MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION

PENZA STATE UNIVERSITY

MEDICAL INSTITUTE

AGREED:
Director of the Medical Institute
_____ A.N. Mitroshin
"_05_" _March_ 2016.

STUDY PROGRAM

C1.1.16 Topographic Anatomy

Course – 31.05.01 General Medicine

Graduate's qualification – Medical doctor

Type of study – full-time

Penza – 2016

1. Aims and goals

The purpose of attaining of the module is to purchase each student specific topographic anatomic knowledge necessary to substantiate the diagnosis, understanding the pathogenesis of the disease, possible complications, mechanisms of development of compensatory processes, as well as the choice of the most rational methods of surgical treatment.

Objectives of the study module are: the study of topographic anatomy areas and bodies; the development of skills to apply this knowledge to explain the features of a pathological processes and solving diagnostic and operative surgical tasks.

2. Links to other disciplines of the general curriculum

Training module "Topographic anatomy" is part of the discipline "Topographic Anatomy and Operative Surgery" and refers to basic part of the cycle C1. Disciplines.

Topographic anatomy of students studying at the II year, when they have mastered the basics of normal anatomy, histology, physiology, and proceed to the development of clinical disciplines. Topographic anatomy is an applied science that combines theory and practice of medicine that studies the mutual arrangement and relationship of organs and tissues of the human body areas. Teaching topographic anatomy based on the principles of system-methodological approach to business training and education specialists, summarizing scientific material from the standpoint of achieving philosophy, medicine, biology, genetics, immunology, molecular biology and chemistry. In the study module "Topographic anatomy" formed the basic knowledge requirements defined by the GEF-specific PLO for the subsequent development of clinical disciplines, such as obstetrics, military emergency medicine, gynecology, eye diseases, hospital treatment, hospital surgery, childhood diseases, infectious diseases, neurological diseases, oncology, forensic medicine, faculty therapy, faculty surgery, according phthisiology formed by competencies.

3. Student competences, developed during learning “Topographic anatomy”

According to the state curriculum for the course, learning is oriented at developing the following competences and their elements:

Competence code	Name of the competence	Structural elements of the competence (knowledge, skill, application as a final learner outcome)
GC-1	ability of abstract thinking, logical analysis and synthesis skills	knowledge: general patterns of origin and evolution of life; anthropogeny and human ontogeny, the main patterns of development and functioning of the body of an adult and a teenager on the basis of the structural organization of cells, tissues and organs; anatomical and physiological, age and sex and the individual characteristics of the structure and development of healthy and sick human functional systems of the human body.
		skill: find in preparations show and call in Latin studied anatomical structures; palpate the main man on bony landmarks, topographic contours outline organs and major vascular and nerve trunks; analyze histological assessment of a variety of cellular, tissue and organ structures in patients and analyze results X-ray examination of patients.
		application: biomedical conceptual apparatus; basics of scientific and technical information of medical subjects, reviewing the results of clinical, laboratory and instrumental methods of examination of patients.
GPC-1	willingness to solve typical problems	knowledge: histofunctional particular tissue elements, and methods

	in their professional activities using different information sources, medical terminology, computer technologies and complying with the demands of information security	of their investigation; anatomical and physiological, age and sex and the individual characteristics of the structure and development of healthy and sick human functional systems of the human body, their regulation and self-regulation when exposed to the external environment in normal and pathological processes.
		skill: analyze the modern domestic and foreign scientific and technical information, use this knowledge to assess the functional state of the body of an adult and a teenager.
		application: biomedical conceptual apparatus; basics of scientific and technical information of medical subjects, reviewing the results of clinical, laboratory and instrumental methods of examination of patients.
GPC-7	implementing knowledge in general science and its branches for solving professional tasks	knowledge: medical anatomical conceptual apparatus structure of the human body, the general laws of origin and evolution of life, and human ontogenesis anthropogeny, basic laws of development and functioning of the human body.
		skill: find in preparations show and call in Latin studied anatomical structures; palpate the main man on bony landmarks, topographic contours outline organs and major vascular and nerve trunks; analyze histological assessment of a variety of cellular, tissue and organ structures in patients and analyze results X-ray examination of patients.
		application: biomedical conceptual apparatus; basics of scientific and technical information of medical subjects, reviewing the results of clinical, laboratory and instrumental methods of examination of patients.
GPC-9	knowing how to use medicines, medical products and technologies in solving professional problems	knowledge: the basic methods of making anatomical preparations, especially age structure of organs, the basic principles of the analysis of radiographs.
		skill: produce anatomical and analyze anatomical variants and abnormal structure of organs, to interpret the results of X-ray and CT examinations
		application: medical anatomical conceptual apparatus; underlying technologies transform information; basics of anatomical tools, reviewing the results of X-ray examination of patients.

4. Structure and content of the module “Topographic Anatomy”

4.1. Structure of the module

Overall workload equals 2 ECTSs, 72 hours.

