

GUIDELINES

Students' independent work during preparation to practical lesson

Academic discipline	HUMAN ANATOMY
Topic	THE VESSELS OF THE UPPER LIMB. THE VESSELS OF THE LOWER LIMB.

1. The relevance of the topic

Deepening of the knowledge of vascular systems of extremities is necessary for the professional interpretation of blood flow disorders in trauma, pathological processes of the extremities. Perfect knowledge of blood vessels of the extremities is the basis for professional activity of orthopedists, traumatologists, vascular surgeons, expand their capabilities of surgery. In addition, every doctor of any specialty is obliged to stop bleeding from damaged vessels quickly and efficiently, especially from the big ones by applying a tourniquet.

2. Specific objectives

- describe, classify, analyse blood vessels of the shoulder girdle and arm
- describe, classify, analyse blood vessels of the thigh, gluteal region, leg, foot
- determine the borders of axillary artery, demonstrate the branches of axillary artery
- describe and demonstrate v. cephalica, v. basilica, v. mediana cubiti
- determine the borders of femoral artery, demonstrate the branches of femoral artery
- determine the borders and branches of lateral femoral circumflex artery
- demonstrate branches of medial femoral circumflex artery
- demonstrate the borders and branches of obturator artery
- determine the borders and branches of popliteal artery
- demonstrate the posterior tibial artery, fibular artery, dorsalis pedis

3. Basic level of preparation includes a knowledge of osteology, myology. The student should know the anatomy of the bones of the upper and lower limb, muscles of the arm and forearm, classification of the junctions of the bones of the extremities; know peculiarities of muscles of the upper and lower limb.

4. Tasks for independent work during preparation for classes

4.1 The list of important terms

MAGISTRAL ARTERY OF THE UPPER LIMB	A. axillaris, a. brachialis, a. ulnaris, a. radialis, superficial palmar arch, general digital palmar artery, proper palmar digital artery, deep palmar arch, palmar metacarpal arteries.
RETE ARICULARE CUBITI	Anastomosis of the brachial artery (radial collateral artery, middle collateral artery, upper ulnar collateral artery, lower ulnar collateral artery) with a. ulnaris (ulnar recurrent artery, interosseous recurrent artery) with radial artery (radial recurrent artery).
RETE CARPALE DORSALE	Anastomosis of the a. ulnaris with radial artery by means of dorsal carpal branches.
SUPERFICIAL PALMAR ARCH	Anastomosis of the a. ulnaris with radial artery (superficial palmar branch)
DEEP PALMAR ARCH	Anastomosis of the radial artery with a. ulnaris (deep palmar branch)

FEMORAL ARTERY	It is a continuation of the external iliac artery
FEMORAL TRIANGLE	It is a hollow area in the anterior upper thigh. Many large neurovascular structures pass through this area and can be accessed relatively easily.
OBTURATOR ARTERY	It descends via the obturator canal to enter the medial thigh, bifurcating into two branches.
POPLITEAL ARTERY	It moves through the popliteal fossa, exiting between the gastrocnemius and popliteus muscles.
DORSAL VENOUS ARCH	Mostly drains into the superficial veins. Some veins from the arch penetrate deep into the leg, forming the anterior tibial vein.

4.2 Theoretical question for the class

Upper limb

1. Describe the axillary artery
2. Describe the brachial artery
3. Describe the radial artery
4. Describe the ulnar artery
5. Describe cubital anastomosis
6. Describe the superficial palmar arch
7. Describe the deep palmar arch
8. Describe the dorsal carpal arch
9. Describe the palmar carpal arch
10. Describe the palmar arterial anastomosis
11. Give general description and classification of the veins of upper limb.
12. Describe the superficial veins.
13. Describe the deep veins of the upper limb
15. Describe the axillary vein

Lower limb

1. Describe the common iliac artery
2. Describe the parietal branches of the internal iliac artery
3. Describe the visceral branches of the internal iliac artery
4. Describe the external iliac artery
5. Describe femoral artery
6. Describe the deep artery of thigh
7. Describe the popliteal artery
8. Describe the anterior tibial artery
9. Describe the posterior tibial artery
10. Describe the genicular anastomoses
11. Describe the medial plantar artery
12. Describe the lateral plantar artery
13. Describe the dorsal artery of foot
14. Discuss the arterial anastomoses of foot
15. Describe the internal iliac vein
15. Describe the parietal tributaries of the internal iliac artery. Describe the superficial veins of the lower limbs.
16. Describe the great saphenous vein
17. Describe the deep veins of lower limb
18. Describe the femoral vein

