

## GUIDELINES

### Students' independent work during preparation to practical lesson

Academic discipline	HUMAN ANATOMY
Topic	VEINS OF THE HEAD AND NECK

#### **1. The relevance of the topic:**

Knowledge of the anatomy of the veins of head and neck is a base of clinical thinking and differential diagnosis for the doctor of any specialty, but, above all, dentists, neurologists and surgeons who operate in areas of the neck or head.

#### **2. Specific objectives**

- demonstrate superior vena cava, right and left brachiocephalic, subclavian, internal and external jugular, anterior jugular veins and venous angles.
- demonstrate dural sinuses, veins of the brain.
- demonstrate pterygoid plexus, retromandibular, facial veins and other tributaries of extracranial part of internal jugular vein.
- demonstrate external jugular vein.
- identify and demonstrate anastomoses on the head and neck.

#### **3. Basic level of preparation**

Student should know and be able to:

1. To demonstrate the structural features of the cervical vertebrae.
2. To demonstrate the anatomical lesions of external and internal base of the skull.
3. To demonstrate the muscles of the head and neck.
4. To demonstrate the divisions of the brain.

#### **4. Tasks for independent work during preparation for practical lessons**

*4.1. A list of the main terms, parameters, characteristics that need to be learned by student during the preparation for the lesson*

Term	Definition
JUGULAR VEINS	Veins that take deoxygenated blood from the head to the heart via the superior vena cava.
INTERNAL JUGULAR VEIN	Starts from the sigmoid sinus of the dura mater and receives the blood from common facial vein. The internal jugular vein runs with the common carotid artery and vagus nerve inside the carotid sheath. It provides venous drainage from inner tissues of the skull.
EXTERNAL JUGULAR VEIN	It runs superficially near sternocleidomastoid muscle.
JUGULAR VENOUS ARCH	Just above the sternum the two anterior jugular veins communicate by a transverse

	trunk, the jugular venous arch (or venous jugular arch), which receive tributaries from the inferior thyroid veins; each also communicates with the internal jugular. There are no valves in this vein.
BASAL VEIN	One of the veins of the brain. It is formed at the anterior perforated substance by the union of (a) a small anterior cerebral vein which accompanies the anterior cerebral artery and supplies the medial surface of the frontal lobe by the fronto-basal vein, (b) the deep middle cerebral vein (deep Sylvian vein), which receives tributaries from the insula and adjacent gyri, and runs in the lower part of the lateral cerebral fissure, and (c) the inferior striate veins, which leave the corpus striatum through the anterior perforated substance.
BASILAR PLEXUS	Transverse or basilar sinus consists of several interlacing venous channels between the layers of the dura mater over the basilar part of the occipital bone (the clivus) and serves to connect the two inferior petrosal sinuses. It communicates with the anterior vertebral venous plexus.
CAVERNOUS SINUS	Creates a cavity called the lateral sellar compartment bordered by the temporal bone of the skull and the sphenoid bone, lateral to the sella turcica.
FALCINE SINUS	A falcine sinus is a venous channel that lies within the falx cerebri connecting the vein of Galen and the posterior part of superior sagittal sinus. It is normally present during fetal development and involutes after birth. The presence of a falcine sinus has been associated with a vein of Galen malformation and other vascular anomalies. The persistence of a falcine sinus after the neonatal period was previously thought to be rare, but has recently been described to be present in up to 5% of all people.
INFERIOR PETROSAL SINUSES	The inferior petrosal sinuses are two small sinuses situated on the inferior border of

