

**MINISTRY OF SCIENCE AND HIGHER EDUCATION
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**FEDERAL STATE AUTONOMOUS EDUCATIONAL INSTITUTION OF
HIGHER EDUCATION
NORTH-CAUCASUS FEDERAL UNIVERSITY**

Methodological Guidelines
for Students on arranging and performing independent work
in the Discipline of Anatomy
for Students majoring (Specialty) in 31.05.01 General Medicine

Methodological Recommendations for Studying Theoretical Material

When performing the independent study of theoretical material, the student must follow the rules as set below. The working curriculum of the respective academic discipline shall be recommended to be used as the basis for such activity. According to the schedule of classroom lessons and independent work, a different number of hours is to be allocated for studying individual topics. A significant portion of the student's independent work should be allocated to mastering the material on the covered topic, writing a summary (notes) on the specified theoretical blocks, and searching for additional literature based on the NCFU library and via the Internet system. The lecture material shall not cover all theoretical material; the greater part of it must be mastered through independent work. Given the above, working with the recommended literature is mandatory. Special attention must be paid to the content of the main provisions and conclusions, the explanation of phenomena and facts, and the understanding of the practical application of the theoretical issues under consideration. In the process of this work, the student should strive to understand and memorize the main provisions of the material being considered, the examples illustrating it, as well as to understand the illustrative material. Preparation should be completed by drawing up a plan (summary/notes) on the material (issue) being studied. This allows for the creation of a concentrated, concise representation of the issues being studied. First, studying the recommended literature is to be done. Special attention must be paid to the content of the main provisions and conclusions, the explanation of phenomena and facts, and the understanding of the practical application of the theoretical issues under consideration.

During this work, the student should strive to understand and memorize the main provisions of the material being considered, the examples illustrating it, as well as to understand the illustrative material. Preparation should be completed by drawing up a plan (summary/notes) on the material (issue) being studied. This allows for the creation of a concentrated, concise representation of the issues being studied. If necessary, one should seek (advice) consultation from the instructor. When going to a consultation, it is necessary to thoroughly think through the questions that require clarification. Keeping records contributes to turning reading into an active process, mobilizing motor memory along with visual memory. The following should be born in mind: a student who systematically keeps records creates their own individual stock of auxiliary materials for a quick review of what has been read and for the mobilization of accumulated knowledge. Records are especially important and useful when they reflect the thoughts that arose during independent work.

It is important to develop the students' capacity to compare sources and to think through the material being studied.

Improving note-taking skills among students is of great importance.

The instructor may recommend the following main forms of recording to students: a plan (simple and detailed), excerpts, and theses (abstracts).

The results of note-taking can be presented in various forms.

- A plan is an outline of the read material, a brief (or detailed) list of questions reflecting the structure and sequence of the material.
- A detailed plan fully replaces a summary.
- A summary (notes) is a systematized, logical presentation of the source material. Four types of summaries are distinguished:
 - Outline-summary (Plan-notes) – this is an expanded, detailed plan in which sufficiently detailed records are provided for those points of the plan that need explanation.
 - Textual summary – this is the reproduction of the most important provisions and facts of the source.
 - Free summary – these are clearly and briefly formulated (stated) main provisions resulting from a deep understanding of the material. It may contain excerpts, quotations, and theses; part of the material may be represented by a plan.

- Theme-based summary – this is compiled on the basis of studying a number of sources and gives a more or less exhaustive answer according to a certain scheme (issue).

Methodological Guidelines for the Preparation for Practical Activities

When preparing for practical activities, the recommendation implies studying the control questions for the given lesson and the theoretical material from one's own notes.

The main form of work during the lessons is an interview (discussion). Each student must be ready to speak on all issues raised in the plan and demonstrate maximum activity during their consideration.

The speech must be constructed freely, convincingly, and with arguments. The instructor ensures that the speech is not reduced to a reproductive level (simple reproduction of the text); simple reading of the summary is also not allowed.

It is necessary for the speaker to show their own attitude towards what they are talking about, express their personal opinion and understanding, substantiate it, and be able to draw the correct conclusions from what has been said. In doing so, the student may refer to the entries in the summary, directly to the primary sources, use knowledge of previously studied disciplines, etc. In addition, to obtain a grade at an advanced level, students solve situational tasks based on the results of the mastered topics.

During the execution of practical works, a defense of practical skills is provided, the full list of which is specified in the fund of assessment tools.

Methodological Recommendations for the Preparation of Presentations and Reports

The report must contain elements of novelty; along with the fundamental aspect, an analysis of the current state of the problem under study must be carried out, as well as inclusion in regional issues. The report must include an introduction, a theoretical part, a conclusion, a list of literature, and a presentation that reveals the essence of the topic in graphs, pictures, diagrams, and formulas.

