Federal State Budgetary Educational Institution of Higher Education
"NORTH-OSSETIAN STATE MEDICAL ACADEMY"
Ministry of Health of the Russian Federation

Department of Human Anatomy with Topographic Anatomy
and operative surgery

METHODICAL UNSTRUCTIONS TO PRACTICAL ACTIVITIES AND TO PERFORMING INDEPENDENT EXTRA WORK

BY DISCIPLINE
“TOPOGRAPHIC ANATOMY AND OPERATIVE SURGERY”

FOR STUDENTS OF 4 COURSE
FACULTY OF GENERAL MEDICINE
(EDUCATIONAL PROGRAM REALIZED IN ENGLISH)

Vladikavkaz

Methodological recommendations for practical classes and for independent extra work for 4th year students (7th semester) of the medical faculty by the discipline “TOPOGRAPHIC ANATOMY AND OPERATIVE SURGERY” (specialty 05.31.01 “General Medicine”) were developed by employees of the Department of Human Anatomy with Topographic Anatomy and operative surgery FSBEI HE SOGMA Ministry of Health of Russia

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CONTENS:

Theme: Topographic anatomy of the trunk: Topographic anatomy of the anterior abdominal wall. Surgery on the anterior abdominal wall. Surgical anatomy of abdominal hernias

Motivational characteristic: knowledge of the location of the main neurovascular bundles of the anterior lateral wall of the abdomen will allow one to predict the distribution of purulent processes and timely surgical interventions. Knowing the ways of metastasis to the lymph nodes will allow timely diagnosis of the localization of malignant tumors of the studied area.

I. Purposes:

Student must know:	Student must be able to:	Student must own:
1. Topographic anatomy of the anterior abdominal wall and abdominal cavity - borders, holotopia, syntopia, skeletotopy, layered structure. 2. Topographic anatomy of the abdominal organs: sympathetic trunk, aortic abdominal plexus, lumbar plexus - holotopia, syntopia, skeletonotomy. 3. Surgical anatomy of hernias of the anterior abdominal wall. 4. Anatomical and physiological prerequisites for their occurrence. 5. Classification of hernias of the anterior abdominal wall. 6. Hernia repair - definition, types. 7. Principles of revision of the abdominal cavity. 8. The technique for performing basic surgical interventions on the anterior abdominal wall and abdominal organs at each stage: • Operations of defects of the anterolateral abdominal wall.	1. Define the boundaries, external landmarks and the anterior abdominal wall. 2. Inspect and palpate the anterior abdominal wall. 3. Determine the boundaries of the abdominal cavity. 4. Dissect selected area 5. Show on the preparation and name the organs of the upper floor of the abdominal cavity 6. Show on the preparation and name the organs of the lower floor of the abdominal cavity 7. Use special surgical instruments for operations of the anterior abdominal wall and abdominal cavity at each stage 8. Perform basic surgery at each stage.	1. Skills of examination and palpation of the anterior abdominal wall and abdominal organs. 2. The method of preparation of the selected area 3. Skills of working with surgical instruments for operations on the anterior abdominal wall and organs of the abdominal cavity. 4. Skills of surgical manipulations at each stage.

II. Questions for checking the initial level of knowledge:

1. Lateral muscles of the abdomen, their beginning and place of attachment, their formation.
2. The front muscles of the abdomen, their beginning and place of attachment, what is and what is formed by the vagina of the rectus muscles, what is the white line of the abdomen.
3. The back muscles of the abdomen, their beginning and place of attachment.
4. Abdominal muscle function.
5. Anatomical and topographic anatomical structure of the white line of the abdomen.
6. The anatomical and topographic anatomical structure of the umbilical ring.
7. 2. The anatomical and topographic anatomical structure of the inguinal region.
8. The inguinal canal. How is he educated.
9. Anatomical and topographic anatomical structure of the femoral ring and femoral canal.
10. The femoral canal. The reasons for the formation. The walls of the femoral canal.
11. External hernia of the abdomen, elements of a hernia.
12. Operations with inguinal hernias (stages, methods of plasty of the inguinal canal according to Girard-Spasokukotsky, Kimbarovsky, Postempsky, Bassini, Kukudzhanov).
13. Surgery for umbilical hernias and hernias of the white line of the abdomen
14. Methods of plastic hernia gate according to Mayo, K.M. Sapiezhko.
15. Operations for femoral hernias (stages, methods for plastic surgery of hernial gates according to Bassini, Ruggi, Parlavecchi, Liechtenstein).
16. Features of operations for congenital, restrained and sliding hernias.
17. Surgical access to the abdominal organs.
18. Laparoscopy.

III. Object of study - human organism.

IV. Informational part:

Stomach *(abdomen)*, it is a part of the body located between the chest and pelvis. Stomach (abdomen) has walls (paries abdominalis), limiting the abdominal cavity (cavitas abdominalis).

The upper border of the abdomen is the lower border of the chest area. Bottom belly restrict *crista iliaca*, inguinal ligament, connecting *spina iliaca anterior superior* and *tuberculum pubicum*, and the upper edge of the pubic symphysis. Laterally, the abdomen borders on the back in the back axillary line.

Through two horizontal lines, the entire abdomen is divided into three departments. Top line – (*linea bicostarum)*, connects the front ends of the tenth ribs. Lower - *linea bispinarum*, connects the front superior awns of the right and left iliac bones. The upper abdomen was called the epigastrium, *(epigastrium)*, middle - celiac region (чрево), *(mesogastrium)*, and lower подчревье, *(hypogastrium)*.

Classification of abdominal muscles

Classification of abdominal muscles by location and shape

I. Anterolateral group

1. Long muscles - *m. rectus abdominis et m. pyramidalis*.

2. Wide muscles - *m. obliquus externus abdominis, m. obliquus internus abdominis, m. transversus abdominis*.

II. Back group

Square muscle of the lower back, *m. quadratus lumborum*.

All of these muscles are paired, have a ventral origin.

Fascia abdomen

There are three fascias in the abdomen:

1) superficial fascia of the abdomen, (*fascia abdominis superficialis)*;

2) own fascia of the abdomen, (*fascia abdominis propria)*;

3) intra-abdominal fascia, (*fascia endoabdominalis).*

Topography of the abdomen

Topographic anatomical formations of the abdomen include the vagina of the rectus abdominis muscle, the white line of the abdomen and the inguinal canal.

Vagina of the straight abdominal muscle, *(vagina m. recti abdominis).* The rectus abdominis muscle is enclosed in a vagina formed by aponeuroses of the wide muscles. Moreover, along the entire length above the navel and at a distance of 2-5 cm below the navel, the aponeurosis of the internal oblique muscle of the abdomen at the lateral edge *(m. rectus abdominis)* splits into front and back plates. The anterior plate fuses with the aponeurosis of the external oblique muscle, resulting in the formation of the anterior vaginal wall of the rectus abdominis muscle. Its posterior wall is represented by a posterior plate of an aponeurosis of the internal oblique muscle and an aponeurosis of the transverse muscle, as well as the transverse fascia and peritoneum, fused together. At a distance of 2-5 cm below the navel, the front wall (*vagina m. recti abdominis)* form aponeuroses of all three broad muscles of the abdomen. The tendon part of the posterior wall of the vagina below ends in an arcuate shape, in the form of a curved line, *(linea arcuata)*. Below this line, the posterior wall of the vagina of the rectus abdominis muscle is very thin and is presented only *fascia transversalis* and the peritoneum growing to it. The front wall of the vagina in this area, on the contrary, is the most durable, since it consists of aponeuroses of all three broad muscles

In this way, *m. rectus abdominis* closed in a durable fibrous case, the front wall of which is firmly fused with tendon jumpers of the rectus abdominis muscle. The back wall connects with the rectus muscle throughout the entire length and is therefore easily separated from it. In one vagina with *m. rectus abdominis* is located *m. pyramidalis*, as well as vessels and nerves.

White line of abdomen, *(linea alba)*, formed as a result of the intersection of the fibers of the aponeurosis of the broad muscles of the abdomen of opposite sides. Moreover, the bundles belonging to *m. obliquus externus abdominis dexter*, goes into bundles *m. obliquus internus abdominis sinister* and vice versa. The described cross of fibers forms a strong fibrous septum containing very few blood vessels - the white line of the abdomen. It extends from the xiphoid process to the pubic symphysis and has a length of 30-40 cm. Above the navel, its width is 1-2 cm, and below the navel 3-4 mm. The thickness of the white line of the abdomen is less significant in the upper section. Thus, the white line of the abdomen above the navel is wider and thinner, and in the lower section it is already thicker. Structural features cause a more frequent formation of hernias of the white line of the abdomen above the navel.

Inguinal canal, *(canalis inguinalis)*, represents a slit-like space located directly above the medial and middle parts of the inguinal ligament. In men, the spermatic cord is located in the inguinal canal, in women - the round ligament of the uterus. The length of the inguinal canal in an adult is, on average, 4-5 cm. The canal has four walls and two openings.

The front wall of the inguinal canal is formed by the aponeurosis of the external oblique muscle of the abdomen, the posterior - by the transverse fascia and peritoneum. The upper channel wall consists of the lower beams *m. obliquus internus abdominis et m. transversus abdominis,* and the bottom - the gutter *lig. Inguinale.*

Superficial inguinal ring, *(anulus inguinalis superficialis)* (external opening of the inguinal canal), represents a gap in the aponeurosis of the external oblique muscle of the abdomen. It is limited to two legs of the aponeurosis of the external oblique muscle of the abdomen.: *crus laterale* - from below, *crus mediale* - from above. From the lateral side of the hole, the fibers of the surface plate of the abdomen fascia, the so-called interstitial fibers, (*fibrae intercrurales)*. On the medial side, the superficial inguinal ring is limited by a curved ligament, *(lig. reflexum)*. The bent ligament is a bundle of connective tissue fibers that are a continuation in men *crus laterale*. Normally, in the study, the inguinal ring should pass the tip of the little finger. People with a wider opening are more likely to have an inguinal hernia.

Deep inguinal ring, *(anulus inguinalis profundus)*, is the internal opening of the inguinal canal and is located in the region of the posterior wall of the latter. From the side of the abdominal cavity, it has the appearance of a funnel-shaped depression located at the level of the border between the lateral and middle parts of the inguinal ligament. At this point, the fascia is thinned, has a loose structure. The deep inguinal ring corresponds to the location of the lateral inguinal fossa on the anterior abdominal wall.

The structural features of the topographic anatomical formations of the abdomen determine the presence of so-called weak spots, in which hernias are more often formed. These include: the inguinal canal, the umbilical ring, a section of the white line located above the navel, as well as the posterior wall of the vagina of the rectus abdominis muscle located below the arcuate line.

The “weak” places include the lumbar triangle located in the posterolateral part of the body, *(trigonum lumbale)*. It is limited: from below - by the crest of the ilium, medially - by the edge of the latissimus dorsi, laterally - by the edge of the external oblique muscle of the abdomen. The bottom of the triangle is the internal oblique muscle of the abdomen. Therefore, in the region of the lumbar triangle, the abdominal wall is represented by only two layers of muscles - the internal oblique and transverse muscles of the abdomen, as well as their fascia.

V. Tasks for independent work:

Task №1.

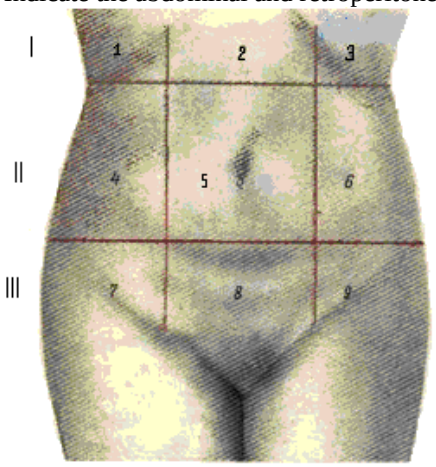
Define laparotomy, name the types of laparotomy. Explain why with a median laparotomy, the incision bypasses the navel on the left. Explain what feature of innervation of the rectus abdominis muscles makes it possible to cross the muscle fibers of these muscles in the transverse direction.

Task №2.
List the indications and tools used to puncture the anterior abdominal wall.

Indications:	Tool:

Task №3.
Define the vagina of the rectus abdominis muscles, sketch the structure. Explain the differences in the structure of the vagina along the rectus abdominis muscles. Indicate the location of the arcuate line (Douglas) and the lunar line (Spigely).

Task №4.
Indicate the abdominal and retroperitoneal organs projected in each area.



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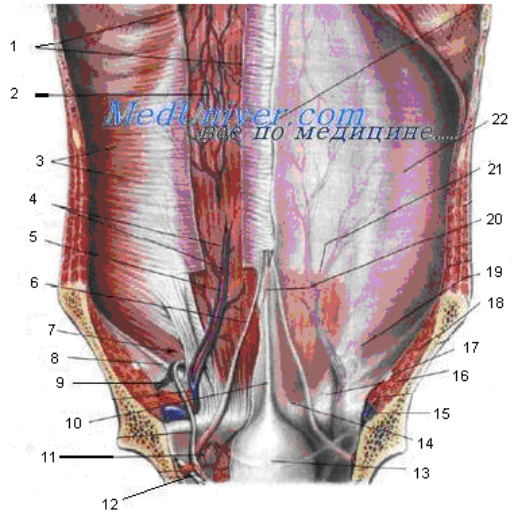
Task №5.
Indicate what is shown in the figure. Indicate the designation. Explain the creases.



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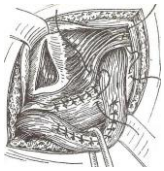
Task №6.

Name the operation. Indicate the correct sequence of steps in the operation.



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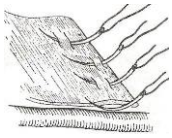

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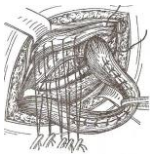

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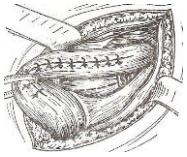

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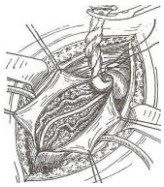

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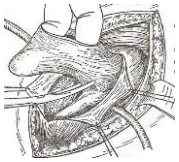

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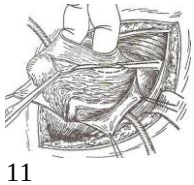

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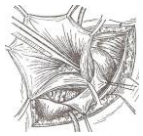

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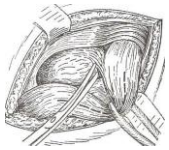

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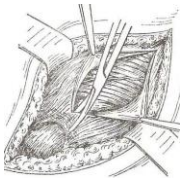

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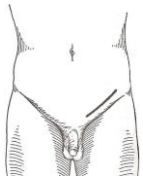

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Task №7.

