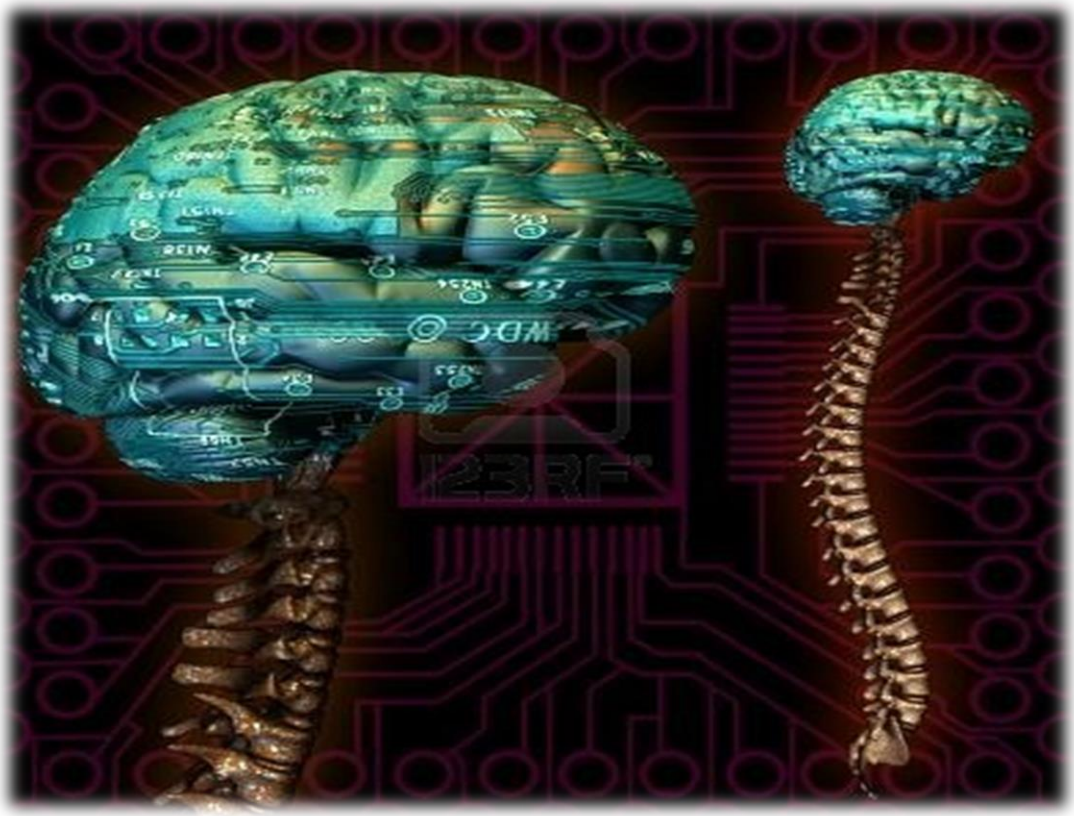
CNS Block



LECTURE (10)