№	Names of parts and topics of the discipline	Semester	Week of the semester	Types of learner activities, including students’ individual work and workload (in hours)									Forms of current assessment *(divided in weeks)*							
				Class study				Individual work												
				Total	Lectures	Practical classes	Laboratory classes	Total	Preparation for class study	Реферат, эссе и др.	Term paper (project)	Exam preparation	Discussion	Tutorial	Test assessment	Test paper grading	Research paper assessment	Workbooks assessment	Term paper (project)	Assessment of practical skills
1.	**Topographic anatomy of the limbs**																			
1.1.	Topographic anatomy of the shoulder girdle: deltoid, clavicular, scapular region, shoulder and arm.	4	1	4	2	2		0.7	0.7				1					1		1
1.2.	Topographic anatomy of the shoulder, elbow and forearm.	4	2	2		2		0.7	0.7				2					2		2
1.3.	Topographic anatomy of the hand.	4	3	2		2		0.7	0.7				3					3		3
1.4.	Topographic anatomy of the buttocks and thighs, the hip.	4	4	4	2	2		0.7	0.7				4					4		4
1.5.	Topographic anatomy of the knee, leg, ankle and foot.	4	5	2		2		0.7	0.7				5					5		5
2.	**Topographic anatomy of the head and neck.**																			
2.1.	Topographic anatomy of the cerebral part of the head.	4	6	4	2	2		0.7	0.7				6					6		6
2.2.	Topographic anatomy of the facial part of the head.	4	7	2		2		0.7	0.7				7					7		7
2.3.	Topographic anatomy of the neck.	4	8	4	2	2		0.7	0.7				8					8		8
3.	**Topographic anatomy of the body.**																			
3.1.	Topographic anatomy of the chest wall.	4	9	4	2	2		0.7	0.7				9					9		9
3.2.	Topographic anatomy of the chest cavity.	4	10	4	2	2		0.7	0.7				10					10		10

№	Names of parts and topics of the discipline	Semester	Week of the semester	Types of learner activities, including students' individual work and workload (in hours)									Forms of current assessment *(divided in weeks)*							
				Class study				Individual work												
				Total	Lectures	Practical classes	Laboratory classes	Total	Preparation for class study	Реферат, эссе и др.	Term paper (project)	Exam preparation	Discussion	Tutorial	Test assessment	Test paper grading	Research paper assessment	Workbooks assessment	Term paper (project)	Assessment of practical skills
3.3.	Topographic anatomy of the anterior abdominal wall.	4	11	4	2	2		0.7	0.7				11					11		11
3.4.	Topographic anatomy of the upper floor of the abdominal cavity.	4	12	4	2	2		0.7	0.7				12					12		12
3.5.	Topographic anatomy of the lower floor of the abdominal cavity.	4	13	2		2		0.7	0.7				13					13		13
3.6.	Topographic anatomy of the pelvic organs.	4	14	4	2	2		0.7	0.7				14					14		14
3.7.	Topographic anatomy of the lumbar region and retroperitoneal space.	4	15	3	1	2		0.7	0.7				15					15		15
3.8.	Topographic anatomy of the spinal column.	4	16	2		2		0.7	0.7				16					16		16
3.9.	Independent work with aids.	4	17	2		2		1.2	1.2						17					17
3.10.	Control class.	4	18	2		2		1.3	1.3				18							18
3.11.	Control class.	4	19	2		2		1.3	1.3				19							19
	Term paper																			
	Exam preparation																			
	Overall workload, in hours			57	19	38		15	15				Interim assessment							
													Type					Semester		
													pass-fail exam					*4*		
													exam					-		

4.2. Content of the discipline

Introduction

The basic concepts of topographic anatomy (the area and its borders, external and internal marks, the projection anatomical structures on the skin, their holotopy, skeletotopy, syntopy, fascial sheaths, fatty tissue spaces, collateral circulation and others).

The doctrine of individual anatomical variability of a human (typical anatomy). Age peculiarities of the structure, topography of organs and systems.

The methods of topographic anatomic investigations on the living human body (projection anatomy, fluoroscopy, radiography, computed tomography, ultrasound and other modern methods of researches); on the cadaver (layered anatomical dissection, including vessels, injected color, contrast hardening masses, cuts frozen cadavers of N.I. Pirogov , diaptrography, corrosion preparations and so on).

Limbs

The general characteristics of the upper and lower extremities of adults and children. The division on the regions. External marks and projections. N.I. Pirogov's doctrine about vascular sheaths and casing structure of the limbs. Fascia, fascial compartments and intermuscular septums, fatty tissue spaces. Pathways burrowing pus and hematomas on the interfascial fatty tissue spaces. Peculiarities of their spreading of children. The system of deep and superficial veins and their relation to the fascias. Collateral circulation of the blood. The system of the deep and superficial lymphatic vessels and nodes. Zones of the skins innervation.

The peculiarities of structure and blood supplying of the tubular bones of children. Surgical anatomy of broken bones of the children (epiphysiolysis, type fractures of "green branches").

Upper limb

The subclaviae region. Borders. External marks. The layers, fascias and fatty tissue spaces. Neurovascular structures.

The deltoid region. Borders. External marks. Layers. Subdeltoid fatty tissue space. Vessels and nerves. Sinovial bursae. Shoulder joint. Its features of newborns. Articular capsule and its reinforcing apparatus. Weaknesses of the joint capsule. Position of the humeral head at dislocations of the shoulder joint.

The Scapular region. Borders. External marks. Layers. Bony-fascial compartments of the supraspinous and infraspinous fossae. Vessels and nerves.

The Axillary region (axillary fossa, armpit). Borders. External marks. Projection of the axillary artery on the skin. Walls of the axillary fossa. Topography of the axillary artery, its relationship with axillary vein, cords and nerves of the brachial plexus. Link of fatty tissue of axillary fossa with fatty tissue spaces of shoulder, deltoid, axillary, subclavian and supraclavicular regions. Character of structure of fatty tissue and peculiarities of phlegmons of newborns. Blood collaterals in the shoulder joint area.

The Shoulder (arm). Borders. External marks. Layers. Anterior arm: layers, fascial compartments and its contents. Topography neurovascular formations front shoulder area. The projection of the brachial artery. Posterior arm: layers, fascial bed and its contents. neurovascular structures. The position of bone's fragments in fractures of the humerus at different levels.

The Elbow(cubital region). Borders. External marks. Anterior elbow region: topography of superficial and deep neurovascular formations, lymph nodes. Posterior elbow region: layers, subcutaneous olecranon bursa. Neurovascular formations. Elbow joint. The features of its structure of the children. Joint capsule, its weaknesses. The blood collaterals in the elbow joint region. The position of bones at dislocations in the elbow joint.