The report is recommended to be submitted on 1 printed sheet. The text of the work must be printed with 1.5 line spacing on one side of a standard sheet (A4) of white paper.

The text and other printed elements of the work must be black, and the contours of letters and signs must be clear, without halos and shading. The font must be Times New Roman, size 14. The titles of chapters and paragraphs are highlighted in bold. The sheet with text must have margins: left – 30 mm, right – 10 mm, top – 20 mm, bottom – 20 mm.

Page numbering of the text is done in the lower right corner of the sheet. It is necessary to number pages starting from the page where the Introduction is printed, on which the number 3 is placed. After that, all pages, including appendices, are numbered.

A space equal to two intervals is placed between the title of the chapter and the title of the paragraph of this chapter, and the title of the paragraph must not be separated from the text of this paragraph by a space. The titles of paragraphs shall be separated from the text of the previous paragraph by a space equal to two intervals. Each chapter, as well as the introduction, conclusions, appendices, and the list of used literature, begin on a new page. The word Chapter is not to be written. Chapters have ordinal numbers within the entire work, designated by Arabic numerals (for example: 1, 2, 3), followed by a period.

The word **PARAGRAPH** or the paragraph symbol (§) is not placed in the title. Paragraphs have ordinal numbers within the chapters, designated by Arabic numerals (for example: 1.1. and 1.2.).

Headings of chapters and paragraphs in the text must be centered; a period shall not be placed at the end of the title of the chapter and paragraph. It is not allowed to hyphenate (transfer) a part of a word in a heading. 4.5. The numbering of tables and figures can be running (continuous) or relate to the number of the chapter and paragraph. For example, if a table or a figure is included in the text of the first paragraph of the second chapter, the numbering is as follows: Table 2.1.1., Fig. 2.1.1.

The last digit means the ordinal number of the table (or figure) in this paragraph.

The table is to be placed as the next page after the first mention of it in the text.

Methodological guidelines
for completing laboratory work
in the discipline " ANATOMY "
for students of the specialty 31.05.01 General Medicine

INTRODUCTION

The purpose of studying the discipline "Anatomy" is to acquire knowledge of the structure, topography, blood supply and innervation of internal organs, the musculoskeletal system, sensory organs, as well as the principles of obtaining morphological knowledge necessary for further training in other fundamental medical disciplines, as well as for clinical and preventive disciplines.

The main objectives of studying the discipline are:

The main **objectives** of studying the discipline are:

- Mastering this discipline will help to study the structure, functions of organs and systems to the required extent.
- To examine individual, gender, and age-related features of the body's structure, including perinatal development (organogenesis); the anatomical and topographic relationships of organs, to demonstrate the variability of organs and systems, developmental defects, and to reveal the interrelationships and interdependence of individual parts of the body.
- To show the relationship of the organism as a whole with changing environmental conditions, the influence of labor and social conditions on the development and structure of the organism and systems as a whole.
- During teaching, foster ethical standards of behavior in the "anatomy theater," and respect and care for human organs and corpses. Instill high moral standards of behavior in the dissection rooms of the medical school.

As a result of studying the discipline, the student should know:

- The main patterns of development and vital activity of the human body based on the structural organization of its organs and systems.
- The structure, functions, topography and development of all organs and systems of the body, taking into account age characteristics and individual variations.
- The functional relationship of individual parts and organs in the human body.
- Blood supply, lymphatic drainage pathways and innervation of all organs.
- Anatomical terms according to the International Anatomical Nomenclature.

Must be able to:

- Accurately and accurately identify parts and areas of the human body.
- Determine the main bone formations, joint spaces, muscle contours, their origins and attachments, and projection onto the body surface.
- Accurately and accurately determine the locations and projections of organs and their parts on the surface of the body and in relation to the skeleton.
- Accurately and precisely determine the location of major blood vessels and nerves, and palpate the pulsation points of arteries.

Must possess:

- Medical and anatomical conceptual apparatus.
- Skill in working with simple medical instruments (tweezers, scalpel, probe, etc.) and biological material.
- Skill in using reference anatomical literature, as well as Internet resources on human anatomy.

Lab Lesson Plans
2nd semester

Introduction to Anatomy. General Skeletal Anatomy

1. Parts and areas of the human body.
2. Planes, axes and main landmarks in anatomy.
3. Fundamentals of anatomical terminology.
4. General osteology
5. Functions of the skeleton
6. Bone as an organ
7. Classification of bones
8. Internal and external structure of bones, chemical composition.
9. Bone development, bone developmental anomalies.

Skeleton of the trunk. Vertebral column.

1. The spinal column. Physiological curves of the spinal column and their age-related changes.
2. General features of the structure of the vertebrae.
3. Features of the structure of the cervical vertebrae.
4. Features of the structure of the thoracic vertebrae.
5. Features of the structure of the lumbar vertebrae.
6. Structural features of the sacral vertebrae. Coccyx.

