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Name : Amira Hamza Khan

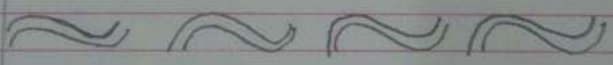
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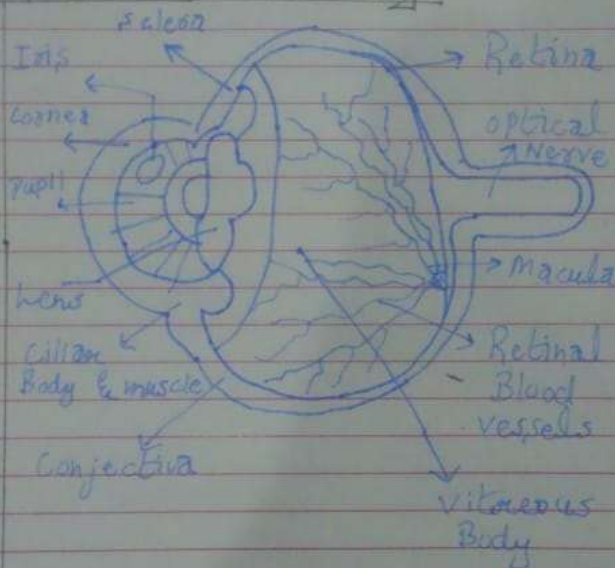
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Attempt All Questions:

Q1: Write about the structure of eye. Also name the foramina found in the base of skull.

Ans: Structure of Eye:





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The human eye is a roughly spherical organ responsible for perceiving visual stimuli. It is enclosed within the eye sockets in the skull and is anchored down by muscles within the sockets.

Anatomically, the eye comprises two components putted into one; hence it does not possess a perfect spherical shape. It is classified based on two aspects, namely external & internal components.

External components include structures which can be seen on the exterior of the eye, and internal components include structures present within.

## Eye Structure:

To understand how the eye sees, it helps to know the eye structures and function:

### (1) Orbit:

The orbit is the bony cavity that contains the eye ball, muscles and nerves and blood vessels, as well as the structures that produce and drain tears. Each orbit is a pear-shaped structure that is formed by several bones.

### (2) Sclera:

The outer covering of the eye ball consist of a relatively tough, white layer called the sclera (or white of the eye).



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### (3) Conjunctiva:-

Near the front of the eye, in the area protected by the eye lids, the sclera is covered by a thin, transparent membrane (conjunctiva), which runs to the edge of the cornea. The conjunctiva also covers the moist back surface of the eye lids and eye balls.

### (4) Cornea:-

Light enters the eye through the cornea, the clear, curved layer in front of the iris and pupil. The cornea serves as a protective covering for the front of the eye and also helps focus light on the retina at the back of the eye.

(5) Pupil:-

The pupil is the black hole in iris - where light enters. Pupil size is controlled by iris muscles.

(6) Iris:-

The circular, colored area of the eye that surrounds the pupil controls the amount of light that enters the eye - the iris allows more light into the eye (enlarging or dilating the pupil) when the environment is bright -

(7) Retina:-

The retina contains the cells that sense light (photoreceptors) and the blood vessels that nourish them. The most sensitive part of the retina is a small area

called the macula, which has millions of tightly packed photoreceptors (the type called cones). The high density of cones in the macula makes the visual image detailed, just as a high-resolution digital camera has more mega pixels.

(8) Optic Nerve:

The optic disk is the part of the optic nerve, is at the back of the eye.

(9) Photoreceptors:

The photoreceptors in the retina convert the image into electrical signals, which are carried to the brain by the optic nerve. They are two main types of photoreceptors: Cones & rods.



## (10) Cones:-

Cones are responsible for sharp, detail central vision and color vision and are clustered mainly in the macula.

## (11) Rods:-

Rods are responsible for night or peripheral (side) vision. Rods are more numerous than cones and much more sensitive to light, but they do not register color or contribute to detail central vision as the cones and much more sensitive do. Rods are grouped mainly in the peripheral areas of the retina.