CRANIAL NERVES XI & XII

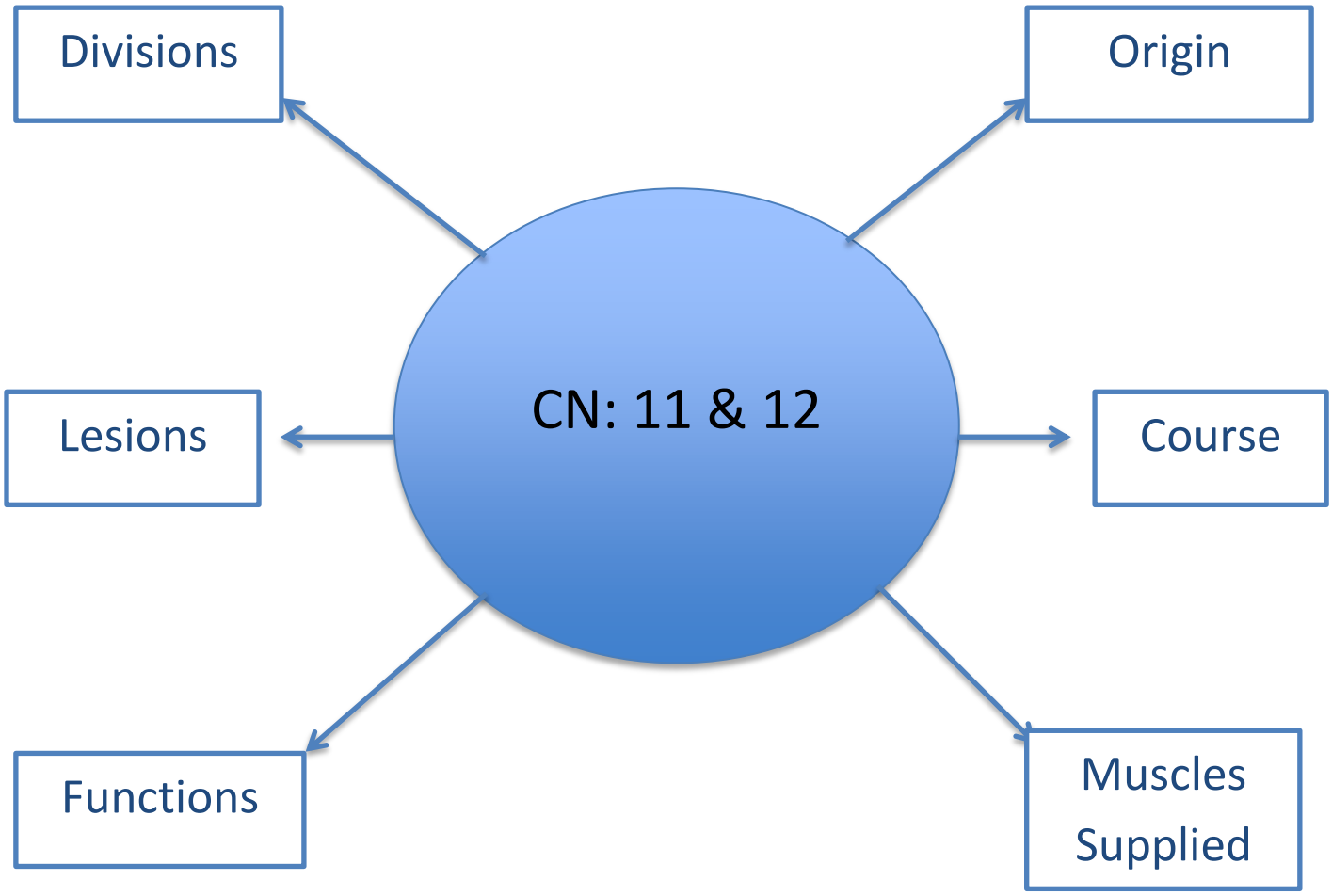
Done by: Abdulmohsen Almeshari

Reviewed by: lama alFaraidi

If there is any mistake please feel free to contact us:

Anatomyteam32@gmail.com

Both - Black
Male Notes - BLUE
Female Notes - GREEN
Explanation and additional notes - ORANGE
Very Important note - Red


Divisions
Origin
CN: 11 & 12
Lesions
Course
Functions
Muscles Supplied

OBJECTIVES

❑ ***At the end of the lecture, the students should be able to:***

- List the nuclei related to accessory and hypoglossal nerves in the brain stem.
- Describe the type and site of each nucleus.
- Describe site of emergence and course of accessory and hypoglossal nerves.
- Describe important relations of accessory and hypoglossal nerves in the neck.
- List the branches of accessory and hypoglossal nerves.
- Describe the main motor effect in case of lesion of accessory and hypoglossal nerve

Nerve	Division	Origin	Course	Muscles Supplied	Functions	Lesions
11th CN: Accessory Nerve (MOTOR)	Cranial Part	Carries fibers that originate in the caudal part of Nucleus Ambiguus **(Receives bilateral corticonuclear fibers, from BOTH cerebral hemispheres)**	Emerges from lateral aspect of the medulla as a linear series caudal to rootlets of the Vagus nerve. At the side of the medulla, it joins the spinal root briefly (To form: Trunk of accessory nerve). It then separates once again as the nerve leaves the skull through the Jugular Foramen. At the level of Jugular foramen, these fibers join the vagus nerve (Pharyngeal Plexus) and distribute with it to the muscles of:	1. Soft palate 2. Esophagus 3. Pharynx 4. Larynx	1. Movements of the soft palate, larynx and the pharynx	1. Difficulty in swallowing and speech
	Spinal Part	Arises from motor neurons in ventral horn of the spinal grey matter at levels C1-C5 (spinal nucleus) **(Receives bilateral corticonuclear fibers, from BOTH cerebral hemispheres)**	The axons leave the cord via series of rootlets, emerge laterally midway between the dorsal and ventral roots of the spinal nerves. Courses upward and enters the skull through the foramen magnum and joins the cranial root briefly (Trunk of accessory nerve). Then it separates once again as the nerve leaves the cranial cavity through the Jugular Foramen. (to supply the neck).	1. Sterno-mastoid 2. Trapezius	2. Controls the movements of the neck	2. Inability to turn the head. 3. Inability to shrug (raise the shoulder). 4. Winging of Scapula