Skeleton of the trunk. Rib cage.

1. Classification of ribs.
2. Structure of the ribs.
3. Sternum.
4. Borders and apertures of the chest.
5. Chest shapes.

Skeleton of the upper limb

1. Bones of the upper limb (scapula, clavicle, humerus, radius, ulna, carpal bones, metacarpal bones, phalanges).

Skeleton of the lower limb

1. Bones of the lower limb (pelvic bones, femur, tibia, fibula, tarsal bones, metatarsal bones, phalanges).

Skeleton of the head (skull).

1. General plan of the skull structure.
2. Bones of the cranium:
 - a) frontal,
 - b) parietal,
 - c) occipital,
 - d) wedge-shaped (main),
 - d) lattice,
 - e) temporal.

Skeleton of the head (skull).

1. Upper jaw.
2. Lower jaw.
3. Small bones of the facial skull:
 - a) zygomatic,
 - b) palatine,
 - c) nasal,
 - d) lacrimal,
 - d) sublingual,
 - e) opener,
 - g) inferior nasal concha.
4. Buttresses of the skull.

Topography of the skull. Topography of the skull: vault (roof), orbit, nasal cavity, temporal, infratemporal, pterygopalatine fossa. Skull of a newborn. The concept of craniometry. X-ray anatomy of the skull.
Topography of the skull. 1. External base of the skull. 2. Internal base of the skull. 3. Skull norms. 4. Projection lines and points of the skull. 5. Ontogenesis of the skull
Types of bone connections. Connections between the vertebrae and the skull. 1. Types of bone joints. 2. Classification of joints. 3. Joints of the vertebrae. Spinal column. 1. Connections of the spinal column with the skull. 2. Joints of the skull bones. Temporomandibular joint.
Joints of the bones of the trunk. Rib cage. 1. The connections of the ribs with the thoracic vertebrae and sternum. 2. The chest as a whole. 3. X-ray anatomy of the spine and chest.
Joints of the bones of the upper limb. 1. Joints of the bones of the upper limb. Joints of the girdle of the upper limb. 2. Shoulder, elbow, wrist joints, joints of the forearm bones. 3. Joints of the hand. 4. X-ray anatomy of the joints of the upper limb.
Joints of the bones of the lower limb. Joints of the lower limb bones. Joints of the pelvic girdle. The pelvis as a whole. Hip and knee joints. Joints of the leg bones. Ankle joint, connections of the bones of the foot. X-ray anatomy of the lower limb joints.
Muscles of the trunk. Muscles of the back and chest. Structure and classification of muscles. Muscles and fascia of the back and chest. Diaphragm. Anatomical prerequisites for the occurrence of diaphragmatic hernias.
Torso muscles. Abdominal muscles. Muscles and fascia of the abdomen. White line of the abdomen. Rectus abdominis sheath. Inguinal canal. Weak spots of the abdominal wall as anatomical prerequisites for the formation of hernias.
Muscles of the head and neck. 1. Muscles and fascia of the neck. 2. Topography of the neck. 3. Muscles of the head: facial expression and chewing. 4. Fasciae of the head.

Muscles of the upper limb.

1. Muscles and fascia of the girdle of the upper limb and shoulder.
2. Axillary fossa and axillary cavity, topography of the shoulder.
3. Muscles and fascia of the forearm and hand.
4. Topography of the forearm and hand.

Muscles of the lower limb.

Muscles and fascia of the pelvis and thigh.
Topography of the gluteal region and thigh.
Femoral canal. Anatomical factors that contribute to the development of femoral hernias.
Muscles and fascia of the leg and foot.
Topography of the leg and foot.

The concept of topographic and anatomical features of fascia and cellular spaces.

Accessory apparatus of skeletal muscles.
Fascia, cellular spaces and topographic formations of the head, neck, chest, abdomen, back, upper limb, lower limb
The structure of the musculoskeletal system on X-ray and tomograms.

Anatomy and topography of the spinal cord and its membranes. Formation of spinal nerves.

1. General anatomy of the nervous system.
2. The membranes of the spinal cord and brain.
3. Topography and anatomy of the spinal cord: grooves and fissures are on the surface of the spinal cord; parts of the spinal cord.
4. Spinal ganglion, structure, topography, meaning.
5. What is called a spinal cord segment?
6. Topography of spinal cord segments.

Anatomy and topography of the spinal cord and its membranes. Formation of spinal nerves.

1. Gray matter of the spinal cord.
2. Nuclei of the anterior horn of the gray matter of the spinal cord.
3. Nuclei of the posterior horn of the gray matter of the spinal cord.
4. Nuclei of the lateral horn of the gray matter of the spinal cord.

Anatomy and topography of the spinal cord and its membranes. Formation of spinal nerves.