Explain the topographic and anatomical causes of congenital inguinal hernia. Specify the features of hernia repair in congenital inguinal hernia.

Task №8.

Define a sliding hernia. Indicate the features of the hernial sac and hernial contents. Specify the features of hernia repair with sliding hernias.

Task №9.

Make a task on the topic of the lesson. (In workbook)

Task №10.

Make 5 tests on the topic of the lesson. (In workbook)

VI. Control questions:

1. The boundaries and external landmarks of the anterior abdominal wall, dividing it into regions.
2. The layered structure of the anterior abdominal wall, its blood supply and innervation.
3. Folds and fossae of the posterior surface of the anterior abdominal wall.
4. Topography of the weaknesses of the anterior abdominal wall: white line, umbilical ring, inguinal canal.
5. Topographic anatomy of the femoral triangle and femoral canal.
6. Topographic and anatomical assessment of access to abdominal organs
7. Lateral muscles of the abdomen, their beginning and place of attachment, the formation formed by them.
8. The front muscles of the abdomen, their beginning and place of attachment, what is and what is formed by the vagina of the rectus muscles, what is the white line of the abdomen.
9. The back muscles of the abdomen, their beginning and place of attachment.
10. Abdominal muscle function.
11. The inguinal canal. How is he educated.
12. The femoral canal. How is he educated.
13. The boundaries and external landmarks of the anterior abdominal wall, dividing it into regions.
14. The layered structure of the anterior abdominal wall, its blood supply and innervation.
15. Folds and fossae of the posterior surface of the anterior abdominal wall.
16. Topography of the weaknesses of the anterior abdominal wall: white line, umbilical ring, inguinal canal.
17. Topographic anatomy of the femoral triangle and femoral canal.
18. Topographic and anatomical assessment of access to abdominal organs.

VII. An example of a task:

№1. Patient P., 21 years old, with hernia repair for a right-sided oblique inguinal hernia during discharge of the hernial sac, the posterior wall of the inguinal canal was medially damaged from the neck of the hernial sac. Arterial bleeding has occurred. What is the source of bleeding.

(Answer: Bleeding arose as a result of injury to the right lower epigastric artery (branch of the external iliac artery)).

№2. A patient with a stab wound of the anterior abdominal wall was delivered to the surgical department. A wound 2 cm long in the projection of the right rectus abdominis muscle at the border of the middle and lateral third of its width 5 cm down from the navel. When examining the patient, there was a suspicion that the wound may penetrate the abdominal cavity. To clarify the diagnosis, primary surgical treatment of the wound; during the audit revealed an extensive hematoma along the posterior wall of the vagina of the rectus abdominis muscle. The peritoneum is not damaged. Indicate the source of bleeding. Between which layers of the anterior abdominal wall is a hematoma localized?

(Answer: Right lower epigastric artery. The hematoma is localized between the posterior surface of the rectus abdominis muscle and the transverse fascia.)

№3. Patient 3., 49 years old, with the purpose of quick access to the stomach performed upper median laparotomy. What are the layers that make up the walls of a laparotomy wound?.

(Answer: Skin, subcutaneous tissue, superficial fascia, intrinsic fascia, white line of the abdomen, intra-abdominal fascia, preperitoneal tissue, parietal peritoneum.)

VIII. Control tests:

The anterolateral wall of the abdomen using horizontal and vertical lines is divided into: (1)

\+ 9 regions
10 regions
11 regions
12 regions
8 regions

The white line of the abdomen is formed due to: (1)

aponeurosis of the external oblique muscle of the abdomen
aponeurosis of the internal oblique muscle of the abdomen
ponurosis of the transverse abdominal muscle
\+ tendon bundles of 3 pairs of wide abdominal muscles
intra-abdominal fascia

"Crown of death" is a variant of artery discharge: (1)

femoral
epigastric lower
epigastric upper
\+ obturator
internal iliac

Indications for emergency surgery are the following hernias of the anterolateral abdominal wall: (1)

congenital
\+ infringed
sliding
irreparable
all listed

The spermatic cord consists of three anatomical elements: (3)

\+ vas deferens
urinary duct

+ vessels and nerves of the vas deferens and testis
+ the remains of the vaginal process of the peritoneum
iliac-hypogastric nerve

IX.Glossary:

Stomach	Ventriculus
Epigastrium	Epigastrium
Cereal region (firm)	Mesogastrium
Gum	Hypogastrium
White line	Linea alba
Muscle Oblique the external abdominal	Musculus obliquus externus abdominis
Muscle Oblique internal abdominal	Musculus obliquus internus abdominis
Transverse abdominal muscle	Musculus transversus abdominis
The rectus abdominis	Musculus rectus abdominis
Pyramidal muscle	Musculus pyramidalis
Squat muscle lumbar	Musculus quadratus lumborum
Surface faction of animal	Fascia abdominis superficialis
Own fascia of animal	Fascia abdominis propria
Internal fabria	Fascia endoabdominalis
Egg channel	Canalis inguinalis
Surface inguine ring	Anulus inguinalis superficialis
Deep inguine ring	Anulus inguinalis profundus

Theme: Topographic anatomy of the trunk: Topographic anatomy of the abdominal organs: upper floor. Surgical interventions on the organs of the upper floor of the abdominal cavity.

Motivational characteristic: knowledge of the location of the main neurovascular bundles and organs of the abdominal cavity will allow us to predict the pathways of purulent processes and timely surgical interventions. Knowing the ways of metastasis to the lymph nodes will allow timely diagnosis of the localization of malignant tumors of the studied area.

I. Purposes:

Student must know:	Student must be able to:	Student must own:
1. The peritoneal cavity. Division into floors. Bags of the upper floor of the abdominal cavity. 2. Stomach, anatomical structure, location (skeletonotopy, syntopia, holotopia), blood supply, innervation, blood and lymph drainage (Melnikov's scheme). 3. The duodenum: anatomical structure, location (skeletonotopy, syntopia, holotopia), blood supply, innervation, blood and lymph drainage. 4. Liver: anatomical structure, location (skeletonotopy, syntopia, holotopia), blood supply, innervation, blood and lymph drainage. 5. Extrahepatic biliary tract. Gall bladder The common hepatic duct. Blood supply, innervation, blood and lymph drainage. 6. Pancreas: location (skeletonotopy, syntopia, holotopia), blood supply, innervation, blood and lymph drainage. 7. Spleen: location (skeletonotopy, syntopia, holotopia), blood supply, innervation, blood and lymph drainage.	1. Inspect the abdominal cavity and the course of the peritoneum. 2. Inspect the organs of the upper floor of the abdominal cavity. 3. Dissect the stuffing bag. 4. Dissect the hepatoduodenal ligament.	1. Skills of examination and palpation of the chest. 2. The method of preparation of the selected area 3. Skills of working with surgical instruments for operations on the chest and chest organs. 4. Skills of surgical manipulations at each stage.

II. Questions for checking the initial level of knowledge:

1. Peritoneum: parietal, visceral; peritoneal cavity, mesentery, ligaments, folds, bags (hepatic, subhepatic, preventricular, omental); her relationship with the abdominal organs.
2. The upper abdomen.
3. Small and large oil seals. Bags of the abdominal cavity.
4. Anatomy of the liver, extrahepatic biliary tract, gall bladder.
5. Surgical anatomy of the stomach
6. Surgical anatomy of the duodenum.
7. Surgical anatomy of the pancreas.
8. Surgical anatomy of the spleen.
9. Surgical anatomy of the celiac trunk.
10. Surgical anatomy of the portal vein.

III. Object of study - human body.

IV. **Informational part:**

Peritoneum *(peritoneum)* - the serous membrane, from the inside lining the walls of the abdomen and most of its organs, forms a closed cavity in the abdominal cavity - the peritoneal cavity *(cavitas peritonei).*

✓The peritoneum lining the walls of the abdomen is called the parietal, or parietal peritoneum *(peritoneum parietale).*

✓The peritoneum lining the abdominal organs is called the visceral peritoneum *(peritoneum viscerale).*

The peritoneal cavity of the transverse colon and its mesentery *(colon transversum et mesocolon)* divided into two floors.

➢The upper floor of the abdominal cavity is located above the transverse colon and its mesentery, it is occupied by the liver, spleen, stomach, partially the duodenum; here are the right and left hepatic, pre-gastric, subhepatic and omental bursa.

➢The lower floor of the abdominal cavity is located below the transverse colon and its mesentery, contains loops of the jejunum and ileum *(jejunum et ileum),* cecum *(caecum),* appendix *(appendix vermiformis),* colon *(colon),* lateral canals and mesenteric sinuses.

The gaster *(gaster)* is a muscle-elastic extension of the digestive tract, located between the esophagus and the duodenum. Food is accumulated and digested in the stomach. Upper - the inlet through which food enters is called the cardiac opening *(ostium cardiacum),* and the bottom - output - the gatekeeper's hole *(ostium pyloricum).* In the gaster, the front wall is distinguished *(paries anterior)* and back wall *(pariesposterior).* Walls pass one into another by means of edges: small curvature *(curvatura minor)* and great curvature *(curvatura major).* Small curvature is directed to the right and up, large - to the left and down. The part of the stomach adjacent to the esophagus is called the cardiac part or *кардией (pars cardiaca; cardia);* the opposite, adjacent to the duodenum, - the pyloric *(пилорической)* частью *(pars pylorica).* The enlarged beginning of the pyloric part is called the pyloric cave *(antrum pyloricum),* which tapers and passes into the gatekeeper's channel *(canalis pyloricus).* Exit from the gaster - the pylorus *(pylorus)* – surrounds the gatekeeper's hole. It has a noticeable interception, which from the inside corresponds to a circular muscle - the pyloric sphincter *(musculus sphincterpyloricus).* The uppermost part of the stomach, located above and to the left of the cardia, is the arch of the stomach *(fornix gastricus)* or the bottom of the stomach *(fundus gastricus).* An acute angle is formed between the esophagus and the arch of the stomach - a cardiac notch *(incisura cardialis).* The wall of the stomach consists of 3 membranes: the mucous membrane with the submucosa, muscle and serous membranes.

Duodenum *(duodenum)* - a horseshoe-shaped tube 25-30 cm long and 4-6 cm wide. The convex edge of the horseshoe is directed to the right and back, and the concave surrounds the head of the pancreas. The duodenum is divided into 4 parts.

❖ The upper part *(pars superior)* 4-5 cm long starts from the pylorus at the level I of the lumbar vertebra and goes up, back and to the right to the neck of the gallbladder, where it forms a bowel bend down - the upper bend *(flexura duodeni superior).* The area from the pyloric opening to the first circular fold of the mucous membrane is called an ampoule or bulb *(ampulla seu bulbus duodeni).* From the upper part to the gate of the liver is the hepato-duodenal ligament (ligamentum

❖ Downstream part *(pars descendes)* 8-10 cm long is located from the upper bend to the level III-IV of the lumbar vertebrae, where the second - lower bend is formed *(flexura duodeni inferior),* leftward. Medially, approximately in the middle of this part, there is a longitudinal fold of the duodenum *(plica longitudinalis duodeni),* which ends with a large papilla of the duodenum *(papilla duodeni major).* Through the large papilla, the hepatic-pancreatic ampoule opens into the intestine *(ampulla hepatopancreatica),* formed by the fusion of the common bile duct *(ductus choledochus)* and pancreatic duct *(ductus pancreaticus)*. Through the small papilla of the duodenum located above *(papilla duodeni minor)* an additional pancreatic duct opens into the intestine *(ductus pancreaticus accessorius)*

❖ Horizontal part *(pars horizontalis*), the narrowest and longest (10-12 cm), passes at the level of III-IV of the lumbar vertebra from right to left.

❖ Ascending part *(pars ascendens)* - continuation of the previous one, the shortest (2-3 cm); rises to the left edge of the I-II lumbar vertebra, where there is a sharp duodeno-jejunal bend *(flexura duodenojejunalis),* which is the site of transition of the duodenum to the jejunum.hepatoduodenale), in which the portal vein of the liver, common bile duct and own hepatic artery are located.

Liver *(hepar)* - the largest gland in the human body. It has a complex structure and multifaceted functions (bile secretion, barrier, protective, participation in hematopoiesis, metabolism and maintaining water balance). This organ of irregular shape, refers to the parenchymal. The mass of the liver of an adult is 1.5-2.0 kg. There are two surfaces: upper - diaphragmatic *(facies diaphragmatica)* and lower - visceral or visceral *(facies visceralis),* which are separated from each other by the bottom edge *(margo inferior).* The convex diaphragmatic surface is divided into upper, front, back and right parts. On the back of the diaphragmatic surface of the liver between the leaves of the coronary ligament *(ligamentum coronarium)* extraperitoneal field is located *(area nuda).*

The visceral surface of the liver has several impressions from the adjacent organs (from right to left): renal *(impressio renalis),* adrenal glandal *(impressio suprarenalis),* colonic *(impressio colica),* duodenal *(impressio duodenalis),* gatekeeper *(impressio pylorica)* and gastric (*impressio gastrica).* In addition, on this surface there are 3 deep grooves dividing the liver into 4 lobes: two grooves are directed longitudinally - the right and left longitudinal grooves, and one is the portal of the liver *(porta hepatis)* - transversely.

Liver topography

The liver is located on the upper floor of the abdominal cavity, almost entirely to the right under the diaphragm. Its borders are projected into the right subcostal and epigastric regions of the abdomen. The upper border of the liver runs arched from the tenth intercostal space on the right along the mid-axillary line to the fourth intercostal space on the right midclavicular line to the base of the xiphoid process of the sternum in the midline. On the left, it can reach the midclavicular line in the fifth intercostal space. The lower border of the liver goes along the costal arch (X rib) to the junction of the IX and VIII ribs and then through the epigastric region at the middle of the distance between the navel and the base of the xiphoid process of the sternum to the junction with the upper border in the fifth intercostal space. The liver is adjacent to the diaphragm, which on the left separates its surface of the same name from the heart and pericardium. Below the liver is in contact with the right bend of the colon, the right kidney and adrenal gland, the inferior vena cava, the upper part of the duodenum, stomach, gall bladder, transverse colon.