4.3 The list of standardized practical skills

Upper limb

- a. axillaris
- a. thoracic superior
- a. thoracica lateralis
- a. subscapularis
- a. thoracodorsalis
- a. thoracoacromialis
- a. circumflexa scapulae
- a. circumflexa anterior humeri
- a. circumflexa posterior humeri
- a. brachialis
- rr. muscularis
- a. profunda brachii
- a. collateralis superior ulnaris
- a. collateralis inferior ulnaris
- a. radialis
- a. recurrens radialis
- r. palmaris superficialis
- r. carpalis palmaris dorsalis
- a. ulnaris
- rr. muscularis
- a. recurrens ulnaris
- a. interossea communis
- a. carpalis palmaris
- a. carpalis dorsalis
- r. palmaris profunda
- aa. digitales palmares propriae

Lower limb

- a. iliaca externa
- a. femoralis
- a. circumflexa iliaca superficialis
- a. epigastrica superficialis
- a. pudenda externa superficialis
- a. pudenda externa profunda
- a. profunda femoris
- a. circumflexa femoris medialis
- a. circumflexa femoris lateralis
- rr. perforantes
- a. descendens genus
- a. poplitea
- a. superior medialis genus
- a. superior lateralis genus
- a. media genus
- a. inferior medialis genus
- a. inferior lateralis genus
- a. tibialis anterior
- a. tibialis posterior
- a. fibularis
- a. dorsalis pedis
- a. tarsalis lateralis
- a. arcuate

- a. metatarsalis dorsalis
- a. digitalis dorsalis communis
- a. digitalis dorsalis
- rr. calcanei
- a. plantaris lateralis
- a. plantaris medialis
- a. metatarsalis plantaris
- a. plantaris communis
- a. digitalis plantaris propria

5. Sources

Anatomy nomenclature	international	http://anatom.ua/anatomical-terminology/
LECTURE		https://anatom.ua/basis/english/lectures/
Textbook 'Human anatomy'		PP. 292-301 http://anatom.ua/basis/english/online-book-in-english/
Work Book (Coloring book)		PP. 103-104
Atlas of human anatomy (Sobotta)		PP. 104, 112-114, 125-129
QUIZES		https://anatom.ua/basis/english/tests/
VIDEO		https://anatom.ua/basis/video/

6. Materials for self-control

1. A nurse inserts a venous catheter into a superficial vein located anterolaterally in the arm. Which vein is most likely to be used for this?
 - A. Radial
 - B. Basilic
 - C. Cephalic
 - D. Axillary

2. Which arteries do provide blood supply to the digiti pedis?
 - A. Aa. plantares mediales et lateralis, a. dorsalis pedis
 - B. A. poplitea, a. profunda femoris
 - C. A. tibialis anterior, a. fibularis
 - D. A. tibialis posterior, a. plantaris medialis
 - E. A. plantares lateralis, a. fibularis

3. What are the arteries formed at the bifurcation of the brachial artery?
 - A. Anterior interosseous, radial and ulnar arteries
 - B. Axillary artery and humeral circumflex arteries
 - C. Profunda brachii, anterior interosseous, radial and ulnar arteries
 - D. Radial and ulnar arteries
 - E. Digital arteries

4. Choose the veins that carry the blood into the femoral vein.
 - A. Femoral circumflex vein, deep femoral vein, middle sacral vein
 - B. Great and small saphenous veins, femoral circumflex vein, deep femoral vein
 - C. Small saphenous vein, anterior tibial vein, middle sacral vein
 - D. Femoral circumflex vein, great saphenous vein, popliteal vein, deep vein of the thigh
 - E. Posterior and anterior tibial vein, femoral circumflex vein, deep femoral vein