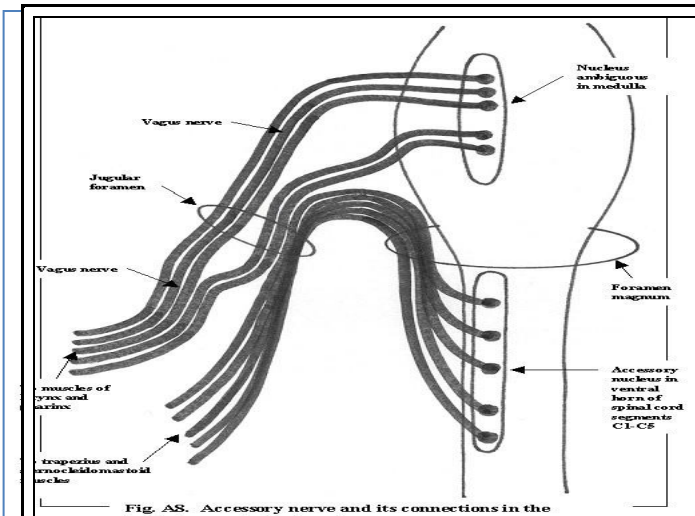
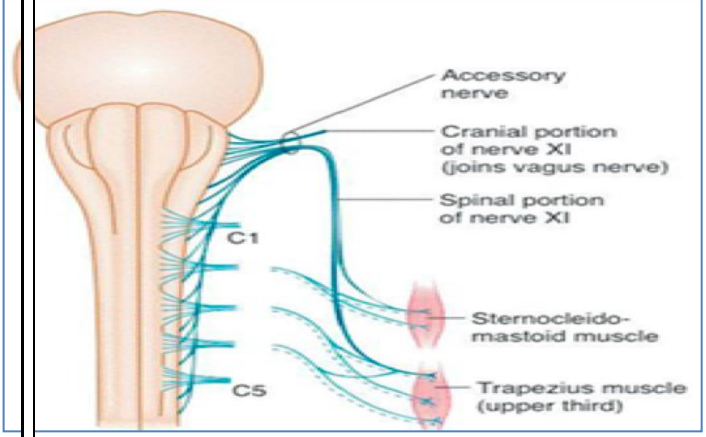