Gall bladder *(vesica biliaris; vesicafellea*) - pear-shaped bile container; lies in the fossa of the gallbladder on the visceral surface of the liver). The peritoneum covers the gallbladder, except for the surface fused with the liver (mesoperitoneal position). The front end of the bladder, slightly protruding beyond the lower edge of the liver, is called the bottom of the gallbladder *(fundus vesicae biliaris),* the back, narrowed end, forms the neck of the gallbladder *(collum vesicae biliaris),* and the section between the bottom and the neck is the body of the bubble *(corpus vesicae felleae).* The transition of the body into the neck of the bubble is called a funnel *(infundibulum vesicae biliaris).* From the neck of the bladder begins the cystic duct *(ductus cysticus).* Here the mucous membrane has a spiral fold *(plica spiralis),* playing the role of a valve with increasing intra-abdominal pressure. The cystic duct 3-4 cm long, connects to the common hepatic duct with the formation of the common bile duct *(ductus choledochus).* The latter passes in the hepato-duodenal ligament, then behind the duodenum, then in the thickness of the pancreas head and opens into the descending part of the duodenum. Before flowing into the intestine, it merges with the duct of the pancreas, forming a hepatic-pancreatic ampoule *(ampulla hepatopancreatica).* The ampoule opens with a hole on the top of the large papilla of the duodenum *(papilla duodeni major).* Before fusion, each of the ducts has a thickening of the muscle layer - the sphincter of the common bile duct *(musculus sphincter ductus choledochi)* and sphincter of the pancreatic duct *(musculus sphincter ductus pancreatici).* At the place where the hepatic-pancreatic ampoule flows into the duodenum, a sphincter of the hepatic-pancreatic ampoule forms in the wall *(musculus sphincter ampullae hepatopancreaticae).*

Bags of upper floor of abdominal cavity

Right liver bag (bursa hepatica dextra) located between the diaphragm and the right lobe of the liver and is limited.

❖ Backside- the right coronary ligament of the liver *(lig. coronarium hepatis dextrum);*

❖ Leftside- crescent ligament *(lig. falciforme);*

❖ Right and bottomside- opens into the subhepatic bag and the right lateral canal; from the bottom it freely communicates with the lower floor of the abdominal cavity.

Left liver bag *(bursa hepatica sinistra*) lies between the diaphragm and the left lobe of the liver and is limited:

❖ Backside- left coronary ligament of the liver *(lig. coronarium hepatis sinistrum);*

❖ Rightside- crescent ligament *(lig. falciforme);*

❖ Leftside- left triangular ligament of the liver *(lig. triangulare hepatis sinistra)*

❖ frontside- communicates with a pre-gastric bag.

FrontGastric bag *(bursa praegastrica)* located between the stomach and the left lobe of the liver and is limited:

❖ frontside- lower surface of the left lobe of the liver;

❖ backside- small oil seal *(omentum minus)* and the front wall of the stomach;

- ❖ upperside the gate of the liver;
- ❖ bottomside- freely communicates with the lower floor of the abdominal cavity.

Underliver bag *(bursa subhepatica)* is limited:

- ❖ Frontside- above the lower surface of the right lobe of the liver;
- ❖ Bottomside- the transverse colon and its mesentery *(colon et mesocolon);*
- ❖ Leftside- liver gate and gland opening *(foramen epiploicum);*
- ❖ Roghtside- opens into the right side channel.

Oil seal bag *(bursa omentalis),* represents a slit-like cavity located behind a stomach and communicating with a subhepatic bag through an omental opening *(foramen epiploicum),* which is limited:

From front side- hepato-duodenal ligament *(lig. hepatoduodenal),* where lies:

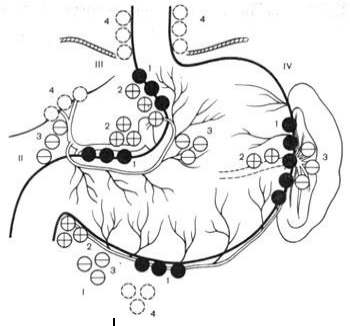
- ❖ common bile duct *(ductus chole-dochus),*
- ❖ portal vein *(v. portae),*
- ❖ own hepatic artery *(a. hepatica propria);*
- ❖ from back side- hepato-renal ligament *(lig. hepatorenale)* and the inferior vena cava passing near it;
- ❖ from lower side- duodenal renal ligament *(lig. duodenorenale);*
- ❖ on top of the caudate lobe of the liver.

The oil seal bag consists of a vestibule *(vestibulum bursae omentalis)* and gastrointestinal sac *(saccus gastropancreaticus).*

V. Tasks for independent work:

Task №1.

Indicate what is shown in the figure. Explain Melnikov's scheme. Indicate the pathways of metastasis in gastric cancer (in accordance with the scheme of lymphatic outflow Melnikov.



	I	II	III	IV
1				
2				
3				
4				

Task №2.

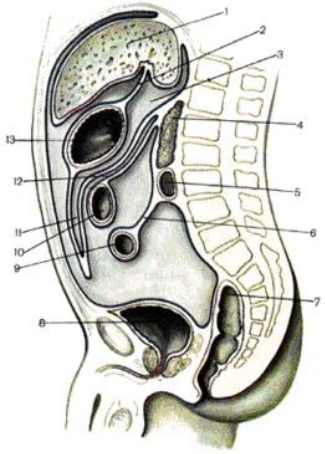
It is known that in the upper floor of the abdominal cavity there is an omental bursa and a number of spaces: pre-gastric, subhepatic, right subphrenic right and left subphrenic. Indicate the possible pathways of the pathological process from the upper floor to the lower floor of the abdominal cavity.

Task №3.

Describe what landmarks are used for cholecystectomy for the isolation and ligation of the gallbladder artery? Indicate the anatomical formations that make up the boundaries of a landmark in the form of a triangle.

Task №4.

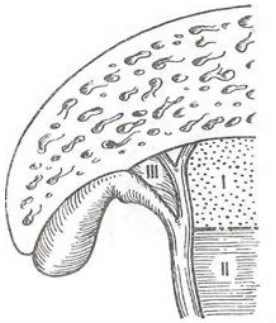
Indicate what is shown in the figure. Indicate the walls
Oil seal bag:



1 -	8 -
2 -	9 -
3 -	10 -
4 -	11 -
5 -	12 -
6 -	13-
7 -	

Task №5.

Indicate what is shown in the figure. Indicate the clinical value of the Kahlo triangle.



I –	
II –	
III –	

Task №6.

Make a task on the topic of the lesson. (In workbook)

Task №7.

Make 5 tests on the topic of the lesson. (In workbook)

VI. Control questions:

1. The peritoneal cavity.
2. Division into floors.
3. Bags of the upper floor of the abdominal cavity.
4. Stomach, anatomical structure, location (skeletonotopy, syntopia, holotopia), blood supply, innervation, blood and lymph drainage (Melnikov's scheme).
5. The duodenum: anatomical structure, location (skeletonotopy, syntopia, holotopia), blood supply, innervation, blood and lymph drainage.
6. Liver: anatomical structure, location (skeletonotopy, syntopia, holotopia), blood supply, innervation, blood and lymph drainage.
7. Extrahepatic biliary tract. Gall bladder The common hepatic duct. Blood supply, innervation, blood and lymph drainage.
8. Pancreas: location (skeletonotopy, syntopia, holotopia), blood supply, innervation, blood and lymph drainage.
9. Spleen: location (skeletonotopy, syntopia, holotopia), blood supply, innervation, blood and lymph drainage.

VII. An example of a task:

№1. Patient V., 44 years old, as a complication of a perforated ulcer of stomach's posterior wall, developed a right-sided subphrenic abscess. Explain the mechanism of this complication.

(Answer: Exudate from the stuffing bag through the stuffing box (Vinslovo) hole spread into the liver bag.)

№2. Patient T., 26 years old, was admitted to the surgical department with a diagnosis of "Acute pancreatitis", symptoms of diffuse peritonitis were revealed. Explain the pathway of exudate to the lower abdomen.

(Answer: From the stuffing bag, the exudate passes through the stuffing box (Vinslovo) into the liver bag, and from it through the right lateral canal into the lower abdomen (floor). There is the possibility of the exudate spreading into the peritoneal pelvic cavity.)

№3. In patient A., 20 years old, after a perforated ulcer of the anterior wall of the stomach (accompanied by “dagger pains” in the epigastrium), the pain decreased, which allows thinking about covering the perforation site. Which abdominal organ is most often involved in limiting the inflammatory process by the formation of adhesions? Why? What research will clarify the diagnosis?

(Answer: Greater omentum. It is characterized by significant mobility, the presence of a large number of nerve receptors, lymphatic and blood vessels, as well as histiocytic cells. Laparoscopy is indicated.)

VII. Control tests:

The upper and lower floors of the abdominal cavity are divided: (1)
large oil seal
gastrocolic ligament
+ mesentery of the transverse colon
mesentery of the small intestine

In the upper floor of the abdominal cavity there are 4 organs: (4)
ascending colon
+ stomach
descending colon
+ liver with gall bladder
+ pancreas
+ spleen
cecum with vermiform appendix
sigmoid colon
skinny and ileum

Sickle ligament of the liver shares: (1)
prehepatic fissure and pancreatic bag
+ right and left subphrenic spaces
subhepatic space and stuffing bag

The composition of the small omentum includes the following three ligaments: (3)
+ diaphragmatic gastric
gastro-splenic
gastrointestinal
+ hepatoduodenal
+ hepatic-gastric

Knowledge triangle Kahlo constituent parties is necessary in the performance: (1)
cholecystostomy
cholecystoyunoanastomosis
cholecystoduodenoanastomosis
+ cholecystectomy
liver resection

IX.GLOSSARY:

Peritoneum	Peritoneum
Peritoneal cavity	Cavitas peritonei
Visceral peritoneum	Peritoneum viscerale
Parietal peritoneum	Peritoneum parietale
Stomach	Gaster
Pylorus	Pylorus
Sphincter muscle of pylorus	Musculus sphincterpyloricus
Fornix of ventricle	Fornix gastricus
Pars cardiaca ventriculi (cardial part)	Pars cardiaca; cardia
Fundus of stomach	Fundus gastricus
Cardial(cardiac) incisure of stomach	Incisura cardialis
Duodenum	Duodenum
Top part	Pars superior
Bottom part (underside)	Pars descendes
Horizontal part	Pars horizontalis
Ascending part	Pars ascendens
Liver	Hepar
Coronary ligament	Ligamentum coronarium
Extraperitoneal field	Area nuda
Renal impression	Impressio renalis
Adrenal impression	Impressio suprarenalis
Colonic impression	Impressio colica
Duodenal impression	Impressio duodenalis

Pyloric impression	Impressio pylorica
Gastric impression	Impressio gastrica
Portal fissure	Porta hepatis
Gall bladder	Vesica biliaris
Gallbladder bottom	Fundus vesicae biliaris
Gallbladder neck	Collum vesicae biliaris
Body of gallbladder	Corpus vesicae felleae
Gallbladder funnel	Infundibulum vesicae biliaris
Cystic duct	Ductus cysticus
Common bile duct	Ductus choledochus
Hepato-pancreatic ampoule	Ampulla hepatopancreatica
Bile papilla	Papilla duodeni
Sphincter of the common bile duct	Musculus sphincter ductus choledochi
Pancreatic duct sphincter	Musculus sphincter ductus pancreatici
Sphincter of the hepato-pancreatic ampoule	Musculus sphincter ampullae hepatopancreaticae
Right liver bag	Bursa hepatica dextra
Left liver bag	Bursa hepatica sinistra
Pancreas bag	Bursa praegastrica
Subhepatic bag	Bursa subhepatica
Stuffing bag	Bursa omentalis

Topic: Topographic anatomy of the trunk: Topographic anatomy of the abdominal cavity: the lower floor. Surgical interventions on the organs of the lower abdominal cavity floor.

Motivational characteristic: knowledge about location of the main neurovascular bundles and the abdominal cavity allows predicting the spread purulent processes and timely surgical intervention. Knowledge about ways of metastases to lymph nodes will help to diagnose localized malignant tumors studied area.

I. Purposes:

The student must know:	The student must be able to:	The student must own::
1. Channels sinuses and deepening of the ground floor, their message to the upper floor and the pelvis. 2. Topographic anatomy of the small intestine. Blood supply, innervation, lymphatic drainage. 3. Topographic anatomy of the colon. Blood supply, innervation, lymphatic drainage. 4. The anatomical difference between the small and large intestines. 5. Surgical anatomy of the small intestine. Features of blood supply and structure. 6. Surgical anatomy of the colon. Features of blood supply and structure. 7. Options for the location of the cecum and the appendix. 8. Innervation of the abdominal organs: sympathetic trunk, aortic abdominal plexus, lumbar plexus. 9. The scheme of lymphatic outflow Melnikov.	1. Produce inspection body floor upper abdomen. 2. Dissect the vessels of the abdominal cavity (lower floor).	1. Abdominal examination and palpation skills. 2. The method of preparation of the selected area 3. Skills of working with surgical instruments for operations on the abdominal organs. 4. Skills of surgical manipulations at each stage.

II. Questions to verify the initial level of knowledge:

1. Topographic anatomy of the abdominal cavity (lower floor). Their attitude to the peritoneum.
2. Blood supply of the lower abdominal organs.
3. Innervation bodies bottom floor of the abdomen.
4. Lymph drainage from lower abdominal cavity floor.
5. Topography canals, sinuses and pockets lower storeys of the abdominal cavity.
6. Anatomy of the small intestine.
7. Anatomy of the colon.
8. Anatomy of the mesentery of the small intestine.
9. Antrums, canals, sinuses, folds and ligaments lower storeys of the abdominal cavity.

III. Object of study - the human body.

IV. Information part:

Peritoneum *(peritoneum)* - serous membrane lining the inside wall of the abdomen and most of his organs, abdominal cavity forms a closed cavity - the peritoneal cavity *(cavitas peritonei)*.

The peritoneal cavity of the transverse colon and its mesentery *(colon transversum et mesocolon)* is divided into two floors.

- The upper floor of the abdominal cavity is located above the transverse colon and its mesentery, it is occupied by the liver, spleen, stomach, partially the duodenum; Here are the right and left hepatic, pre-gastric, subhepatic and omental bursa.
- Bottom floor of the abdominal cavity located below the transverse colon and its mesentery comprises loops jejunum and ileum (*jejunum et ileum),* cecum *(caecum),* appendix *(appendix vermiformis),* colon, *(colon),* side channels and mesenteric sines.

The small intestine *(intestinum tenue)* has a thinner wall than the stomach. It starts from the stomach and ends when it flows into the colon. The length of the small intestine varies significantly from 4 to 5 m.

In the small intestine, 3 sections are transferred into each other: the duodenum, originating from the pylorus; jejunum, which makes up the middle section of the small intestine; ileum - end section. The border between the duodenum and jejunum is the duodenum-jejunum bend. There is no anatomical border between the jejunum and ileum. Both the skinny and ileum are covered on all sides by the peritoneum, are mobile, because they are suspended in the abdominal cavity on the mesenterium *(mesenterium)*, form numerous loops, therefore both departments are called the mesenteric intestine. 2/5 of the mesentery are referred to as jejunum, and 3/5 to the ileum. In functional terms, the small intestine is the most important department of the digestive system, as there are committed mechanical and enzymatic treatment of food, sucking her cleavage and removal of slag products.