5. At which level does the basilic vein travel deep into the upper limb?
- A. Cubital fossa
 - B. Teres major
 - C. Axilla
 - D. Clavipectoral triangle
6. What arteries do provide blood supply to the articulation coxae?
- A. Aa. circumflexa femoris medialis et lateralis, a. obturatoria
 - B. A. rectalis inferior, a. circumflexa ilium profunda
 - C. Aa. gluteae, a. obturatoria, a. circumflexa femoris medialis
 - D. Aa. perforantes, aa. iliacae externae
 - E. A. glutea superior, a. circumflexa femoris lateralis
7. Which of the following statements is true?
- A. The left and right common carotid arteries branch off the brachiocephalic trunk.
 - B. The brachial artery is the distal branch of the axillary artery.
 - C. The radial and ulnar arteries join to form the palmar arch.
 - D. All of the above are true.
8. Where is the brachial artery bifurcated?
- A. the cubital fossa, underneath the brachialis muscle
 - B. the coronoid fossa, underneath the brachialis muscle
 - C. the axillary region
 - D. near the head of the humerus
 - E. distal to the teres major
9. What vein is formed from the dorsal venous arch and leads to the popliteal vein?
- A. anterior tibial vein
 - B. femoral vein
 - C. femoral circumflex vein
 - D. deep femoral vein
 - E. saphenous vein
10. Where does cephalic vein drain into?
- A. Brachial vein
 - B. Dorsal venous network of the hand
 - C. Axillary vein
 - D. Basilic vein
12. Which artery DOESN'T arise from a. femoralis?
- A. A. profunda femoris
 - B. A. genus descendens
 - C. A. epigastrica inferior
 - D. A. pudenda externa
 - E. A. epigastrica superficialis
13. Choose the veins that do NOT carry the blood into the femoral vein.
- A. Femoral circumflex vein, deep femoral vein
 - B. Femoral circumflex vein, great saphenous vein
 - C. Great saphenous vein, femoral circumflex vein, deep femoral vein
 - D. Small saphenous vein, anterior tibial vein, middle sacral vein
 - E. Popliteal vein, deep vein of the thigh

14. Choose the branches of the femoral artery.

- A. Genicular artery, lateral deep femoral artery, superficial epigastric artery
- B. Genicular artery, lateral deep femoral artery, lateral circumflex artery, superficial epigastric artery
- C. Anterior and posterior tibial arteries, lateral circumflex artery
- D. Anterior and posterior tibial arteries, superficial epigastric artery
- E. Dorsalis pedis artery, medial and lateral plantar artery

15. Which arteries do provide blood supply for the articulation genus?

- A. A. femoris, a. poplitea, a. tibialis anterior
- B. A. glutea superior, a. femoris, a. poplitea
- C. A. poplitea, a. glutea inferior
- D. A. tibialis posterior, a. poplitea
- E. A. tibialis anterior et posterior, a. iliaca externa

16. What arteries do anastomose and form the superficial palmar arch?

- A. Arteria radialis et a. ulnaris
- B. Arteria princeps pollicis et a. radialis indicis
- C. Ramus anterior et posterior arteriae recurrentis ulnaris
- D. Ramus carpalis palmaris arteriae ulnaris
- E. A. interossea communis (anterior interosseous, posterior interosseous)

17. Choose the branches of the femoral artery.

- A. Dorsalis pedis artery, genicular artery, lateral deep femoral artery
- B. Genicular artery, deep femoral artery, lateral circumflex artery, superficial epigastric artery
- C. Superficial external pudendal artery, deep external pudendal artery, lateral circumflex artery
- D. Anterior and posterior tibial arteries, superficial epigastric artery
- E. Superficial external pudendal artery, superficial circumflex iliac artery, deep external pudendal artery

18. Choose the major superficial veins of the upper limb

- A. Perforating veins
- B. Cephalic, basilica, perforating veins
- C. Cephalic and basilic veins
- D. Brachial and basilic veins
- E. Ulnar and radial veins

19. From which artery is lateral circumflex artery branched off?

- A. femoral artery
- B. deep femoral artery
- C. popliteal artery
- D. genicular artery
- E. anterior tibial artery

20. Which arteries form anastomosis in the sulcus cubitalis posterior lateralis?

- A. A. collateralis ulnaris inferior, a. interossea recurrens
- B. A. collateralis media, a. interossea recurrens
- C. A. collateralis radialis, a. interossea recurrens
- D. A. collateralis ulnaris inferior, a. recurrens ulnaris anterior
- E. A. collateralis ulnaris superior, a. recurrens ulnaris posterior