	<p>the petrous part of the temporal bone, one on each side. Each inferior petrosal sinus drains the cavernous sinus into the internal jugular vein.</p>
<p>INFERIOR SAGITTAL SINUS</p>	<p>The inferior sagittal sinus (also known as inferior longitudinal sinus) allows blood to drain outwards posteriorly from the center of the head. It drains (from the center of the brain) to the straight sinus (at the back of the head), which connects to the transverse sinuses.</p>
<p>INTERCAVERNOUS SINUSES</p>	<p>The intercavernous sinuses are two in number, an anterior and a posterior, and connect the two cavernous sinuses across the middle line. The anterior one passes in front of the hypophysis cerebri (pituitary gland), while the posterior one is behind it. Together with the cavernous sinuses they form a venous circle (circular sinus) around the hypophysis.</p>
<p>SUPERIOR PETROSAL SINUS</p>	<p>The superior petrosal sinus is one of the dural venous sinuses located beneath the brain. It receives blood from the cavernous sinus and passes backward and laterally to drain into the transverse sinus. The sinus runs in the attached margin of the tentorium cerebelli, in a groove in the petrous part of the temporal bone formed by the sinus itself - the superior petrosal sulcus. The sinus receives some cerebellar veins, inferior cerebral veins and veins from the tympanic cavity.</p>
<p>SUPERIOR SAGITTAL SINUS</p>	<p>The superior sagittal sinus (also known as the superior longitudinal sinus), within the human head, is an unpaired area along the attached margin of the falx cerebri. It allows blood to drain from the lateral aspects of anterior cerebral hemispheres to the confluence of sinuses. Cerebrospinal fluid drains through arachnoid granulations into the superior sagittal sinus and is returned to</p>

	venous circulation.
--	---------------------

#### **4.2. The list of practical skills:**

- The internal jugular vein
- External jugular vein
- Superior vena cava
- Brachiocephalic vein (right, left)
- Thoracic duct
- V. emissaria parietali
- V. emissaria mastoidea
- V. emissaria condylaris
- V. emissaria occipitalis
- Plexus venosus canalis nervi hypoglossi
- Plexus venosus foraminis ovalis
- Plexus venosus caroticus internus
- Vv. meningae encephali
- V. meningea media
- Vv. orbitale
- V. ophthalmica superior
- Vv. encephali
- Vv. superficiales cerebri
- Vv. profundae cerebri
- Vv. basales dextra et sinistra
- Vv. internae cerebri dextra et sinistra
- V. magna cerebri
- V. basalis
- V. interna cerebri
- V. magna cerebri
- Vv. trunci encephali
- Vv. cerebelli
- Vv. pharyngeae
- V. lingualis
- Vv. dorsales linguae
- V. profunda linguae
- V. sublingualis
- V. thyroidea superior
- V. thyroidea media
- V. thyroidea inferior
- V. facialis
- V. angularis
- Superficial temporal vein

- Middle temporal vein
- Transverse vein face
- Maxillary veins
- V. alveolaris inferior
- V. jugularis externa
- V. auricularis posterior
- V. jugularis anterior
- V. brachiocephalica dextra
- V. brachiocephalica sinistra
- V. vertebralis
- V. cervicalis profunda
- V. colli profunda
- Vv. thoracicae internae,
- V. intercostalis suprema dextra
- V. left upper intercostal vein

#### **4.3. Questions to control the final level of training**

1. Describe and demonstrate veins which contribute to the formation of superior vena cava and right and left brachiocephalic veins.
2. Describe and demonstrate the internal jugular vein.
3. Describe and demonstrate the sinuses of the dura mater.
4. Categorize the veins of the brain, describe and demonstrate superficial veins of the brain.
5. Describe the deep veins of the brain, veins of cerebellum and brainstem.
6. Describe and show superior and inferior ophthalmic veins.
7. Name and show extracranial part of internal jugular vein, its tributaries and describe retromandibular vein.
8. Describe and show the topography of external and anterior jugular veins, jugular venous arch.
9. What are the areas from which the blood is flowing into the external jugular vein?

#### **5. Sources:**

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

## **6. Materials for self-control:**

1. Veins that carry the blood from the scalp and face are:
  - A. external jugular veins
  - B. internal jugular veins
  - C. internal and external jugular veins
  - D. dural venous sinuses
  - E. anterior jugular veins
  
2. Choose vessels which provide venous drainage of the neck
  - A. external jugular veins
  - B. internal jugular veins
  - C. internal and external jugular veins
  - D. dural venous sinuses
  - E. anterior jugular veins
  
3. External jugular vein is formed from:
  - A. posterior auricular vein, retromandibular vein (posterior branch)
  - B. internal jugular vein
  - C. dural venous sinuses
  - D. subclavian vein
  - E. azygos vein
  
4. Choose vessels which provide venous drainage of the brain and meninges
  - A. external jugular veins
  - B. internal jugular veins
  - C. internal and external jugular veins
  - D. dural venous sinuses
  - E. anterior jugular veins
  
