

Neuroanatomy Answer Key

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About StudyAid

StudyAid is a student organization at the Jagiellonian University in Krakow. Throughout the academic year we host seminars in the major theoretical subjects: anatomy, physiology, biochemistry, immunology, pathophysiology, supplementing the lectures provided by the university. We are a group of 25 tutors, who are students at JU, each with their own field of specialty. To make our seminars as useful and relevant as possible, we teach in an interactive manner often using drawings and diagrams to help students remember the concepts. In addition to most seminars we create booklets, on which the seminars are based to aid the students in following the presentations. If you have any questions, do not hesitate to contact StudyAid at www.studyaid.no, we are always happy to answer any questions you may have academically related or not.

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Section 1 – Autonomic Nervous System

1) Fill in the blanks

Neurotransmitters		
	Preganglionic	Postganglionic
Parasympathetic	Acetylcholine (ACh)	Acetylcholine (ACh)
Sympathetic	Acetylcholine (ACh)	Norepinephrine Epinephrine

2) Preganglionic fibers of the autonomic system are myelinated

3) Sympathetic nerve fibers that travel in the splanchnic nerves innervate the visceral organs

4) White ramus contains preganglionic sympathetic neurons

5) Pair the functions with the right system

- | | |
|--------------------|---|
| a) Sympathetic | 1. Dilates the pupil |
| b) Parasympathetic | 2. Increased heart rate |
| | 3. Constricts bronchi and increases secretion |
| | 4. Erection of the penis |
| | 5. Increases viscosity of saliva |

a) 1,2,5

b) 3, 4

Section 2 – Cranial Nerves

1) Which 4 nerves contain parasympathetic fibers?

- a) CN II, IV, VII, IX
- b) CN III, V, VII, XII
- c) CN III, VII, X, XI
- d) **CN III, VII, IX, X**

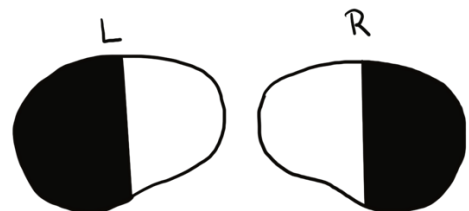
2) The afferent limb of the pupillary light reflex is the optic nerve and the efferent limb is the oculomotor nerve.

3) Fill in the blanks

Olfactory nerve	
Main function	Mediate the sense of smell
Type of fibers	Sensory <i>Special Visceral Afferent (SVA)</i>
	Arises from neurons of the olfactory area and the upper 1/3 of the nasal mucosa
Exit from the brain	Extension of telencephalon
Exit from the skull	Cribriform plate of ethmoid

4) Bilateral hemianopia, which is loss of temporal vision, is caused by a lesion of?

- a) Optic nerve
- b) Optic tract
- c) **Optic chiasm**
- d) Upper radiation



5) The oculomotor nerve carries parasympathetic fibers that are responsible for

- a) Elevation of the eyelid
- b) Mydriasis
- c) Miosis
- d) Accommodation
- e) **C and D are correct**

6) With a lesion of the 4th cranial nerve we can see

- a) Inability to move the eye laterally
- b) Ptosis and loss of accommodation
- c) **Inability to look down and out**
- d) Pupil looks down and out

7) With a lesion of the ophthalmic branch of the trigeminal nerve you will experience loss of sensation:

- a) On the skin of the cheeks
- b) On skin of the chin
- c) On the skin of the lower eye lid
- d) On the eyeball**

8) Which of the cranial nerves exit the brainstem from the dorsal side?

Trochlear nerve

9) With a lesion of the facial nerve above where the chorda tympani branches off in the facial canal, which functions will be lost?

Paralysis of ipsilateral facial muscles, and loss of taste from the 2/3 anterior part of tongue and salivation from submandibular and sublingual glands

10) With lesion of the hypoglossal nerve, the tongue will deviate towards the injured side

11) Afferent and efferent limb of the gag reflex is:

- a) Both are vagus
- b) Afferent: IX, Efferent X**
- c) Afferent: X, Efferent IX
- d) Both are glossopharyngeal

12) The posterior 1/3 of the tongue is innervated by which nerve?