## (12) Aqueous humour:-

The front section extends from the inside of the cornea to



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The front surface of the lens is filled with a fluid called the aqueous humor, which nourishes the internal structures.

★ Name of the foramina found in the base of skull:

- (1) Cribriform plate  
Olfactory n (CN I)
- (2) Optic canal  
Optic n (CN II)
- (3) Superior orbital fissure,  
Oculomotor n (CN III)  
Trochlear n (CN IV)  
Ophthalmic n (CN V<sub>1</sub>)  
Abducens n (CN VI)
- (4) Foramen rotundum  
Maxillary n (CN V<sub>2</sub>)
- (5) Foramen ovale  
Mandibular n (CN V<sub>3</sub>)

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(6) Internal acoustic meatus  
Facial n (CN VII)  
Vestibulocochlear n (CN VIII)

(7) Jugular Foramen  
Glossopharyngeal n (CN IX)  
Vagus n (CN X)  
Accessory n (CN XI)

(8) Hypoglossal canal  
Hypoglossal n (CN XII)

Q2: Write the Names of the muscles of the medial fascial compartment of thigh with their origin and insertion?

Ans Muscles of medial fascia compartment are;

- (1) Gracilis
- (2) Obturator externus
- (3) Adductor brevis
- (4) Adductor Magnus
- (5) Adductor Longus



(1) Coccygeus:-

Origin:-

Inferior pubic ramus and ischial ramus (pubic arch close to its margin).

Insertion:-

Upper part of the medial surface of the shaft of the tibia.

(2) Obturator externus:-

Origin:-

Outer surface of obturator foramen and pubic & ischial rami.

Insertion:-

Medial surface of greater trochanter.

(3) Adductor brevis:-

Origin:-

Inferior ramus of pubis.

Insertions

Posterior surface of shaft of femur - (linea aspera)

(4) Adductor Magnus:

Origin:

Inferior ramus of pubis, ramus of ischium, ischial tuberosity.

(5) Adductor Longus:-

Insertions:-

Posterior surface of shaft of femur, adductor tubercle of femur.



(5) Adductor Longus:

Origins:-

Body of pubis, medial to pubic tubercle.

Insertion:-

Posterior surface of shaft of femur (linea aspera).

Q3: What is the effect of injury external laryngeal nerve and also write about how to test the integrity of facial nerve.

Ans: Injury of the external laryngeal nerve.

- Paralysis of the cricothyroid muscle which affects the voice (weakness) with no effect on air pathway.
- The most common anatomic variations of the distal portion of the external laryngeal

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voice. In its relation to the  
internal constriction muscle is  
critical to allows vibrating  
and producing the intelligible  
of the sound in most cases.  
The larynx muscle is susceptible  
to damage during laryngectomy  
or other things as it has  
immediately deep to the  
superior thyroid artery. The  
ability to produce pitched sounds  
is then impaired along with  
easy voice fatigability,  
usually monotone voices.  
Some patients may not have  
difficulty in changing the pitch  
and significant consequences of  
Larynx, while others may have  
difficulty in changing the pitch  
of their voice or reduced  
straining in their voice. This  
can have disastrous consequences  
for those who use their voice in  
their careers, for example singers  
and public speakers.



How to test the integrity of facial nerve:

As the facial nerve supplies motor branches to the muscles of facial expression, the nerve is innervated tested by asking the patient to wrinkle up their forehead (raise their eyebrows), close their eyes and keep them closed against resistance, puff out their cheeks and neutral their teeth.

Clinical facial nerve tests:

- Facial movement:
- Temporal branches:
  - Wrinkle forehead
  - Elevate eyebrow
- Zygomatic branches:
  - Close the eyes

## Mandibular branches:

- Shaw teeth
- Blow cheek
- Cervical paresthesia

### ★ Procedure steps:

- Step 1: Handwash, cotton ball, Pen torch, Fundoscope, Tuning Fork.
- Step 2: When your hands, introduce yourself to the patient and clarify their identity.
- Step 3: The olfactory nerve is simple tested by offering for the patient to smell & identify.
- Step 4: The optic nerve is tested in five ways;
  - Acuity
  - Colour
  - Fields
  - Reflexes
  - Fundoscopy
- Step 5: The facial nerve supplies motor branches to the muscles of facial expression.