5. Where do posterior auricular vein and retromandibular vein (posterior branch) join to form the external jugular vein?
  - A. the area of scalp superior and posterior to the outer ear
  - B. immediately posteriorly to the angle of mandible, and inferiorly to the outer ear
  - C. within the superficial fascia
  - D. underneath the clavicle
  
6. Which anatomical structure collects venous blood from the veins that drain the brain and bony skull, and ultimately drain into the internal jugular vein?
  - A. dural venous sinuses
  - B. posterior auricular vein and retromandibular vein (posterior branch)
  - C. external jugular veins
  - D. internal jugular veins
  - E. internal and external jugular veins
  
7. Where are venous sinuses of the head located?
  - A. immediately posterior to the angle of mandible, and inferior to the outer ear
  - B. within the superficial fascia
  - C. underneath the clavicle
  - D. between the periosteal and meningeal layers of dura mater
  - E. the jugular foramen
  
8. Which vein is responsible for draining of bigger part of the face?

- A. external jugular vein
- B. internal jugular vein
- C. anterior jugular vein
- D. posterior auricular vein

9. Into which vein do the anterior jugular veins carry the blood?

- A. internal jugular vein
- B. facial vein
- C. subclavian vein
- D. inferior vena cava
- E. superior vena cava

10. The internal jugular vein is a continuation of:

- A. Cavernous sinus
- B. Inferior petrosal sinus
- C. Sigmoid sinus
- D. Transverse sinus

11. Superior petrosal sinus is communicated with one with sigmoid sinus and with opposite end with \_\_\_\_\_

- A. Straight sinus
- B. Inferior petrosal sinus
- C. Cavernous sinus
- D. Azygos vein
- E. Cerebral vein

12. Which venous sinuses directly contribute to formation of confluence of sinuses?

- A. Straight, Cavernous, Sigmoid, Transverse, Occipital
- B. Straight, Superior sagittal, Transverse, Occipital
- C. Straight, Inferior sagittal, Transverse, Occipital
- D. Straight, Inferior sagittal, Transverse, Occipital
- E. Cavernous, Sigmoid, Transverse, Occipital

13. How many paired dural sinuses do we have?

- A. 3
- B. 4
- C. 5
- D. 6
- E. 7

14. External jugular vein carries the blood to:

- A. Azygos vein
- B. Internal jugular vein
- C. Subclavian vein
- D. Vertebral vein
- E. Anterior jugular vein

15. Superior thyroid vein carries the blood to:

- A. Azygos vein
- B. Internal jugular vein
- C. Subclavian vein
- D. Vertebral vein
- E. Anterior jugular vein

16. Superior thyroid vein carries the blood to:

- A. Azygos vein
- B. Internal jugular vein
- C. Subclavian vein
- D. Vertebral vein
- E. Anterior jugular vein

17. What plexus is located immediately behind sphenoid bone?

- A. Vertebral
- B. Basilar
- C. Sagittal
- D. Straight
- E. Sphenoidal

18. What dural sinus surrounds infundibulum which leads to hypophysis?

- A. Sigmoid
- B. Intercavernous
- C. Cavernous
- D. Straight
- E. Sphenoidal

19. Ophthalmic veins carry the blood to:

- A. Sigmoid sinus
- B. Intercavernous sinus
- C. Cavernous sinus
- D. Straight sinus
- E. Sphenoidal sinus

20. Inferior thyroid vein carries the blood to:

- A. Sigmoid sinus
- B. Axillary vein
- C. External jugular vein
- D. Right brachiocephalic vein
- E. Left brachiocephalic vein

**ANSWERS:**

<b>1</b>	<b>C</b>
<b>2</b>	<b>E</b>
<b>3</b>	<b>A</b>
<b>4</b>	<b>D</b>
<b>5</b>	<b>B</b>

<b>6</b>	<b>A</b>
<b>7</b>	<b>D</b>
<b>8</b>	<b>A</b>
<b>9</b>	<b>C</b>
<b>10</b>	<b>C</b>
<b>11</b>	<b>C</b>
<b>12</b>	<b>B</b>
<b>13</b>	<b>E</b>
<b>14</b>	<b>C</b>
<b>15</b>	<b>B</b>
<b>16</b>	<b>B</b>
<b>17</b>	<b>B</b>
<b>18</b>	<b>B</b>
<b>19</b>	<b>C</b>
<b>20</b>	<b>E</b>