# MODUL 3

## TASK №1.

## Systemic (greater) and pulmonary (lesser) circulation. The Heart: topography of the heart, chambers and valves of the heart.

1. **During the percussion of the patient's chest the doctor examines the boundary of the heart. Where is the apex of the heart felt?** (Vinnitsa)
   A. The apex beat may be felt in the fifth intercostal space on the left midclavical line.
   B. The apex beat may be felt in the sixth intercostal space 1,5 cm from the left midclavical line toward the midline.
   * C. The apex beat may be felt in the fifth intercostal space 1,5 cm from the left midclavical line toward the midline.
   D. The apex beat may be felt in the fifth intercostal space 2 cm from the left midclavical line toward the midline.
   E. The apex beat may be felt in the fifth intercostal space 1,5 cm lateraly from the left midclavical line.

2. **During the percussion of the patient's chest the doctor examines the boundary of the heart. Where does the superior border of the cardiac projection pass?** (Vinnitsa)
   A. The superior border of the cardiac projection passes on a level with the superior margin of the second costal cartilages.
   *B. The superior border of the cardiac projection passes on a level with the superior margin of the third costal cartilages.
   C. The superior border of the cardiac projection passes on a level with the second intercostal space.
   D. The superior border of the cardiac projection passes on a level with the third intercostal space.
   E. The superior border of the cardiac projection passes on a level with the first intercostal space.

3. **Stenosis of the aortic orifice as well as shift of the heart boundary to the left were revealed in the patient. Where does the left heart boundary pass in norm?** (Vinnitsa)
   * A. The left border passes from the cartilage of the third left rib to the heart apex
   B. The left border passes from the cartilage of the second left rib to the heart apex.
   C. The left border passes from the cartilage of the third left rib to the cartilage of the fifth left rib.
   D. The left border passes from the cartilage of the third left rib to the sixth intercostal space.
   E. The left border passes from the third left intercostal space to the heart apex

4. **Stenosis of the pulmonary trunk orifice as well as shift of the heart boundary to the right were revealed in the patient. Where does the right heart boundary pass in norm?** (Vinnitsa)
   A. The right border of the heart passes 3 cm to the right of the right sternal border between the third and fifth ribs.
   *B. The right border of the heart passes 2 cm to the right of the right sternal border

between the third and fifth ribs.
C. The right border of the heart passes 1 cm to the right of the right sternal border between the third and fifth ribs.
D. The right border of the heart passes 2 cm to the right of the right sternal border between the second and fifth ribs.
E. The right border of the heart passes 1 cm to the right of the right sternal border between the second and fifth ribs.

**5. During the percussion of the patient's chest the doctor examines the boundary of the heart. Where does the inferior heart boundary pass in norm?** (Vinnitsa)
A. The inferior border stretches transversely from the cartilage of the sixth right rib to the heart apex.
* B. The inferior border stretches transversely from the cartilage of the fifth right rib to the heart apex.
C. The inferior border stretches transversely from the cartilage of the fifth right rib to the sixth left rib.
D. The inferior border stretches transversely from the cartilage of the fourth right rib to the heart apex.
E. The inferior border stretches transversely from the cartilage of the fifth right rib to the fifth left rib.

**6. A patient with thrombophlebitis of lower extremities had got chest pain, blood spitting, growing respiratory failure that caused his death. Autopsy revealed multiply pulmonary infarctions. What is the most probable reason of their development?** (2006)
A. Pulmonary artery thrombosis
B. Bronchial artery embolism
C. Pulmonary venous thrombosis
* D. Pulmonary artery embolism
E. Bronchial artery thrombosis

**7. Contraction of a great vessel reduced blood derivation from the left ventricle. Which vessel has undergone pathological changes?** (Kiev)
A. Pulmonary vein
B. Pulmonary trunk
*C. Aorta
D. Superior vena cava
E. Inferior vena cava

**8. Blood pressure rise in aorta increased the load of the cardiac muscle. The muscular wall of which region of the heart reacts to irritation?** (Kiev)+
* A. Left ventricle
B. Left atrium
C. Right ventricle
D. Right atrium
E. Venous sinus

**9. Blood pressure rise in a great vessel which carries blood to lungs increased the load of the cardiac muscle. The muscular wall of which region of the heart reacts to irritation?** (Kiev)
*A. Right ventricle
B. Left ventricle
C. Right atrium

D. Left atrium.
E. Venous sinus.

**10. Usually, if a patient has essential hypertension, his left cardiac border is shifted to the left. Due to which chambers of heart or vessels does it happen?** (Kiev)

A.Left atrium
*B. Left ventricle
C. Left ventricle and left atrium
D .Arch of aorta
E. Pulmonary trunk

**11. During the ultrasonic examination of the heart a doctor observes semilunar cusps. What happens to them at diastole (relaxation) of ventricles?** (Kiev)

*A. Interlock, closing the lumen of vessels.
B.Turn out into the lumen of vessels.
C.Turn out into the lumen of ventricles.
D. Press to the vessels walls.
E. Press to the ventricle walls.

**12. A patient has significant enlargement of the left atrium, enlarged liver. Which structure of heart is damaged?** (Kiev)

*A. Valva tricuspidalis.
B. Valva aortae.
C. Valva bicuspidalis.
D.Valva trunci pulmonalis.
E. Auricula sinistra.

**13. A 27-year-old cardiac patient with an irregular heartbeat visited her doctor's office for examination. Where should the physician place the stethoscope to listen to the sound of the mitral valve? +**

A. Over the medial end of the second left intercostal space
B. Over the medial end of the second right intercostal space
C. In the left fourth intercostal space at the midclavicular line
*D. In the left fifth intercostal space 1,5 cm medially from the midclavicular line
E. Over the right half of the lower end of the body of the sternum

**The answer is D.** The mitral valve (left atrioventricular [AV] valve) produces the apical beat (thrust) of the heart, which is most audible over the left fifth intercostal space at the midclavicular line. The pulmonary valve is most audible over the medial end of the second left intercostals space, the aortic valve is most audible over the medial end of the second right intercostals space, and the right AV valve is most audible over the right half of the lower end of the body of the sternum.

**14. A 46-year-old male patient with high blood pressure was examined in the emergency department, and his physician found a leakage of blood from the blood vessel that normally carries richly oxygenated blood. Which of the following vessels would most likely be damaged?**

(A) Superior vena cava
(B) Pulmonary arteries
**(C)Pulmonary veins**
(D)Ascending aorta
(E) Coronary sinus

**The answer is** C. Pulmonary veins return oxygenated blood to the heart from the lungs. Pulmonary arteries carry deoxygenated blood from the heart to the lungs for oxygen renewal. The ascending aorta carries oxygenated blood from the left ventricle to all parts of the body. The superior vena cava and coronary sinus carry deoxygenated blood to the right atrium.

**15. The pulmonalis embolism has suddenly developed in a 40-years old patient with the opened fracture of the hip. Choose the possible kind of embolism.**

A. Tissue
***B. Fat***
C. Thrombus-embolus
D. Air
E. Foreign body

## TASK №2.
## Structure of the heart walls. The conducting system of the heart.

**1. In the hospital intensive care unit on the screen of the cardiograph there were signs of the abnormal functioning of the impulse-conducting system in the patient. Where is the sinoatrial node situated in?** (Vinnitsa)+

A. It is situated in thickness of the right atrial wall between the orifices of the superior vena cava and inferior vena cava under the endocardium.
B. It is situated in thickness of the left atrial wall between the orifices of the right and left pulmonary veins under the epicardium.
* C. It is situated in thickness of the right atrial wall between the right auricular and orifice of the superior vena cava under the epicardium
D. It is situated in thickness of the right atrial wall between the right auricular and orifice of the superior vena cava under the endocardium.
E. It is situated in thickness of the right atrial wall between the orifices of the superior vena cava and inferior vena cava under the epicardium.

**2. Artificial battery-powered pacemaker, about the size of the pocket watch, is implanted to the patient with the signs of the complete heart block for permanent pacing of the heart. Where is the atrioventricular node located in?** (Vinnitsa)

*A. The atrioventricular node is located in the inferior part of the interatrial septum near the septal cusp of the tricuspid valve under the endocardium of the right atrium.
B. The atrioventricular node is located in the inferior part of the interatrial septum near the septal cusp of the tricuspid valve under the endocardium of the left atrium.
C. The atrioventricular node is located in the superior part of the interatrial septum under the endocardium of the right atrium.
D. The atrioventricular node is located in the superior part of the interatrial septum under the endocardium of the left atrium.
E. The atrioventricular node is located in the superior part of the interventricular septum under the endocardium of the right ventricle.

**3. Patient with the massive myocardial infarction experiences crushing chest pain and have signs of the abnormal functioning of the impulse-conducting system on the electrocardiogram. The atrioventricular bundle of the conducting system of the heart is damaged. Where does this bundle pass?** (Vinnitsa)

A. It runs through the interatrial septum

*B. It runs through the membranous part of the interventricular septum
C. It is the bridge between the sinoatrial and atrioventricular nodes.
D. It runs through the anterior wall of the right ventricle
E. It runs through the muscular part of the interventricular septum

**4. In the hospital intensive care unit on the screen of the cardiograph there were no signs of the abnormal functioning of the impulse-conducting system in the patient. What nodes are distinguished in the conducting system.** (Vinnitsa)

A. The sinoatrial node *(nodus sinuatrialis)* or the node of Aschoff - Tawara and the atrioventricular node *(nodus atrioventricularis)* or the node Keith-Flack.
*B. The sinoatrial node *(nodus sinuatrialis)* or the node of Keith-Flack and the atrioventricular node *(nodus atrioventricularis)* or the node of Aschoff-Tawara.
C. The sinoventricular node *(nodus sinuventricularis)* or the node of Keith-Flack and the atrioventricular node *(nodus atrioventricularis)* or the node of Aschoff-Tawara.
D. The sinoatrial node *(nodus sinuatrialis)* or the node of Keith-Flack and the sinoventricular node *(nodus sinuventricularis)* or the node of Aschoff- Tawara.
E. The sinoatrial node *(nodus sinuatrialis)* or the node of Keith-Flack and the interventricular node *(nodus sinuventricularis)* or the node of Aschoff- Tawara.

**5. During the ultrasonic examination of the heart a doctor observes semilunar cusps. What happens to them at diastole (relaxation) of ventricles?** (Kiev)

*A. Interlock, closing the lumen of vessels.
B. Turn out into the lumen of vessels.
C. Turn out into the lumen of ventricles.
D. Press to the vessels walls.
E. Press to the ventricle walls.

**6. A 54-year-old patient is implanted with an artificial cardiac pacemaker. Which of the following conductive tissues of the heart had a defective function that required the pacemaker? +** (Gross Anatomy)

A. Atrioventricular (AV) bundle
B. AV node
* C. Sinoatrial (SA) node
D. Purkinje fiber
C.Moderator band

**The answer is** C. The sinoatrial (SA) node initiates the impulse of contraction and is known as the pacemaker of the heart. Impulses from the SA node travel through the atrial myocardium to the atrioventricular (AV) node and then race through the AV bundle (bundle of His), which divides into the right and left bundle branches. The bundle breaks up into terminal conducting fibers (Purkinje fibers) to spread out into the ventricular walls. The moderate band carries the right limb of the AV bundle from the septum to the sternocostal wall of the ventricle.

**8. A 47-year-old man with a known atrial fibrillation returns to see his cardiologist for follow-up of his cardiac health. The right atrium is important in this case because it:** (Gross Anatomy)

A. Receives blood from the oblique cardiac vein
B. Is associated with the apex of the heart
* C. Contains the sinoatrial node
D. Receives the right pulmonary vein

E. Is hypertrophied by pulmonary stenosis

**The answer is** C. The sinoatrial (SA) and atrioventricular (AV) nodes are in the wall of the right atrium and are not associated with the apex of the heart. The oblique cardiac vein drains into the coronary sinus and the pulmonary veins empty into the left atrium. The right ventricle is hypertrophied by the pulmonary stenosis.

9. **After the trauma, the patient's right n.vagus was damaged. Which violation of the cardiac activity is possible in this case?**

A. Violation of the automatism of a atrio-ventricular node
***B. Violation of the automatism of a Kiss-Fleck node***
C. Violation of the conductivity in the right auricle
D. Block of a conductivity in the atrio-ventricular node
E. Arrhythmia

10. **A person has steady HR not exceeding 40 bmp. What is the pacemaker of the heart rhythm in the person?**

A. Branch of His Bundle
B. His bundle
C. Purkinye fibers
D. Sinoatrial node
***E. Atrio-ventricular node***

## TASK №3.
## The vessels and nerves of the heart. The pericardium: structure and topography.

1. **A 50-year old patient was admitted to the hospital with complains about pain behind his breastbone, asphyxia during physical activity. Angiography revealed pathological changes in the posterior interventricular branch of the right coronary artery. What heart part was affected?** (2007)

* A. Posterior wall of the right and left ventricle
B. Right atrium
C. Anterior wall of the right and left ventricle
D. Left atrium
E. Right atrioventricular valve

2. **A 58-year-old patient is admitted to a cardiological clinic with acute persistent pain in substernal area which does not reduce after the second taking of nitroglycerine. Electrocardiogram shows that he has big necrosis of the posterior surface of the heart. The diagnosis is transmural myocardial infarction of the posterior wall of the heart. Acute occlusion of which vessel led to this disease?** (Kiev)

*A. Right coronary artery.
B. Coronary sinus.
C. Right pulmonary artery.
D. Left coronary artery.
E. Left common carotid artery.