White matter of the spinal cord.
Conducting pathways of the anterior funiculus of the spinal cord.
Conducting pathways of the posterior funiculus of the spinal cord.
Conducting pathways of the anterior funiculus of the spinal cord.
Spinal nerve, topography, formation, division into branches.
Reflex and reflex arc.

Rhombencephalon. Medulla oblongata. Hindbrain: pons, cerebellum, isthmus of the rhombencephalon.

1. Derivatives of the rhombencephalon.
2. Topography and external structure of the medulla oblongata.
3. Localization and functional significance of the nuclei of the gray matter of the medulla oblongata.
4. Localization of conducting pathways in the medulla oblongata.
5. Bridge: external and internal structure: localization, functional significance of gray matter nuclei and conducting pathways.
6. Rhomboid fossa. Fourth ventricle of the brain.
7. Cerebellum: external and internal structure.
8. Cerebellar peduncles, their fiber composition, functional significance of the bundles.
9. Anatomical formations of the isthmus of the rhombencephalon, their functional significance.

Midbrain. Nuclei of the cranial nerves of the brainstem.

1. Midbrain, topography, external and internal structure. Cerebral peduncles.
2. Nuclei of the cranial nerves.
3. Cranial nerves that exit the brain between the pyramid and the olive.
4. Cranial nerves that emerge from the medulla oblongata behind the olive.
5. Cranial nerves emerging from the brain at the border of the pons and medulla oblongata.
6. Cranial nerves emerging from the brain on the dorsal surface of its stem.
7. The openings through which the cranial nerves of the brainstem exit the skull.

3rd semester***Anatomy and topography of the forebrain. Diencephalon.***

1. Diencephalon.
2. The thalamus.
3. Supratubercular region (epithalamus). Metathalamus.
4. Subthalamic region (hypothalamus).
5. Third ventricle.

Anatomy and topography of the forebrain. Telencephalon.

1. The telencephalon. Surface of the hemispheres.
2. Lobes of the hemispheres.
3. Corpus callosum.
4. Basal ganglia.
5. Cerebral cortex.
6. Localization of functions in the cerebral cortex.
7. Lateral ventricles of the brain. Cerebrospinal fluid.

Conducting pathways of the brain and spinal cord.

1. General anatomical and functional characteristics, classification and functional significance of the conducting pathways (nerve bundles) of the brain and spinal cord.
2. Anatomy and topography of the associative pathways of the cerebrum and their functional significance.
3. Anatomy and topography of the commissural tracts of the cerebrum and their functional significance.
4. Classification of projection pathways (nerve bundles) of the brain and spinal cord.
5. Afferent (ascending, or sensory) pathways (nerve bundles): general principle of structure, classification.

Conducting pathways of the brain and spinal cord.

1. Topography of the pain and temperature sensitivity pathway in sections of the brain and spinal cord, its significance.
2. Topography of the pathway of touch and pressure on sections of the brain and the spinal cord, its importance.
3. Topography of the proprioceptive pathways of cortical sensitivity in sections of the brain and spinal cord. Their significance.
4. Projection of the conduction pathways of proprioceptive sensitivity of the cerebellar direction on sections of the brain and spinal cord, their significance.

Conducting pathways of the brain and spinal cord.

1. Efferent (descending, or motor) pathways (nerve bundles): general principle of structure, classification.
2. Topography of the pyramidal tracts in sections of the brain and spinal cord, their meaning:
 - a) corticonuclear pathway;
 - b) anterior corticospinal tract;
 - c) lateral corticospinal tract.
3. Topography of extrapyramidal tracts on sections of the brain and spinal cord brain, their meaning:
 - a) rubrospinal tract;
 - b) tectospinal tract;
 - c) vestibulospinal tracts;
 - d) olivospinal tract (fibers).

The membranes and intermeningeal spaces of the brain and spinal cord. Cerebrospinal fluid, formation and drainage pathways into the blood and lymph. Lateral ventricles. Third ventricle. Fourth ventricle.

1. Spinal cord membranes.
2. Intermeningeal spaces of the spinal cord and their contents.
3. The membranes of the brain.
4. Intermeningeal spaces of the brain and their contents.
5. Anatomy of the fourth ventricle, its messages and their significance.
6. Anatomy of the third ventricle, its messages and their significance.
7. Anatomy of the lateral ventricles, their communications, significance.
8. Ventriculo-cerebrospinal fluid system, formation, outflow and reabsorption pathways of cerebrospinal fluid.

Cranial nerves

V, XI, XII cranial nerves: nuclei, branches, areas of innervation:

1. Anatomy of the trigeminal nerve: nuclei, exit point from the brain, node, 3 branches, their topography, branching, fiber composition of the branches, innervation areas.
2. Anatomy of the accessory nerve: nuclei, exit points from the brain and skull, branches, fiber composition, innervation areas.
3. Anatomy of the hypoglossal nerve: nucleus, exit points from the brain and skull, topography, branches, fiber composition, innervation areas.