Forearm. Borders. External marks. Anterior forearm. Front fascial compartments, muscle layers. Topography of neurovascular structures. Projection of the median and ulnar nerves, radial and ulnar artery. Space of Pirogov-Parons, its connection with fatty tissue spaces of adjacent regions. Posteror forearm. Posterior and lateral fascial spaces, muscle layers. Neurovascular formations. Position of fragments in fractures of forearm bones at different levels.

Hand. Borders. External marks. The wrist. Layers of the palmar and dorsal surfaces. Channels of the wrist and their contents. Neurovascular structures. Wrist joint.

The palmar surface of the hand and fingers. Projections of the superficial and deep palmar arches, motor branches of the median and ulnar nerves. Features of structure of the skin, subcutaneous fatty tissue, palmar aponeurosis. Fascial compartment of the palm. Hands fatty tissue spaces and their link with same spaces of adjacent regions. Bony-fibrous canals, tendons apparatus, synovial sheaths of flexors of the hand, their structure and meaning in the dissemination of inflammatory processes on a hand. Innervation of the skin and palmar muscles of the hand and fingers, surgical anatomy of syndactyly.

The dorsal surface of the hand and fingers. The zones of skin innervation. The layers. Neurovascular structures of back surface of the hand. Projection of the joint cavities, of the metacarpophalangeal, the interphalangeal joints and the ligaments.

Lower limb

Gluteal region. Borders. External marks. The layers. Fascias, fatty tissue spaces and their link with fatty tissue

spaces of adjacent regions. Neurovascular formations, their projections on the skin. The hip joint. The features of its structure in children. Surgical anatomy of congenital dislocation of the hip. Joint capsule and its strengthening apparatus. Weaknesses of the joint capsule. Position of head of the femur at dislocations. Position of bone fragments in fractures of the femurs neck. Blood collaterals in the hip joint region.

Thigh. Borders. External marks. Inguinal ligament, vascular and muscle lacunae. Fascial compartments, intermuscular septa, muscle groups.

Anterior thigh. Femoral (Schabowski) triangle. Topography of neurovascular formations, their skin projection. Femoral canal, walls, openings. Femoral hernias. Obturator canal. The neurovascular bundle. The adductor canal (Hunter s).

Postrior thigh. Layers, fascial compartment. Neurovascular structures. Sciatic nerve. Position of fragments of bone fractures of the femur at different levels.

The knee. Borders. External marks.

Anterior knee. The layers. Neurovascular formations, synovial bursae.

Posterior knee (popliteal fossa). Layers. Fascias. Muscles. Topography of neurovascularformations, skin projection of the popliteal artery. The knee joint. Joint capsule. Strengthening apparatus of the joint. Weaknesses of the joint capsule. Inversions of synovial joint capsule and their role in spreading of burrowing pus. Collateral circulation in the area of the knee joint. Features of the structure of the knee joint in children.

The Shin (leg). Borders. External marks.

Front leg. Fascial compartments. Topography of neurovascular structures. Skin projection of the anterior tibial artery.

Lateral leg area. The layers. Fascial compartments. The superior musculoperoneal canal. Topography of neurovascular structures.

Posterior leg. The layers. Fascial compartment. The cruropopliteal and inferior musculoperoneal canals. Communication of fatty tissue spaces of the leg with fatty tissue spaces of popliteal fossa and foot. Topography of neurovascular formations of the leg. The projection of the posterior tibial artery. The position of fragments in fractures of the tibial and fibular bones at different levels.

Ankle joint. Borders. External marks. Area of the medial malleolus. The layers. Topography of flexors tendons of the foot and neurovascular structures. Synovial sheaths of tendons.

The front area. The layers. Bony-fibrous canals. Topography of vessels, nerves and tendons.

The dorsal area (the area of the Achilles tendon), sinovial bursae, vessels, nerves.

The ankle. Joint capsule and its strengthening apparatus. Weaknesses of the articular capsule. The blood supply, innervation. Position of fragments of leg bones of the foot with broken ankles. Features of the structure of joint of children.

Foot. Borders. External marks.

The back area. Borders. The layers. Fascias, muscles, tendons. Topography of neurovascular structures. The skin projection of the dorsal artery of foot. Zones of skin innervation. Projections of Chopart s and Lisfranc s joints.

Plantar region, layers, fascial compartments. Topography of muscles, vessels, nerves. Fatty tissue spaces, and their link with fatty tissue spacesof the leg and dorsal foot. Surgical anatomy of congenital clubfoot.

Head

Borders. External marks. Individual and age differences.

The brain department. Borders. Regions. Fronto-parietal-occipital and temporal areas. Layers, vessels, nerves. Fatty tissue spaces and their connection with fatty tissue spaces of neighboring areas. Features of the structure of the skull of children. Topography of the fontanels. Cranio-cerebral topography: projection on the surface of the fornix of the skull of the middle meningeal artery, the superior sagittal sinus, main sulci and gyri of brain. hemispheres.

The mastoid process area. Borders, External marks. The layers. Vessels, nerves. The structure of the mastoid process. Trepanations triangle of SIPO. Projection of the facial nerve canal, sigmoid sinus, tympanic cavity.

The base of the skull. Front, middle, and posterior cranial fossa, their contents. Topography of cranial nerves. Meninges of the brain, meningeal spaces. Ventricular system of brain. Dural venous sinuses and their connection with the superficial veins of skull fornix and face. Typical places of fractures of the skull base at trauma. Surgical anatomy of congenital cerebral hernias and hydrocephalus.

Facial region. Borders. External marks. Division by regions.