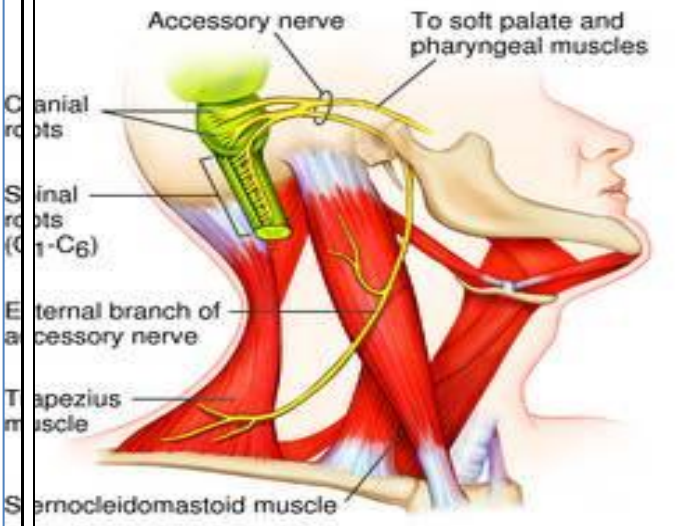
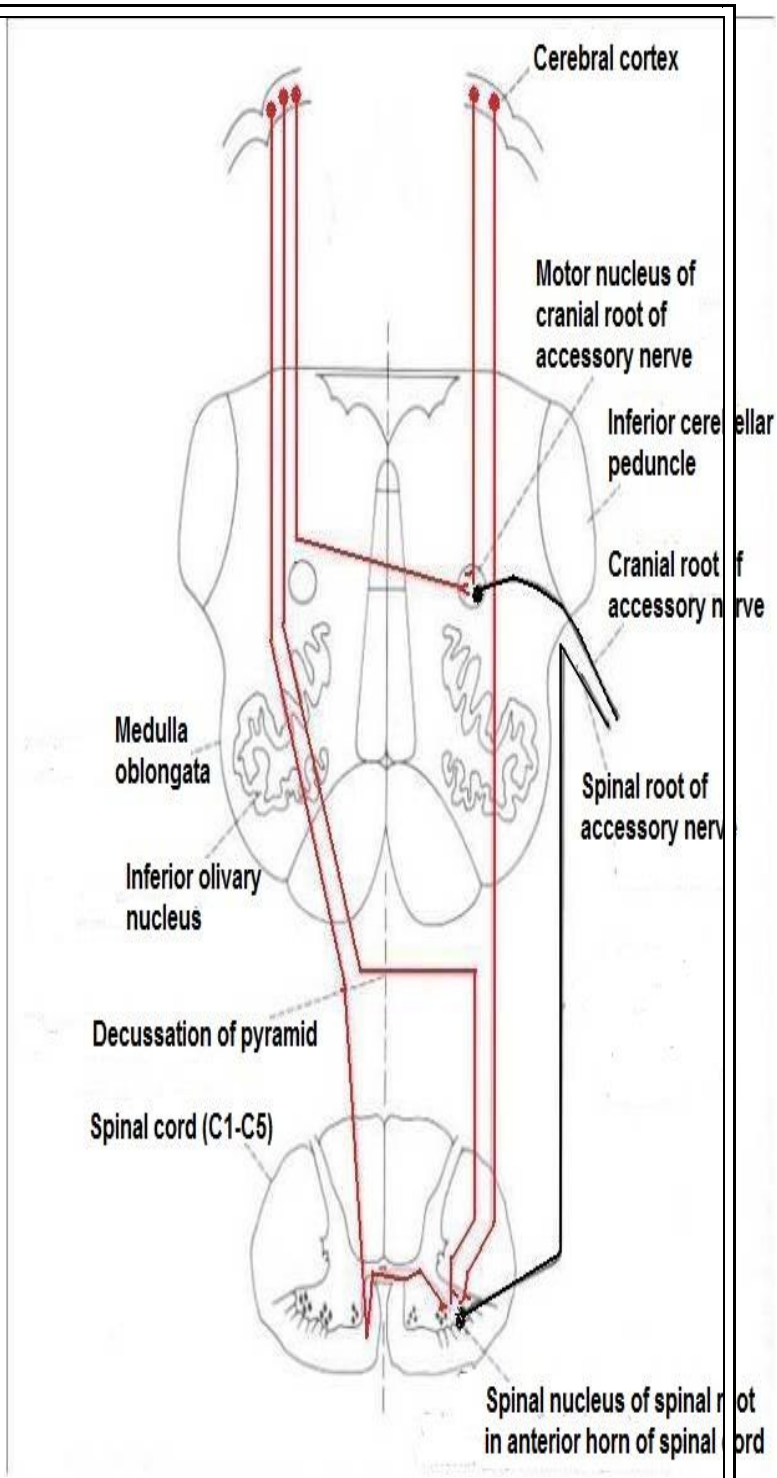