3. **A patient has an infarction of the anterior wall of the left ventricle. Blood circulation of which vessel is damaged?** (Kiev)

* A. Anterior interventricular branch of the left coronary artery.

B. Atrioventricular branches of the right coronary artery.
C. Circumflex branch of the left coronary artery.
D. Posterior interventricular branch of the right coronary artery.
E. Left marginal branch of the left coronary artery.

**4. A 19-year-old man came to the emergency department and his angiogram exhibited that he was bleeding from the vein that is accompanied by the posterior interventricular artery. Which of the following veins is most likely to be ruptured?** (Gross Anatomy)+

A. Great cardiac vein
* B. Middle cardiac vein
C. Anterior cardiac vein
D. Small cardiac vein
E. Oblique veins of the left atrium

**The answer** is B. The middle cardiac vein ascends in the posterior interventricular groove, accompanied by the posterior interventricular branch of the right coronary artery. The great cardiac vein is accompanied by the anterior interventricular artery, the anterior cardiac vein drains directly into the right atrium, and the small cardiac vein is accompanied by the marginal artery.

**5. An 83-year-old man with a typical coronary circulation has been suffering from an embolism of the circumflex branch of the left coronary artery. This condition would result in ischemia of which of the following areas of the heart?** (Gross Anatomy)

A. Anterior part of the left ventricle
B. Anterior interventricular region
C. Posterior interventricular region
*D. Posterior part of the left ventricle
E. Anterior part of the right ventricle

**The** answer is D. The circumflex branch of the left coronary artery supplies the posterior portion of the left ventricle. The anterior interventricular artery supplies the anterior aspects of the right and left ventricles and the anterior interventricular septum.

**6. An 8-year-old boy with atrial septal defect presents to a pediatrician. This congenital heart defect shunts blood from the left atrium to the right atrium and causes hypertrophy of the right atrium, right ventricle, and pulmonary trunk. Which of the following veins opens into the hypertrophied atrium?** (Gross Anatomy)

A. Middle cardiac vein
B. Small cardiac vein
C. Oblique cardiac vein
*D. Anterior cardiac vein
E. Right pulmonary vein

**The answer** is D. The anterior cardiac vein drains into the right atrium. The middle, small, and oblique cardiac veins drain into the coronary sinus. The right and left pulmonary veins drain into the left atrium.

**7. A 37-year-old patient with severe chest pain, shortness of breath, and congestive heart failure was admitted to a local hospital. His coronary angiograms reveal a thrombosis in the circumflex branch of the left coronary artery. Which of the following conditions could result from the blockage of blood flow in the circumflex branch?** (Gross Anatomy)

A. Tricuspid valve insufficiency

*B. Mitral valve insufficiency
C. Ischemia of atrioventricular (AV) node
D. Paralysis of pectinate muscle
E. Necrosis of septomarginal trabecula

The answer is B. The circumflex branch of the left coronary artery supplies the left ventricle and thus its blockage of blood flow results in necrosis of myocardium in the left ventricle, producing mitral valve insufficiency. The pectinate muscles, tricuspid valve, and septomarginal tra-becula are present in the right atrium and ventricle.

8. **A 56-year-old patient recently suffered a myocardial infarction in the area of the apex of the heart. The occlusion by atherosclerosis is in which of the following arteries?** (Gross Anatomy)

A. Marginal artery
B. Right coronary artery at its origin
*C. Anterior interventricular artery
D. Posterior interventricular artery
E. Circumflex branch of the left coronary artery

**The answer is** C. The apex of the heart typically receives blood from the anterior interventricular branch of the left coronary artery. The marginal artery supplies the right inferior margin of the right ventricle, the right coronary artery at its origin supplies the right atrium and ventricle, and the posterior interventricular artery and a circumflex branch of the left coronary artery supply the left ventricle.

9. **Coronary angiographs of a 44-year-old male patient reveal an occlusion of the circum flex branch of the left coronary artery. This patient has been suffering from myocardial in farction in which of the following areas?** (Gross Anatomy)

A. Right and left ventricles
B. Right and left atria
C. Interventricular septum
D. Apex of the heart
*E. Left atrium and ventricle

**The answer is** E. The left atrium and ventricle receive blood from the circumflex branch of the left coronary artery. The interventricular septum and the apex of the heart are supplied by the anterior interventricular branch of the left coronary artery. The right ventricle receives blood from the anterior interventricular artery and the marginal branch of the right coronary artery. The right atrium receives blood from the right coronary artery.

## TASK №4.
## The aorta. The branches of the arch of the aorta. The common and external carotid arteries.

1. **For repairing the upper incisor tooth the dentist made an injection anesthetic fluid near the infraorbital foramen. The bruise is produced by seepage of blood under the skin. Which artery was damaged?** (Vinnitsa)

A. the facial artery;
* B. the infraorbital artery;
C. the superior alveolar artery;
D. the superior labial artery.

E. the maxillary artery

**2 During a surgical operation the surgeon should be careful working within the Pirogov's triangle. Which artery can be found within this triangle?** (Vinnitsa)+

A. the facial artery;
*B. the lingual artery;
C. the superior thyroid artery;
D. the superficial temporal artery
E. the maxillary artery.

**3. During injury of the tongue, because of intensive bleeding it was necessary to tie the lingual artery with a ligature. What topographic area of the neck is it possible to find the lingual artery?** (Vinnitsa)

A. the carotid triangle;
B. the submandibular triangle;
C. the sublingual triangle;
* D. the lingual triangle.
E. the muscular triangle

**4. During the extraction of the 2nd superior molar tooth profuse bleeding began in the patient. What artery supplies blood to the superior molar teeth?** (Vinnitsa)+

A. the lingual artery;
B. the facial artery;
C. the molar artery;
*D. the infraorbital artery
E. the dental artery

**5. A patient what suffers from cancer of back of tongue has an intense bleeding as a result of affection of dorsal lingual artery by tumor. What vessel should be ligated to stop bleeding?** (2007)

*A. Lingual artery
B. Deep lingual artery
C. Ascending pharyngeal artery
D. Facial artery
E. Dorsal lingual artery

**6. A victim of a car accident has a contused wound in temporal region. During medical examination a fracture of temporal bone and symptoms of intracranial hemorrhage are observed. Which artery might be damaged in this region?** (Kiev)+

A. Superficial temporal.
* B. Middle meningeal.
C. Anterior meningeal.
D. Maxillary.
E. Facial.

**7. After the injury of temporal region a patient got epidural hematoma. Which artery is damaged?** (Kiev)

A. Deep temporal.
*B. Middle meningeal.
C. Deep auricular.
D. Superior tympanic.
E. Inferior tympanic.

8. **A patient was admitted to a hospital with an open fracture of the ramus of mandible and profuse bleeding in the fracture site. Which artery is damaged ?** (Kiev)
   A. A. palatina ascendens.
   B. A. temporalis media.
   C. A. facialis.
   D.A. lingualis.
   * E. A. alveolaris inferior.

9. **A patient has epidural hematoma in the temporal region. Which artery is damaged?** (Kiev)
   * A. Medial meningeal
   B. Medial cerebral
   C. Posterior communicating
   D. Anterior meningeal.
   E. Anterior cerebral.

10. **A patient who got into a car accident has bleeding from soft tissues in front of the angle of the mandible. Which vessel must be ligated to stop the bleeding?** (Kiev)
   A. A. lingualis.
   B. A. carotis interna.
   C. A. temporalis superficialis.
   D. A. alveolaris inferior.
   *E. A. facialis.

11. **A 30-years old patient was hospitalized due to bleeding of the facial artery. What place on the face has to be pressed to stop bleeding?**

   F. The mandibles branch
   G. The noses back
   H. The molar bone
   ***I. The mandible edge***
   J. The mental process

## TASK №5.
## The internal carotid and subclavian arteries. The blood supply of the brain.

1. **A stroke or cerebrovascular accident results from either sudden hemorrhage in to the brain or sudden stoppage of the blood supply of the part of the brain. What arteries provide blood supply to the brain?** (Vinnitsa)
   A. external and internal carotid arteries;
   * B. internal carotid artery and vertebral artery;
   C. external carotid artery and vertebral artery;
   D. facial artery and vertebral artery
   E. internal carotid artery and facial artery

2. **After thrombosis of the anterior cerebral artery (occlusion of the lumen) revealed during angiography, the nutrition of the brain was partly restored by means of the anastomoses. Which arteries take place in the formation of the cerebral arterial circle of Willis?** (Vinnitsa)
   A. anterior cerebral, middle cerebral, posterior cerebral, anterior communicating and posterior communicating arteries;
   B. internal carotid, anterior cerebral, middle cerebral, posterior cerebral, anterior

communicating and posterior communicating arteries;

* C. internal carotid, anterior cerebral, posterior cerebral, anterior communicating and posterior communicating arteries;

D. anterior cerebral, middle cerebral, posterior cerebral, posterior communicating arteries.

E. anterior cerebral, posterior cerebral, anterior communicating and posterior communicating arteries;

**3. During the examination of the fundus of the diabetic patient's eye the ophthalmologist found changes in the eye blood supply characteristic of this disease. What artery provides blood supply for the retina of the eyeball?** (Vinnitsa)

*A. the central artery of the retina;

B. the ciliary arteries;

C. the optic artery;

D. the lacrimal artery.

E. the ophthalmic artery

**4. A surgeon, accessing the organs of the thoracic cavity, made an incision on the anterior chest wall along one of the intercostals space. He carefully dissected the tissues of the anterior medial region of the intercostal space in order not to damage the artery situated in parallel to the edge of the breast bone, by 1-1.5 cm more lateral from it. Which artery is meant?** (Kiev)

A. Inferior phrenic.

B. Anterior intercostal.

C. Superior phrenic.

D. Costocervical trunk.

*E. Internal thoracic.

**5. A doctor examined a patient who got into a car accident. The patient has a fracture of the left clavicle and disorders of blood circulation in the extremity (radial artery pulsation is absent). What is the cause of blood circulation disorder?** (Kiev)

A. Compression of vertebral artery.

B. Compression of axillary artery.

C. Compression of subclavian vein.

* D. Compression of subclavian artery.

E. Compression of axillary vein.

**6. A 56-year-old patient has worked for 28 years at a chemical plant in a workshop with harmful production conditions. He often has hemorrhages of the nasal cavity mucosa. Which arteries are involved?** (Kiev)

* A. Anterior and posterior ethmoid.

B. Supraorbital.

C. Ciliary.

D. Anterior cerebral.

E. Ophthalmic.

**7. A 37-year-old female patient has a fracture of the clavicle. The junction of the inner and middle third of the bone exhibits overriding of the medial and lateral fragments. The arm is rotated medially, but it is not rotated laterally. Which of the following conditions is most likely to occur secondary to the fractured clavicle?** (Gross Anatomy)

A. A fatal hemorrhage from the brachiocephalic vein

B. Thrombosis of the subclavian vein, causing an embolism in the ascending aorta
* C. Thrombosis of the subclavian artery, causing a embolism of the brachial artery
D. Damage to the upper trunk of the brachial plexus
E. Damage to the long thoracic nerve, causing the winged scapula

**The answer is C.** The fractured clavicle may cause thrombosis of the subclavian artery, resulting in embolism of the brachial artery; damage the subclavian vein, resulting in a pulmonary embolism; or damage the lower trunk of the brachial plexus.

**8. A 50-year old patient had hemorrhage of the brain and was taken to the hospital. The place of the hemorrhage was revealed on the lateral hemispheres surface during the medical examination. What artery was injured?+**

**K. A posterior cerebral artery**
***L. A middle cerebral artery***
**M. The anterior communicating artery**
**N. The posterior communicating artery**
**O. The anterior cerebral artery**

## TASK №6.
## The axillary artery

**1. While performing the operation in the area of axillary crease a surgeon has to define an arterial vessels surrounded by fascicles of brachial plexus. What artery is it?** (2008)

A. A. transversa colli
B. A. subclavia
C. A. profunda brachii
* D. A. axillaries
E. A. vertebralis

**2. A 17 year-old boy with a stab wound received multiple injuries on the upper part of the arm and required surgery. If the brachial artery were ligated at its origin, which of the following arteries would supply blood to the profunda brachii artery?** (Gross Anatomy)+

A. Lateral thoracic
B. Subscapular
* C. Posterior humeral circumflex
D. Superior ulnar collateral
E. Radial recurrent

**The answer is C.** The posterior humeral circumflex artery anastomoses with an ascending branch of the profunda brachii artery, whereas the lateral thoracic and subscapular arteries do not. The superior ulnar collateral and radial recurrent arteries arise inferior to the origin of the profunda brachii artery.