The jejunum and the ileum *(ileum)* form a series of loops located on the lower floor of the abdominal cavity. In front, they are partially covered with a large gland. The position loop is not constant due to their high mobility. Usually jejunum loop lies above and to the left, and the ileum - the right and bottom. The wall of the small intestine consists of 3 membranes: the mucous membrane with the submucosa, muscle

The large intestine *(intestinum crassum)* is a continuation of the small and goes to the anus, which ends the gastrointestinal tract. The length of the colon is about 1.5 m, the diameter ranges from 8 to 4 cm, gradually decreasing to the rectum. The large intestine first forms a large blind protrusion, then surrounds the small intestine in the form of a rim, passing into the final straight segment in the small pelvis. According to the position of the colon, the cecum, colon, rectum and anal canal *(canalis analis)* are isolated in it.

The cecum *(caecum)* is a saccular protrusion down the initial part of the colon. This is the widest section of the colon. The length of the cecum is 6-8 cm, the diameter is 7.0-7.5 cm. The final ileum flows into the colon over the cecum. At the place where the small intestine enters the large intestine, there is an ileal opening *(ostium ileale)* bounded by the upper, ileo-colonic lip *(labrum ileocolicum),* and the lower, ileo-intestinal lip *(labrum ileocaecale),* which are connected in front of the back by the frenulum of the ileum *(frenulum ostii ilealis)*. These formations function as a valve or damper. Stretching of the cecum and ascending colon leads to tension of the frenulum, closer lips of the flap and its closure. As a result, the ileocecal valve prevents the passage of contents from the colon to the small one. In addition, the areas adjacent to the valve and the valve itself are a reflexogenic zone that takes part in the regulation of food movement through the small intestine, and therefore in the regulation of digestion in it.

A long and narrow appendix *(appendix vermiformis)* departs from the lower inner surface of the cecum. Its length is variable and varies from 2 to 20 cm, usually 7-10 cm, diameter 0.5-1 cm. The cavity of the appendix is opened into the cecum by the opening of the appendix *(ostium appendicis vermiformis)*. The appendix is covered on all sides by the peritoneum and has a short mesentery.

In the wall of the process, the layers of which are similar to the layers of the colon, there are many group lymphoid nodules. In this regard, it is believed that the appendix has a protective function.

The position of the appendix is very different. It can take a descending, lateral, medial or ascending position. The cecum is located in the right ileal fossa. In front, the intestine is adjacent to the anterior abdominal wall in the right inguinal region, its bottom is projected at a distance of 4-5 cm upward from the middle of the inguinal ligament.

The colon is curved in the shape of a large horseshoe and is located clockwise. Appearance colon colon characterized by tapes; bloating or gaustra and filling processes.

Tapes colon *(taeniae coli)* disposed longitudinally along the intestine and appear due to the uneven distribution of longitudinal muscle bundles assembled in the form of stripes in three places only. The width of the tapes is about 1 cm. Distinguish the packing tape *(taenia omentalis),* lying along line attachment omentum to the transverse colon and to continue this line to the other parts of the bowel; mesenteric tape *(taenia mesocolica)* located along line of mesentery attachment to the transverse colon; free tape *(taenia libera),* passing along the ascending and descending colon along the front surface, and along the transverse colon - behind.

Colonic gaustra (swellings) *(haustra coli)* are formed in the colon due to the fact that the ribbons of the colon are shorter than the rest of the wall membranes and therefore tighten and corrugate them.

Omental processes *(appendices omentales seu epiploicae)* are outgrowths of the peritoneum up to 3-5 cm long, containing fatty tissue. They are located along the stuffing box and loose bands.

In the colon, the ascending colon, transverse colon, descending colon, and sigmoid colon are distinguished.

Omental processes *(appendix omentales seu epiploicae)* have outgrowths of the peritoneum up to 3-5 cm long, having fatty tissue. They are located along the stuffing box and loose tape.

The ascending colon *(colon ascendens)* starts from the blind in the right ileal fossa, goes along the right edge of the posterior abdominal wall upward and slightly posteriorly to the lower surface of the liver, where, forming the right curve *(flexura coli dextra),* passes into the transverse colon. The length of the intestine is 10-14 cm, it is covered by the peritoneum in front and sides. Topography of the gut. The ascending colon is projected onto the right lateral region of the anterior abdominal wall, and its right curve is at the end of the right X rib. The back of the intestine is adjacent to the right kidney, from above (the right bend) - to the lower surface of the liver, in front - to the loops of the small intestine.

The transverse colon *(colon transversum)* is located transversely, forming an arc, convex downward and anteriorly. On the left, it passes into the descending colon, while forming a left bend *(flexura coli sinistra),* which lies slightly higher than the right. The transverse colon is the longest part of the colon (an average of 25-30 cm). The intestine is covered on all sides by the peritoneum and has a rather long mesentery *(mesocolon transversum)*. Topography of the intestine. The transverse colon is adjacent to the liver, gall bladder, large curvature of the stomach, the lower edge of the spleen, from the bottom to the loops of the small intestine, from the front to the greater omentum and the anterior abdominal wall, from the back to the right kidney, the descending part of the duodenum, pancreas and left kidney.

The descending colon *(colon descendens)* is the narrowest and shortest (9-12 cm). It is a continuation of the transverse colon below the left bend, goes to the ileal crest, at the level of which passes into the sigmoid colon. It is covered by the peritoneum in the same way as the ascending intestine. Topography of the gut. The descending colon is projected onto the left lateral region of the anterior abdominal wall. Loops of the small intestine lie in front of the intestine, and the left kidney in the back. Front to the intestine are adjacent small bowel loops, rear - left kidney.

The sigmoid colon *(colon sigmoideum)* goes from the level of the ileal crest to the III sacral vertebra, its loops are usually located in the small pelvis. The intestine is covered on all sides by the peritoneum and has a mesentery *(mesocolon sigmoideum).* Topography of the gut. The sigmoid colon is projected onto the anterior abdominal wall in the left inguinal and partially pubic areas. In front, the intestine is adjacent to the anterior abdominal wall; loops of the small intestine are located above it. At the bottom of the loop, the sigmoid colon is in contact with the bladder and rectum.

The rectum and anal *(anal)* canal *(rectum et canalis analis)*. In the rectum, the nadampular part, covered with the peritoneum on all sides, and the ampulla of the rectum *(ampulla recti)* are distinguished, the upper part of which is located mesoperitoneally, and the lower one - subperitoneally. The final section of the digestive tract, the length of which varies from 13 to 16 cm, is S-shaped, forming two bends in the sagittal plane: one convex posteriorly - the sacral bend *(flexura sacralis)*, the other convex anteriorly - the anal-rectal *(perineal)* bend *(flexura anorectalis seu perinealis)*. In addition, bends in the frontal plane are distinguished in the rectum, among which the lower-right lateral bend is essential. At the level of the diaphragm of the pelvis, the rectum passes into the anal *(anal)* canal. The anal canal 2.5-3.0 cm long ends with the anus *(anus).* At the level of the pelvic diaphragm rectum enters anal (anal) channel.

Canals, sinuses and indentations of the lower floor of the abdominal cavity

The right lateral canal *(canalis lateralis dexter)* is limited:

- ❖ right side wall of the abdomen;
- ❖ at the top it communicates with the subhepatic and right liver bags;

- below communicates with the right iliac fossa and further with the peritoneal pelvic cavity

The left lateral canal *(canalis lateralis sinister)* is limited:

- left side wall of the abdomen;
- on the right of the descending colon and sigmoid colon *(colon descendens et colon sigmoideum)*;
- on top of the diaphragmatic-colon ligament *(lig. Phrenicocolicum)*;
- below communicates with the left iliac fossa and the peritoneal pelvic cavity.

The right mesenteric sinus *(sinus mesentericus dexter)* has a triangular shape, closed, bounded:

- right ascending colon *(colon ascendens)*;
- from above the transverse colon *(colon transversum);*
- left by the root of the mesentery *(radix mesenterii).*

The left mesenteric sinus *(sinus mesentericus sinister)* is limited:

- left descending colon *(colon descendens)*;
- to the right with the root of the mesentery *(radix mesenterii)*;
- below the sigmoid colon *(colon sigmoideum)*.

In a duodenal-lean bend, the peritoneum forms several folds and indentations.

- Superior and inferior duodenal folds *(plica duodenalis superior et inferior)*, and in the upper duodenal fold passes the inferior mesenteric vein *(v. Mesenterica inferior)*.
- The superior duodenal groove *(recessus duodenalis superior)* is located above the superior duodenal fold.
- The paraduodenal recess *(recessus raga-duodenalis)* is located between the upper and lower duodenal folds, a possible place for the formation of an internal hernia.
- The inferior duodenal recess *(recessus duodenalis inferior)* lies below the lower duodenal fold.
- Between the mesentery, the cecum and the ileocecal fold *(plica ileocaecalis)*, the lower ileoecal depression *(recessus ileocaecalis inferior)* forms.

Melnikov lymphatic drainage scheme:

1st stage of metastasis - lymph nodes located in the thickness of the gastrointestinal ligament along the great curvature near the pylorus;

2nd stage of metastasis - lymph nodes along the lower edge of the pancreatic head and behind the pylorus;

3rd stage of metastasis - the lymph nodes located in the interior of the small bowel mesentery

The 4th stage of metastasis is retroperitoneal para-aortic lymph nodes.

The second pool lymph collects lymph from the part piloroantralnogo department adjacent to the lesser curvature, and from the body of the stomach.

1st stage of metastasis - retropiloric lymph nodes;

2nd stage of metastasis - lymph nodes in the small omentum in the distal part of the lesser curvature, in the pylorus and duodenum, immediately behind the pylorus;

The 3rd stage of metastasis is the lymph nodes located in the thickness of the hepato-duodenal ligament. It is difficult, but often impossible, to remove these lymph nodes during surgery;

4th stage of metastasis - lymph nodes in the gates of the liver.

The third lymphatic pool is the largest and main lymphatic outflow, has the largest lymphatic vessels and lymph nodes. A powerful discharge lymphatic vessel is located on the small gastro-pancreas ligament, along the left gastric vessels - arteries and veins. It collects lymph nodes and the gastrointestinal tract, adjacent sections of the anterior and posterior walls, cardiology, the medial part of the esophagus and the abdominal digestion.

1st stage of metastasis - the lymph nodes, arranged in a chain along the lesser curvature of a small gland tissue. The upper nodes of this chain are called paracardial, they are affected by metastases primarily in case of cardia cancer.

2nd stage of metastasis - lymph nodes along the left gastric vessels, in the thickness of the gastro-pancreatic ligament;

3rd stage of metastasis - lymph nodes along the upper edge of the pancreas and in the region of its tail;

4th stage of metastasis - lymph nodes in the paraaortic tissue above and below the

Fourth pool lymph collects lymph from the vertical portion of large curvature of the stomach, the adjacent front and rear walls, a significant portion of the stomach vault

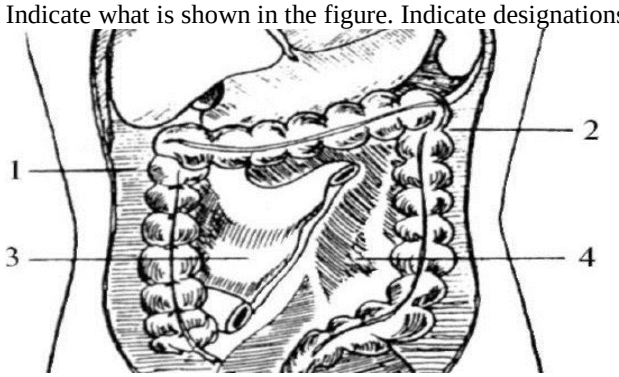
1st stage of metastasis - lymph nodes located in the upper left part of the gastrointestinal ligament;

2nd stage of metastasis - lymph nodes along the short arteries of the stomach;

3rd stage of metastasis - lymph nodes in the gate of the spleen;

4th stage of metastasis AV Melnikov thought splenic lesion. However, with damage to the spleen, its parenchyma, and not the lymph nodes, is. Tasks for independent work.

Task №1.
Indicate what is shown in the figure. Indicate designations.



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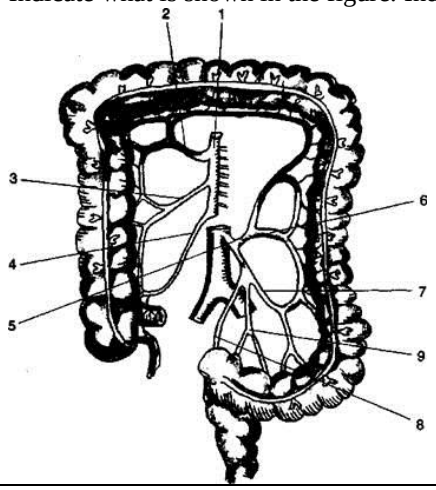
Task №2.
Define the Griffiths critical point. Explain the clinical significance.

Task №3.
Indicate what is shown in the figure. Indicate the designation.



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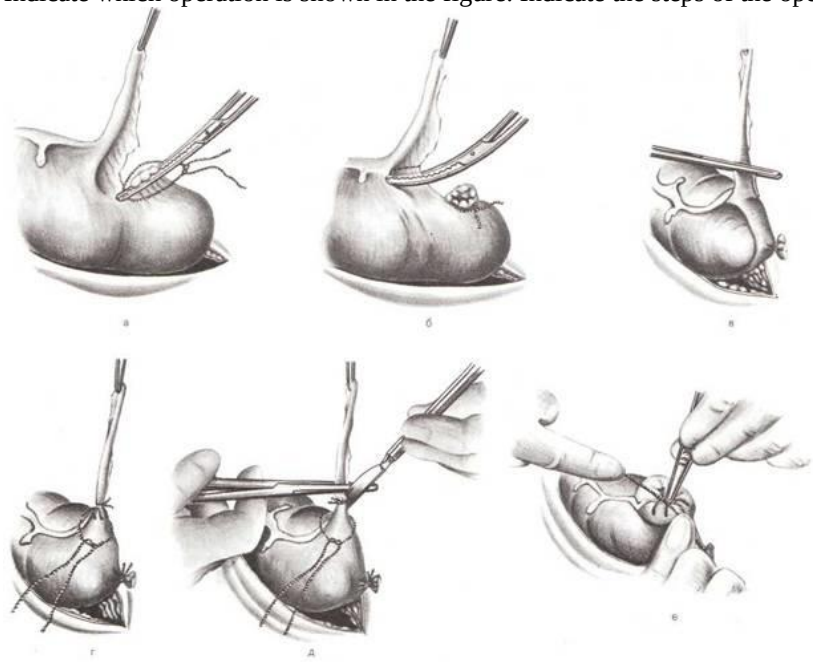
Task№4.
Define Sudek's critical point. Explain the clinical significance.

Task №5.
Indicate which operation is shown in the figure. Indicate the steps of the operation.