21. Choose the major deep veins of the upper limb

- A. Perforating veins
- B. Brachial vein
- C. Cephalic vein
- D. Ulnar vein
- E. Radial vein

22. Which of the following arteries DO NOT branch off from a. radialis?

- A. A. interossea communis
- B. A. palmaris, a. metacarpea dorsalis
- C. A. recurrent radialis, ramus palmaris superficialis
- D. A. princeps pollicis
- E. A. metacarpea dorsalis prima

23. Which of the following is not a branch of the anterior trunk of the internal iliac artery?

- A. Inferior gluteal artery
- B. Superior gluteal artery
- C. Obturator artery
- D. Middle rectal artery

24. Choose the vein that carries the blood into the femoral vein.

- A. Femoral circumflex vein
- B. Middle sacral vein
- C. Anterior tibial vein
- D. Fibular vein
- E. Small saphenous vein

25. From which artery does the superficial circumflex iliac artery branches off?

- A. External iliac artery
- B. Internal iliac artery
- C. Femoral artery
- D. Deep femoral artery
- E. Common iliac artery

26. Choose the arteries which do NOT branch off from the popliteal artery.

- A. anterior tibial arteries
- B. posterior tibial artery
- C. anterior and posterior tibial arteries
- D. genicular artery
- E. fibular artery

27. Which anatomical landmark marks the transition from the femoral vein to the external iliac vein?

- A. Adductor hiatus
- B. Femoral triangle
- C. Inguinal ligament
- D. Anterior superior iliac spine
- E. Cubital fossa

28. Choose the veins that carry the blood into the popliteal vein.

- A. Femoral circumflex vein, deep femoral vein, middle sacral vein
- B. Anterior tibial vein, fibular vein, small saphenous vein

- C. Femoral circumflex vein, deep femoral vein, small saphenous vein
- D. Femoral circumflex vein, deep femoral vein, great saphenous vein
- E. Femoral circumflex vein, great saphenous vein, small saphenous vein

29. From which artery does lateral plantar artery arise?

- A. Posterior tibial artery
- B. Popliteal artery
- C. Anterior tibial artery
- D. Arcuate arch
- E. Dorsalis pedis artery

30. Which vessel do the superior and inferior gluteal veins empty into?

- A. External iliac
- B. Internal iliac
- C. Deep femoral
- D. Femoral
- E. Dorsal venous arch

31. What is location of the a. femoralis?

- A. Trigonum femorale, sulcus femoralis anterior, canalis adducorius
- B. Trigonum femorale, canalis obturatorius
- C. Trigonum femorale, canalis adducorius, canalis femoralis
- D. Trigonum femorale, canalis inguinalis
- E. Sulcus femoralis anterior, fossa poplitea

32. From which artery does the medial plantar artery arise?

- A. Anterior tibial artery
- B. Posterior tibial artery
- C. Popliteal artery
- D. Arcuate arch
- E. Dorsalis pedis artery

33. From which artery does dorsalis pedis artery arise?

- A. Anterior tibial artery
- B. Posterior tibial artery
- C. Popliteal artery
- D. Arcuate arch
- E. Genicular artery

34. Which arteries do provide blood supply to the posterior group of muscles of the thigh?

- A. Rr. perforantes a. profundae femoris
- B. A. circumflexa femoris medialis
- C. A. circumflexa femoris lateralis
- D. Aa. gluteae superiores et inferiores
- E. A. obturatoria

35. Which vein is used as a common site of venipuncture and of providing intravenous therapy?

- A. V. basilica
- B. V. mediana cubiti
- C. V. brachiales
- D. V. cephalica
- E. V. metacarpales dorsalis

ANSWERS

1	C
2	A
3	D
4	D
5	B
6	A
7	C
8	A
9	A
10	C
11	C
12	D
13	D
14	A
15	A
16	A
17	E
18	C
19	B
20	B
21	B, D, E
22	A
23	B
24	A
25	C
26	D, E
27	C
28	B
29	A
30	B
31	A
32	B
33	A
34	A
35	B