Oral region. The structure of the upper and lower lips. The vestibule of mouth, its division into departments (upper and lower fornixes). Transition fold of mucous and its value. Surgical anatomy of congenital cleft lip and palate. The oral cavity: borders, the soft and hard palate, layers, vasculature, innervation. The line "A", its value. The Fouces. Fharyngeal lymphoid ring of Pirogov-Valdeier. The upper and lower jaws. The structure of teeth, innervation, blood supply. The periodontium. Parodontium. Anatomical and clinical formula of milk and permanent teeth. The concept of facial counterforts. Tongue: structure, innervation, blood supply. Sublingual space, maxillo-lingual groove, its value. Mouth floor: muscles, fascias, fatty tissue space. The ways of spreading of inflammatory processes from the oral cavity.

The nose. External nose. The nasal cavity. Paranasal sinuses.

The area of the eye socket. Borders, walls, departments, contents: muscles, vessels, nerves. Peculiarities of the eye of children.

Buccal region. External marks. Boundaryes, layers. Neurovascular formations. Projection of output of supraorbital, infraorbital and mental branches of the trigeminal nerve and their bone canals. Topography of buccal fat body

(Bichat) and its importance in the spreading of inflammatory process on the face.

Parotid chewing region. Borders. External marks. Retromandibular fossa. Topography of the parotid gland of adults and children. Features of the structure of its fascial capsule. Fatty tissue space of the parotid gland, its connection with frontal peripharingeal fatty tissue space. Topography of vessels, nerves, parotid duct and their projection.

Deep area of the face. Borders. Externalmarks. Temporo-mandibular-pterygoid and interpterigoid fatty tissue slits (by N.I. Pirogov). Pterygoid venous plexus, its connection with facial veins and dural venous sinuses. Topography of vessels and nerves. Peripharingeal and retropharingeal fatty tissue spaces.

Superficial and deep lymph nodes. Venous and lymphatic drainage.

Surgical anatomy of congenital defects of the face: coloboma, macrostomia, cleft-lip and palate.

Neck

Borders. External marks. Division by region. Skeletotopy, projection of organs and neurovascular formations on the skin. Individual and age differences. Fascias and fatty tissue spaces. Pathways of spreading of purulent processes. Reflexogenic zones. Superficial and deep lymphatic nodes of the neck.

Internal triangle of the neck.

Suprahyoid region. Borders. Mental triangle: layers, vessels, nerves. Submandibular triangle. Bed and capsule of submandibular gland. Neurovascular formations and lymph nodes. Pirogoff's triangle

Carotid triangle, borders. Common carotid artery, its bifurcation. External and internal carotid artery. Carotid sinus's area. Relationships of elements into the neurovascular bundle the neck. Topography of hypoglossal, vagus, superior laryngeal nerves, sympathetic trunk, its nodes, and heart nerves.

Infrahyoid region. Fascias and fatty tissue spaces. The topography of the thyroid and parathyroid glands, larynx, trachea, pharynx and esophagus. Syntopy of the inferior thyroid artery and recurrent laryngeal nerve. Peculiarities of neck organs topography of children.

Sternocleidomastoid region. Borders. Skin projection of the common carotid artery. Ttopography of the common carotid artery, vagus nerve, internal and external jugular veins. Scaleno-vertebral triangle: boundaryes, layers. Topography of subclavian artery and its branches, stellate ganglion of the sympathetic trunk. Antescalein interval: subclavian vein, venous angle, thoracic lymphatic duct, phrenic nerve.

Regions of the lateral triangle. Muscles intervals. Topography of subclavian artery and vein, brachial plexus, branches of the cervical plexus.

Surgical anatomy of congenital defects: fistulas and cysts neck.

Chest

Borders. External marks. Projection organs of chest cavity to the thoracic wall of adults and children. Individual and age differences of shapes of the thorax and thoracic cavity organs.

Thoracic wall. Borders, regions. Layers. Vessels and nerves. Superficial and deep fatty tissue space. Topography of intercostal spaces and their peculiarities of children. Internal thoracic artery. Anomalies of development of ribs, sternum, diaphragm, funnel and keeled chest.

Topography of mammary glang. The blood supplying, innervation, lymph drainage from the mammary glang. The peculiarities of its structure of children. Malformations of the mammary glang: amastia, polymastia, ginekomastia.

Diaphragm, parts, cruses.Features of children. Lumbocostal triangle, openings and hiatus. The relation of the diaphragm to the thoracic and abdominal organs.

Thoracic cavity. The pleural cavity. Projection of borders of the pleura to the thoracic wall, pleural sinuses. Topography of lunghs. Division of lungs on lobes and segments. Hilum and root of the lung. Syntopy of neurovascular formations and bronchi of right and left roots of the lungs, their seletotopy. Peculiarities of lungs topography of children.

The mediastinum. The definition, boundaries, division.

Anterior mediastinum. The thymus gland and the peculiarities of its structure of children. Topography of the pericardium, the heart, the arch of the aorta and its branches, the superior and the inferior cava veins, brachiocephalic veins. Surgical anatomy of congenital defects of the heart and blood vessels: persistent ductus arteriosus, coarctation of the aorta, stenosis of the pulmonary artery, defect of the interatrial and interventricular septum, tetralogy of Fallot. Topography of the trachea, diaphragmatic, vagus and recurrent laryngeal nerves.

The posterior mediastinum. Topography of the thoracic aorta, the azygos and hemiazygos veins, the esophagus, vagus nerves, the sympathetic trunk and its branches, the thoracic lymphatic duct.

Reflexogenic zones of the thoracic cavity. Fatty tissue spaces of the mediastinum. Parietal and visceral lymph nodes.

Abdomen

Borders. External benchmarks. Individual and age differences of shape of the abdomen. The abdominal cavity and its walls (anterolateral wall of the abdomen and lumbar region). The abdominal cavity, and retroperitoneal space.