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в -	е -

Task № 6.
Make a task on the topic of the lesson. (In a notebook)

Task № 7.
Make 5 tests on the topic of the lesson. (In a notebook)

VI.Control questions:
1. Canals, sinuses and indentations lower storeys of the abdominal cavity, their communications with upper floor and pelvis .
2. Topographic anatomy of the small intestine. Blood supply, innervation, lymphatic drainage.
3. Topographic anatomy of the colon. Blood supply, innervation, lymphatic drainage.
4. The anatomical difference between the small and large intestines.
5. Surgical anatomy of the small intestine. Features of blood supply and structure.
6. Surgical anatomy of the colon. Features of blood supply and structure. Options for the location of the cecum and the appendix.
7. Innervation of the abdominal organs: sympathetic trunk, aortic abdominal plexus, lumbar plexus.

VII. An example of a task:
№1. Patient I., 22 years old, about an “acute appendicitis” an incision was made according to N. M. Volkovich-P. I. Dyakonova. Gastric contents found in the abdominal cavity. What disease should the surgeon suspect? How did gastric contents appear in the right iliac fossa?

(Answer: Perforated ulcer of the anterior wall of the pyloric stomach. The gastric contents along the right lateral canal spread from the upper section (this part) to the lower part (to the right iliac fossa).

№2. Patient M., 66 years old, was taken to the surgical department with a diagnosis of "Acute small bowel obstruction." Conservative treatment was ineffective. At laparotomy found pinching a small portion at the edge protivobryzheechnogo wall jejunum II in the lower lumbar vertebrae duodenal recess. Define this pathological process. What acute surgical diseases of the organs of the upper abdomen (floor) can simulate this pathological process?

(Answer: Internal strangulated abdominal hernia of the lower duodenal cavity (Treitz hernia) The contents of the hernia sac is a small section of intestine protivobryzheechnogo edge with parietal (Litreevskim) infringement. A hernia can simulate a perforated gastric ulcer, acute cholecystitis, acute pancreatitis, intestinal infarction.)

№3. Patient A., 70 years old, was admitted to the surgical department. The diagnosis of acute abdomen. When abdominal audit ascertained thrombosis of the inferior mesenteric artery. In which sections of the colon are blood circulation disturbed?

(Answer: In the left part of the bending transverse, descending and sigmoid colon, and in rectum's upper part)

VIII. Control tests:
Meckel's diverticulum is: (1)
non venous duct
unclaimed urinary duct
unclosed umbilical vessels

+ embryonic residue of the vitelline duct
The organs of the lower floor of the abdominal cavity include: (5)
+ ascending colon
stomach
+ descending colon
gall bladder
pancreas
spleen
+ cecum with vermiform appendix
+ sigmoid colon
+ jejunum and ileum
Of the listed organs, the peritoneum is covered with mesoperitoneal: (3)
stomach
+ liver
Spleen
pancreas
duodenum
+ ascending colon
transverse colon
+ descending colon
Of these bodies are covered with peritoneum mezoperitoneal:
stomach
+ liver
spleen
pancreas
duodenum
+ ascending colon
transverse colon
+ descending colon
Kuznetsov-Pensky's sut is used for suturing wounds: (1)
skin
muscle
aponeurosis
guts
+ liver
Knowledge of the constituent sides of the Kahlo triangle is necessary when performing: (1)
cholecystostomy
cholecystoyunoanastomosis
cholecystoduodenoanastomosis
+ cholecystectomy
liver resection

IX.GLOSSARY:

Small intestine	Intestinum tenue
Jejunum	Jejunum
Ileum	Ileum
Large intestine	Intestinum crassum
Blind gut (cecum)	Caecum
Ileal aperture	Ostium ileale
Ileo-colon lip	Labrum ileocolicum
Iliac-cecal lip	Labrum ileocaecale
Iliac-intestinal frenulum	Frenulum ostii ilealis
Vermiform appendix	Appendix vermiformis
Colonic ridges (haustra)	Haustra coli
Epiploic appendices	Appendices omentales seu epiploicae
Ascending colon	Colon ascendens
Transverse colon	Colon transversum
Descending colon	Colon descendens
Sigmoid colon	Colon sigmoideum
Rectum and anal canal	Rectum et canalis analis
Rectal ampulla	Ampulla recti
Sacral flexure of rectum	Flexura sacralis
Anorectal flexure	Flexura anorectalis seu perinealis
Right side canal	Canalis lateralis dexter

Left side canal	Canalis lateralis sinister
Right mesenteric sinus	Sinus mesentericus dexter
Left mesenteric sinus	Sinus mesentericus sinister
Superior and inferior duodenal folds	Plica duodenalis superior et inferior
Superior duodenal recess	Recessus duodenalis superior
Paraduodenal recess	Recessus para-duodenalis
Inferior duodenal recess	Recessus duodenalis inferior
Inferior ileocecal recess	Recessus ileocaecalis inferior

Topic: Topographic anatomy of the body. Topographic anatomy of the lumbar region and retroperitoneal space. Surgical interventions on the organs of the retroperitoneal space.

Motivational characteristic: knowledge of the main location neurovascular bundles and organs of the lumbar region and retroperitoneal space will allow one to predict the distribution of purulent processes and timely surgical interventions. Knowledge of the ways of metastasis to the lymph nodes will allow timely diagnosis of the localization of malignant tumors in the studied area.

I. Purposes

The student must know:	The student must be able to:	The student must own:
1. Topographic anatomy of the lumbar region and retroperitoneal space - holotopia, syntopia, skeletonotopy, layered structure. 2. Filtration and urinary apparatus of the kidney. 3. Topographic anatomy of the ureter. 4. The concept of a vagus kidney. 5. The technique for performing basic surgical interventions on the organs of the retroperitoneal space at each stage: •Drainage phlegmon retroperitoneal space • Pyelotomy • Pyelostomy • Nephrotomy • Nephrostomy • Kidney resection • Nephrectomy •Operations for nephroptosis - classification. • Surgery on the ureters. • Adrenal gland surgery.	1. Determine the boundaries, external landmarks of the lumbar region and retroperitoneal space. 2. Inspect and palpate the lumbar region. 3. Show on the drug and name the organs and formations of the lumbar region. 4. Show and name organs and formations of retroperitoneal space. 5. Dissect selected area. 6. Use special surgical instruments for operations on the organs of the lumbar region and retroperitoneal space at each stage. 7. Perform basic surgery at each stage.	1. Skills of examination and palpation of the lumbar region and retroperitoneal space. 2. The method of preparation of the selected area. 3. Skills of working with surgical instruments for operations on the lumbar region and retroperitoneal organs. 4. Skills of surgical manipulations at each stage.

II. Questions to test the initial level of knowledge:

1. The boundaries and external landmarks of the lumbar region.
2. Layers in the lumbar region and weaknesses in it.
3. Retroperitoneal space. What are the messages with neighboring areas?
4. Topography of the kidneys and ureters**.**

III. The object of study is the human body.

IV.Information part:

The retroperitoneal space *(spatium retro-peritoneale*) is located between the parietal peritoneum of the posterior abdominal wall and the intraperitoneal fascia *(fascia endoabdominalis),* which, lining the muscles of the posterior abdominal wall, gets their names: in the transverse abdominal muscle, the transverse fascia *(fascia transversalis),* in the square muscle lower back - square fascia *(fascia quadrata),* in the large lumbar muscle - lumbar fascia *(fascia psoatis).*

Back wall of the abdomen - lower back (lumbus) – limited

- ✓top XII rib;
- ✓from below the crest of the ilium *(crista iliaca);*
- ✓medially by the posterior median line *(linea mediana posterior);*
- ✓laterally by a vertical line drawn from the end of the XI rib to the ilium crest *(Lesgaft line).*

The paravertebral line *(linea paravertebralis),* that is, the vertical line drawn along the outer edge of the muscle straightening the spine *(m. erector spinae),* the lower back is divided into the outer lumbar region *(regio lumbalis lateralis)* and the inner lumbar region *(regio lumbalis medialis*).

The retroperitoneal space *(spatium retroperitoneale)* is located between the parietal peritoneum of the posterior abdominal wall and the intraperitoneal fascia *(fascia endoabdominalis),* which, lining the muscles of the posterior abdominal wall, gets their names: in the transverse abdominal muscle - transverse fascia *(fascia transversalis).* in the square muscle of the lower back - square fascia (fascia quadrata), in the large lumbar muscle - lumbar fascia *(fascia psoatis).*

In the retroperitoneal space are located kidneys, ureters, adrenal glands, aorta and inferior vena cava with its branches, pancreas and duodenum. With the exception of the last two, which are discussed in the section "Organs of the abdominal cavity," the organs of the retroperitoneal space are surrounded on all sides by fatty tissue.

Kidney *(nephros)* - a paired organ that forms and removes urine. The kidneys lie in the lumbar region, to the left and right of the spine, in the so-called renal bed, bounded by the transverse abdominal muscle, the square muscle of the lower back and the large lumbar muscle

The kidneys are located on the sides of the spine at the level from the XII thoracic to II (sometimes III) lumbar vertebra.

• The right kidney lies below the left: if the XII rib divides the left kidney in half, then it cuts off the upper third from the right kidney. However, the height of the kidneys position may be different. With a high position, the kidneys can be completely hidden behind the ribs, with a low position they can be below the XII rib.

• The different height of the kidney position has significant surgical significance: with a high version of the position, to ensure adequate access, it is necessary to resect the XII rib, and sometimes the two lower ribs.

• The angle between the longitudinal axes of the kidneys is located above the level of the kidneys and ranges from 15 to 30°, since the distance between the upper poles of the kidneys (about 7 cm) is less than between the lower ones (about 10 cm).

Renal syntopy

Behind the membranes of the kidneys are adjacent.

✓ to the lumbar diaphragm;
✓ to the square muscle of the lower back;
✓ to the transverse muscle of the abdomen;
✓ to the large lumbar muscle.
✓adrenales.

Adjacent to the upper pole of kidney:

Adject to the right kidney's layers in front:

✓right lobe of liver;
✓the descending part of the duodenum;
✓the ascending colon and right bend of the colon

Adject to the left kidney's layers in front:

✓posterior wall of stomach;
✓tail of pancreas;
✓spleen;
✓left flexture of colon;
✓parietal peritoneum of the left mesenteric sinus..

The peritoneum, when passing from the kidney to neighboring organs, forms ligaments: in the right kidney - the hepato-renal *(lig. hepatorenale)* and duodenal-renal *(lig. duodenorenale)* ligaments, in the left - the spleen-renal ligament *(lig. lienorenale).*

In the kidney distinguish :

- front and back surfaces *(facies anterior et posterior);*
- upper and lower ends *(extremitas superior et inferior);*
- medial and lateral edges *(margo medialis et lateralis).*

Shell of the kidney

The kidney is covered by a fibrous capsule *(capsula fibrosa),* which, after dissection easily separated from the parenchyma. The adipose capsule of the kidney *(capsula adiposa renis)* surrounds the fibrous capsule with a uniform layer on all sides. The external capsule of the kidney *(capsula renalis externa)* separates the perinephric (perinephral) fiber from the retroperitoneal cell space in the back and the parietal fiber in front, connecting medially attached to the fascial case of the aorta and the inferior vena cava, from the bottom they pass into the pre-ureteric *(fascia praeureterica)* and ureteric *(fascia retroureterica)* fascia.

Behind the fibrous capsule covering a renal parenchyma is located kidney parenchyma, which is divided into cortical (cortex renis) and medulla (medulla renis) substance.

➢The cortical substance is located outside the base of the pyramids, enters between the pyramids in the form of renal columns *(columnae renalis),* contains renal corpuscles *(corpusculi renales*), proximal and distal convoluted tubules *(tubuli renales contorti proximales el distales).*

➢Brain substance consists of 10-15 renal pyramids, based on the directed outer surface of the kidneys, and the apex - towards the renal sinus. Renal pyramids contain straight tubules *(tubuli renalis recti)* , nephron loops *(ansa nephron)* and collecting tubules *(ductus papillares),* opening on the papillae *(papillae renalis).*

Ureter *(ureter)* - is a paired organ that removes secondary urine from the kidneys and connects the renal pelvis with a bladder, has the shape of a tube 30-35 cm long and 5-10 mm in diameter.

Position of the ureters.

Surrounded by fiber and the pre- and posterior ureteral fascia *(fasciae praeureterica et retroureterica*), the ureters descend along the psoas major muscle *(m. psoas major)* along with the femoral-genital nerve *(n. genitofemoralis)* and bend through the external iliac artery to the right and the common iliac artery on the left, going into the lateral cellular space of the pelvis. The projection of the ureter on the front wall of the abdomen corresponds to the outer edge of the rectus abdominis muscle. The projection on the posterior wall of the abdomen is the paravertebral line - *(linea paravertebralis),* that is, a vertical line drawn along the outer edge of the muscle that straightens the spine, which corresponds to the ends of the transverse processes of the vertebrae.

Adjacent to the left ureter:

In front:

- descending part of the duodenum;
- parietal peritoneum of the right mesenteric sinus and right colon vessels *(a. et v. colica dextra);*
- root of mesentery and iliocolic vessels *(a. et v. ileocolica);*
- testicular (ovarian) vessels *(vasa testicularia (ovarica)).*

Laterally – ascending colon.

Medially – inferior vena cava.

Adjacent to the left ureter:

In front:

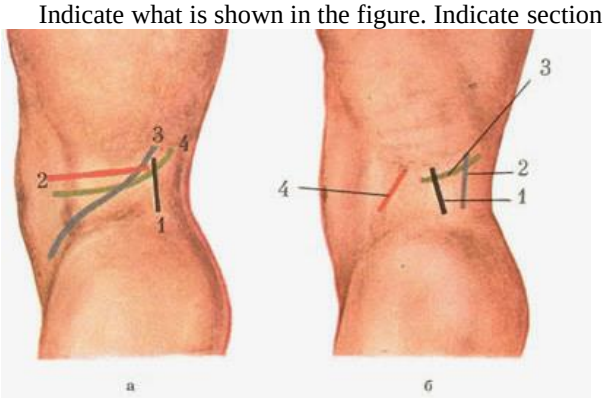
- parietal peritoneum of the left mesenteric sinus and left colon vessels *(a. et v. colica sinistra);*
- root of mesosigmoid , sigmoid and upper rectal vessels*(a. et v. sigmoidea et rectalis superior);*
- testicular (ovarian) vessels *(vasa testicularia (ovarica).*

Laterally – descending colon.

Medially - aorta.

V.Tasks for independent work:
Task №1.
List «weak spots» of the lumbar region.

Task№2.
Indicate what is shown in the figure. Indicate section types.