- a) Hypoglossal
- b) Glossopharyngeal**
- b) Vagus
- c) Facial

Section 3 – Cranial Nerve Nuclei

1) Edinger Westphal nucleus supplies Parasympathetic fibers to the Pupillary sphincter and ciliary muscles of the eye

2) Which nucleus is responsible for transmission of taste fibers to the VII, IX and X?

a) Nucleus ambiguus

b) Solitary nucleus

c) Superior salivatory

d) Dorsal vagal nucleus

3) The trigeminal nerve has 3 sensory nuclei, which one is responsible for the fibers that relay information about touch, vibration and joint position?

a) Pontine (principal nuclei)

b) Mesencephalic

c) Spinal

4) The superior salivatory nucleus is responsible for supplying fibers that innervate which glands?
Sublingual and submandibular

5) A patient comes in and after a neurological surgery in the left jugular canal. He presents with no gag reflex on the left side, and the uvula was deviated to the right. Which nuclei will contain the neural cell bodies for the motor supply of the paralyzed muscles?

a) Nucleus solitary

b) Nucleus ambiguus

c) Dorsal vagal nucleus

d) Trigeminal motor nucleus

Section 4 – Spinal Tracts

1) Where does the dorsal column/medial lemniscus tract decussate?

a) Spinal cord

b) Medulla

c) Pons

d) Midbrain

2) Which tract is known as the pyramidal tract?

a) Dorsal column/medial lemniscus

b) Spinothalamic

c) Corticospinal

d) Corticobulbar

e) a and b

f) c and d

Section 5 – Arterial Blood Supply

1) What causes the “talk and die” syndrome?

- a) Subarachnoid hemorrhage
- b) Subdural hemorrhage
- c) Epidural hemorrhage**
- d) Ischemic stroke

2) Which of the following arteries are not a part of the Circle of Willis?

- a) Anterior cerebral artery
- b) Internal carotid artery
- c) Middle cerebral artery**
- d) Posterior cerebral artery

3) Aneurysms at which artery can cause the classical “down and out” gaze from CNIII damage?

- a) Anterior cerebral artery
- b) Internal carotid artery
- c) Middle cerebral artery
- d) Posterior cerebral artery**

4) What is the most common location for a Berry aneurysm?

- a) Anterior cerebral artery**
- b) Internal carotid artery
- c) Middle cerebral artery
- d) Posterior cerebral artery

Section 6 – Venous Drainage and Cerebrospinal Fluid

1) What happens if CSF flow is obstructed?

a) Nothing it's ok 😊

b) Hydrocephalus

c) Orthostatic hypotension

e) Meningitis

2) What is the choroid plexus

a) Nerve plexus in the brain stem

b) A collection of veins in the dura mater

c) Specialized ependymal cells

d) Cells that produce neurotransmitters for the brain

3) What are arachnoid villi?

a) Arachnoid granulations

b) Extensions of the arachnoid mater into the dural venous sinuses

c) A passage for CSF into the venous system

d) All of the above

4) Which cranial nerves passes through the cavernous sinus?

CNIII + CNIV + CNV1 + CNV2 + CNVI

5) Which venous sinuses merge in the confluence of sinuses?

a) Sigmoid sinus + straight sinus + transverse sinus

b) Transverse sinus + Occipital sinus + Cavernous sinus + Superior sagittal sinus

c) Transverse sinus + Occipital sinus + Straight sinus + Superior sagittal sinus

d) Occipital sinus + Cavernous sinus

Section 7 – Pharynx and Larynx

1) What is the function of the circular muscles of the pharynx?

- a) Elevation of the pharynx
- b) Lowering the pharynx
- c) Constrict the pharynx**
- d) Dilate the pharynx

2) What is the function of the longitudinal muscles of the pharynx?

- a) Elevation of the pharynx**
- b) Lowering the pharynx
- c) Constrict the pharynx
- d) Dilate the pharynx

3) All intrinsic muscles of the larynx are innervated by the recurrent laryngeal nerve, EXCEPT for cricothyroid which is innervated by the external laryngeal nerve

4) Which structure does the right recurrent laryngeal nerve pass inferior to before ascending?

- a) Right subclavian artery**
- b) Right external carotid artery
- c) The aortic arch
- d) The bifurcation of the trachea

5) Which structure does the left recurrent laryngeal nerve pass inferior to before ascending?

- a) Right subclavian artery
- b) Right external carotid artery
- c) The aortic arch**
- d) The bifurcation of the trachea

6) The posterior cricothyroid muscle is responsible for abduction?

7) The stylopharyngeus muscle is innervated by

- a) Vagus nerve
- b) External laryngeal
- c) Recurrent laryngeal
- d) Glossopharyngeal**