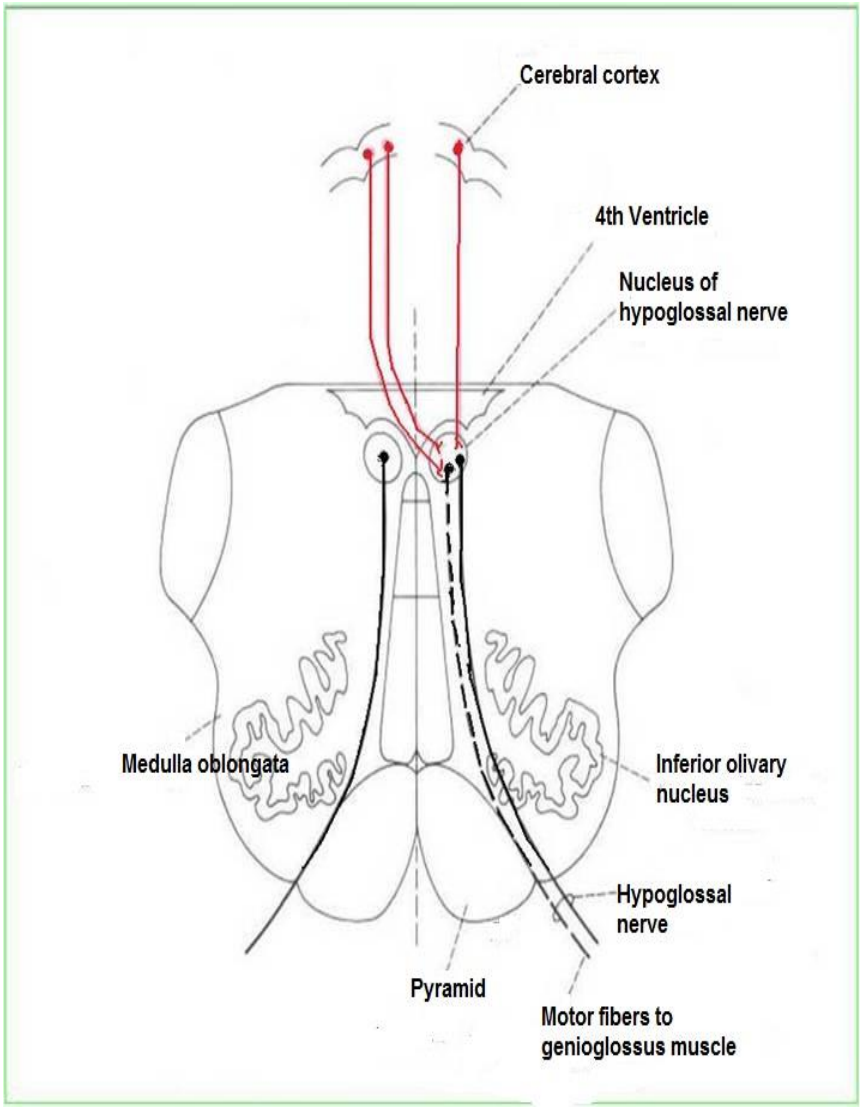
Fig. A8. Accessory nerve and its connections in the brainstem and spinal cord