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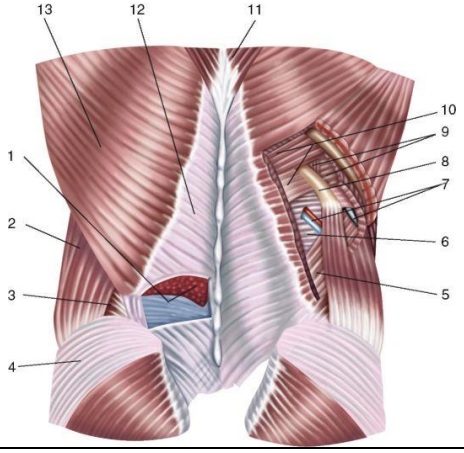
Task№3.
Indicate what is shown in the figure. Put the notation.



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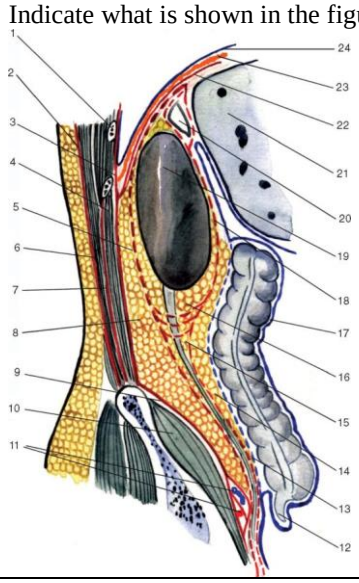
Task №4.
Indicate what is shown in the figure. Put the notation.



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Task №5.
Sketch the ureteral suture.

Task №7.
Make a task on the topic of the lesson. (In an exercise book)

Task №8.
Make 5 tests on the topic of the lesson. (In an exercise book)

VI. Control questions:
1. Projection and syntopy of the kidneys and ureters.
2. Floating kidney concept.
3. Layers of the kidney's membrane, it's filtration and urinary apparatus.
4. Blood supply and innervation of the kidney.
5. How to perform perirenal novocaine blockade of the kidneys.
6. Access to the kidneys and ureters.
7. How is a kidney resected and removed?
8. Kidney transplant concept.

VII. An example of a task:
№1. Patient K., 27 years old, after laparotomy and operative access to the omental bursa (through the gastrocolic ligament) revealed pancreatic necrosis of the body and tail, abscesses of the retroperitoneal space with the formation of a shutter in the lateral cell space. Explain the path of purulent drip in this patient. Indicate the possible spread of purulent drip with necrosis of the pancreatic head.

(Answer: In case of necrosis of the body and tail of the pancreas, pus flows along the left parietal space into the subperitoneal cavity (lateral cellular space) of the small pelvis; with head necrosis - to the cecum.)

№2. Patient M, 52 years old, for eliminate pain in chronic (recurrent pain) pancreatitis, a perinephral blockade is made according to A. V. Vishnevsky. What criteria indicates to the surgeon the position of the needle in the perinephric fiber? How does a solution of novocaine reach the nerve plexuses along the abdominal aorta? (Answer: When a needle enters the perihepatic cellulose from it, the reverse flow of the

novocaine solution ceases; the needle "breathes". The solution of novocaine on the fiber of the vascular "leg" of the kidney reaches the abdominal part of the aorta, where the celiac, superior mesenteric, renal, mesenteric and inferior mesenteric plexuses are located.)

№3. У Ш., 19 years Due to a blunt injury to the right lumbar region, there is damage to the kidney. The extent of kidney damage is unknown. When examining a patient, soreness during palpation and percussion, muscle tension and swelling of the right lumbar region, microhematuria are noted. Given the characteristic feature of kidney injury, the mismatch of the severity of their damage to clinical manifestations, it was decided to conduct an x-ray inspection . What research is most often used in patients with a closed kidney injury as an objective method of differential diagnosis?

(Answer:Excretory urography.)

VIII. Control tests:

The border between the lumbar region and the retroperitoneal space is: (1)
lumbar guadrate muscle
transverse muscle of abdomen
+ intra-abdominal fascia
Supraperitonial fascia

Perinephric fatty tissue is located around the kidney : (1)
Under the fibrous capsule of the kidney
+ between fibrous and fascial capsules on top of a fascial kidney capsule

The practical significance of the PTI triangle is being: (2)
+ the hernia exit site
+ the place of abscesses from retroperitoneal space
the place to access the organs of the retroperitoneal space
the place for punctures and blockades
pain point for differential diagnosis of abdomen's diseases

Ovarian artery is branch of` (1)
+ Abdominal aorta
Internal iliac artery
Uterine artery
Common iliac artery

Side of the Lesgaft-Grunfeld rhombus form: (4)
abdominal external oblique muscle
+ abdominal internal oblique muscle
transverse muscle of abdomen
+ extensor of the back (erector spinal)
+ 12-th rib
broadest muscle of back
+posterior dentate muscle

IX. GLOSSARY:

Retroperitoneal space	Spatium retro-peritoneale
Iliac crest	Crista iliaca
Kidney	Ren
Fibrous capsule	Capsula fibrosa
Adipose capsule	Capsula adiposa renis
Renal capsule	Capsula renalis externa
Cortical substance	Cortex renis
Medullary substance	Medulla renis
Ureter	Ureter
Right ureter	Ureter dexter
Left ureter	Ureter sinister
Renal fascia	Fascia renalis
Hilum of kidney	Hilus renalis
Renal plexus	Plexus renalis
Renal artery	Arteria ren(al)is
Renal impression	Impressio renalis
Renal sinus	Sinus renalis
Renal pelvis	Pelvis renalis

Topic: Topographic anatomy of the spine and spinal cord. Surgical interventions on the spine and spinal cord.

Motivational characteristic: knowledge of topographic anatomy of the spinal column and spinal cord will allow to foresee the ways of distribution of purulent processes and timely conduct surgical interventions. Knowledge of the ways of metastasis to the lymph nodes will allow timely diagnosis of the localization of malignant tumors of the studied area.

I. Purposes:

The student should know:	A student should be able to:	The student must own:
1. Topographic anatomy of the vertebral column and spinal cord - holotape, syntopia, sellotape, layered structure. 2. The concept of the spinal segment. 3. What is the spinal nerve. 4. Distinctive features of somatic and vegetative reflex arcs. 5. Methods of spinal anesthesia. 6. Determination of the degree of scoliosis by Chaklin 7. Differences between the vertebrae of each spine 8. The technique of performing basic surgical interventions on the spine and spinal cord at each stage: • Lumbar puncture * Operations for scoliosis * Spondylolysis surgery * Spondylolisthesis surgery * Operations for spinal hernias	1. To carry out examination and palpation of the spinal column. 2. To show on a model departments of a vertebral column. 3. Show on the dummy parts of the spinal cord. 4. To dissect a selected area. 5. Use special surgical instruments for spine and spinal cord operations at each stage. 6. To perform basic surgical intervention at each stage.	1. Skills of examination and palpation of the spine and spinal cord. 2. The technique of dissection of the selected area. 3. Skills of work with surgical instruments for operations on the spine and spinal cord. 4. Skills of surgical manipulations at each stage

II. Questions to test the initial level of knowledge:

1. Spine.
2. Spinal cord.
3. The difference of the 1st and 2nd vertebrae from typical vertebrae.
4. Membranes of the spinal cord.
5. Kyphosis.
6. Lordosis. Tools necessary for operations on the spine and spinal cord.
7. Types of spinal column injuries.
8. Types of spinal fractures.
9. Malformations of the spine and spinal cord
10. Classification of spinal hernias.

III. The object of study is the human body.

IV.Information part:

The vertebral column (columna vertebralis) is a complex anatomical and functional formation consisting of 33-34 vertebrae, of which 24 vertebrae in an adult are free (7 cervical, 12 thoracic, 5 lumbar), and the rest have fused with each other and formed the sacrum (5 sacral vertebrae) and the coccyx (4-5 coccygeal vertebrae). The human spine is a long curved column consisting of a number of vertebrae lying one above the other. The most typically the next their number of: cervical vertebrae (With-from Latin. servix-neck) - 7, thoracic (Th - from lat. Thorax-chest) - 12, lumbar (L - from lat. lumbalis-lumbar) - 5, sacral (S - from lat. sacralis-sacral) - 5, coccygeal (Co-from lat. sasodei - coccygeal) - 4. In a newborn child, the number of individual vertebrae is 33 or 34.

In an adult, the lower vertebrae fuse to form the sacrum and coccyx.

Vertebrae of different departments differ in shape and size. However, they all have common features. Each vertebra consists of a vertebra located in front of the body and behind the arc. The arch and body of the vertebra limit the wide vertebral opening. The vertebral openings of all vertebrae form a long vertebral canal, in which the spinal cord lies, reliably protected by the walls of the canal. At the vertebral column between the bodies of the vertebrae are intervertebral discs built of fibrous cartilage. From the arch of the vertebra, the processes depart, the unpaired spinous process is directed posteriorly. The apex of many spinous processes is easily palpable in humans along the midline of the back. To the sides of the vertebral arch depart transverse processes and two pairs of articular processes: upper and lower, with which the vertebrae are connected to each other. On the upper and lower edges of the arc near its departure from the body of the vertebra there is a notch. The lower notch of the overlying and upper notch of the underlying vertebrae form the intervertebral opening through which the spinal nerve passes. The number of cervical vertebrae in humans is seven. Human cervical vertebrae differ from others in their small size and the presence of a small rounded hole in each of the transverse processes.

The bodies of the cervical vertebrae are low, their shape is close to rectangular. The articular processes have a rounded smooth surface, the upper processes 9-spinous process it is turned posteriorly and upwards, the lower-forward and down. The length of the spinous processes increases from the II to the VII vertebra, their ends are forked (except for the VII vertebra, the spinous process of which is the longest).

The first and second cervical vertebrae articulate with the skull and bear its weight; the I cervical vertebra, or Atlas, has no process spinous, its remainder is a small posterior tubercle protruding on the posterior arch. The middle part of the body, separated from the Atlas, was attached to the body of the II vertebra, forming its tooth. The remains of the body are preserved-lateral masses, from which the posterior and anterior arches of the vertebra depart. On the latter there is an anterior tubercle. Atlas has no articular

processes. Instead, on the upper and lower surfaces of the lateral masses are articular pits. The upper ones serve for articulation with the skull, the lower ones - with the axial (second cervical) vertebra.

The second cervical vertebra is axial, rotational. When the head turns, the Atlantean, together with the skull, rotates around the tooth that distinguishes the second vertebra from the others. Laterally from the tooth on the upper side of the vertebra are two articular surfaces, facing up and sideways, articulating with the Atlas. On the lower surface of the axial vertebra there are lower articular processes facing forward and down. The spinous process is short, with a forked end.

The seventh cervical vertebra (protruding) has a long spinous process, which is palpable under the skin on the lower border of the neck.

The twelve thoracic vertebrae are connected to the ribs. This leaves an imprint on their structure. On the lateral surfaces of the bodies there are rib pits for articulation with the heads of the ribs. On the body I thoracic vertebra has a hole for the ribs and half of the fossa for the upper half of the head II ribs; on the body II of the vertebra the lower half of the pit for the second rib and floor - holes for III, etc. Thus, II and the underlying edge to X, inclusive, are attached to two adjacent vertebrae. To XI and XII vertebrae are attached only those ribs that correspond to them in the count. Their pits are located on the bodies of the eponymous vertebrae. On the thickened ends of the transverse processes of the ten upper thoracic vertebrae there are costal pits, with which the corresponding ribs articulate. There are no such pits on the transverse processes of the XI and XII thoracic vertebrae. The articular processes of the thoracic vertebrae are located almost in the frontal plane. The spinous processes are much longer than those of the cervical vertebrae. In the upper part of the thoracic Department they are directed more horizontally, in the middle and lower parts they fall almost vertically. The bodies of the thoracic vertebrae increase in the direction from top to bottom. The vertebral openings are rounded.

Five lumbar vertebrae are different from other major dimensions of the bodies, absence of the costal pits. The transverse processes are relatively thin. The articular processes lie almost in the sagittal plane. The vertebral openings are triangular in shape. High, massive, but short spinous processes are located almost horizontally. The structure of the lumbar vertebrae provides greater mobility of this part of the spine.

Five sacral vertebrae in an adult, fusing, form the sacrum, which in a child still consists of five separate vertebrae. The process of ossification of cartilaginous intervertebral discs between the sacral vertebrae begins at the age of 13-15 years and ends by 25 years. In a newborn child, the posterior wall of the sacral canal and the arch of the V lumbar vertebra are still cartilaginous. The fusion of the halves of the bone arches of the II and III sacral vertebrae begins from 3-4 years, III-IV - in 4-5 years.

The anterior surface of the sacrum is concave, it distinguishes the middle part formed by bodies, the boundaries between which are clearly visible due to transverse lines. Two rows of round pelvic sacral openings (four on each side) separate the middle part from the lateral. The posterior surface of the sacrum is convex, it has five longitudinal ridges formed by the merger of the processes of the sacral vertebrae: the median ridge-spinous, right and left intermediate-articular processes and lateral-transverse processes of the vertebrae. Inside the lateral ridges are four pairs of dorsal sacral openings communicating with the sacral canal, which is the lower part of the spinal canal. On the lateral parts of the sacrum are ear-shaped surfaces for articulation with the pelvic bones. At the level of the auricular surfaces, the sacral tuberosity is located behind, to which the ligaments are attached.In the sacral canal are the terminal thread of the spinal cord and the roots of the lumbar and sacral spinal nerves. Through the pelvic (anterior) sacral openings pass the anterior branches of the sacral nerves and blood vessels; through the dorsal sacral openings pass the posterior branches of the same nerves.

The coccyx is formed by 1 to 5 (usually 4) fused coccygeal vertebrae. The coccygeal vertebrae fuse at the age of 12 to 25 years, and this process goes in the direction from the bottom up.

The spinal cord (medulla spinalis) is enclosed within the spinal canal (canalis vertebralis). The spinal cord at the top is connected directly with the medulla oblongata, at the bottom ends with a short cerebral cone (conus medullaris), passing into the terminal thread (filum terminale).

The spinal cord is divided into four parts: cervical (pars cervicalis), thoracic (pars thoracica), lumbar (pars lumbalis), and sacral (pars sacralis).

Membranes of the spinal cord

✓ The soft membrane of the spinal cord (pia mater spinalis) tightly covers the substance of the brain, contains many vessels.

The arachnoid membrane of the spinal cord (arachnoiclea spinalis) is thin, with fewer vessels.

✓ Dura mater spinalis (Dura mater spinalis) is a dense connective tissue plate covering the web membrane.

In the spinal cord there are the following interbranch spaces:

The epidural space (cavum epidurale) is located between the Dura mater of the spinal cord and the periosteum of the vertebrae, contains connective tissue and venous plexuses.

✓ Subdural space (spatium subdurale) - slit-like space between the Dura and arachnoid membranes of the spinal cord.