Q4 Write about the sutures of skull - Also write a note on trigeminal nerves & its branches -

Ans Sutures of the skull:-

The sutures are a type of fibrous joint, found in between many of the bones that make up the skull. There are three sutures the coronal suture, the sagittal suture, and the lambdoid suture.

(1) Coronal Suture:-

The first suture we're going to take a look at is the coronal suture, and this is located at the front of the skull - This suture separates the frontal bone from both the left and right parietal bones - ~~to~~ The coronal

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Sutures extend capitated  
(towards the apex of skull)  
and meet the sagittal suture.

## (2) Sagittal suture:

The sagittal suture is a dense, fibrous connective tissue joint between the two parietal bones of the skull. The sagittal suture is also known as the infraorbital suture, the sutura inaequalis. In forensic anthropology, the sagittal suture is one method used to date human remains.

## (3) Lambdoid suture:

The lambdoid suture (or lambdoidal suture) is a dense, fibrous connective tissue joint on the posterior aspect of the skull that connects the parietal bone with the occipital bone. It is continuous with the occipitomastoid suture.



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The name comes from its upper-  
case lambda-like shape.

★ Note on Trigeminal nerves  
& its 3<sup>rd</sup> branches:

Ans: Trigeminal nerves:

The Trigeminal nerve (the 5<sup>th</sup> cranial nerve, or simply CNV) is a nerve responsible for sensation in the face and motor functions such as biting and chewing; it is the most complex of the cranial nerves.

The trigeminal nerve is associated with the derivatives of the 1<sup>st</sup> pharyngeal arch. The trigeminal nerve is the largest of the 12 cranial nerves. Its main function is transmitting sensory information to the skin, sinuses and mucous membranes in the face. It also stimulates movement in the jaw muscles. Cranial nerves can transmit two types of information:

(1) Sensory information:

Includes details about smells, sight, taste, touch, and sounds to the brain.

(2) Motor information:-

Refers to signals that affect the movement or activity of muscles and glands.

Nerves that send sensory information are said to have sensory functions. Those that send motor information have motor functions. While some nerves have only sensory or motor functions, others can have both. The trigeminal nerve is one of the cranial nerves that has both sensory and motor function. Cranial nerves are also classified using roman numerals based on their location.



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## Branches of Trigeminal <sup>nerve</sup> branches:

There are three branches of Trigeminal nerves:

### (1) Ophthalmic Nerve:

Component: sensory:

Function:

- Cornea
- Skin of forehead
- Scalp
- Eyelids & nose
- Mucous membranes of paranasal sinuses & nasal cavity

Origin: Anterior aspect of the pons.

Opening of the skull:

Superior orbital fissure.

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## (2) Maxillary Nerve:-

Component: Sensory

Function:

- Skin of the face over maxilla-
- Teeth of the upper jaw
- Mucous membrane of the nose, the maxillary sinus and palate-

Origin: Anterior aspect of the pons-

Opening to the skull:

foramen ovale

## (3) Mandibular Nerve:-

• Component: (a): Motor

Component: (B): Sensory



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(a) Component (a) Motor

Functions

- Muscles of Mastication
- Mylohyoid
- Anterior belly of Digastric
- Tensor vel palatine
- Tensor tympani

Origin: anterior aspect of the pons.

Opening to the skull:

Foramen Rotundum

(b) Component (B) Sensory

Functions

- Skin of cheek
- Skin over mandible and side of head
- Teeth of lower jaw and TMJ.
- Mucous membrane of mouth and

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Origin: anterior aspect of the pons.

Opening to the skull:  
foramen cecum

Qs: Write a note on spinal cord with reference to its anatomical position and structure. Also write a short note on pharynx with enumeration to its constrictors.