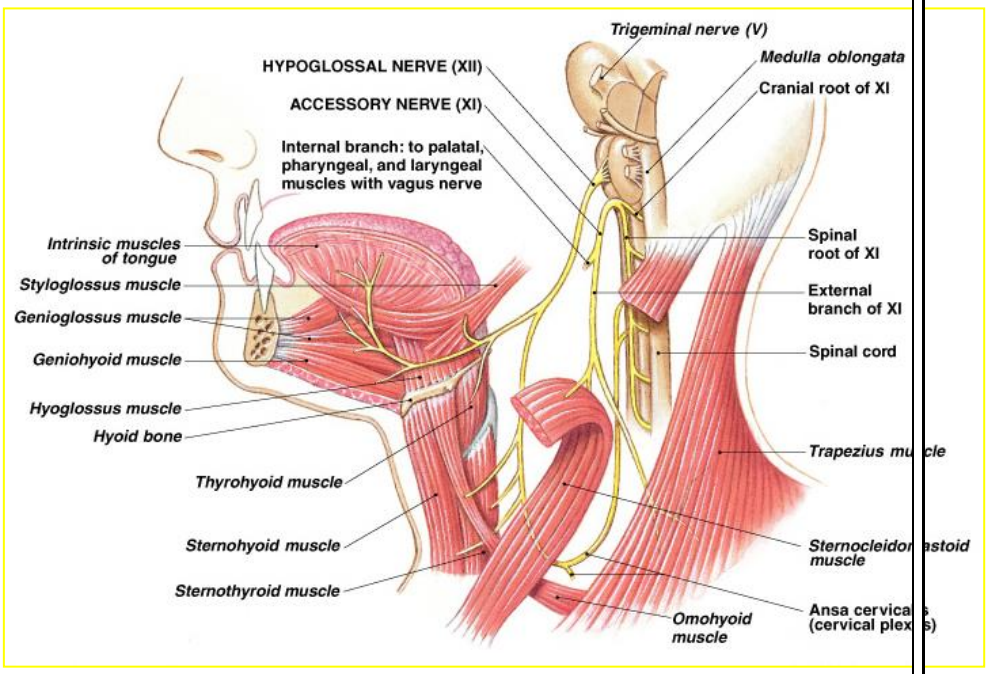






Nerve	Origin	Course	Muscles Supplied	Functions	Lesions
12th CN: Hypoglossal Nerve (MOTOR)	Hypoglossal nucleus of the medulla (in the floor of the 4th ventricle) **(Receives corticonuclear fibers from both cerebral hemispheres EXCEPT the region that supplied "Genioglossus" muscles (receives contralateral supply only)** Also receives afferent fibers from Nucleus Solitarius and Trigeminal Sensory Nucleus	The fibers emerge from the anterior surface of the medulla oblongata through the sulcus between the pyramid and the olive. Then exits the skull from the Hypoglossal Canal. The nerve then courses downward with cervical neuro-vascular bundle (Internal Carotid Artery, Internal Jugular Vein, Vagus Nerve). Then curves forward behind the Mandible to supply the tongue.	Innervates both extrinsic and intrinsic muscles of the tongue EXCEPT the Palatoglossus (which is supplied by Vagus) (During its initial course, it carries C1 fibers (in the area between the hypoglossal canal and the tongue) which leave in a branch to take part in the formation of Ansa Cervicalis (a loop of nerves supplying the neck muscles) (C1,C2,C3) to supply Infrahyoid muscles	1. Controls the movements and shape of the tongue during speech and swallowing 2. Carries proprioceptive afferents from the tongue muscles.	1. Loss of tongue movements. 2. Difficulty in chewing and speech 3. Paralysis and atrophy of the tongue. It becomes shrunken and furrowed on the affected side (LMN paralysis) 4. On protrusion, tongue deviates to the affected side. 5.If both nerves are damaged, person can't protrude tongue.


Cerebral cortex
4th Ventricle
Nucleus of hypoglossal nerve
Medulla oblongata
Inferior olivary nucleus
Hypoglossal nerve
Pyramid
Motor fibers to genioglossus muscle


Trigeminal nerve (V)
HYPOGLOSSAL NERVE (XII)
ACCESSORY NERVE (XI)
Internal branch: to palatal, pharyngeal, and laryngeal muscles with vagus nerve
Medulla oblongata
Cranial root of XI
Spinal root of XI
External branch of XI
Spinal cord
Intrinsic muscles of tongue
Styloglossus muscle
Genioglossus muscle
Geniohyoid muscle
Hyoglossus muscle
Hyoid bone
Thyrohyoid muscle
Sternohyoid muscle
Sternothyroid muscle
Trapezius muscle
Sternocleidomastoid muscle
Ansa cervicalis (cervical plexus)
Omohyoid muscle

Questions:

1. From where does the cranial part of the accessory nerve originate from:
    A. Solitary nucleus
    B. Nucleus ambiguous
    C. Spinal nucleus

2. The spinal part of the accessory nerve supply which muscles:
    A. Sternomastoid and Trapezius muscles
    B. Muscles of the soft palate
    C. Muscles of the face

3. The nucleus ambiguous and the spinal nucleus receive:
    A. Ipsilateral corticonuclear fibers
    B. Contralateral corticonuclear fibers
    C. Bilateral corticonuclear fibers

4. The hypoglossal nerve supplies:
    A. The intrinsic muscles of the tongue
    B. The extrinsic muscles of the tongue
    C. The palatoglossus
    D. All the muscles of the tongue except palatoglossus

5. The accessory nerve is a:
    A. Mixed nerve
    B. Motor nerve
    C. Sensory nerve

6. The ansa cervicalis is formed from:
    A. C1-C2-C3
    B. C2-C3-C4
    C. C3-C4-C5

7. Spinal part of the accessory nerve arises from motor neurons in ventral horn of the spinal gray matter at levels of :
    A.C1-C5
    B.C2-C7
    C.C3-C8

8.The cranial part of accessory nerve leaves the cranial cavity through:

A.jugular foramen

B.foramen magnum

C.foramen ovale

Question number	Answer
1	B
2	A
3	C
4	D
5	B
6	A
7	A
8	A

GOOD LUCK

Anatomy Team Leaders:

Fahad AlShayhan & Eman AL-Bediea.