**3. A person who was sleeping in an uncomfortable position experienced a sense of numbness (tinglining) in the region of the left shoulder joint. What arteries don't supply blood to the shoulder joint?** (Vinnitsa)

A. The suprascapular artery (arteria supascapularis)
B. The thoracoacromial artery (arteria thoracoacromialis)
C. The anterior circumflex humeral artery (arteria circumflexa humeri aterior)
D. The posterior circumflex humeral artery (arteria circumflexa humeri posterior)
* E. The thoracodorsal artery

**4. During the ligation of an injured axillary or subclavian artery the blood flow is reverted and the blood reaches the distal portion of the axillary artery owing the arterial anastomose. Which arteries form this anastomose?** (Vinnitsa)

* A. The suprascapular and circumflex scapular arteries
B. The anterior and posterior circumflex humeri arteries
C. The circumflex scapular and posterior circumflex humeri arteries
D. The circumflex scapular and anterior circumflex humeri arteries
E. The suprascapular and posterior circumflex humeri arteries

**5. A 10-year-old boy falls off his bike, has difficulty in moving his shoulder, and is brought to an emergency room. His radiogram and angiogram reveal fracture of the surgical neck of his humerus and bleeding from the point of the fracture. This accident most likely leads to damage of which of the following arteries?** (Gross Anatomy)

A. Axillary
B. Deep brachial
*C. Posterior humeral circumflex
D. Superior ulnar collateral
E. Scapular circumflex

**The answer is** C. The posterior humeral circumflex artery accompanies the axillary nerve that passes around the surgical neck of the humerus. None of the other arteries are involved.

**6. An 11-year-old boy falls down the stairs. A physician examines a radiograph of the boy's shoulder region. The surgical neck of the humerus is fractured. Which of the structures is most likely injured?** (Gross Anatomy)

A. Musculocutaneous nerve
B. Radial nerve
C. Deep brachial artery
* D. Posterior humeral circumflex artery
E. Scapular circumflex artery

**The answer is D.** Fracture of the surgical neck of the humerus occurs commonly and would damage the axillary nerve and the posterior humeral circumflex artery.

## TASK №7.
## The arteries and veins of the upper limbs. The lymphatic nodes of the upper limbs.

**1. A 14-year-old boy falls on the outstretched hand and has a fracture of the scaphoid bone. The fracture is most likely accompanied by a rupture of which of the following arteries?** (Gross Anatomy)

A. Brachial artery
B. Ulnar artery
C. Deep palmar arterial arch
* D. Radial artery
E. Princeps pollicis artery

**The answer is D.** The scaphoid bone forms the floor of the anatomic snuffbox, through which the radial artery passes to enter the palm. The radial artery divides into the princeps pollicis artery and the deep palmar arch.

**2. The knife wound of the posterior area of the middle of the arm resulted in the damage of the main artery. What is this artery called?** (Vinnitsa)

A. The brachial artery (arteria brachialis)
* B. The profunda brachii artery (arteria profunda brachii)
C. The posterior circumflex humeral artery (arteria circumflexa humeri posterior)
D. The superior ulnar collateral artery (arteria collateralis ulnaris superior)
E. The axillary artery

**3. A patient complains of having pain with repeated movements of his thumb (claudication). His physician performs the Allen test and finds an insufficiency of the radial artery. Which of the following conditions would be a result of the radial artery stenosis?** (Gross Anatomy)

A. A marked decrease in the blood flow in the superficial palmar arterial arch
B. Decreased pulsation in the artery passing superficial to the flexor retinaculum
C. Ischemia of the entire extensor muscles of the forearm
* D. A marked decrease in the blood flow in the princeps pollicis artery
E. A low blood pressure in the anterior interosseous artery

**The answer is D.** The radial artery divides into the princeps pollicis artery and the deep palmar arterial arch. Thus, stenosis of the radial artery results in a decreased blood flow in the princeps pollicis artery. The superficial palmar arterial arch is formed primarily by the ulnar artery, which passes superficial to the flexor retinaculum. The extensor compartment of the forearm receives blood from the posterior interosseous artery, which arises from the common interosseous branch of the ulnar artery. However, the radial and radial recurrent arteries supply the brachiora-dialis and the extensor carpi radialis longus and brevis.

**4. As the result of the occupational accident a person lost the thumb. During the microsurgery the surgeon had to repair princeps pollicis artery. The brunch of which artery is this?** +(Vinnitsa)

A. The ulnar artery (arteria ulnaris),
* B. The radial artery (arteria radialis),
C. The superficial palmar arch (arcus palmaris superficialis),
D. The deep palmar arch (arcus palmaris profundus).
E. The anterior interosseous artery (arteria interossea anterior)

**5. After a trauma a 44-year old patient had a rupture of left palm muscle tendons and superficial blood vessels. After operation and removal of the most part of the necrotically changed muscle tissue the bloodstream was normalized. What vessels have helped to restore the bloodstream?** (2006)

* A. Arcus palmaris profundus
B. Aa.metacrpea palmares
C. Aa. Digitales palmares communis
D. Arcus palmaris superficialis
E. Aa. Perforantes

**6. Examining patients with cardiovascular system pathology it is often necessary to compare the character of vessels pulsation in symmetrical points of both body parts. Pulsation of which artery is easy to feel on the anterior surface of the inferior third of forearm?** (Kiev)

A. A. ulnaris.
* B. A. radialis.
C. A. interossea anterior.

D. Ramus palmaris superficialis.
E. A. interossea posterior.

**7. During an operative intervention on a mammary gland profuse bleeding appeared. Which artery was damaged?** (Kiev)

A. Internal thoracic.
* B. Lateral thoracic.
C. Superior epigastric.
D. Axillary.
E. Superior thoracic.

**8. A 64-year-old man with a history of liver cirrhosis has been examined for hepatitis A, B, and C viruses. In an attempt to obtain a blood sample from the patient's median cubital vein, a registered nurse inadvertently procures arterial blood. The blood most likely comes from which of the following arteries?** (Gross Anatomy)

* A Brachial
B. Radial
C. Ulnar
D. Common interosseous
E. Superior ulnar collateral

**The answer is A.** The median cubital vein lies superficial to the bicipital aponeurosis and thus separates it from the brachial artery, which can be punctured during intravenous injections and blood transfusions.

**9. A 17-year-old boy is injured in an automobile accident. He has a fracture of the shaft of the humerus. Which of the following arteries may be damaged?** (Vinnitsa)

A. Brachial artery
B. Posterior humeral circumflex artery
* C. Profunda brachii artery
D. Radial artery
E. Radial recurrent artery

## TASK №8.
## The descending aorta, its parts. The thoracic aorta: its topography and branches.

**1. During the examination of the nursing mother marked hyperemia and tenderness of the mammary gland were found. Which arteries don't supply blood to the mammary gland?** (Vinnitsa)

A. the posterior intercostals arteries (arteriae intercostals posteriors)
B. the lateral thoracic artery (arteria thoracica lateralis)
*C. the thoracodorsal artery (arteria thoracodorsalis)
D. the internal thoracic artery (arteria thoracica interna)
E. the thoracoacromial artery

**2. The patient underwent X-ray examination of the lungs. Which artery supply blood to the lungs?** (Vinnitsa)

A. the pulmonary arteries (arteriae pulmonales),
*B. the bronchial branches of the thoracic aorta (rami bronchiales aortae thoracicae),
C. the pleural branches of the thoracic aorta (rami pleurales aortae thoracicae),
D. the tracheal branches of the arch of aorta (rami tracheales arcus aortae)

E. the pulmonary branches of the arch of aorta (rami pulmonales arcus aortae)

3. **A 33-year-old patient is suffering from an sudden occlusion at the origin of the descending (thoracic) aorta. This condition would most likely decrease blood flow in which of the following intercostal arteries?** (Gross Anatomy)+

A. Upper six anterior
B. All of the posterior
C. Upper two posterior
D. Lower anterior
*E. Lower nine posterior

**The answer is** E. The first two posterior intercostal arteries are branches of the highest (superior) intercostal artery of the costocervical trunk; the remaining nine branches are from the thoracic aorta. The internal thoracic artery gives off the upper six anterior intercostal arteries and is divided into the superior epigastric and musculophrenic arteries, which gives off anterior intercostal arteries in the seventh, eighth, and ninth intercostal spaces and ends in the tenth intercostal space where it anastomoses with the deep circumflex iliac artery.

4. **A 45-year-old women presents with a tumor confined to the posterior mediastinum. This could result in compression of which of the following structures?** (Gross Anatomy)

A. Trachea
*B. Descending aorta
C. Arch of the aorta
D. Arch of the azygos vein
E. Phrenic nerve

**The answer is B.** The descending aorta is found in both the superior and posterior medi-astina. The superior mediastinum contains the trachea and arch of the aorta, and the middle mediastinum contains the ascending aorta, arch of the azygos vein, and main bronchi. The phrenic nerve runs in the middle mediastinum.

5. **A 32-year-old patient has a tension pneumothorax that can be treated with needle aspiration. To avoid an injury of the intercostals neurovascular bundle, the needle may be inserted in which locations?**

* A. Above the upper border of the ribs
B. Deep to the upper border of the ribs
C. Beneath the lower border of the ribs
D. Between the external and internal intercostals
E. Through the transversus thoracis muscle

**The answer is A.** The intercostal veins, arteries, and nerves run in the costal groove beneath the inferior border of the ribs between the internal and innermost layers of muscles. The transversa thoracis muscles are situated in the internal surface of the lower anterior thoracic wall.

## TASK №9.
## The abdominal aorta: its topography and branches.

1. **During gastroscopy a pathological formation in the pyloric canal of the stomach with the disturbance of its blood supply was revealed. What arteries don't supply blood to the stomach?** (Vinnitsa)+

A. the left gastric artery (arteria gastrica sinistra),

B. the right gastric artery (arteria gastrica dextra),
* C. the superior gastric artery (arteria gastrica superior),
D. the left gastroomental artery (arteria gastroomentalis sinistra),
E. the right gastroomental artery (arteria gastroomentalis dextra)

2. **In course of laparotomy a surgeon revealed gangrenous lesion of descending colon. It was caused by thrombosis of the following artery**: (2008)
A. Ileocolic
B. Median colic
C. Superior mesenteric artery
*D. Sinister colic
E. Dexter colic

3. **During an examination of the abdominal cavity in a patient doctor revealed an aggregation of the mesenteric lymph nodes, which became increased due to a tumor process. These lymph nodes compressed the artery of the ascending colon. Name the artery which supply blood to this part of the large intestine.** (Vinnitsa)
*A. the right colic artery (arteria colica dextra)
B. the middle colic artery (arteria colica media)
C. the left colic artery (arteria colica sinistra)
D. the sigmoid artery (arteria sigmoidea)
E. the iliocolic (arteria iliocolica)

4. **During an examination of the abdominal cavity in a patient doctor revealed an aggregation of the mesenteric lymph nodes, which became increased due to a tumor process. These lymph nodes compressed the artery of the descending colon. Name the artery which supply blood to this part of the large intestine.** (Vinnitsa)
A. the right colic artery (arteria colica dextra)
B. the middle colic artery (arteria colica media)
* C. the left colic artery (arteria colica sinistra)
D. the sigmoid artery (arteria sigmoidea)
E. the iliocolic (arteria iliocolica)

5. **During the postmortem examination of the male cavader the vascular necrosis (necrosis of the tissues) of the pancreas was found. Which arteries give rise the branches to the pancreas?** (Vinnitsa)
***** A. the splenic artery (arteria splenica)
B. the proper hepatic artery (arteria gepatic propria),
C. the common hepatic artery
D. the superior mesenteric artery (arteria mesenterica superior)
E. the inferior mesenteric artery (arteria mesenterica inferior)

6. **A patient underwent appendectomy. Which artery does the appendicular artery arise from?** (Vinnitsa)
A. the right colic artery (arteria colica dextra);
B. the middle colic artery (arteria colica media);
C. the left colic artery (arteria colica sinistra);
*D. the iliocolic artery (arteria iliocolica)*
E. the inferior mesenteric artery

7. **A 40-year-old woman had appendectomy, during which an artery of the vermiform process was ligated. This artery separates from:** (Kiev)

A. Left colic artery.
B. Jejunal artery.
* C. Iliocolic artery
D. Right colic artery.
E. Middle colic artery.

**8. Examination of the patient has shown pancreas blood supply disorder. Which artery could be damaged?** (Kiev)
A. A. gastrica dextra.
B. A. hepatica propria.
C. A. gastrica sinistra.
D. A. gastroepiploica dextra.
*E. A. lienalis.