Anterolateral wall of the abdomen

Borders. External marks, division on regions. Projection of abdominal organs on the anterolateral wall of the abdomen of children and adults. Structure of anterolateral wall of the abdomen in the medial and lateral departments. The blood supply, innervation, venous and lymphatic drainage. Anastomoses between cava veins and portal vein. Weak points.

Structure of the linea alba, the umbilicus, the semilunar line. The inguinal canal of men, women and children. Inguinal triangle, inguinal interval. Surgical anatomy of hernias of the linea alba, umbilical hernias, external oblique, direct, moving, congenital inguinal and femoral hernias. Postoperative hernia. Topography inner surface of the abdominal wall. The folds of the peritoneum. Fossae, their relation to the inner opening of the inguinal canal. Congenital defects of the anterior abdominal wall: fistulas navel (the bladder, the yolk), hernia of the umbilical cord.

Abdominal cavity

Borders, leading of the peritoneum, relation to the organs of the abdominal cavity. Subdivisions of the peritoneal cavity. Ligaments, bursae, sinuses, canals, recesses, their clinical significance. Lesser omentum, greater omentum, features of its structure of children.

Topography of the upper level of the abdominal cavity. Abdominal part of the esophagus. The relationship to the peritoneum. Syntopy. The blood supply, innervation, lymph drainage.

The stomach. The relatioship to the peritoneum, skeletotopy, syntopy, ligaments of the stomach. The blood supply, innervation, venous and lymphatic drainage. Topographic anatomy of the vagus nerves in the region of cardia and the pylorus. Features of shape, size and position of the stomach of children. Surgical anatomy of congenital pyloric stenosis.

Duodenum. Departments, skeletotopy, relationship to the peritoneum, syntopy. Variants of inflowing of the common bile duct and the pancreatic duct. The blood supply, innervation, venous and lymphatic drainage. Surgical anatomy of atresia and diverticulus of the duodenum.

The liver. Skeletotopy, relatioship to the peritoneum. Syntopy. Lobes, sectors, segments, ligament of the liver. Syntopy of elements of the hepatoduodenal ligament. Portal vein, anastomoses between portal vein, superior vena cava and inferior vena cava. The blood supply and innervation of the liver, lymphatic drainage. Peculiarities of its location, forms and sizes of children.

The gallbladder. Relatioship to the peritoneum, syntopy. Topography of the hepatic, cystic ducts and the common bile duct, the gallbladder artery. Triangle Kahlo. Surgical anatomy of atresia of the gallbladder, the biliary tract.

Spleen. Skeletotopy, relatoinship to the peritoneum, ligaments. Syntopy. The blood supply, innervation, venous and lymphatic drainage.

The pancreas. Skeletotopy, relationsip to the peritoneum, aorta, inferior vena cava and portal vein, celiac trunk and superior mesenteric artery, mesentery of transverse colon. Pancreatic duct. The blood supply, innervation, venous and lymphatic drainage. Surgical anatomy of annular pancreas.

Ttopography of lower level of the abdominal cavity. The small intestine. Skeletotopy, syntopy, blood supply, innervation, lymph drainage. Methods of determination of the beginning of the small intestine. Surgical anatomy of congenital defects, atresia, Meckel's diverticulum, "doubling" of the intestinal tube.

The large intestine. Division into sections, relationship to the peritoneum. Skeletotopy syntopy. Ileocaecal angle. Variants of location of the cecum and the vermiform process. Relationship of the vermiform process to the peritoneum. The blood supply, innervation, venous and lymphatic drainage. Peculiarities of blood supply to small and large intestines. Surgical anatomy of congenital defects: megacolon, Hirschsprung's disease.

Lumbar region and retroperitoneal space

Lumbar region (posterior lateral wall of the abdomen). Borders. External marks. Projection of organs and large vessels on the skin. Layers, vessels, nerves and lymphatic formations. Weak points. Bone-ligament apparatus of the lumbar spine. Individual and age peculiarities.

Retroperitoneal space. Borders, fascias and fatty tissue layers. Pathways of spreading purulent streaks and haematomas. Projection of organs and vessels on the anterior and posterior walls of the abdominal cavity. The kidneys. Topography of hilum of the kidneys. Variants of location elements of the renal peduncle, features of shape and location of kidneys of children. Surgical anatomy of congenital and acquired dystopia of kidneys, horseshoe kidney.

Topography of the adrenal glands. Syntopy, blood supply, innervation, venous and lymphatic drainage.

Topography of ureters. Syntopy of parts, blood supply, innervation, lymph outflow. Projection on the anterior and posterior walls of the abdomen. Surgical anatomy of defects of the urinary tract (congenital narrowing, valves, doubling, congenital hydronephrosis).

Topography of the abdominal aorta and its branches, inferior vena cava, nerve plexus and sympathetic edge trunk. Lymph nodes of retroperitoneal space. Forming of the thoracic duct, azygos and hemiazygos veins.

The pelvis and perineum

Borders. External marks. Walls of lesser pelvis and its bottom (the pelvic floor, urogenital diaphragm). Pelvic cavity. Bone-fibrous borders of inlet and outlet of lesser pelvis. Individual, sex and age peculiarities of structure of the pelvis. Division of the lesser pelvis on "levels": abdominal, ifraperitoneal, subcutaneous.

The arrangement of the peritoneum of men and women, the folds of the peritoneum. Rectovesical pouch of men, vesicouteral and rectouterin pouches of women. Fascias, parietal and near organs located fatty tissue spaces of pelvis. The course of parietal and visceral sheets of internal pelvic fascia and its spurs.Peritoneo-perineal aponeurosis (aponeurosis Denonville-Selishev's).