Cranial nerves I, VII, and IX: nuclei, branches, and innervation areas. Gustatory and olfactory analyzers and their pathways:

1. Anatomy of the olfactory nerve: exit points from the brain and cranial cavity, fiber composition, innervation areas. The olfactory analyzer and its pathway.
2. The concept of the terminal nerve.
3. Anatomy of the facial nerve: nuclei, exit points from the brain and cranial cavity, topography, sensory and parasympathetic ganglia, branches, fiber composition, innervation areas. The taste analyzer and its pathway.
4. Anatomy of the glossopharyngeal nerve: nucleus, exit points from the brain and cranial cavity, topography, sensory and parasympathetic nodes, branches, fiber composition, innervation areas.
5. I, III, IV, VI cranial nerves: nuclei, branches, areas of innervation, places of exit from the brain and cranial cavity, fiber composition, areas of innervation.
6. X, XI cranial nerves: nuclei, branches, areas of innervation, places of exit from the brain and cranial cavity, fiber composition, areas of innervation.

Spinal nerves.

1. Spinal nerve: formation, branches. Posterior branches of the spinal nerves. Anterior branches of the thoracic nerves.
2. Cervical plexus: formation, cutaneous and muscular branches. Phrenic nerve. Areas of innervation.
3. Brachial plexus: structure, cutaneous and muscular branches. Areas of innervation.
4. Anterior branches of the thoracic nerves.
5. Brachial plexus: formation, short and long branches, areas of innervation.
6. Lumbar plexus: formation, branches, areas of innervation.
7. Sacral plexus: formation. Short branches, areas of innervation. Long branches of the sacral plexus, areas of innervation.
8. Coccygeal plexus: formation, branches, areas of innervation.
9. Principles of innervation of the human body (internal organs, blood vessels, muscles, joints, skin).

Autonomic nervous system.

1. Anatomy and functions of the suprasegmental division of the autonomic (vegetative) nervous system.
2. The central part of the segmental division of the autonomic (vegetative) nervous system: nuclei, their histotopography .
3. The peripheral part of the segmental division of the autonomic (vegetative) nervous system: nodes, branches, fibers, nerves.
4. Features of the structure of the autonomic (vegetative) nervous system, the autonomic reflex arc, their differences from the somatic parts of the nervous system.
5. Division of the autonomic (vegetative) nervous system into three parts: sympathetic, parasympathetic and metasympathetic .
6. Anatomy of the sympathetic part of the autonomic nervous system: centers, nodes, branches, fibers, nerves, plexuses.
7. Anatomy and functional purpose of the parasympathetic centers parts of the autonomic (vegetative) nervous system.
8. Anatomy of the parasympathetic nodes of the head.
9. Anatomy of the parasympathetic parts of the oculomotor, facial, glossopharyngeal and vagus cranial, sacral spinal nerves.
10. Features of the structure and function (differences) of the three parts of the autonomic (vegetative) nervous system – sympathetic, parasympathetic and metasympathetic .
11. Anatomy of the vagus nerve: nuclei, exit points from the brain and cavities skull, topography, branches, fiber composition, innervation areas.

Anatomy of the visual system. The eye and associated structures: extrinsic muscles, lacrimal apparatus, eyelids, conjunctiva.

1. General anatomical and functional characteristics and classification of the structures of the visual analyzer. Definition of the concept of "organ of vision."
2. The eyeball: external structure.
3. Fibrous membrane of the eyeball: structure, functions.
4. The choroid of the eyeball. Accommodation apparatus: structure, functions.
5. The inner shell of the eyeball: structure, functions.
6. The nucleus of the eyeball: the lens, anterior and posterior chambers, vitreous body, their structure and functions. Refractive media of the eye.
7. Aqueous humor: formation, outflow, functions.
8. Accessory structures of the eye.
9. External muscles of the eyeball: structure, topography, functions.
10. Eyelids, conjunctiva, eyebrow: structure, functions.
11. Lacrimal apparatus: structure, functions

Anatomy of the organ of hearing and balance: external, middle and inner ear.

1. General anatomical and functional characteristics and classification structures of the auditory analyzer.
2. Outer ear: auricle, external auditory canal, eardrum.
3. Middle ear:
 - tympanic cavity, walls, openings, their contents;
 - auditory ossicles, their structure, joints, ligaments and muscles of the auditory bones;
 - auditory tube;
 - mammillary cave, mammillary cells.
4. Inner ear: the concept of the "vestibule-cochlear organ", the bony labyrinth, the membranous labyrinth

Functional anatomy of the heart. Arteries and veins of the heart.