**9. A patient with a stomach ulcer situated in the pyloric region on the lesser curvature of stomach has bleeding. What vessel should be ligated to stop the bleeding?** (Kiev)
*A. Right gastric artery.
B. Left gastric artery.
C. Left gastroomental artery.
D. Hepatic artery
E. Right gastroomental artery.

## TASK №9.
## The common iliac and internal iliac arteries: topography and branches.

**1. A woman underwent in operation on account of extrauterine (tubal) pregnancy. In course of the operation the surgeon should ligate the branches of the following arteries:** (2008)
*A. Uterine and ovarian
B. Inferior cystic and ovarian
C. Uterine and inferior cystic
D. Uterine and superior cystic
E. Superior cystic and ovarian

**2. After a car accident the driver had a rupture of the ligament of the head of the femur. As a result an aceptic necrosis of the head of the femur developed. What arterial branch passes in the ligament of the head of the femur?** (Vinnitsa)
A. the branch of the femoral artery (arteria femoralis)
* B. the branch of the obturator artery (arteria obturatoria)
C. the branch of the external iliac artery (arteria iliaca interna)
D. the branch of the external iliac artery (arteria iliaca interna)
E. the branch of the profunda femoris muscle (arteria profunda femoris)

**3. In herniotomy of the femoral hernia there is a great danger of injury of the arterial anastomosis near the medial circumference of the femoral ring (so-called "the crown of death") Between which arterial branches is this anastomosis formed?** (Vinnitsa)
A. between the obturator and femoral arteries;
* B. between the obturator and inferior epigastric arteries;
C. between the femoral and inferior epigastric arteries;
D. between the femoral and profunda femoris arteries.
E. between lateral and medial circumflex femoral arteries

**4. During the extirpation of the uterus the doctor must put a ligature on the uterine**

**artery (bind it). Where does the uterine artery pass?** (Vinnitsa)

*A. It passes in thickness of the broad ligament of the uterus in front and above of the ureter.

B. It passes in thickness of the broad ligament of the uterus behind and below of the ureter.

C. It passes in thickness of the round ligament of the uterus.

D. It passes in thickness of the rectouteral ligament.

E. It passes in thickness of the cardinal ligament of the uterus.

5. **The patient was admitted into the proctology department for the bleeding in the walls of the rectum. Which artery and in what topographical region does the inferior rectal artery arise from?** (Vinnitsa)

A. from superior gluteal artery (arteria glutea superior) in the region of the buttock;

B. from inferior gluteal artery (arteria glutea inferior) in the region of the buttock;

* C. from internal pudendal artery (arteria pudenda interna) in the region of the ischiorectal fossa;

D. from internal iliac artery (arteria iliaca interna) in the cavity of the lesser pelvis.

E. from external iliac artery (arteria iliaca externa) in the cavity of the lesser pelvis.

6. **The patient has the affection of the head of the femur of ischemic origin diagnosed. Which artery is damaged?** (Kiev)

*A. Ramus acetabularis

B. A. femoralis.

C. A. illiaca externa.

D. A. profunda femoris.

E. A. umbilicalis.

## TASK №10.
## The external iliac arteries: topography and branches.

1. **Bleeding as a result of the wound of the lower part of the abdomen in the region of the lateral umbilical fold was revealed in a male. What artery is situated in the lateral umbilical fold?** (Vinnitsa)

A. the umbilical artery (arteria umbilicalis)

B. the superior epigastric artery (arteria epigastrica superior)

*C. the inferior epigastric artery (arteria epigastrica inferior)

D. the superficial epigastric artery (arteria epigastrica superficialis)

E. the thoracoepigastric artery

## TASK №11.
## The arteries and veins of the lower limbs. The lymphatic nodes of the lower limbs.

1. **At the patients angiogram the vessels of the leg were not contrasted because of the occlusion of the popliteal artery. Which artery passes in the cruropopliteal canal?** (Vinnitsa)

A. the anterior tibial artery (arteria tibialis anterior)

*B. the posterior tibial artery (arteria tibialis posterior)

C. the fibular artery (arteria fibularis)

D. the femoral artery (arteria femoralis)

E. the popliteal artery (arteria poplitea)

**2. During his visit to a surgeon an old man presented complaints of sensitivity disturbance in the toes (numbness, a sense of cold, a sense of creeps). During palpation of the artery on the dorsal surface of the foot the pulse was not detected. What is the name of this artery?** (Vinnitsa)

A. the anterior tibial artery (arteria tibialis anterior)
B. the posterior tibial artery (arteria tibialis posterior)
* C. the dorsal pedis artery (arteria dorsalis pedis)
D. the fibular artery (arteria fibularis)
E. the arcuate artery (arteria arcuata)

**3. During the examination the surgeon found that the patient had varicose veins of the lower limb, darkening, infiltration of the skin in the region of the medial malleolus. Which vein drains the blood from this region?** (Vinnitsa)

*A. the great saphenous vein (vena saphena magna)
B. the small saphenous vein (vena saphena parva)
C. the femoral vein ( vena femoralis)
D. the tibial vein (vena tibialis)
E. the fibular vein (vena fibularis)

**4. As a result of a penetrating gun wound of the femur the surgeon must put a ligature on the artery, which are located in the adductor canal, for arrest bleeding. Which artery was damaged?** (Vinnitsa)/

*A. the femoral artery (arteria femoralis)
B. the obturator artery (arteria obturatoria),
C. the profunda femoris artery (arteria profunda femoris);
D. the popliteal artery (arteria poplitea)
E. the lateral circumflex femoral artery (arteria circumflexa femoris lateralis)

**5. As a result of a penetrating gun wound of the femur the adductor longus and adductor magnus muscles were injured. The surgeon must put a ligature on the artery (bind it) in the femoral groove for arrest bleeding. Which artery was damaged?** (Vinnitsa)

*A. the femoral artery (arteria femoralis)
B. the obturator artery (arteria obturatoria),
C. the profunda femoris artery (arteria profunda femoris);
D. the medial circumflex femoral artery (arteria circumflexa femoris medialis)
E. the lateral circumflex femoral artery (arteria circumflexa femoris lateralis)

**6. At the patients angiogram the vessels of the leg were not contrasted because of the occlusion of the popliteal artery. What branches does the popliteal artery divide into?** (Vinnitsa)

*A. the anterior and posterior tibial arteries,
B. the posterior tibial and fibular arteries,
C. the anterior tibial and fibular arteries,
D. the tibial and fibular arteries.
E. the anterior and posterior fibular arteries

7. **A patient has tissue ischemia below the knee joint accompanied with intermittent claudication. What artery occlusion should be suspected?** (2006)

* A. Popliteal artery
B. Proximal part of femoral artery
C. Posterior tibial artery

D. Anterior tibial artery
E. Peroneal artery

8. **After resection of the middle third of femoral artery obliterated by a thromb the lower extremity is supplied with blood due to the surgical bypass. Name an artery that plays the main role reestablishment of blood flow.** (2007)
A. Superficial epigastric artery
B. Superficial circumflex artery of hip bone
C. Descending genicular artery
*D. Deep femoral artery
E. Deep external pudendal artery

**9. During an examination of the patient the popliteal artery aneurysm was found. The surgeon must put a ligature on the femoral artery (bind it). In what canal can he do this?** (Vinnitsa)
A. the femoral canal
*B. the vastoadductor canal,
C. the cruropopliteal canal
D. the obtorator canal
E. the inguinal canal

**10. A patient has the ischemia of tissues below the knee-joint accompanied by intermittent claudication. Which artery occlusion is meant?** (Kiev)
* A. Popliteal.
B. Femoral.
C. Posterior tibial.
D. Anterior tibial.
E. Proximal part of femoral artery.

**11. A 45-year-old patient's skin of the right foot and leg is pale, there is no pulsation of the dorsal artery of foot and posterior tibial artery. Pulsation of the femoral artery is preserved. Which artery is damaged?** (Kiev)
A. Descending genicular.
B. External iliac.
C. Fibular.
D. Deep artery of thigh.
*E. Popliteal.

**12. Examination of a patient has shown an edema on the medial surface of the femur, enlargement of veins, and nodulation. Which vein has pathology?** (Kiev)
A. V. poplitea.
B. V. saphena parva.
C. V. femoralis.
*D.V. saphena magna.
E. V. iliaca externa.

**13. While examining a patient, a surgeon detects artery pulsation behind the medial malleolus. Which artery is meant?** (Kiev)
*A. Posterior tibial.
B. Fibular.
C. Anterior tibial.
D. Posterior recurrent tibial.
E. Anterior recurrent tibial.

**14. A patient has varicose veins and thrombophlebitis on the posterolateral surface of the leg. Which vein is damaged?** (Kiev)

A. V. saphena magna.
*B.V. saphena parva.
C. V. tibialis posterior.
D.V. peronea.
E. V. tibialis anterior.

**15. A patient has vessel dilation on the anteromedial surface of the shin. Which vessel dilation caused this process?** (Kiev)

A. V. saphena parva.
B. A. tibialis anterior.
*C. V. saphena magna.
D. A. tibialis posterior.
E. V. poplitea.

## TASK №12.
## The superior vena cava. The veins of the head and neck. The lymph nodes of the head and neck.

**1. The infection from the face may spread to the cavernous sinus through the venous anastomose. Name this anastomose.** (Vinnitsa)

* A. the anastomose between the angular vein (tributary of the facial vein) and the dorsal vein of the nose (tributary of the ophthalmic vein);
B. the anastomose between the superior labial vein (tributary of the facial vein) and the dorsal vein of the nose (tributary of the ophthalmic vein);
C. the anastomose between the angular vein (tributary of the facial vein) and the superficial middle cerebral veins (tributaries of the cavernous sinus);
D. the anastomose between the angular vein (tributary of the facial vein) and the meningeal veins (tributaries of the ophthalmic vein);
E. the anastomose between the infraorbital vein (tributary of the maxillary vein) and the dorsal vein of the nose (tributary of the ophthalmic vein);

**2. The infection from the teeth may spread to the cavernous sinus through the venous anastomose. Name this anastomose.** (Vinnitsa)

*A. the anastomose between the pterygoid plexus and cavernous sinus
B. the anastomose between the maxillary plexus and cavernous sinus
C. the anastomose between the alveolar plexus and cavernous
D. the anastomose between the dental plexus and cavernous sinus
E. the anastomose between the mandibular plexus and cavernous sinus

**3. During a surgical operation the surgeon should be careful working within the anterior region of the neck because venous anastomose (arcus venosus juguli) is located in this region. Which veins are connected with each other by means of this anastomos?** (Vinnitsa)/+

A. right and left internal jugular veins;
B. right and left external jugular veins;
*C. right and left anterior jugular veins;
D. internal jugular and subclavial veins;

E. internal and external jugular veins

**4. A 70-years old patient has cut an abscess of in the area of mammiform process during shaving. Two days later he was admitted to the hospital with inflammation of arachnoid membranes. How did the infection penetrate into the cavity of skull?** (2007)

A. V.emissariae mastoideae
B. Vv. Auriculares
C. Vv.labyrinthi
* D. V.facialis
E. Vv.tympanicae

**5. An injury of skin in the lateral region of the sternocleidomastoid muscle caused air embolism. Which cervical vein was damaged?** (Kiev)

A. Posterior auricular.
B. Anterior jugular.
C. Internal jugular.
* D. External jugular.
E. Transverse cervical.

**6. A 37-year-old female patient has a fracture of the clavicle. The junction of the inner and middle third of the bone exhibits overriding of the medial and lateral fragments. The arm is rotated medially, but it is not rotated laterally. Which of the following conditions is most likely to occur secondary to the fractured clavicle?** (Gross Anatomy)

A. A fatal hemorrhage from the brachiocephalic vein
* B. Thrombosis of the subclavian vein, causing a pulmonary embolism
C. Thrombosis of the subclavian artery, causing an embolism in the ascending aorta
D. Damage to the upper trunk of the brachial plexus
E. Damage to the long thoracic nerve, causing the winged scapula

**The answer is B.** The fractured clavicle may damage the subclavian vein, resulting in a pulmonary embolism; cause thrombosis of the subclavian artery, resulting in embolism of the brachial artery; or damage the lower trunk of the brachial plexus.