Parietal lateral fatty tissue space. Topography of internal iliac artery and its branches, sacral plexus and the edge of the sympathetic trunk, veins and venous plexus. Communication of fatty tissue of infraperitoneal floor of the pelvis

and retroperitoneal space, fat of gluteal region, hips and ischio-anal fossa.

The rectum. Division into sections, relationship to the peritoneum. The topography of the rectum of men and women. Pararectal and pelvirectal space. The blood supply, innervation, venous and lymphatic circulation. Features of shape and position of the rectum of children, its malformations.

The bladder. Relationship to the peritoneum, peritoneal folds. Subvesical fascia. Prevesicle, paravesicle and infraperitoneal fatty tissue spaces. Bladder syntopy of men and women, its blood supply, innervation, lymph drainage. Particulars of forms and location of the urinary bladder of children. Malformations of the urinary bladder (bladder extrophy, diverticulum). Topography of the prostate, seminal vesicles, the ductus deferens.

Topography of the uterus and its appendages. Syntopy, ligaments. The blood supply, innervation, lymph drainage. Parauterine fatty tissue spaces. Syntopy of pelvic part of the vagina, vasculature, innervation, lymph drainage. Features of shape and position of the uterus and vagina of girls.

Topography of pelvic part of ureters, syntopy of their parietal and visceral parts.

Perineum. Borders. Division by regions. Anal triangle: layers; levator ani muscle, its parts. External and internal sphincters of the rectum. Topography of the pudendal neurovascular bundle. Fat body of the ischio-anal fossa and its connection with fatty tissue spaces of lesser pelvis and gluteal region. Urogenital triangle, superficial and deep layers, urogenital diaphragm. The male external genital organs: penis, scrotum and its content, urethra. Surgical anatomy of the defects of the external genitalia (the cryptorchid testis, hydrops of the testicle envelopes and spermatic cord, epispadias, hypospadias).The external female genital organs.Vasculature, innervation, lymph outflow.

The spine

Departments, external marks. The spine and the spinal canal. Individual and age differences of the spine and spinal cord. The spinal cord, meninges, nerve roots. Skeletotopy of spinal segments. Blood supply, venous outflow. Surgical anatomy of malformations of the spine and spinal cord (lumbalisation, sacralization, platyspondyly, hidden in the cleft of the bows, spondylosis, kyphosis, lordosis, scoliosis, spinal hernia).

5. Teaching forms and techniques

- Traditional knowledge of anatomical and visual aids.
- Multimedia lectures
- Solving situational tasks
- Execution of written works (essays on the specified or free topic, reports).
- Individual work.

6. Teaching and learning materials for students' individual work. Forms of current and interim assessment.

6.1. Outline of students' individual work

№	Topic	Type of individual work	Task	Suggested reading material	Hours
1	Topographic anatomy of the shoulder girdle: deltoid, clavicular, scapular region, shoulder and armpit.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7
2	Topographic anatomy of the shoulder, elbow and forearm.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7
3	Topographic anatomy of the hand.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7
4	Topographic anatomy of the buttocks and thighs, the hip.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7

№	Topic	Type of individual work	Task	Suggested reading material	Hours
5	Topographic anatomy of the knee, leg, ankle and foot.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7
6	Topographic anatomy of the cerebral part of the head.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7
7	Topographic anatomy of the facial part of the head.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7
8	Topographic anatomy of the neck.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7
9	Topographic anatomy of the chest wall.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7
10	Topographic anatomy of the chest cavity.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7
11	Topographic anatomy of the anterior abdominal wall.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7
12	Topographic anatomy of the upper abdomen.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7
13	Topographic anatomy of the lower floor of the abdominal cavity.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7
14	Topographic anatomy of the pelvic organs.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7
15	Topographic anatomy of the lumbar region and retroperitoneal space.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7
16	Topographic anatomy of the spinal column.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	0.7
17	Independent work with aids.	Preparation for class study	Preparing for a job interview and testing of practical skills relating to classes	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	1.2
18	Control class.	Preparation for control class	Preparing for a job interview, a practical test, testing on materials of the whole module	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	1.3

№	Topic	Type of individual work	Task	Suggested reading material	Hours
19	Control class.	Preparation for control class	Preparing for a job interview, a practical test, testing on materials of the whole module	Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.	1.3

6.2. Instructional guidance for individual students' work

- Lectures and theoretical block studying.
- The filling of work-books using definitions, answer the questions.
- Self-work using tables, tests, additional literature.

6.3. Current and interim assessment materials

Competence development assessment

№	Type of assessment	Topics (parts) assessed	Competences and elements assessed
1.	Test assessment	Part 1, 2, 3	GC-1, GPC-1, GPC-7, GPC-9
2.	Assessment of practical skills	Part 1, 2, 3	GC-1, GPC-1, GPC-7, GPC-9
3.	Workbooks assessment	Part 1, 2, 3	GC-1, GPC-1, GPC-7, GPC-9
4.	Discussion	Part 1, 2, 3	GC-1, GPC-1, GPC-7, GPC-9

Demo variant of test

1. Which of the following is not true regarding the clavicle?
A) its medial end is enlarged where it attaches to the sternum
B) its lateral end is flat where it articulates with the humerus
C) the medial two-thirds of the shaft are convex anteriorly
D) the clavicle transmits shock from the upper limb to the axial skeleton
E) the clavicle is a "long bone" that has no medullary cavity

2. Which of the following regions of the clavicle does the trapezius attach to?
A) lateral one-third of the clavicle
B) conoid tubercle
C) subclavian groove
D) trapezoid line
E) quadrangular tubercle

3. Which of the following is true in respect to the scapula?
A) the spine of the scapula continues laterally as the coracoid process
B) the lateral surface of the scapula forms the glenoid cavity
C) the acromion is superior to the glenoid cavity and projects anterolateral
D) the scapula is fastened securely to the thoracic cage at the scapulothoracic joint
E) the acromioclavicular joint represents the true shoulder joint