1. Cardiovascular system. General anatomical and functional characteristics. Division into circulatory and lymphatic, circulatory
 - into arterial and venous
2. Mediastinum – definition, division into sections.
3. Topography of the mediastinal organs.
4. General anatomy of the heart.
5. The structure of the heart chambers in relation to their function in the systemic and pulmonary circulation.
6. Structure of the heart wall.
7. Structure and function of the cardiac conduction system.
8. Arteries of the heart.
9. Veins of the heart.
10. Pericardium.
11. Topography of the heart:
 - syntopy of the heart,
 - projection of the borders of the heart onto the anterior chest wall (with percussion),
 - projection of the heart valves on the anterior chest wall and the places where they can be heard (during auscultation).

Vessels of the small and large circles of blood circulation.

1. Vessels of the pulmonary circulation.
2. Aorta: sections and their topography.
3. Branches of the aortic arch and thoracic descending aorta:
 - brachiocephalic trunk, its topography, branches;
 - common carotid artery, its topography, branches;
 - external carotid artery, branches (anterior, posterior, medial, terminal) and areas of blood supply.
4. Thoracic aorta, its topography, branches and areas of blood supply.
5. Internal carotid artery, its anatomy, topography and branches, their areas of blood supply.
6. Subclavian artery, its anatomy, topography and branches, their areas of blood supply.
7. Anastomoses between the branches of the external, internal carotid arteries and the subclavian artery.
8. Topography of the abdominal aorta, classification of its branches.
9. Parietal branches of the abdominal aorta, areas of their blood supply.
10. Visceral branches of the abdominal aorta, areas of their blood supply.
11. Blood supply to the organs and walls of the abdominal cavity.
12. Arterial anastomoses in the abdominal region, their significance.

Arteries of the upper and lower limbs.

1. Axillary artery, its topography, branches and areas of blood supply.
2. Brachial artery, its topography, branches and areas of blood supply.
3. Arteries of the forearm: topography, branches and areas of blood supply.
4. Arteries of the hand, arterial palmar arches, their significance.
5. Arterial anastomoses of the upper limb, their significance.
6. Common, external and internal iliac arteries, their topography, branches and areas of blood supply.
7. Femoral artery, its topography, branches and areas of blood supply.
8. Blood supply to the organs and walls of the pelvis, perineum.
9. Blood supply to the hip joint and thigh muscles.
10. Arterial anastomoses in the pelvic and femoral region, their significance.

Anatomy of the venous system. The superior vena cava system.

1. Anatomy and topography of the superior vena cava, sources of its formation and its own tributaries.
2. Anatomy and topography of the azygos and hemiazygos veins, their tributaries.
3. Anatomy and topography of the brachiocephalic veins, their tributaries.
4. Anatomy and topography of the internal jugular vein, its extracranial and intracranial tributaries.
5. Anatomy and topography of the sinuses of the dura mater, diploic and emissary veins.
6. Anatomy and topography of the subclavian vein, its tributaries.
7. Directions of blood outflow from the brain, its membranes, and bones skull, organs of vision, hearing and balance, organs of the head, neck, chest cavity and chest wall.
8. Anatomy and topography of the veins of the upper limb: superficial and deep.
9. Paths of blood outflow through the veins from the fingers of the upper limb, muscles, joints, bones of the upper limb.

Inferior vena cava system.

1. Anatomy and topography of the inferior vena cava, sources of its formation and its own tributaries.
2. Anatomy and topography of the common, external and internal iliac veins, their tributaries.
3. Anatomy and topography of the veins of the lower limb: superficial and deep.
4. Paths of blood outflow through the veins from the fingers of the lower limb, muscles, joints, and bones of the lower limb.
5. Anatomy, topography of the portal vein and its tributaries.
6. Directions of blood outflow from the organs and walls of the pelvis and abdominal cavity.
7. Formation and location of cava- caval anastomoses.
8. Formation and location of portocaval anastomoses.

Anatomy of the lymphatic system.

1. General plan of the structure and principles of functioning of the lymph drainage pathways.
2. Features of the structure and functions of lymphatic capillaries and vessels. Principles of lymphatic vessel classification.
3. Lymph nodes: classification, structure, functions. Concept of regionality of lymph flow.
4. Anatomy and topography of lymphatic ducts, formation, lymph collection areas.
5. Lymphatic vessels, trunks and lymph nodes of the head and neck.
6. Directions of lymph drainage from the areas of the head, organs of hearing, vision, nasal cavity, teeth, tongue, salivary glands, pharynx, larynx, thyroid gland glands, neck areas, their regional lymph nodes.
7. Lymphatic vessels, trunks and lymph nodes of the thoracic cavity.

4th semester

Anatomy of the lymphatic system.