✓ The subarachnoid space (cavum subarachnoidealis) is located between the arachnoid and soft membranes of the spinal cord, filled with cerebrospinal fluid.

The centrally located grey matter is subdivided into anterior and posterior horns; its middle section is called the grey spike (comissura grisea).

White matter contains bundles of conductive pathways. In the front ropes there are descending paths, in the side-ascending and descending, in the rear - ascending conducting paths.

❖ The anterior cord.

✓ The axillary-spinal pathway (tractus tectospinalis) is directly adjacent to the anterior median fissure (fissura mediana anterior).

The anterior cortical-spinal (pyramidal) pathway (tractus corticospinalis (pyramidalis) ventralis (anterior)) is located in the anterior medial divisions of the anterior cord, adjacent to the axillary-spinal pathway.

The reticular-spinal pathway (tractus reticulospinalis) is located in the Central part of the anterior cord laterally to the anterior cortical-spinal pathway.

The anterior spinothalamic pathway (tractus spinothalamics ventralis (anterior)) is slightly anterior to the reticular-spinal pathway.

✓ A posterior longitudinal tuft (fasciculus longitudinalis dorsalis (posterior)) is located between the anterior pyramidal pathway and the anterior grey spike.

✓ The vestibular-spinal pathway (tractus vestibulospinalis) is located on the border of the anterior and lateral ropes.

❖ The lateral cord.

✓ The posterior cerebrospinal pathway (tractus spinocerebellaris dorsalis (posterior)) - a bundle of Flexig-occupies the posterior parts of the lateral cord.

The anterior cerebrospinal pathway (tractus spinocerebellaris ventralis (anterior)) - a bundle of Govers-occupies the anterolateral sections of the lateral cord.

✓ Lateral spinothalamic pathway (tractus spinothalamics lateralis).

✓ Lateral cortical-spinal (pyramidal) pathway (tracts corticospinalis (pyramidalis) lateralis).

✓ Krasnodare-spinal path (tractus rubrospinalis).

✓ Other bundles - dorsal, olivospinal, etc.

Rear rope.

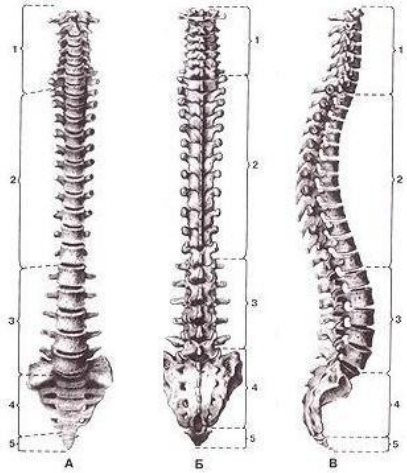
✓ Thin beam (fasciculusgracilis) - Gaulle beam.

✓ Wedge-shaped bundle (fasciculus cuneats) - Burdach bundle.

V. Tasks for independent work:

Task №1.

Specify what is shown in the figure. Specify the departments of the spinal column:



	A	B	C
11			
22			
33			
44			

Task №2.

Name the types of vertebral fractures.

*Depending on the location of the fractures:

* Depending on the extent of spinal cord injury:

* Depending on the number of damaged vertebrae:

* Depending on changes in the stability of the spine after a fracture:

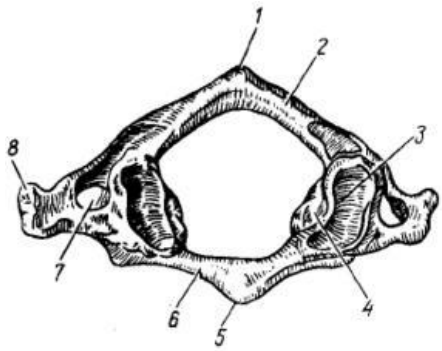
* Depending on the nature of the fracture, there are:

Compression fractures in turn can be:

✓Проникающие компрессионные переломы, у которых компрессия сопровождается переломом краниальной замыкательной пластинки и патологией краниального диска. При таких травмах происходит вторичное смещение тела позвонка, увеличение клиновидной деформации и увеличение кифоза. Для лечения применяют оперативное вмешательство по типу частичной или костно-пластической резекции сдавленного тела позвонка для исправления деформации позвоночника и надежной фиксацией поврежденного отдела

✓Непроникающие компрессионные переломы, у которых компрессия не сопровождается переломами замыкательных пластинок и повреждением смежных дисков. При таких повреждениях процесс регенерации тела позвонка протекает достаточно хорошо благодаря надежной фиксации стяжкой поврежденного позвонка

Task №3.
Specify what is shown in the figure. Identify the vertebra. Specify education.



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2 –	6 -
3 –	7 -
4 –	8 -

Task 4.
Specify what is shown in the figure. What are the puncture needle:

А -

Б -

Task №5.
Make a task on the topic of the lesson. (In a notebook)

Task №6
Make 5 tests on the topic of the lesson. (In a notebook)

VI. Control question:
1. Structure of the spinal column.
2. the structure of the spinal cord.
3. Physiological curves of the vertebral column.

4. methods of spinal anesthesia.
5. Distinctive features of somatic and autonomic reflex arcs.
6. Lumbar puncture.

VII. An example of a task:

№ 1. Patient E, 34, was hospitalized with a head injury. To clarify the diagnosis, a lumbar puncture is indicated. Name the location of the lumbar puncture.

(Answer: Given the fact that the spinal cord ends at level II of the lumbar vertebra, the insertion of a puncture needle with minimal risk of injury to the spinal cord substance is performed below this level between the III and IV lumbar vertebrae.)

№ 2. Patient Wu, 19 years old, suffered a spinal injury during a ski jump, which resulted in complete paralysis of the upper and lower limbs. What part of the spine and spinal cord was injured?

(Answer: Muscles of upper limb receive innervation from the lower cervical segments of the spinal cord and lower limbs from lumbar and sacral, so when damage to the cervical spinal cord results in paralysis of both extremities, and, for example, breast - only the bottom.)

№ 3. Patient H, 45 years old, has a lumbar puncture. There is blood in the punctate. What is the possible cause of blood in the punctate.

(Answer: blood Impurity in the cerebrospinal fluid is most typical for subarachnoid hemorrhage.)

VIII. Control tests:

Where is the compression of the spinal roots in "lumbar radiculitis"? (1)
in the feeding holes of the lumbar vertebrae.
+ in the intervertebral openings of the lumbar spine.
in the spinal canal.
in the holes of the transverse processes of the cervical vertebrae.
in the structures of cerebral substances of lumbar segments of the spinal cord.

Which part of the spine and spinal cord is most often injured in complete paralysis of the upper and lower limbs? (1)
the sacral region
thoracal department.
lumbar department.
+ cervical department.
lumbar and sacral.

Select indications for laminectomy: (2)
violation of the patency of the sub-web space.
symptom of the anterior spinal artery.
symptom of the posterior spinal artery.
+ violation of the patency of the epidural space.
+ irritation and compression of spinal cord roots.

How many rows of stitches are applied at the end of laminectomy? (1)
One
Two
+ Three
Four
Five

What are the most common treatments for spinal injuries? (1)
fixation.
aminectomy.
removal of the vertebra.
resection of the vertebral body.
+ combined method.

IX. Glossary:

Spine	Columna vertebra/is
Spinal cord	Medulla spinalis
Soft shell of the spinal cord	Pia mater spinalis
The arachnoid membrane of the spinal cord	Arach-noiclea spinalis
Dura mater of the spinal cord	Dura mater spinalis
Epidural space	Cavum epidurale
Subdural space	Spatium subdurale
Subarachnoid space	Cavum subarach-noidealis
The axillary-spinal pathway	Tractus tectospinalis
Anterior cortical-spinal (pyramidal) pathway	Tractus corticospinalis (pyra-midalis) ventralis (anterior)
The reticular-spinal pathway	Tractus reticulospinalis
Anterior spinothalamic pathway	Tractus spinothalamics ventralis (anterior)
Posterior longitudinal beam	Fasciculus longitudinalis dorsalis (posterior)

Vestibular-spinal pathway	Tractus vestibulospinalis
Rear cerebro-cerebellar path	Tractus spinocerebellaris dorsalis (posterior)
Front cerebro-cerebellar path	Tractus spinocerebellaris ventralis (anterior)
Lateral spinothalamic pathway	Tractus spinothalamics lateralis
Lateral cortical-spinal (pyramidal) pathway	Tracts corticospinalis (pyramidalis) lateralis
The red-nuclear spinal pathway	Tractus rubrospinalis
A thin beam - beam gaulle	Fasciculusgracilis
Wedge the beam - beam burdah	Fasciculus cuneats

Topic: Topographic anatomy of the trunk: Topographic anatomy of the pelvis and perineum. Surgical interventions on the pelvic and perineal organs.

Motivational characteristic: knowledge of the topography of organs and spaces of the pelvis will allow to foresee the ways of distribution of purulent processes and timely conduct surgical interventions. Knowledge of the ways of metastasis to the lymph nodes will allow timely diagnosis of the localization of malignant tumors of the studied area.

I. Purposes

The student should know:	A student should be able to:	The student must own:
a. Topographical anatomy of small pelvis and perineum - holotape, syntopia, sellotape, layered structure. b. The differences of the male pelvis from the female. c. The technique of determining the size of the pelvis. d. The technique of performing basic surgical interventions on the pelvic organs and perineum at each stage: e. • Novocaine blockade •Drainage of phlegmon of the pelvis •Operations on urinary bladder * Prostate surgery •Operations on the testicle and spermatic cord •Operations on the penis * Puncture of the abdominal cavity through the posterior vault of the vagina * Operations on the uterus and appendages •Operations on the rectum.	1. To distinguish the male pelvis from the female. 2. Inspect and palpate the perineum. 3. To dissect a selected area. 4. Show on the drug and name the organs and formations of the pelvis and perineum. 5. Use special surgical instruments for operations on the organs of intervention on the pelvic organs and perineum at each stage. 6. To perform basic surgical intervention at each stage.	1. Skills of examination and palpation of the pelvis and perineum. 2. The technique of dissection of the selected area. 3. Skills of work with surgical instruments for operations on the pelvic organs and perineum. 4. Skills of surgical manipulations at each stage.

II. Questions to test the initial level of knowledge:

1. External landmarks of the pelvis.
2. Bones and ligaments of the pelvis.
3. The size of the pelvis. The difference between male and female pelvis.
4. Urgent (urgent) operations performed on the pelvic organs.
5. Suprapubic cystostomy. Concept.
6. Tubal pregnancy. Concept.
7. Prostate adenoma. Concept.

III. The object of study is the human body.

IV. Information part:

Pelvis (pelvis) - part of the human body, located between the abdomen and lower limbs and limited outside the pelvic bones, sacrum, coccyx, and below-the perineum (perineum).

Pelvic walls

The osseous-ligamentous apparatus and the parietal muscles forming the anterior, posterior and lateral walls of the pelvis are covered in front by the muscles belonging to the anterior region of the thigh; the soft tissues of the gluteal region covering the skeleton of the pelvis behind and from the sides also belong to the lower limb. The only external wall of the pelvis is represented by the perineum.

The skeleton of the pelvis is represented by four bones: two pelvic (ossa coxae), the sacrum (os sacrum) and the coccyx (os coccygis).

The large pelvis is laterally bounded by the wings of the iliac bones (ala ossis) and forms the lower wall of the abdominal cavity

The pelvis is bounded in front by the pubic symphysis, behind by the sacrum, and laterally by the pelvic bones. The bone walls of the pelvis have defects

External landmarks

Protrusions on the bones forming the skeleton of the pelvis serve as good landmarks. The following formations can be easily palpated:

- ❖ The iliac crest (crista iliaca).
- ❖ The anterior superior iliac spine (spina iliaca anterior superior).
- ❖ Pubic tubercle (tuberculum pubicum).
- ❖ Pubic symphysis (symphysis pubica).
- ❖ The dorsal surface (fades dorsalis) of the sacrum (os sacrum).

❖ The coccyx (os coccygis).

❖ Ischial tuberosity (tuber ischiadicum).

❖ Greater trochanter of the femur (trochanter major ossisfemoralis).

Под subpubic angle (angulus subpubicus); palpated in men behind the root of the scrotum.

In addition, the following formations can be palpated in women during vaginal examination:

❖ Pubic arch (arcus pubis).

Мы Cape (promontorium) - in the upper part of the pelvic surface of the sacrum (fades pelvica).

Sex differences of the pelvic skeleton

The adult skeleton structure of the pelvis the sex differences are clearly seen).

➢ The wings of the iliac bones in women are more horizontal, so the pelvis of women is wider and lower than in men.

➢ The lower branches of the pubic bones in women are located at an obtuse angle and form a pubic arc (arcus pubis), in men they are located at an acute angle and form a sub-pubic angle (angulus subpubicus).

➢ In women, the upper aperture of the pelvis is rounded, in men-in the form of a "card heart", as the Cape protrudes more forward.

➢ The pelvic cavity in women has the shape of a curved cylinder, since the size of the upper and lower apertures of the pelvis differ little. In men, the pelvic cavity has the shape of a curved cone, since the size of the lower aperture of the pelvis is noticeably smaller than the size of the upper aperture.

➢ Pelvic tilt (inclinatio pelvis) - the angle between the horizontal plane and the plane of the upper aperture of the pelvis-in women is 55-60°, in men-50-55°.

Апертура таза	Размеры, см					
	прямой		поперечный		косой	
	Ж	М	Ж	М	Ж	М
Верхняя	11,0	10,5	13,5	12,5	13,0	12,0
Нижняя	9,5	7,5	11,0	8,0	—	—

V. Tasks for independent work:

Task №1.

Specify the cellular space of the pelvis with possible options for the spread of purulent processes from them to other areas.

Task№ 2.

List the floors of the pelvis: boundaries. Specify located in each floor organs and neurovascular bundles.

Task №3.

Define the following concepts:

crotch -

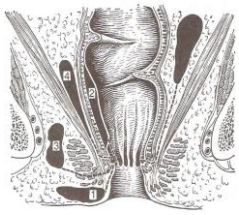
obstetric perineum -

pelvic floor -

urogenital diaphragm

Task №4

Specify which types of paraproctites are shown in the figure. What is the topographic and anatomical justification of the direction of cuts in paraproctitis?



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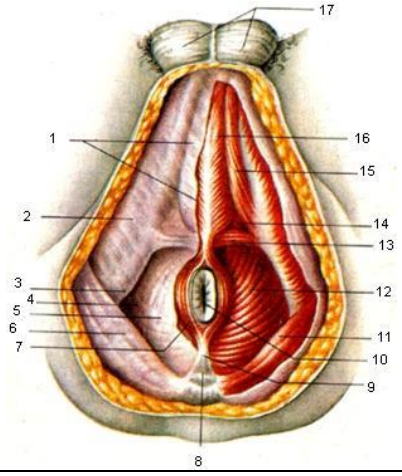
Task №5

Specify what is shown in the figure. Arrange the symbols



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2 –	11 –
3 –	12 –
4 –	13 –
5 –	14 –
6 –	15 –
7 –	16 –
8 –	17 -
9 –	

Task №6.