4. Which of the following is <u>not</u> included in the condyle of the humerus?
A) radial, coronoid, and olecranon fossae
B) epicondyles
C) trochlea
D) capitulum
E) greater tubercle

5. Which of the following is <u>not</u> true in respect to the ulna and radius?
A) the brachialis attaches to the tuberosity of the ulna
B) the ulnar styloid process is much larger than the radial styloid process and extends farther distally
C) the head of the ulna lies distally, whereas the head of the radius articulates with the humerus
D) the ulna is medial to the radius in the anatomical position

E) the bodies of these bones are firmly bound together by the interosseous membrane

6. Which of the following is true regarding the carpus?
A) the scaphoid articulates proximally with the ulna and has a tubercle
B) the lunate articulates with the ulna and is broader anteriorly than posteriorly
C) the triquetrum articulates proximally with the articular disc of the distal radioulnar joint
D) the pisiform lies on the palmar surface of the trapezium
E) it is composed of seven bones

7. Which of the following describes the correct order of the distal row of carpals from lateral to medial?
A) triquetrum, trapezoid, capitate, hamate
B) trapezoid, trapezium, capitate, hamate
C) trapezium, trapezoid, capitate, hamate
D) trapezium, triquetrum, capitate, hamate
E) scaphoid, lunate, triquetrum, pisiform

8. Which of the following is actually a lateral cutaneous branch of an intercostal nerve, innervating the skin of the medial surface of the arm?
A) intercostobrachial nerve
B) superior lateral cutaneous nerve of the arm
C) inferior lateral cutaneous nerve of the arm
D) medial cutaneous nerve of the arm
E) lateral pectoral nerve

9. Which of the following is <u>not</u> a branch of the radial nerve?
A) posterior cutaneous nerve of the arm
B) posterior cutaneous nerve of the forearm
C) inferior lateral cutaneous nerve of the arm
D) superior lateral cutaneous nerve of the arm
E) posterior interosseous nerve

10. Which of the following is <u>not</u> an anterior thoracoappendicular muscle?
A) pectoralis major
B) pectoralis minor
C) deltoid
D) subclavius
E) serratus anterior

11. Which of the following best describes the action of the pectoralis minor?
A) stabilizes scapula by drawing it inferiorly and anteriorly against thoracic wall
B) anchors and depresses clavicle
C) adducts and medially rotates humerus
D) rotates scapula
E) flexes humerus

12. Which of the following muscles attaches to the coracoid process of the scapula?
A) pectoralis minor
B) triceps brachii
C) brachialis
D) pectoralis major
E) subclavius

13. All of the following are medial rotators of the arm <u>excepting</u>:
A) latissimus dorsi
B) teres major
C) subscapularis
D) infraspinatus
E) anterior part of deltoid

14. What muscles are necessary to raise the arm above the shoulder?
A) first the supraspinatus, next the deltoid, and then the serratus anterior
B) first the deltoid, next the supraspinatus, and then the serratus anterior
C) first the supraspinatus, next the serratus anterior, and then the deltoid
D) first the serratus anterior, next the deltoid, and then the supraspinatus
E) first the deltoid, next the serratus anterior, and then supraspinatus

15. Which of the following is innervated by the dorsal scapular nerve?
A) serratus anterior

B) rhomboid major and minor
C) erector spinae
D) subscapularis
E) supraspinatus

Criteria for assessing of the test

"Excellent" ("5") – 91% or more correct answers to test items.
"Good" ("4") – 81-90% of correct answers to test items.
"Satisfactory" ("3") – 71-80% of correct answers to test items.
"Disappointing" ("2") – 70% or less correct answers to test items.

Sample questions of practical skills

Show and name in Latin

Upper Limb

1. Circumflex scapula artery
2. Deep artery of arm
3. Deep branch of the radial nerve
4. Dorsal bundle of the brachial plexus
5. Posterior circumflex humeral artery

Lower limb

1. The femoral artery
2. The femoral nerve
3. Great saphenous vein
4. Tibial nerve
5. Superior gluteal artery

Head and neck

1. Vagus nerve
2. Superior laryngeal nerve
3. Superior thyroid artery
4. Internal carotid artery
5. Internal jugular vein

Thorax

1. Superior vena cava
2. Internal thoracic artery
3. Ascending aorta
4. Thoracic part of the descending aorta
5. Phrenic nerve (in the thoracic cavity)

Anterolateral abdominal wall

1. Superior epigastric artery
2. Lateral inguinal fossa
3. Lateral umbilical fold
4. Medial inguinal fossa
5. Medial umbilical fold

Abdomen

1. Antrum of the stomach
2. Mesentery of the transverse colon
3. Coronary ligament of liver
4. Superior ileocaecal recess
5. Superior mesenteric artery

Lumbar region and retroperitoneum

1. Femoral nerve in the retroperitoneal space
2. Bifurcation of the aorta
3. Abdominal part of the descending aorta
4. Superior rectal artery

5. Lateral femoral cutaneous nerve in the retroperitoneal space

Pelvis

1. Internal iliac artery
2. Internal iliac vein
3. Obturator nerve
4. Sacral plexus
5. Bladder

Criteria for assessing of the practical skills

"Excellent" ("5") – 91% or more correct answers to test items.
"Good" ("4") – 81-90% of correct answers to test items.
"Satisfactory" ("3") – 71-80% of correct answers to test items.
"Disappointing" ("2") – 70% or less correct answers to test items.