1. Lymphatic vessels, trunks and lymph nodes of the thoracic cavity.
2. Directions of lymph drainage from the heart, lungs and bronchi, esophagus, chest walls, and their regional lymph nodes.
3. Paths of lymph drainage from the mammary gland, its regional lymph nodes.
4. Lymphatic vessels, trunks and regional lymph nodes of the upper limb, directions of lymph drainage in the upper limb.
5. Lymphatic vessels, trunks, lymph nodes of the abdominal cavity.
6. Lymphatic vessels and lymph nodes of the pelvis.
7. Directions of lymph drainage from the stomach, intestinal sections, liver, gallbladder, pancreas, kidneys and adrenal glands, bladder, internal and external genital organs, their regional lymph nodes.

Anatomy of the lymphatic system.

1. Lymphatic vessels and lymph nodes of the lower limb, directions of lymph drainage in the lower limb.
2. General anatomical and functional characteristics of the lymphoid system.
16. Thymus: topography, structure, functions, blood supply, innervation, regional lymph nodes
3. Secondary organs of the lymphoid system: topography, general structural features, functions.
4. Tonsils of the pharynx: topography, structure, blood supply, innervation, regional lymph nodes.
5. Spleen: topography, structure, functions, blood supply, innervation, regional lymph nodes.

Anatomy of the digestive system.

1. General anatomy of internal organs.
 2. Internal organ systems.
 3. Parenchymatous, tubular (hollow) organs, principles of structure.
 4. Serous membranes, serous cavities.
 5. Lines and areas of the chest and abdomen.
 6. Topography of internal organs (holotopy , skeletotopy , syntopy).
- The digestive system, divided into the alimentary canal (tract) and the large digestive glands. Sections of the alimentary canal.

Anatomy of the digestive system.

Oral cavity: vestibule of the mouth, the oral cavity itself, their walls. Cheeks.
Lips. Diaphragm of the mouth.
Teeth: structure, types of teeth. Baby and permanent teeth. Formula
Teeth. Timing of teeth eruption and replacement.
Language: parts, structure.
Oral glands. Major salivary glands: structure, topography, excretory ducts.
Sky. Hard palate, soft palate, pharynx.

Anatomy of the digestive system.

1. Pharynx: topography, parts, wall structure, communications. Pharyngeal tonsils (Waldeyer -Pirogov ring).
2. Esophagus: topography, parts, constrictions, wall structure.
3. Abdominal areas.
4. Stomach: topography, parts, wall structure.

Anatomy of the digestive system. Small and large intestines. Liver. Pancreas.

1. Sections and structure of the small intestine in relation to its function:
 - 1.1. general plan of the wall structure, division into sections,
 - 1.2. structural features and topography of the duodenum,
 - 1.3. Features of the structure and topography of the jejunum and ileum.
2. Sections and structure of the large intestine in relation to its function:
 - 1.1. general plan of the wall structure, division into sections,
 - 1.2. structural features and topography of the cecum,
 - 1.3. Features of the structure and topography of the colon sections.
3. Differences between the small intestine and the large intestine.
4. Features of the structure and topography of the rectum.
5. Liver: structure, topography, ligaments.
6. Features of blood circulation in the liver.
7. Gallbladder: structure, topography.
8. Anatomy of the biliary tract.
9. Pancreas: structure, topography.

Abdominal cavity and peritoneum.

1. Structure of the peritoneum.
2. Peritoneal cavity. Floors of the peritoneal cavity (upper, lower). Topography of organs located at their levels. Layers of the peritoneum.
3. Location of organs in relation to the peritoneum:
 - a) extraperitoneally;
 - b) mesoperitoneally;
 - c) intraperitoneally.
4. Derivatives of the peritoneum: omentum, ligaments, mesentery, their structure and topography.
5. Bags, pockets, pits of the peritoneal cavity, their structure and topography, practical significance.

Anatomy of the respiratory system.

1. The respiratory system, division into the respiratory tract and respiratory organs.
Sections of the respiratory tract.
2. Nose. Nasal cavity: nasal vestibule, nasal turbinates and nasal passages, respiratory and olfactory regions. Paranasal sinuses.
3. Larynx: topography, laryngeal cavity, cartilages, ligaments, joints, muscles, fibroelastic membrane of the larynx, vocal apparatus.
4. Trachea: topography, parts, cartilages and ligaments of the trachea.
5. Bronchi. Bronchial tree. Main bronchi. Structure and topography.
6. Lungs, structure.
7. Lung lobes. Bronchopulmonary segments.
8. Intrapulmonary branches of the bronchial tree.
9. Alveolar tree. Structural and functional unit of the lung.
10. Features of blood circulation in the lungs.
11. Serous membrane of the lung pleura:
 - visceral (pulmonary)
 - parietal: diaphragmatic, costal, mediastinal
 - pleural cavity, pleural sinuses.
12. Borders of the lungs (upper, posterior, anterior, lower).
13. Borders of the pleural sacs (upper, posterior, anterior, lower)

Anatomy of the urinary system.