**7. A 50-year old patient had hemorrhage of the brain and was taken to the hospital. The place of the hemorrhage was revealed on the lateral hemispheres surface during the medical examination. What artery was injured?**

A. A posterior cerebral artery
***B. A middle cerebral artery***
C. The anterior communicating artery
D. The posterior communicating artery
E. The anterior cerebral artery

## TASK №13.
## The system of the vena cava inferior. The portal vein.

**1. The eggs (oncosheres) of the tapeworn (echinococcus) got into the human gastro-intestinal tract. By what veins can the embrios of the helminthes reach the liver and cause echinococcosis?** (Vinnitsa)

A. the hepatic veins (venae hepaticae),

*B. the portal vein (vena portae),
C. the inferior vena cava (vena cava inferior)
D. the superior vena cava (vena cava superior
E. the splenic vein (vena lienalis)

**2. Examination of a patient has shown a tumor of the head of pancreas and disorder of the venous outflow from some organs of the abdominal cavity. Which venous vessel was pressed by the tumor?** (Kiev)

*A.Porta.
B. Renal vein.
C. Left gastric vein.
D. Inferior vena cava.
E. Right gastric vein.

**3. A patient was admitted to a surgical department in grave condition with a stab wound in the right hypochondrium with signs of internal hemorrhage. After laparotomy a doctor detected hepatic parenchyma injuries and blood in the abdominal cavity. For a temporary arrest of bleeding the doctor applied smooth tissue forceps on the hepatoduodenal ligament. Which vessels are bandaged in the region of this ligament?** (Kiev)

A. Right and left hepatic arteries.
B. Hepatic veins and hepatic arteries.
C. Proper hepatic artery and hepatic veins.
* D. Proper hepatic artery and porta.
E. Coeliac trunk and superior mesenteric artery.

**11. A patient has left-side varicocele. Blood outflow disorder has taken place in:**

* A. V. testicularis sinistra.
B. V. testicularis dextra.
C. V. renalis sinistra.
D. V. renalis dextra.
E. V. ovarica.

## TASK №14.
## The anastomoses between the systems of veins. Specific features of the blood circulation of the fetus.

**1. The patient was admitted into the proctology department for the bleeding in the walls of the rectum. What venous anastomoses are there in the walls of the rectum?** (Vinnitsa)

A the cava-caval anastomose: between the superior and inferior caval veins
B. the porto-caval anastomose: between the superior caval vein and portal vein
*C. the porto-caval anastomose: between the inferior caval vein and portal vein
D. the porto-cava-caval anastomose: between the portal vein, superior and inferior caval veins
E. the intercaval anastomose: between the branches of the inferior vena cava

**2. In considerable congestion in the portal vein (e.g. in cirrosis of the liver) there is a characteristic dilatation of the veins around the umbilicus. This condition known as "caput Medusae". Which venous anastomoses are formed around the umbilicus?+** (Vinnitsa)

A the cava-caval anastomose: between the superior and inferior caval veins
B. the porto-caval anastomose: between the superior caval vein and portal vein

* C. the porto-caval anastomose: between the inferior caval vein and portal vein
D. the porto-cava-caval anastomose: between the portal vein, superior and inferior caval veins
E. the intercaval anastomose: between the branches of the inferior vena cava

3. **A 54-years old man was admitted to the hospital with complaints of pain in the right subcostal region, vomiting with blood. Objectively: enlarged liver, varicose veins in the stomach and esophagus. Disfunction of what vessel is likely to taken place?** (2006)
A. Aorta abdominalis
B. Vena hepatica
C. Vena cava inferior
* D. Vena porta
E. Vena cava superior

4. **Examining a teenager a doctor detected a congential heart disease - patent ductus arteriosus. What structures does the duct join in the period of prenatal development?** (Kiev)
A. Right and left atriums.
B. Right and left ventricles.
C. Aorta and inferior vena cava.
*D. Pulmonary trunk and aorta.
E. Pulmonary trunk and superior vena cava.

5. **A patient suffers from liver cirrhosis. The varicose veins of which porta-caval shunt are observed?** (Kiev)
A. V. subcostalis.
B. V. femoralis.
*C. V. epigastrica superficialis.
D.V. circumflexa ilium profunda.
E. Vv. intercostales posteriores.

6. **A patient with complaints of pain in the right hypochondrium and bloody vomit was admitted to a hospital. Examination has shown that the patient had enlarged liver, subcutaneous veins of the anterior abdominal wall dilation. In which vessel is blood outflow hindered?** (Kiev)
A. In the hepatic vein.
B. In the abdominal aorta.
*C. In the porta.
D. In the inferior vena cava.
E. In the superior vena cava.

7. **A 60-year-old patient has sharp dilation of subcutaneous veins of the anterior abdominal wall. Circulation of which vein was violated?** (Kiev)
A. Vena cava superior.
B. Vena azygos.
*C. Vena portae.
D. Vena mesenterica superior.
E. Vena cava inferior.

8. **Examining a 48-year-old patient a doctor detected ascites (peritoneal dropsy), in the site of the umbilicus -dilated plethoric veins (Medusa head symptom). In past history there is alcohol abuse. What organ of the abdominal cavity is affected, and by what venous**

**anastomoses does venous blood outflow?**
(Kiev)
*A. Liver. Portacavocaval anastomosis through paraumbilical veins.through a mesenteric vein.
C. Spleen. Portacaval anastomosis through the system of gastric veins.
D. Liver. Portacaval anastomosis through the system of inferior and superior mesenteric and lumbar veins.
E. Stomach. Portacaval anastomosis through the system of gastric veins, inferior and superior mesenteric veins.

**9. A patient was admitted to a hospital with subcutaneous veins dilation in the area of umbilicus (cirsomphalos). The vascular permeability of which great venous vessel is damaged?** (Kiev)
A. V. renalis.
B. V. mesenterica superior.
C. V. mesenterica inferior.
D. V. iliaca interna.
* E. V. portae hepatis.

**10. During the fetal period of the development in the vascular system of the fetus a large arterial (Botallos) duct is functioning witch convert into *lig.arteriosum* after birth. What anatomical formations does this duct connect?**

B. Aorta and inferior vena cava
C. Right and left auricle
***D. Pulmonary trunk and aorta***
E. Aorta and superior vena cava

Pulmonary trunk and superior vena cava During the fetal period of the development in the vascular system of the fetus large arterial
(Botallo's) duct is functioning which converts into lig. arteriosum after birth. What anatomical formations does this duct connect between each other?
***A*** Pulmonary trunk and aorta
***B*** Right and left auricle
***C*** Aorta and inferior vena cava
***D*** Pulmonary trunk and superior vena cava
***E*** Aorta and superior vena cava

**11. A 54-years old man was admitted to the hospital with complaints of pain in the right subcostal region, vomiting with blood. Objectively: enlarged liver, varicose veins in the stomach and esophagus. Disfunction of what vessel is likely to taken place?**

A. Aorta abdominalis
B. Vena hepatica
C. Vena cava inferior
***D. Vena porta***
E. Vena cava superior

## TASK №15.
## The spinal nerves. It's dorsal branches. The cervical plexus: formation, topography, branches, regions of innervation.

1. **A patient complains to the neurologist of the pain during the extension of the trunk. What nerves innervate the deep muscles of the back?** (Vinnitsa)+
   A. the intercostals nerves
   *B. the dorsal branches of the spinal nerves
   C. the short branches of the brachial plexus
   D. the short branches of the lumbar plexus
   E. the short branches of the sacral plexus

2. **Patient consulted a doctor about high sensitivity of skin behind his auricle and external acoustic meatus. Palpation behind sternocleidomastoid muscle is painful. It can be caused by irritation of the following nerve:** (2008)
   A. Nn. supraclaviculares
   B. N. occipitalis minor
   * C. N. auricularis magnus
   D. N. vagus
   E. N. transversus coli

3. **In injury of the anterior region of the neck the patient experiences the disturbance of the sensitivity of the skin in this area. Which nerve of the cervical plexus innervates this zone?** (Vinnitsa)
   A. the great auricular nerve (nervus auricularis magnus)
   B. the lesser occipital nerve (nervus occipitalis minor)
   C. the great occipital nerve (nervus occipitalis major)
   D. the supraclavicular nerve (nervi supraclaviculares)
   * E. the transverse cervical nerve (nervus transversus colli)

4. **In contusion of the anterior neck area of tendesness in the area of infrahyoid group of muscles is registered. What nerve innervates these muscles?** (Vinnitsa)+
   A. the cervical branches of the facial nerve (rami colli nervi facialis),
   *B. the cervical loop (ansa cervicalis),
   C. the supraclavicular nerve (nervi supraclaviculares),
   D. the transverse cervical nerve (nervus transversus colli).
   E. the infrahyoid nerve (nervus infrahyoideus)

5. **A furuncle in the area of the external acoustic meatus provokes marked tenderness. Name the nerves which don't innervate an external ear and external acoustic meatus.** (Vinnitsa)
   A. the great auricular nerve (nervus auricularis magnus),
   B. the lesser occipital nerve (nervus occipitalis minor),
   C. the auricular branch of vagus nerve (ramus auricularis nervi vagi),
   D. the auriculotemporal nerve (nervus auriculotemporalis).
   *E. the great occipital nerve (nervus occipitalis major),

6. **A 36-year-old operated man has convulsive reductions of the diaphragm. The blockade of what nerve is it necessary to do to liquidate this complication?** (Vinnitsa)+
   A. Accessory.
   B. Vagus.
   C. Greater splanchnic.
   *D Phrenic.
   E. Sympathetic trunk.

7. **A patient consulted a doctor about high sensitivity of skin behind his auricle and external acoustic meatus. Palpation behind sternocleidomastoid muscle is painful. It can**

**be caused by irritation of the following nerve:** (2008)

A. Nn. supraclaviculares
B. N. occipitalis minor
**C. N. auricularis magnus**
D. N. vagus
E. N. transversus coli

## TASK №16.
## The brachial plexus: formation, topography, branches, regions of innervation.

1. **A 10-year-old boy falls off his bike, has difficulty in moving his shoulder, and is brought to an emergency room. His radiogram and angiogram reveal fracture of the surgical neck of his humerus and bleeding from the point of the fracture. Following this accident, the damaged nerve causes difficulty in abduction, extension, and lateral rotation of his arm. Cell bodies of the injured nerve involving in movement of his arm are located in which of the following structures?** (Gross Anatomy)

A. Dorsal root ganglion
B. Sympathetic chain ganglion
* C. Anterior horn of the spinal cord
D. Lateral horn of the spinal cord
E. Posterior horn of the spinal cord

**The answer is** C. The (injured) axillary nerve contains general somatic efferent (GSE) fibers whose cell bodies are located in the anterior horn of the spinal cord and these GSE fibers supply the deltoid and teres minor muscles. The axillary nerve also contains general somatic afferent (GSA) and general visceral afferent (GVA) fibers whose cell bodies are located in the dorsal root ganglia and sympathetic postganglionic fibers whose cell bodies are located in sympathetic chain ganglia. The lateral horn of the spinal cord between Tl and L2 contains cell bodies of sympathetic preganglionic fibers. The posterior horn of the spinal cord contains cell bodies of interneurons.

2. **A 10-year-old boy falls off his bike, has difficulty in moving his shoulder, and is brought to an emergency room. His radiogram and angiogram reveal fracture of the surgical neck of his humerus and bleeding from the point of the fracture. The damaged nerve causes numbness of the lateral side of the arm. Cell bodies of the injured nerve fibers involved in sensory loss are located in which of the following structures?** (Gross Anatomy)

A. Anterior horn of the spinal cord
B. Posterior horn of the spinal cord
C. Lateral horn of the spinal cord
* D. Dorsal root ganglia
E. Sympathetic chain ganglia

**The answer is** C. The (injured) axillary nerve contains general somatic efferent (GSE) fibers whose cell bodies are located in the anterior horn of the spinal cord and these GSE fibers supply the deltoid and teres minor muscles. The axillary nerve also contains general somatic afferent (GSA) and general visceral afferent (GVA) fibers whose cell bodies are located in the dorsal root ganglia and sympathetic postganglionic fibers whose cell bodies are located in sympathetic chain ganglia. The lateral horn of the spinal cord between Tl and L2 contains cell bodies of sympathetic preganglionic fibers. The posterior horn of the spinal cord contains cell bodies of interneurons.

