- Describe the boundaries and contents of the popliteal fossa.
- Describe the close relations of the knee joint, including major bursae and explain which of these structures may be injured by trauma.
- Describe the anatomy of the ankle and subtalar joints. Explain the movements of plantar flexion, dorsiflexion, inversion and eversion. Summarise the muscles responsible for these movements, their innervation and their attachments.
- Describe the factors responsible for stability of the ankle joint, especially the lateral ligaments, and explain the anatomical basis of 'sprain' injuries.
- Describe the arches of the foot and the bony, ligamentous and muscular factors that maintain them.
- Describe the fascial compartments enclosing the major muscle groups and explain the functional importance of these compartments and their contents in relation to compartment syndrome.
- Describe the anatomical bases (nerve root or peripheral nerve) for loss of movements and reflexes at the knee and ankle resulting from spinal injuries, disc lesions and common peripheral nerve injuries. Describe the dermatomes of the lower limb and perineum that can be used to assess spinal injuries.
- Describe the lymphatic drainage of the lower limb and its relationship to infection and tumour spread.
- Interpret standard diagnostic images, e.g. CT, MRI, X-ray and ultrasound of the lower limb, and recognise common abnormalities.



Overview. By the end of the module, students should be able to describe the features of development of the nervous system and to understand how and why common malformations occur in the nervous system. They should have gained a good knowledge of the topography and

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- Describe the development of the brainstem and of the 4th ventricle and compare the composition of the spinal nerves with the composition of the cranial nerves
- Describe the development of the cerebellum
- Illustrate the events that lead to the organization of the gray and white matter in the different portions of the central nervous system: spinal cord, brainstem and brain
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sinuses

- Describe the innervation of the meninges
- Describe the most important aspects of meningeal vessels



- Describe the organization of the enteric nervous system

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PPP portfolio: chest



Introduction to Radiology of the Back

Students should be able to:

- Distinguish between xRay of the spine, CT and MRI of the spine
- Distinguish among cervical, dorsal and lumbar vertebrae
- Identify the vertebral body, pedicles, laminae, spinous and transverse processes, intervertebral joints
- Being able to count the vertebrae on Xray, CT and MRI
- Recognise intervertebral disk
- Identify spinal cord and CSF
- Identify main arterial and venous vessels

Introduction to Radiology of the Neck

Students should be able to:

- Distinguish between xRay, CT and MRI of the neck
- Distinguish among buccal cavity, pharynx and larynx
- Identify the different neck spaces
- Recognise the main neck vessels
- Identify neck lymph nodes

Introduction to radiology of the thorax

Students should be able to:

- describe how to approach chest x-ray execution and which artefacts may impact the evaluation of cardio-mediastinal anatomy (respiration, over- and under-exposure, patient's rotation).

- Recognize x-ray anatomy of cardio-mediastinal arches and pulmonary lobes both latero-

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- Recognize MR and CT sectional images of the bony structures, main ligaments and tendons of the following joints of the upper limbs: shoulder, elbow, wrist and hand.
- Recognize MR and CT sectional images of the bony structures, main ligaments and tendons of the following joints of the lower limbs: hip, knee, ankle and feet.

ANATOMY and Radiology PRACTICAL CLASSES

Practical classes are considered an integral part of the course of Body Architecture. Attendance is mandatory.

Topics:

1) Bones of the skull 2) Back and spinal cord 3) Thorax 4) Abdomen and pelvis 5) Upper limb 6) Lower limb 7) Skull and brain

Organization: see section on "Teaching methods"

PROFESSIONALIZING ACTIVITIES ASSOCIATED TO THE COURSE

Practicals on general and orthopaedic physical examination

These practical activities will introduce students to the basis of the general physical examination (thorax, heart, and abdomen) and of the orthopedic physical examination

For the practicals on the bases of the physical examination, a stethoscope is needed.

Organization: see section on "Teaching methods"

Practical on blood sampling

This practical will introduce students to the procedure of blood sampling using manikin training arms .