1. The genitourinary system: reasons for combining the urinary and reproductive systems into a single system.
 2. The urinary system. Division into the urinary organs and the urinary tract. The importance of the urinary organs for the body's vital functions.
 2. Kidneys: structure and topography.
 3. Kidney membranes, kidney fixing apparatus.
 4. Features of blood circulation in the kidney.
 5. The structure of the nephron, the concept of its function.
 6. Segmental structure of the kidney.
- Intrarenal urinary tract (collecting tubes, straight renal tubules, papillary ducts, minor and major calyces, renal pelvis), extrarenal:
- ureter: structure, topography, parts, constrictions;
 - urinary bladder: structure, topography, relationship to the peritoneum;
 - urethra (male and female): structure, topography.

Anatomy of the reproductive system. The male reproductive system.

1. General anatomical and functional characteristics of the reproductive systems.
2. Topographical and anatomical subdivision of male genital organs.
3. Testicle: structure, membranes, function.
4. Epididymis: structure, topography, function.
5. Vas deferens: structure, topography.
6. Seminal vesicles: structure, topography, function.
7. Prostate: structure, topography, function.
8. The process of testicular descent and the origin of the layers of the scrotum.
9. Spermatic cord: membranes, structure, topography.
7. Bulbourethral glands.
- 10 Penis: structure.
11. Paths of semen excretion.

Anatomy of the reproductive system. The female reproductive system.

1. Topographic and anatomical subdivision of female genital organs internal and external.
3. Ovary: structure, topography, functions.
4. Ovarian appendages: structure, topography.
5. Uterus: structure, topography, function. Age-related changes in the uterus.
6. Fallopian tube: structure, topography, function. Structural features in connection with the function performed.
7. Vagina: structure, topography.
8. Labia majora.
9. Labia minora.
10. Vestibule of the vagina, glands of the vestibule.
11. Clitoris: structure.
12. Definition of the perineum.
13. Anatomy of the muscles and fascia of the urogenital diaphragm.
14. Anatomy of the muscles and fascia of the pelvic diaphragm.
15. Anal -rectal pit and its contents.
16. Function of the male and female perineum.

Development and functional anatomy of the internal organs organs

1. Development of the oral cavity and its derivatives during ontogenesis. Anomalies.
2. Derivatives of the primary intestine in ontogenesis. Anomalies.
3. Transformations of the ventral and dorsal mesenteries of the embryo. Anomalies.
4. Development of the nasal cavity during ontogenesis. Anomalies.
5. Development of the respiratory system during ontogenesis. Structural variations and anomalies.
6. Development of the urinary system during ontogenesis. Structural variations and anomalies.
7. Development of male reproductive organs during ontogenesis. Structural variations and anomalies.
8. Development of female reproductive organs during ontogenesis. Structural variations and anomalies.

<i>Anatomy of the endocrine glands.</i> 1. Anatomical and functional characteristics of endocrine glands. 2. Classification of endocrine glands. 3. Neurogenic group of glands: - pituitary gland: structure, topography, functions, age-related characteristics; - pineal gland: structure, topography, functions, age peculiarities.
<i>Anatomy of the endocrine glands.</i> 1. Branchiogenic group of glands: - thyroid gland: structure, topography, functions, age-related features; - parathyroid glands: structure, topography, functions, age-related characteristics; 2. The endocrine part of the pancreas: structure, topography, functions, age-related characteristics.
<i>Anatomy of the endocrine glands.</i> 1. Glands of mesodermal origin: - interrenal (adrenal cortex, accessory adrenal glands): structure, topography, functions, age-related features; - endocrine part of the sex glands (testicle, ovary): structure, topography, functions, age-related characteristics.
<i>Anatomy of the endocrine glands.</i> 1. Adrenal group of glands: adrenal medulla, glomus (paraganglia): structure, topography, functions, age-related characteristics. 2. The adrenal gland as an organ: structure, topography, functions.
<i>General covering. Mammary gland.</i> 1. Anatomy of the general integument. 2. Mammary gland: topography, structure, functions.

Recommended literature.

Main literature:

1. Frederic H. Martini, Ph.D., University of Hawaii at Manoa, Michael J. Timmons, M.S., Moraine Valley Community College, Robert B. Tallitsch, Ph.D. with William C. Ober, M.D Human anatomy. 2023. – 901 p.

Further reading:

1. Frank H. Netter MD Atlas of Human Anatomy 7th Edition. 2014. – 791 p.
2. Mark Nielsen, Shawn Miller Atlas of Human Anatomy. 2019. – 354 p.

Internet resources:

1. <http://rudocor.net/> - Medical portal
2. <http://www.e-reading.club/> - Large online library
3. <http://www.pubmed.com/> - a database of full-text articles on medicine
4. <http://www.spravocnikpolekarstvam.ru/> - free online pharmacological reference
5. <https://dic.academic.ru/> - Dictionaries and encyclopedias
6. <https://www.rmj.ru/> - Russian Medical Journal