Make a task on the topic of the lesson. (In a notebook)

Task 7

Make 5 tests on the topic of the lesson. (In a notebook)

VI. Control question:

1. The floor of the pelvis.
2.Course of the peritoneum in the upper floor.
3. Ligaments, muscles, cellular
4. II floor spaces and their connection with neighboring areas
5. Topography, syntopia, blood supply, innervation and lymph flow of pelvic organs.
6. Topography and cellular spaces of the III floor (male and female perineum.
7. Puncture of the abdominal cavity through the posterior vault of the vagina. Indications. Technique.
8. Fascia and cellular spaces of the pelvis.
9. Operations in ectopic pregnancy. Types, indications, technique
10. Topographic anatomy of the rectum. Blood supply, innervation, lymph flow.
11. Dropsy of the testicle (hydrocele). Surgical treatment. Indications. Operations Winkelmann, Bergman. Technique.
12. Topographic anatomy of the bladder. Blood supply, innervation, lymph flow.
13. Varicocele. Surgical treatment. Views. Operations Ivanissevich, Palomo. Indications. Technique.
14. Topographic anatomy of the uterus, its appendages, fallopian tube. Ovary. Blood supply, innervation, lymph flow.

VII. An example of a task:

№1. K., 26 years old, fractured pubic bone with extraperitoneal damage to the bladder wall. What principles should be the basis of surgical treatment of wounds in this situation?

(Answer: 1) suture the wound of the bladder (if possible) with a double-row suture without capturing the mucous membrane; 2) ensure the removal of urine from the bladder (cystostomy); 3) provide drainage (pubic-femoral or pubic-perineal drainage technique) zalobkovogo (predpuzyrnogo) space.)

№2. The first stage of surgical intervention in paraproctitis is the opening and drainage of the amniotic ulcer by radial or semilunar incision. Which form of paraproctitis is used a radial incision in the semilunar valves? Explain the essence of the second stage of surgical intervention in paraproctitis.

(Answer: radial-in the submucosal form of paraproctitis, when the fistula is located inside the sphincter (when dissecting the fistula, the fibers of the sphincter of the anus are not injured); semilunar-in subcutaneous, sciatic-rectal, pelvic - rectal, posterior-rectal forms. The essence of the second stage of the operation in paraproctitis is the elimination of the internal opening (fistula) of the abscess located in the rectum.)

№3. Patient M., 53 years old, for cancer of the rectum, abdominal-perineal extirpation is performed. During the operation, the surgeon encountered difficulties in mobilizing the anterior wall of the rectum. What feature of the structure of the fascial capsule of the rectum explains the difficulties of separating the anterior wall of this organ from the vagina?

(Answer: the Fascial capsule (amuss capsule) is formed by the fascia of the rectum. In the formation of the anterior part of this capsule, the rectal-vaginal septum (peritoneal-perineal fascia or aponeurosis Denonvillier - E. G. Salishchev) is involved, which is common to the posterior vaginal wall and the anterior wall of the rectum (dividing and) connecting the walls of these organs.)

VIII. Control tests:

The ovarian artery is a branch of (1)
+ abdominal aorta
internal iliac artery
uterine artery
common iliac artery

In tubal pregnancy, rupture of the fallopian tube is accompanied by blood accumulation in: (1)
lateral cellular space of the pelvis
perinatal cellular space
+ rectum-uterine depression
bladder-uterine depression

The testicular artery is a branch of: (1)
+ abdominal aorta
internal iliac artery
the obturator artery
external iliac artery
common iliac artery

Finger rectal examination in men is carried out to determine the condition, primarily: (1)
bladder
ureters'
+ prostate
anterior sacral lymph nodes

The main cellular spaces of the pelvic cavity are within the pelvic floor: (1)
peritoneal
+ underperitoneal
subcutaneous

IX. Glossary:

Pelvis	Pelvis
Iliac crest	Crista iliaca
The upper anterior superior iliac spine.	Spina iliaca anterior superior
Pubic tubercle	Tuberculum pubicum
Pubic symphysis	Symphysis pubica
The dorsal surface of the sacrum	Fades dorsalis os sacrum
Coccyx	Os coccygis
Ischial tuberosity	Tuber ischiadicum
Greater trochanter of the femur	Trochanter major ossisfemoralis
Underpubic angle	Angulus subpubicus
Pubic arch	Arcus pubis
Cape	Promontorium
The tilt of the pelvis	Inclinatio pelvis
Crotch	Perineum

1. **MODULAR LESSON**

«TOPOGRAPHIC ANATOMY AND OPERATIVE SURGERY OF THE TRUNK (ABDOMINAL WALL, ABDOMINAL CAVITY, LUMBAR REGION AND RETROPERITONEAL SPACE, SPINE AND SPINAL CORD, PELVIS AND PERINEUM) »

QUESTIONS FOR THE MODULAR LESSON

1. Herniotomy. The basic principles of hernia.
2. Plastic hernia gate with oblique inguinal hernias. Types, differences between them, their advantages and disadvantages.
3. Plastic hernia gate with direct inguinal hernias. Types, differences between them, their advantages and disadvantages.
4. Hernia treatment with strangulated and sliding hernias. Peculiar properties. Stages. Possible complication.
5. Hernia repair with femoral hernias. Views. Difference between them. Possible complication.
6. Hernia repair with umbilical hernias. Views. Technique. Their comparative topographic and anatomical assessment.
7. Hernia repair in congenital inguinal hernia. Peculiar properties. Technique.
8. Anterior abdominal wall boundaries of the division in the region. Layer-by-layer topography, blood supply and innervation.
9. Folds and pits of the posterior surface of the anterior abdominal wall. Their anatomical and practical significance.
10. Topographic anatomy of weak spots of the anterior abdominal wall: white line, navel, inguinal canal.
11. Topographic anatomy of the femoral ring and femoral canal.
12. Hernias of the anterior abdominal wall. The constituent elements of hernias. Classification of hernias.
13. Strangulated and sliding hernias. Types of strangulated and sliding hernias.
14. Surgical anatomy of inguinal hernias. Their types and differences between them.
15. Laparotomy. The requirements for laparotomy. Views. Indications, advantages and disadvantages.
16. General principles of surgical treatment of rectal cancer. Palliative and radical surgery. Indications. Views.
17. The principles of revision of the abdominal cavity.
18. Bags of the upper floor of the abdominal cavity. Channels, sinuses and depressions of the lower floor of the abdominal cavity.
19. Intestinal suture. Classification. Types, advantages and disadvantages.
20. Topographic anatomy of the stomach. Blood supply, innervation, blood and lymph flow.
21. Gastrostomy. Indications, types, technique.
22. Topographic anatomy of the liver. Blood supply, innervation, blood and lymph flow.
23. Gastroenterostomy. Indications. Views. Advantages and disadvantages.
24. Extrahepatic biliary tract. Blood supply, innervation, blood and lymph flow.
25. Suturing of perforated gastric ulcer. Views. Technique.
26. Topographic anatomy of the pancreas. Blood supply, innervation, blood and lymph flow.
27. Gastric resection. Indications. Classification. Resection by Billroth 1 and Billroth 2
28. Topographic anatomy of the spleen. Blood supply, innervation, blood and lymph flow.
29. Pyloroplasty. Views. Indications. Technique.
30. Topographic anatomy of the duodenum. Blood supply, innervation, blood and lymph flow.
31. Resection of the small intestine. Types of intestinal anastomosis. Indications. Advantages and disadvantages.
32. Topographic anatomy of the jejunum and ileum. Blood supply, innervation, blood and lymph flow.
33. Appendectomy. Indications, types, technique.
34. Topographic anatomy of the colon (blind, colon). Blood supply, innervation, blood and lymph flow. Features of blood supply to the colon.
35. Resection of the colon. Indications. Views.
36. Layer-by-layer topography of lumbar region. Lumbar triangle, Lesgaft-Grunfeld rhombus. Blood supply and innervation of the lumbar region.
37. Colostomy. Indications. Views. Technique.
38. Layer-by-layer topography of the retroperitoneal space.
39. Cholecystostomy. Indications. Technique.
40. Topographic anatomy of the kidneys. Blood supply, innervation, blood and lymph flow.
41. Cholecystectomy. Indications. Views. Technique.
42. Topographic anatomy of the adrenal gland. Blood supply, innervation, blood and lymph flow.
43. Paranephral blockade. Indications. Technique.
44. Topographic anatomy of the ureters. Blood supply, innervation, blood and lymph flow.
45. Surgical accesses to the organs of retroperitoneal space. Nephrostomy. Indications. Technique.
46. Blood and lymphatic vessels of the retroperitoneal space.
47. Nephrectomy. Indications, technique.
48. The nerves of the retroperitoneal space.
49. Nephroptosis. Operations for nephroptosis. Indications. Views. Technique.
50. Pelvis. Boundaries, external landmarks. Skeleton, ligaments and joints of the pelvis.
51. Novocaine blockade of the spermatic cord and the round ligament of the uterus. Intra-phase novocaine blockade on Shkolnikov-Selivanov. Indications. Technique.
52. The muscles of the pelvis. The muscles of the pelvic floor. Muscles of the urogenital diaphragm.
53. Drainage of the pre-bubble cellular space by Buyalsky-mcwhorter. Indications. Technique.
54. Vessels of the pelvis. Innervation of the pelvis.
55. Cystostomy. Indications. Technique.
56. The cavity of the pelvis. Floors of the pelvic cavity. Course of the peritoneum.
57. Puncture of the abdominal cavity through the posterior vault of the vagina. Indications. Technique.
58. Fascia and cellular spaces of the pelvis.

59. Operations in ectopic pregnancy. Types, indications, technique.
60. Topographic anatomy of the rectum. Blood supply, innervation, lymph flow.
61. Dropsy of the testicle (hydrocele). Surgical treatment. Indications. Operations Winkelmann, Bergman. Technique.
62. Topographic anatomy of the bladder. Blood supply, innervation, lymph flow.
63. Varicocele. Surgical treatment. Views. Operations Ivanissevich, Palomo. Indications. Technique.
64. Topographic anatomy of the uterus, its appendages, fallopian tube. Ovary. Blood supply, innervation, lymph flow.
65. Peritoneum. Peritoneal cavity.
66. Topographic anatomy of the spine and spinal cord.
67. Lumbar puncture.
68. Laminectomy.

A STUDENT IS NOT ALLOWED TO PARTICIPATE IN A MODULAR LESSON:

1. With unprocessed passes
2. With outstanding independent work

MODULAR LESSON
QUESTIONS TO THE MODULE ON PRACTICAL SKILLS

1. Puncture of the pleural cavity.
2. Intercostal nerve block.
3. Suturing penetrating wounds of the chest cavity (open pneumothorax).
4. Subperiosteal resection of the ribs.
5. Treatment of superficial mastitis.
6. Treatment of intramammary mastitis.
7. Treatment retromammary mastitis.
8. Radical mastectomy by Halsted-Meyer.
9. Thoracotomy anterior-lateral.
10. Thoracotomy posterior-lateral.
11. The thoracotomy side.
12. Right-sided pulmonectomy for inflammatory diseases / cancer.
13. Left-sided pulmonectomy for inflammatory diseases / cancer.
14. Pericardiocentesis.
15. Suturing wounds of the heart.
20. Laparocentesis.
21. Median laparotomy and revision of the upper and lower floors of the abdominal cavity.
22. Transrectal laparotomy.
23. Pararectal laparotomy.
24. Herniation in oblique inguinal hernias. Plastic surgery of the anterior wall of the inguinal canal by Martynov.
25. Herniation in oblique inguinal hernias. Plastic anterior wall of the inguinal canal according to Girard-Spasokukotsky.
26. Herniation in oblique inguinal hernias. Plastic surgery of the inguinal canal by Kimbarovsky.
27. Hernia repair for direct inguinal hernias. Plastic surgery of the posterior wall of the inguinal canal by Bassini.
28. Hernia repair for direct inguinal hernias. Plastic surgery of the posterior wall of the inguinal canal by Kukudzhanov.
29. Hernia repair with umbilical hernias. Plastic surgery of the anterior abdominal wall by Lexer.
30. Hernia repair with umbilical hernias. Plastic anterior abdominal wall on Sapezhko.
31. Hernia repair with umbilical hernias. Plastic surgery of the anterior abdominal wall by Mayo.
32. Hernia repair femoral hernias in the inguinal way.
33. Herniation in femoral hernias femoral way.
34. Gastrostomy by Witzel.
35. Gastrostomy by Strain-Kader.
36. Gastrostomy by Toprover.
37. Suturing of wounds and perforated ulcers of the stomach or 12-duodenum.
38. Access to the retroperitoneal part of the 12-duodenum and pancreas (according to Kocher).
39. Cholecystectomy from the bottom.
40. Cholecystectomy from the neck.
41. Suturing wounds of the small intestine and colon.
42. Small intestine resection with end-to-end anastomosis.
43. Resection of the small intestine with the imposition of anastomosis "side-side".
44. Meckel diverticulum resection.
45. Appendectomy.
46. The imposition of a double-barreled artificial anus (surgery Midle).
47. Method of temporary hemostasis (the Pringle maneuver) in wounds of the liver.
48. Hemostatic sutures of the liver Kuznetsov-Pensky, Opel.
49. Paranephral novocaine blockade by A. V. Vishnevsky.
50. Access to retroperitoneal space by Fedorov.
51. Access to retroperitoneal space by Bergman-Israel.
52. Access to the retroperitoneal space by Simon.
53. Access to the retroperitoneal space by Pean.
54. Nephrectomy.
55. Nephropexy.
56. Resection and suture of the ureter.
57. Puncture of the bladder.
58. High cross-section of the bladder (cystostomy).
59. Suturing wounds of the bladder.
60. Surgical treatment of testicular dropsy. Operation Winkleman.
61. Surgical treatment of testicular dropsy. Operation Bergman.
62. Surgical treatment of varicocele. Operation Ivanissevich.
63. Surgical treatment of varicocele. Operation Palomo.
64. Puncture of the abdominal cavity through the posterior vault of the vagina.
65. Lumbar puncture.

Literature:

1. Topographic anatomy and operative surgery: textbook. In 2 T. Sergienko V. I., Petrosyan E. A., Frauchi I. V. M.: GEOTAR-Media, 2010.
2. Topographic anatomy and operative surgery: textbook Sergienko V. I.; Petrosyan E. AM: GEOTAR-Media, 2013.
3. Workshop on operative surgery: studies. Manual Lopukhin Yu. M., Vladimirov