3. **A man with a stab wound in the area of the quadrilateral foramen applied to a doctor. Examination revealed that the patient was unable to draw his arm aside from body. What nerve is most possible damaged?** (2008)
   A. A. N.subclavius
   * B. N.axillaris
   C. N.ulnaris
   D. N.radialis
   E. N.medialis

4. **A woman suffering from osteochondrosis felt acute pain in her humeral articulation that become stronger when she abducted her shoulder. These symptoms might be caused by damage of the following nerve:** (2008)
   A. Subclavicular nerve
   B. Thoracodorsal nerve
   C. Dorsal scapular nerve
   D. Subscapular nerve
   * E. Axillary nerve

5. **18-year-old boy involved in an automobile accident presents with arm that cannot abduct. His paralysis is caused by damage to which of the following nerves?** (Gross Anatomy)
   * A. Suprascapular and axillary
   B. Thoracodorsal and upper subscapular
   C. Axillary and musculocutaneous
   D. Radial and lower subscapular
   E. Suprascapular and dorsal scapular

   **The answer is A**. The abductors of the arm are the deltoid and supraspinatus muscles, which are innervated by the axillary and suprascapular nerves, respectively. The thoracodorsal nerve supplies the latissimus dorsi, which can adduct, extend, and rotate the arm medially. The upper and lower subscapular nerves supply the subscapularis, and the lower subscapular nerve also supplies the teres major; both of these structures can adduct and rotate the arm medially. The musculocutaneous nerve supplies the flexors of the arm, and the radial nerve supplies the extensors of the arm. The dorsal scapular nerve supplies the levator scapulae and rhomboid muscles; these muscles elevate and adduct the scapula, respectively.

6. **Patient complains to the neurologist that he has no skin sensitivity in the area of the deltoid muscle. He can't abduct the arm. The injury of which nerve can cause this condition?** (Vinnitsa)
   A. The radial nerve
   * B. The axillary nerve
   C. The thoracicus longus nerve
   D. The musculacutaneous nerve
   E. The lateral and medial pectoral nerves

7. **After prolonged exercise (gymnastics) a man had tenderness in the area of latissimus dorsi muscle. Which nerve innervates this muscle?** (Vinnitsa)**+**
   A. The axillary nerve (nervus axillaries)
   * B. The thoracodorsal nerve (nervus thoracodorsalis)
   C. The long thoracicus nerve (nervus thoracicus longus)
   D. The dorsal scapular nerve (nervus dorsalis scapulae)
   E. The dorsal branches of the spinal nerves (rami dordales nervi spinales)

**8. During the mastectomy the cancerous axillary limph nodes were removed. After this operation the serratus anterior muscle is paralyzed. Instead the keeping the scapula applied to the chest, as in normal, the paralyzed serratus anterior muscle allows the scapula move out like a wing – "winging of the scapula". The medial border and inferior angle of the scapula become prominent. This "winging" is accentuated when the person pushes against the wall with both hands. What nerve innervates this muscle?** (Vinnitsa)

A. The axillary nerve (nervus axillaries)
B. The thoracodorsal nerve (nervus thoracodorsalis)
* C. The long thoracicus nerve (nervus thoracicus longus)
D. The dorsal scapular nerve (nervus dorsalis scapulae)
E. The subscapular nerve (nervus subscapularis)

**9. A 10-year-old boy falls off his bike, has difficulty in moving his shoulder, and is brought to an emergency room. His radiogram and angiogram reveal fracture of the surgical neck of his humerus and bleeding from the point of the fracture. Which of the following nerves is most likely injured as a result of this accident?** (Gross Anatomy)

A. Musculocutaneous
* B. Axillary
C. Radial
D. Median
E. Ulnar

**The answer** is B. The axillary nerve runs posteriorly around the surgical neck of the humerus and is vulnerable to injury such as fracture of the surgical neck of the humerus or inferior dislocation of the humerus. The other nerves listed are not in contact with the surgical neck of the humerus.

**10. A 10-year-old boy falls off his bike, has difficulty in moving his shoulder, and is brought to an emergency room. His radiogram reveal fracture of the surgical neck of his humerus with damage of axillary nerve. Following this accident, the boy has weakness in abduction his arm and rotating it laterally. Which of the following muscles are paralyzed?** (Gross Anatomy)

A. Teres major and teres minor
* B. Teres minor and deltoid
C. Infraspinatus and deltoid
D. Supraspinatus and subscapularis
E. Teres minor and infraspinatus

**The answer is B.** The abductor of the arm is the deltoid muscle, the lateral rotators of the arm include the teres minor, which are innervated by axillary nerve. The deltoid, and infraspinatus muscles also abduct the arm, but the infraspinatus muscle is innervated by the suprascapular nerve.

**12. An 11-year-old boy falls down the stairs. A physician examines a radiograph of the boy's shoulder region. The scapular notch is calcified. Which of the following muscles is most likely paralyzed?** (Gross Anatomy)

A. Deltoid
B. Teres major
C. Teres minor
* D. Infraspinatus
E. Subscapularis

**The answer is D.** The scapular notch transmits the suprascapular nerve below the superior transverse ligament, whereas the suprascapular artery and vein run over the ligament. The suprascapular nerve supplies the supraspinatus and infraspinatus muscles. The axillary nerve innervates the deltoid and teres minor muscles. The subscapular nerves innervate the teres major and subscapularis muscles.

**13. A 35-year-old man walks in with a stab wound to the most medial side of the proximal portion of the cubital fossa. Which of the following structures would most likely be damaged?** (Gross Anatomy)

A. Biceps brachii tendon
B. Radial nerve
C. Brachial artery
D. Radial recurrent artery
E. Median nerve*

**The answer is E.** The contents of the cubital fossa from medial to lateral side are the median nerve, the brachial artery, the biceps brachii tendon, and the radial nerve. Thus, the median nerve is damaged. The radial recurrent artery ascends medial to the radial nerve.

**14. A 12-year-old boy walks in; he fell out of a tree and fractured the upper portion of his humerus. Which of the following nerves are intimately related to the humerus and are most likely to be injured by such a fracture?** (Gross Anatomy)

A. Axillary and musculocutaneous
B. Radial and ulnar
C. Radial and axillary*
D. Median and musculocutaneous
E. Median and ulnar

**The answer is C.** The axillary nerve passes posteriorly around the surgical neck of the humerus and the radial nerve lies in the radial groove of the middle of the shaft of the humerus. The ulnar nerve passes behind the medial epicondyle and the median nerve is vulnerable to injury by supracondylar fracture of the humerus, but they lie close to or in contact with the lower portion of the humerus. The musculocutaneous is not in direct contact with the humerus.

**15. A 23-year-old woman who receives a deep cut of her ring finger by a kitchen knife is unable to move the metacarpophalangeal joint. Which of the following pairs of nerves are damaged?** (Gross Anatomy)

A. Median and ulnar
B. Radial and median
C. Musculocutaneous and ulnar
D. Ulnar and radial*
E. Radial and axillary

**The answer is D.** The metacarpophalangeal joint of the ring finger is flexed by the lumbrical, palmar, and dorsal interosseous muscles, which are innervated by the ulnar nerve. The extensor digitorum, which is innervated by the radial nerve, extends this joint. The musculocutaneous and axillary nerves do not supply muscles of the hand. The median nerve supplies

**16. A 23-year-old man complains of numbness on the medial side of the arm following a stab wound in the axilla. On examination, he is diagnosed with an injury of his medial brachial cutaneous nerve. In which of the following structures are the cell bodies of the**

**damaged nerve involved in numbness located?** (Gross Anatomy)

A. Sympathetic chain ganglion
B. Dorsal root ganglion*
C. Anterior horn of the spinal cord
D. Lateral horn of the spinal cord
E. Posterior horn of the spinal cord

**The answer is B.** The medial brachial cutaneous nerve contains sensory (general somatic afferent [GSA]) fibers that have cell bodies in the dorsal root ganglia, and an injury of these GSA fibers causes numbness of the medial side of the arm. It also contains sympathetic postganglionic fibers that have cell bodies in the sympathetic chain ganglia. The anterior horn of the spinal cord contains cell bodies of skeletal motor (general somatic efferent [GSE]) fibers, and the lateral horn contains cell bodies of sympathetic preganglionic fibers. The posterior horn contains cell bodies of interneurons.

**17. A 38-year-old homebuilder was involved in an accident and is unable to supinate his forearm. Which of the following nerves are most likely damaged?** (Gross Anatomy)

A. Suprascapular and axillary
B. Musculocutaneous and median
C. Axillary and radial
* D. Radial and musculocutaneous
E. Median and ulnar

**The answer is D.** The supinator and biceps brachii muscles, which are innervated by the radial and musculocutaneous nerves, respectively, produce supination of the forearm. This is a question of two muscles that can supinate the forearm.

**18. A 31-year-old patient complains of sensory loss over the anterior and posterior surfaces of the medial third of the hand and the medial one and one-half fingers. He is diagnosed by a physician as having "funny bone" symptoms. Which of the following nerves is injured?** (Gross Anatomy)

A. Axillary
B. Radial
C. Median
* D. Ulnar
E. Musculocutaneous

**The answer is D.** The ulnar nerve supplies sensory fibers to the skin over the palmar and dorsal surfaces of the medial third of the hand and the medial one and one-half fingers. The median nerve innervates the skin of the lateral side of the palm; the palmar side of the lateral three and one-half fingers; and the dorsal side of the index finger, the middle finger, and one-half of the ring finger. The radial nerve innervates the skin of the radial side of the hand and the radial two and one-half digits over the proximal phalanx.

**19. A patient with a deep stab wound in the middle of the forearm has impaired movement of the thumb. Examination indicates a lesion of the anterior interosseous nerve. Which of the following muscles is paralyzed?** (Gross Anatomy)

A. Flexor pollicis longus and brevis
B. Flexor pollicis longus and opponens pollicis
* C. Flexor digitorum profundus and pronator quadratus
D. Flexor digitorum profundus and superficialis

E. Flexor pollicis brevis and pronator quadratus

**The answer is C.** The anterior interosseous nerve is a branch of the median nerve and supplies the flexor pollicis longus, half of the flexor digitorum profundus, and the pronator quadratus. The median nerve supplies the pronator teres, flexor digitorum superficialis, palmaris longus, and flexor carpi radialis muscles. A muscular branch (the recurrent branch) of the median nerve innervates the thenar muscles.

**20. A 29-year-old patient comes in; he cannot flex the distal interphalangeal joint of the index finger. His physician determines he has nerve damage by the supracondylar fracture. Which of the following conditions is also a symptom of this nerve damage?** (Gross Anatomy)

A. Inability to flex the distal interphalangeal (DIP) joint of the ring finger
B. Atrophy of the hypothenar eminence
* C. Loss of sensation over the distal part of the second digit
D. Paralysis of all the thumb muscles
E. Loss of supination

**The answer is C.** The flexor digitorum profundus muscle flexes the distal interphalangeal (DIP) joints of the index and middle fingers and is innervated by the median nerve, which also supplies sensation over the distal part of the second digit. The same muscle flexes the DIP joints of the ring and little fingers but receives innervation from the ulnar nerve, which also innervates the hypothenar muscles. The median nerve innervates the thenar muscles. The radial nerve innervates the supinator, abductor pollicis longus, and extensor pollicis longus and brevis muscles. The ulnar nerve innervates the adductor pollicis. The musculocutaneous nerve supplies the biceps brachii that can supinate the arm.

**21. A 27-year-old man with cubital tunnel syndrome complains of numbness and tingling in the ring and little finger and back and sides of his hand because of damage to the ulnar nerve in the tunnel at the elbow. Which of the following muscles is most likely to be paralyzed?** (Gross Anatomy)

A. Flexor digitorum superficialis
B. Opponens pollicis
* C. Two medial lumbricals
D. Pronator teres
E. Supinator

**The answer is C.** The ulnar nerve innervates the two medial lumbricals. However, the median nerve innervates the two lateral lumbricals, the flexor digitorum superficialis, the opponens pollicis, and the pronator teres muscles.

**22. A secretary comes in to your office complaining of pain in her wrists from typing all day. You determine she likely has carpal tunnel syndrome. Which of the following conditions would help you determine the diagnosis?** (Gross Anatomy)

A. Inability to adduct the little finger
B. Inability to flex the distal interphalangeal joint of the ring finger
* C. Flattened thenar eminence
D. Loss of skin sensation of the medial one and one-half fingers
E. Atrophied adductor pollicis muscle

**The answer is C.** The carpal tunnel contains the median nerve and the tendons of flexor pollicis longus, flexor digitorum profundus, and flexor digitorum superficialis muscles. Carpal

tunnel syndrome results from injury to the median nerve, which supplies the thenar muscle. Thus, injury to this nerve causes the flattened thenar eminence. The middle finger has no attachment for the adductors. The ulnar nerve innervates the medial half of the flexor digitorum profundus muscle, which allows flexion of the distal interphalangeal joints of the ring and little fingers. The ulnar nerve supplies the skin over the medial one and one-half fingers and adductor pollicis muscle.

**23. A man is unable to hold typing paper between his index and middle fingers. Which of the following nerves was likely injured?** (Gross Anatomy)+

A. Radial nerve
B. Median nerve
* C. Ulnar nerve
D. Musculocutaneous nerve
E. Axillary nerve

**The answer is C.** To hold typing paper, the index finger is adducted by the palmar interosseous muscle, and the middle finger is abducted by the dorsal interosseous muscle. Both muscles are innervated by the ulnar nerve.