Sample control questions

1. Topographic anatomy of the parotid- masticatory area.
2. Topographic anatomy of the mastoid area.
3. Topographic anatomy of the blood vessels and nerves of the face.
4. Peripharyngeal fatty tissue spaces and their relationship to other fat spaces.
5. Topographic anatomy of the deep areas of the face.
6. Fascias and fatty tissue spaces of the lateral facial area.
7. Fatty tissue spaces of the mouth floor.
8. Surgical anatomy of the parotitis, retropharyngeal abscesses, peripharyngeal abscesses and phlegmons, phlegmons of the mouth floor.
9. Surgical anatomy of the facial malformations: coloboma , makrostomiya , cleft of the upper lip and palate .
10. Triangles and fascias of the neck.

Criteria for assessing of the interview in control classes

"Excellent" - the story complete, competent, logical; anatomical structures are shown on the preparations quickly and confidently; fluency in anatomical terminology; answers to additional questions clear brief.
"Good" - the story is not enough to single logical errors in particular; lack of confidence and speed in the demonstration of anatomical formations on preparations; single error in the Latin terminology; answers to additional questions correct, clear enough.
"Satisfactory" - the story is not enough literate, part-time, with errors in the details; uncertainty in the demonstration of anatomical structures; errors in Latin terminology; answers to additional questions is not enough clear, with errors in particular.
"Disappointing" - the story of an illiterate, incomplete, with gross errors; errors in the demonstration of anatomical structures; ignorance of the Latin terminology; answers to additional questions wrong.

7. Information materials for the module "Topographic anatomy"

a) Basic reading

1. Kalmin O.V., Bochkareva I.V., Kalmina O.A. Topographic anatomy: Tutorial. - Penza: PSU Publishing, 2015.
http://elib.pnzgu.ru/library/11121200

b) Supplementary reading

1. Kalmin O.V., Kalmina O.A., Galkina T.N., Burko P.A. Myology: Tutorial. – Penza: PSU Publishing, 2014.
http://elib.pnzgu.ru/library/16031200
2. Kalmin O. V., Bochkareva I. V., Burko P. A. Splanchnology: Tutorial. – Penza: PSU Publishing, 2015.
http://elib.pnzgu.ru/library/15593800
3. Kalmin O V., Kalmina O. A., Galkina T. N., Bochkareva I. V., Nikishin D. V., Burko P. A. Arthrology: Tutorial. – Penza: PSU Publishing, 2015.

http://elib.pnzgu.ru/library/15511200

4. Kalmin O.V., Kalmina O.A., Burko P.A. Anatomy of the central nervous system: Tutorial. – Penza: PSU Publishing, 2016.
   http://elib.pnzgu.ru/library/15560500

c) Software and Internet resources

1. MIT OpenCourseWare. Free Online Course Materials http://ocw.mit.edu/index.htm
2. Free video lectures, Free Animations, Free Lecture Notes, Free Online Tests, Free Lecture Presentations http://www.learnerstv.com/index.php
3. The Visible Human Project - Images & Animations http://www.nlm.nih.gov/research/visible/animations.html
4. Microsoft Windows (DreamSpark/Microsoft Imagine Standart); reg. number 00037FFE-BACF8FD7, contract № СД-130712001 of 12.07.2013.
5. Kaspersky Anti-Virus 2016-2017, reg. number KL4863RAUFQ, contract № ХП-567116 of 29.08.2016.
6. Open source software: LibreOffice; Google Chrome; Adobe Reader; 7zip.

8. Equipment

№	Name of special classroom and classroom for independent work	Equipment of special classroom and classroom for independent work
1.	Classroom 10-013, housing 10, 36.6 m^2	Multimedia projector – 1 pc. Laptop – 1 pc. Anatomical table - 1 pc. School table – 4 pcs. Cupboard for aids – 4 pcs. Screen – 1 pc. Blackboard – 1 pc. X-ray view box – 1 pc. Stool – 30 pcs. Anatomical aids. Anatomical dummies. Visual aids. Anatomical tables
2.	Classroom 10-014, housing 10, 39 m^2	Multimedia projector – 1 pc. Laptop – 1 pc. Anatomical table – 1 pc. School table – 4 pcs. Cupboard for aids – 4 pcs. Screen – 1 pc. X-ray view box – 1 pc. Blackboard – 1 pc. Stool – 30 pcs. Anatomical aids. Anatomical dummies. Visual aids. Anatomical tables

The study program for the module "Topographic anatomy" is drawn in accordance with the federal state educational standard of higher education and academic plan for the course 31.05.01 – General Medicine.

The program developers:

Head of the Department of Human Anatomy _____ O.V. Kalmin

The program was discussed and agreed at the department meeting

Records № 7 on "04" March 2016.

Head of the Department _____ O.V. Kalmin

The program is agreed with the Dean of the Medical Faculty of PSU

Dean of the Medical Faculty _____ I.Ya. Moiseeva

The program was approved by methodological commission of the Medical Institute

Records № 7 on "05" March 2016.

Chair of the methodological commission _____ O.V. Kalmin

Annual list of registration for changes and amendments to the present program

Academic year	Department review (records №, date, head of the department signature)	Changes and amendments	Pages		
			changed	added	deleted
2016-2017 уч. год	Протокол № 1 от 31.08.2016	Переутверждена без изменений на новый учебный год			
2016-2017 уч. год	Протокол № 9 от 18.05 2017	Изменена квалификация выпускников	1		
2017-2018 уч. год	Протокол № 1 от 30.08.2017	Добавлено в п.5 описание применения образовательных технологий к обучающимся с ограниченными возможностями здоровья и инвалидам	13		
2017-2018 уч. год	Протокол № 1 от 30.08.2017	Переутверждена на новый учебный год			
2018-2019 уч. год	Протокол № 1 от 01.09.2018	Переутверждена на новый учебный год без изменений			
2019-2020 уч. год	Протокол № 1 от 31.08.2019	Переутверждена на новый учебный год без изменений			