Ans: Spinal cord:

The spinal cord is a part of the central nervous system. It is a long pipe-like structure arising from the medulla oblongata part of the brain consisting of a collection of nerve fibres, running through the vertebral column of the backbone. It is segmented with a pair of roots (dorsal & ventral roots).



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consisting of nerve fibres joining to form the spinal nerves. The spinal cord is a continuation of the brainstem. It extends from the foramen magnum at the base of the skull to the L1/L2 vertebrae, where it terminates as the conus medullaris (medullary cone). A thin thread called filum terminale extends from the tip of the conus medullaris all the way to the 1<sup>st</sup> coccygeal vertebra (Co1) and anchors the spinal cord in place. The spinal cord and spinal nerve roots are wrapped within three layers called meninges. The outermost is the dura mater, underneath it is the arachnoid mater and the deepest is the pia mater. Between the arachnoid and pia mater is the subarachnoid space, it is filled with cerebrospinal fluid.

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## Anatomical position & structure:

- Contained in epidural space
- Network of sensory and motor nerves.
- Firm-cord like structure
- Extends from Foramen magnum to L1.
- Terminate at the conus medullaris.
- The cauda equina begins below L1.
- Filum terminale extends from conus medullaris to the coccyx.
- A transverse section of the adult spinal cord shows white matter in the periphery, gray matter inside and a tiny central canal filled with CSF at its center.
- The shape and size of the gray matter varies according to spinal cord level.



- The white matter, which consists of longitudinal bundles of nerve fibres.

### Structures

- The spinal cord is a cylindrical structure, greyish-white in colour. It has a relatively simple anatomical course.
- The spinal cord arises cranially as a continuation of the medulla oblongata.
- It then travels inferiorly within the vertebral canal, surrounded by the spinal meninges containing cerebrospinal fluid.
- At the L<sub>2</sub> vertebral level the spinal cord tapers off, forming the conus medullaris.
- As a result of the termination of the spinal cord at L<sub>2</sub>, it occupies around two thirds of the vertebral canal.

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★ note on pharynx with its constrictors -

### Pharynx:-

The pharynx is a muscular tube that connects the oral and nasal cavity to the larynx & esophagus.

It begins at the base of the skull, and ends at the inferior border of the cricoid cartilage (C6) - The pharynx is composed of three parts;

- Nasopharynx
- Oropharynx
- Laryngopharynx

### (1) Nasopharynx:-

The nasopharynx is found b/w the base of the skull and the soft palate - It is continuous with the nasal cavity, and performs a respiratory



Function by conditioning inspired air and propagating it into the larynx.

(2) Oropharynx:

The oropharynx is the middle part of the pharynx, located between the soft palate and the superior border of the epiglottis.

(3) Laryngopharynx:

The most distal part of the pharynx, the laryngopharynx is located between the superior border of the cricoid cartilage (C6). It is continuous inferiorly with the esophagus.

Circular:

There are three circular pharyngeal constrictor muscles; the superior, middle & inferior.

pharyngeal constrictors.

• Superior pharyngeal constrictor:

The upper most pharyngeal constrictor - It is located in the oropharynx -

- Originates from the pterygo mandibular ligament, alveolar process of mandible, the medial pterygoid plate and pterygoid hamulus of the sphenoid bone.
- Inserts posteriorly into the pharyngeal tubercle of the occiput and the median pharyngeal raphe.

• Middle pharyngeal constrictor:-

Located in the laryngopharynx.

- Originates from the stylohyoid ligament and the horns of the hyoid bone.
- Inserts posteriorly into the pharyngeal raphe.



### Inferior pharyngeal constrictor:

Located in the Laryngopharynx.  
It has two components:

- Superior component (thyropharyngeus) has oblique fibres that attach to the thyroid cartilage.
- Inferior component (cricopharyngeus) has horizontal fibres that attach to the cricoid cartilage.

All pharyngeal constrictors are innervated by the vagus nerve.

{ Thyropharyngeus }  
{ Cricopharyngeus }