**24. A patient with a stab wound receives a laceration of the musculocutaneous nerve. Which of the following conditions is most likely to have occurred?** (Gross Anatomy)+

* A. Lack of skin sensation on the lateral side of the forearm. Inability to flexed the forearm
B. Inability to extend the forearm
C. Paralysis of brachioradialis muscle
D. Loss of tactile sensation on the arm
E. Constriction of blood vessels on the hand

**25. The person can't extend the wrist owing the paralysis of the extensor muscles of the forearm. The hand is flexed at the wrist and lies flaccid, a condition known as wrist-drop. The digits are also flexed at the metacarpophalangeal joints. Which nerve is damaged?** (Vinnitsa)

A. the ulnar nerve (nervus ulnaris),
B. the median nerve (nervus medianus),
* C. the radial nerve (nervus radialis),
D. the musculocutaneous nerve (nervus musculocutaneus)
E. the anterior interosseus nerve (nervus interosseus anterior)

**26. After the trauma of the arm in the area of the humeromuscular canal a man has pains in the posterior side of the arm and antebrachium. Which nerve is supposed to be injured in this trauma?** (Vinnitsa)+

A. the ulnar nerve (nervus ulnaris),
B. the median nerve (nervus medianus),
* C. the radial nerve (nervus radialis),
D. the musculocutaneous nerve (nervus musculocutaneus).
E. the axillary nerve (nervus axillaries)

**27. A patient has elbow joint trauma with avulsion of medial epicondyle of humerus. What nerve can be damaged in this trauma?** (2006)+

A. Musculocutaneous nerve
B. Cardiac cutaneous nerve
C. Medial cutaneous nerve of forearm
D. Radial

* E. Ulnar

**28. A patient lost skin sensitivity of the little finger. Which nerve is damaged?**(Kiev)

A. Median.
* B. Ulnar.
C. Radial.
D. Musculocutaneous.
E. Medial cutaneous nerve of forearm.

**29. A 21-year-old man injures his right arm in an automobile accident. Radiographic examination reveals a fracture of the medial epicondyle of the humerus. Which of the following nerves is most likely injured as a result of this accident?** (Gross Anatomy)

(A) Axillary
(B) Musculocutaneous
(C) Radial
(D) Median
**(E) Ulnar***

**The answer is** E. The ulnar nerve runs down the medial aspect of the arm and behind the medial epicondyle in a groove, where it is vulnerable to damage by fracture of the medial epicondyle. Other nerves are not in contact with the medial epicondyle.

**30. A 21-year-old man injures his right arm in an automobile accident. Radiographic examination reveals a fracture of the medial epicondyle of the humerus with damage of the ulnar nerve. Which of the following muscles is most likely paralyzed as a result of this accident?** (Gross Anatomy)

A. Extensor pollicis brevis
B. Abductor pollicis longus
C. Abductor pollicis brevis
***D. Adductor pollicis**
E. Opponens pollicis

**The answer is D.** The ulnar nerve innervates the adductor pollicis muscle. The radial nerve innervates the abductor pollicis long and extensor pollicis brevis muscles, whereas the median nerve innervates the abductor pollicis brevis and opponens pollicis muscles.

**31. A 64-year-old man with a history of liver cirrhosis has been examined for hepatitis A, B, and C viruses. In an attempt to obtain a blood sample from the patient's median cubital vein, a registered nurse inadvertently procures arterial blood. During the procedure, the needle hits a nerve medial to the artery. Which of the following nerves is most likely damaged?** (Gross Anatomy)

A. Radial
* B. Median
C. Ulnar
D. Lateral antebrachial
E. Medial antebrachial

**The answer is B.** The median nerve is damaged because it lies medial to the brachial artery. The bicipital aponeurosis lies on the brachial artery and the median nerve. The V-shaped cubital fossa contains (from medial to lateral) the median nerve, brachial artery, biceps tendon, and ra-

dial nerve. The ulnar nerve runs behind the medial epicondyle; the lateral and medial antebrachial cutaneous nerves are not closely related to the brachial artery.

**32. A 17-year-old boy is injured in an automobile accident. He has a fracture of the shaft of the humerus. Which of the following nerves is most likely damaged?** (Gross Anatomy)

A. Axillary nerve
* B. Radial nerve
C. Musculocutaneous nerve
D. Median nerve
E. Ulnar nerve

**The answer is B.** The radial nerve runs in the radial groove on the back of the shaft of the humerus with the profunda brachii artery. Axillary nerve passes around the surgical neck of the humerus. The ulnar nerve passes the back of the medial epicondyle. The musculocutaneous and median nerves are not in contact with the bone, but the median nerve can be damaged by supracondylar fracture.

**33. A 17-year-old boy is injured in an automobile accident. He has a fracture of the shaft of the humerus. Following this accident, the patient has no cutaneous sensation in which of the following areas?** (Gross Anatomy)

A. Medial surface of the arm
B. Lateral surface of the forearm
C. Palmar surface of the second and third fingers
* D. Dorsal surface of the first, second and half of the third fingers
E. Dorsal surface of the fifth, fourth and half of the third fingers

**The answer is D.** The superficial branch of the radial nerve runs distally to the dorsum of the hand to innervate the radial side of the hand, including the first, second and one-half of the third fingers over the proximal phalanx. The medial aspect of the arm is innervated by the medial brachial cutaneous nerve, the lateral aspect of the forearm by the lateral antebrachial cutaneous nerve of the musculocutaneous nerve, the palmar aspect of the second and third digits by the median nerve, and the medial one and one-half fingers by the ulnar nerve.

**34. A 29-year-old man comes in with a stab wound, cannot raise his arm above horizontal, and exhibits a condition known as "winged scapula." Which of the following nerves of the brachial plexus would most likely be damaged?** (Vinnitsa)

A. Axillary nerve
**B. Long thoracic nerve**
C. Thoracodorsal nerve
D. Suprascapular nerve
E. Subscapular nerve

**The answer is B.** Winged scapula is caused by paralysis of the serratus anterior muscle that results from damage to the long thoracic nerve

**35. A patient has elbow joint trauma with avulsion of medial epicondyle of humerus. Which nerve can be damaged in this trauma?**

A. Cardiac cutaneous nerve
B. Medial cutaneous nerve of forearm

C. Musculocutaneus nerve
***D. Ulnar***
E. Radial

## TASK №17.

## The intercostal nerves: formation, topography, branches, regions of innervation. The lumber plexus: formation, topography, branches, regions of innervation.

1. **A patient was admitted to a traumatology center with the greater psoas muscle damage. The patient lost possibility to straighten his leg in the knee joint. Which nerve is damaged?** (Kiev)
   * A. The femoral nerve (nervus femoralis)
   B. The obturator nerve (nervus obturatorius)
   C. The genitofemoral nerve (nervus genitofemoralis)
   D. The sciatic nerve (nervus ischiadicus)
   E. The gluteal nerve (nervus gluteus)

2. **A patient knee joint does not extend, there is no knee jerk, skin sensitivity of the anterior femoral surface is disturbed. What nerve structures are damaged?** (2007)
   A. Superior gluteal nerve
   * B. Femoral nerve
   C. Inferior gluteal nerve
   D. Big fibular nerve
   E. Obturator nerve

3. **Examining a patient a neuropathologist detected the following symptom complex: cremasteric reflex extinction (reduction of m. cremaster), disorder of skin sensitivity on the anterior and internal surface of the superior third of the thigh and scrotum. Which nerve was injured?** (Kiev)
   A. Ilioinguinal.
   * B. Genitofemoral.
   C. Sciatic.
   D. Femoral.
   E. Obturator.

4. **A patient can not extend a knee joint, knee reflex is not observed, skin sensitivity of the anterior surface of the thigh is damaged. Which nerve is damaged?** (Kiev)
   A. Obturator.
   B. Superior gluteal.
   C. Common peroneal.
   * D. Femoral.
   E. Inferior gluteal nerve.

5. **A 41-year-old man was involved in a fight and felt weakness in extending the knee joint. On examination, he was diagnosed with a lesion of the femoral nerve. Which of the following symptoms would be a result of this nerve damage?** (Gross Anatomy)
   A. Paralysis of the psoas major muscle
   B. Loss of skin sensation on the lateral side of the foot
   C. Loss of skin sensation over the greater trochanter
   * D. Paralysis of the quadratus femoris muscle

E. Paralysis of the tensor fasciae latae

**The answer** is D. The femoral nerve innervates the quadratus femoris, and sartorius muscles. Therefore, damage to this nerve results in paralysis of these muscles. The second and third lumbar nerves innervate the psoas major muscle, the sural nerve innervates the skin on the lateral side of the foot, the iliohypogastric nerve and superior clunial nerves supply the skin over the greater trochanter, and the superior gluteal nerve innervates the tensor fasciae latae.

## TASK №18.

## The sacral plexus: formation, topography, branches, regions of innervation.

1. **In person with the poliomyelitis the gluteus medius and minimus muscles are weakened. The supportive and steadying effect of these muscles on the pelvis is lost. The person walks with waddling gait known as the gluteal or duck gait, characterized by falling of the pelvis toward the unaffected side at each step. Which nerve innervate the gluteus medius and minimus muscles?** (Vinnitsa)+
   A. The sciatic nerve (nervus ischiadicus)
   B. The obturator nerve (nervus obturaturius)
   * C. The superior gluteal nerve (nervus gluteus superior)
   D. The inferior gluteal nerve (nervus gluteus inferior)
   E. The femoral nerve (nervus femoralis)

2. **A patient with a deep knife wound in the buttock walks with a waddling gait that is characterized by the pelvis falling toward one side at each step. Which of the following nerves is damaged?** (Gross Anatomy)+
   A. Obturator nerve
   B. Nerve to obturator internus
   * C. Superior gluteal nerve
   D. Inferior gluteal nerve
   E. Femoral nerve

   **The answer is** C. The superior gluteal nerve innervates the gluteus medius muscle. Paralysis of this muscle causes gluteal gait, a waddling gait characterized by a falling of the pelvis toward the unaffected side at each step. The gluteus medius muscle normally functions to stabilize the pelvis when the opposite foot is off the ground. The inferior gluteal nerve innervates the gluteus maximus, and the nerve to the obturator internus supplies the obturator internus and superior gemellus muscles. The obturator nerve innervates the adductor muscles of the thigh, and the femoral nerve supplies the flexors of the thigh.

3. **The person is unable to plantarflex his foot and flex his toes. There is also a loss of sensation on the sole of the foot. What nerve is likely to be injured?** (Vinnitsa)
   * A. The tibial nerve (nervus tibialis)
   B. The common fibular nerve (nervus fibularis communis)
   C. The superficial fibular nerve (nervus fibularis superficialis)
   D. The deep fibular nerve (nervus fibularis profundus)
   E. The planter nerve (nervus plantaris)

4. **As a result of a knife wound around the neck of the fibula the person is unable to extend (dorsoflex) his foot. In addition he can't raise the lateral border of the foot. The loss of eversion and dorsoflexion of the foot causes the foot to hang down, a condition known as**

***foot-drop.*** **The patient has a *high stepping gait* in which the foot is raised higher than it is necessary so the toes do not hit the ground. The foot is brought down suddenly, producing a distinctive "clop'. There is also a variable loss of sensation on the anterolateral; aspect of the leg and dorsum of the foot. Which nerve is injured?** (Vinnitsa)+

A. The femoral nerve (nervus femoralis)
B. The tibial nerve (nervus tibialis)
* C. The common fibular nerve (nervus fibularis communis)
D. The superficial fibular nerve (nervus fibularis superficialis)
E. The deep fibular nerve (nervus fibularis profundus)

**5. Pieces of the sural nerve are used for nerve grafts (e.g. in the repair of defects resulting from wounds)**. **The skin of the which regions of the foot is innervated of the sural nerve?** (Vinnitsa)

A. The skin of the dorsal surface of the foot
B. The skin of the plantar surface of the foot
C. The skin of the medial border of the foot
* D. The skin of the lateral border of the foot and the skin of the hill
E. The skin of the whole foot

**6. Examination of a patient with acut wound in the inferior third of the right leg anterior area has shown the absence of extension movements in the right ankle joint. Muscles are not injured. Which nerve integrity has been affected?** (Kiev)

A. Saphenous.
B. Common peroneal.
C. Superficial fibular.
* D. Deep fibular.
E. Femoral

**7. A 30-year-old patient appealed to a neuropathologist complaining of skin sensitivity loss of the middle and inferior third of the posterior region of the leg and lateral border of the foot on the right. Which nerve is damaged?+**

*A. Sural.
B. Posterior cutaneous nerve of thigh.
C. Genitofemoral.
D. Branches of obturator nerve.
E. Tibial.

**8. A 27-year-old patient exhibits a loss of skin sensation and paralysis of muscles on the plantar aspect of the medial side of the foot. Which of the following nerves is most likely damaged?** (Gross Anatomy)

A. Common peroneal
* B. Tibial
C. Superficial peroneal
D. Deep peroneal
E. Sural

**The answer** is B. The tibial nerve innervates the posterior muscles of the leg, muscle and skin of the plantar surface of the foot. The common peroneal nerve divides into the deep peroneal nerve, which innervates the anterior muscles of the leg and supplies the adjacent skin of the first and second toes, and the superficial peroneal nerve, which innervates the lateral muscles of the leg and supplies the skin on the side of the lower leg and the dorsum of the ankle and foot. The sural nerve supplies the lateral aspect of the foot and the little toe.

9. **A patient presents with sensory loss on adjacent sides of the great and second toes and impaired dorsiflexion of the foot. These signs probably indicate damage to which of the following nerves?** (Gross Anatomy)

   A. Superficial peroneal
   B. Lateral plantar
   * C. Deep peroneal
   D. Sural
   E. Tibial

   **The answer is** C. The deep peroneal nerve supplies the anterior muscles of the leg, including the tibialis anterior, extensor hallucis longus, extensor digitorum longus, and peroneus tertius muscles, which dorsiflex the foot. The medial branch of the deep peroneal nerve supplies the skin of adjacent sides of the great and second toes, whereas the lateral branch supplies the extensor digitorum brevis and extensor hallucis brevis. The superficial peroneal nerve innervates the peroneus longus and brevis, which plantar flexes the foot, and supplies the skin on the side of the lower leg and the dorsum of the ankle and foot. The tibial nerve innervates the muscles of the posterior compartment that plantar flexes and supplies the skin on the heel and plantar aspect of the foot. The lateral plantar nerve innervates muscles and skin of the lateral plantar aspect of the foot. The sural nerve supplies the skin on the posterolateral aspect of the leg and the lateral aspect of the foot and the little toe.

10. **A motorcyclist falls from his bike in an accident and gets a deep gash that severs the superficial peroneal nerve near its origin. Which of the following muscles is paralyzed?** (Gross Anatomy)

   * A. Peroneus longus
   B. Extensor hallucis longus
   C. Extensor digitorum longus
   D. Peroneus tertius
   E. Extensor digitorum brevis

   **The answer is A.** The superficial peroneal nerve supplies the peroneus longus and brevis muscles. Other muscles are innervated by the deep peroneal nerve.

11. **A 67-year-old patient has been given a course of antibiotics by gluteal intramuscular injections after a major abdominal surgery. To avoid damaging the sciatic nerve during an injection, the needle should be inserted into which of the following areas?** (Gross Anatomy)

   A. Over the sacrospinous ligament
   B. Midway between the ischial tuberosity and the lesser trochanter
   C. Midpoint of the gemelli muscles
   * D. Upper lateral quadrant of the gluteal region
   E. Lower medial quadrant of the gluteal region

   **The** answer is D. To avoid damaging the sciatic nerve during an intramuscular injection, the clinician should insert the needle in the upper lateral quadrant of the gluteal region. The inserted needle in the lower medial quadrant may damage the pudendal and sciatic nerves. The inserted needle midway between the ischial tuberosity and the lesser trochanter may damage the sciatic and posterior femoral cutaneous nerves on the quadratus femoris. The inserted needle over the sacrospinous ligament may damage the pudendal nerve and vessels.

## TASK №19.
## The vegetative nervous system: sympathetic part.

1. **A 17-year-old boy fell from his motorcycle and complains of numbness of the lateral part of the arm. Examination reveals the axillary nerve is severed. Which of the following types of axons is most likely spared?** (Gross Anatomy)

   A. Postganglionic sympathetic axons
   B. Somatic afferent axons
   * C. Preganglionic sympathetic axons
   D. General somatic efferent axons
   E. General visceral afferent axons

   **The answer is** C. The axillary nerve contains no preganglionic sympathetic general visceral efferent (GVE) fibers, but it contains postganglionic sympathetic GVE fibers. The axillary nerve also contains general somatic afferent (GSA), general somatic efferent (GSE), and general visceral afferent (GVA) fibers.

2. **A 17-year-old boy is injured in an automobile accident. He has a fracture of the shaft of the humerus. As a result of this fracture, the patient shows lack of sweating on the back of the arm and forearm. Cell bodies of the damaged nerve fibers involved in sweating are located in which of the following structures?** (Gross Anatomy)

   A. Anterior horn of the spinal cord
   B. Posterior horn of the spinal cord
   C. Lateral horn of the spinal cord
   * D. Sympathetic chain ganglion
   E. Dorsal root ganglion

   **The answer is D.** The (damaged) radial nerve contains sympathetic postganglionic nerve fibers whose cell bodies are located in the sympathetic chain ganglion. Sympathetic postganglionic fibers supply sweat glands, blood vessels, and hair follicles. The radial nerve also contains general somatic efferent (GSE) fibers whose cell bodies are located in the anterior horn of the spinal cord, and general somatic afferent (GSA) and general visceral afferent (GVA) fibers whose cell bodies are located in the dorsal root ganglion. The lateral horn of the spinal cord between Tl and L2 contains cell bodies of sympathetic preganglionic nerve fibers.

3. **A 23-year-old man received a gunshot wound and his greater splanchnic nerve was destroyed. Which of the following nerve fibers would be injured?**

   A. General somatic afferent (GSA) and preganglionic sympathetic fibers
   B. General visceral afferent (GVA) and postganglionic sympathetic fibers
   ***C. General visceral afferent (GVA) and preganglionic sympathetic fibers**
   D. General somatic efferent (GSE) and postganglionic sympathetic fibers
   E. General visceral afferent (GVA) and general somatic afferent GSE fibers

   **The answer is** C. The greater splanchnic nerves contain general visceral afferent (GVA) and preganglionic sympathetic general visceral efferent (GVE) fibers.

4. **As a result of a pathological process the function of the efferent part central link of the vegetative nervous system sympathetic department was affected. Point out possible localization of the process in the spinal cord.**

   * A. Lateral intermediate nucleus of lateral horns.

B. Medial intermediate nucleus of lateral horns.
C. Dorsal nucleus of posterior horns.
D. Proper nucleus of posterior horns.
E. Central nucleus of anterior horns.

5. **A 17-year-old boy was involved in gang fighting and a stab wound severed the white rami communicantes at the level of his sixth thoracic vertebra. This injury would result in degeneration of nerve cell bodies in which of the following structures?**
   A. Dorsal root ganglion and anterior horn of the spinal cord
   B. Sympathetic chain ganglion and dorsal root ganglion
   C. Sympathetic chain ganglion and posterior horn of the spinal cord
   **D. Dorsal root ganglion and lateral horn of the spinal cord**
   E. Anterior and lateral horns of the spinal cord

**The answer is D.** The white rami communicantes contain preganglionic sympathetic general visceral efferent (GVE) fibers and general visceral afferent (GVA) fibers whose cell bodies are located in the lateral horn of the spinal cord and the dorsal root ganglia. The sympathetic chain ganglion contains cell bodies of the postganglionic sympathetic nerve fibers. Anterior horn of the spinal cord contains cell bodies of the GSE fibers. The dorsal root ganglion contains cell bodies of GSA and GVA fibers.

## TASK №20.
## The vegetative nervous system: parasympathetic part.

1. **Based on the examination at her doctor's office, a patient is told that her parasympathetic nerves are damaged. Which of the following muscles would most likely be affected?**

   A. Muscles in the hair follicles
   B. Muscles in blood vessels
   C. Muscles that act at the elbow joint
   * D. Muscles in the gastrointestinal (GI) tract
   E. Muscles enclosed by epimysium

**The answer is D.** Smooth muscles in the gastrointestinal (GI) tract are innervated by both parasympathetic and sympathetic nerves. Smooth muscles in the wall of the blood vessels and arrector pili muscles in hair follicles are innervated only by sympathetic nerves. Muscles act at the elbow joint and muscles enclosed by epimysium are skeletal muscles that are innervated by somatic motor (general somatic efferent [GSE]) nerves.

2. **A patient has lacrimation and increased salivation. In combination with other symptoms this state is considered to be an irritation of fibers of a cranial nerve. Which nerve is this, and what fibers are these?**
   * A. Parasympathetic fibres of facial nerve.
   B. Parasympathetic fibres of oculomotor nerve.

C. Somatic motor fibres of oculomotor nerve.
D. Parasympathetic fibres of vagus nerve.
E. Somatic motor fibres of facial nerve.

**3. Examination of pupillary reflex has shown asthenocoria. Which nucleus function is damaged?**
* A. Accessory nucleus of oculomotor nerve.
B. Nucleus of trochlear nerve.
C. Nucleus of abducent nerve.
D. Nucleus of superior tubercles of tectum of mesencephalon.
E. Nucleus of oculomotor nerve.

**4. The growth of a tumor in the cavity of the third ventricle of brain caused such vegetative disorders as sleep disturbance, disorder of thermoregulation, all kinds of metabolism, diabetes insipidus. The irritation of nuclei of what part of the brain caused these symptoms?**
A.Medulla oblongata.
B.Cerebral peduncles.
C. Mesencephalic tegmentum.
D.Pons.
* E. Hypothalamus.

## TASK №21.
## The lymphatic system: structure, function, clinical significance.

2. **A surgeon is going to take lymph from a patient lymphatic duct, from where it flows into the venous stream. Where should he insert a catheter into?** (2008)

A. Site of precava origination
**B. Left venous angle**
C. Right venous angle
D. Site of portal vein origination
E. Site of postcaval origination

## TASK №22.
## The lymphatic nodes of the abdominal and pelvic cavities. The outflow of the lymph.

1. **A patient has pain, edema and reddening of his skin in the anterosuperior area of his thigh and his foot thumb. What lymph nodes of his lower extremity responded to the inflammatory process?** (2007)
A. Superficial longitudinal
B. Deep inguinal
C. General longitudinal
D. Internal longitudinal
* E. Superficial inguinal

## TASK №23.
## The lymphatic nodes of the head and neck and thoracic cage. The outflow of the lymph from the mammary gland.

1. **While palpating mammary gland of a patient a doctor revealed an induration in form of a node in the inferior medial quadrant. Metastases may extend to the following lymph nodes:** (2008) +

A. Superior diaphragmal
B. Posterior mediastinal
C. Bronchopulmonary
D. Profound lateral cervical
* E. Parasternal

2. **A 49-year-old woman is diagnosed as having a large lump in her upper lateral quadrant of the right breast gland. Lymph from the cancerous breast drains primarily into which of the following nodes?** (Vinnitsa)

A. Deep lateral cervical nodes
*B. Anterior (pectoral) axillary nodes
C. Parasternal (internal thoracic) nodes
D. Supraclavicular nodes
E Nodes of the anterior abdominal wall

**The answer is B.** Lymph from the upper lateral quadrant of the breast gland drains mainly (75%) to the axillary nodes, more specifically to the anterior (pectoral) nodes.

3. **A patient has a malignant swelling in the abdominal part of the esophagus. Which group of lymph nodes is regional for this part of esophagus?** (Kiev)

* A. Anulus lymphaticus cardiacae.
B. Nodi paratracheales.
C. Nodi prevertebrales.
D. Nodi perecardiales laterales.
E. Nodi mediastinales posteriores.

4. **According to the results of diagnostic tests, a doctor decided to do lymphography of thoracic cavity organs of a 40-year-old patient. The doctor detected that the swelling affected the organ, from lymphoid vessels of which the lymph gets directly into the thoracic duct. Which organ is damaged?** (Kiev)

* A. Esophagus.
B. Trachea.
C. Left principal bronchus.
D. Heart.
E. Pericardium.

5. **A 54-year-old woman finds a lump in her right breast during an annual mammogram and physical examination. On further examination, she is diagnosed with a malignancy in her upper right quadrant. Cancer cells most likely metastasize primarily to which of the following groups of lymph nodes?** (Gross Anatomy)

A. Apical (subclavian) nodes
B. Lateral (brachial) nodes
* C. Pectoral (anterior) nodes
D. Parasternal (internal thoracic) nodes
E. Subscapular (posterior) nodes

**The answer is** C. Breast cancer cells spread primarily to the pectoral (anterior) axillary nodes

because most lymph (75%) from the upper lateral quadrant of the breast drains specifically to the pectoral nodes. Breast cancer cells also spread to the apical and parasternal nodes. The central axillary nodes receive lymph from lateral and subscapular nodes.

**6. While palpating mammary gland of a patient a doctor revealed an induration in form of a node in the inferior medial quadrant. Metastases may extend to the following lymph nodes:** (2008)

F. Superior diaphragmal
G. Posterior mediastinal
H. Bronchopulmonary
I. Profound lateral cervical
**J. Parasternal**