NAME: NWOSU NYIMENKA ISAAC

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**ANSWERS:**

**1.** The word *“vasculature”* is defined as the blood vessels or arrangement of blood vessels in an organ or body part. The immune system is the body’s defense network against harmful viruses, bacteria and other organisms, therefore a healthy lifestyle helps one’s immune system to be in its best shape to tackle pathogens, but it’s better to stop them from entering the body. The corona virus pandemic has turned everyone’s attention to the immune system, the body’s defense force against disease causing bacteria, virus and other organisms we inhale, ingest and touch everyday.

**2.** The subsatorial canal is an important part of the lower limb. Hence, it is a narrow conical tunnel located in the thigh. It is also known as “*ADDUCTOR CANAL”* and serves as a passageway of structures between the anterior thigh and the posterior leg. It transmits the femoral artery, femoral vein (posterior to the artery), nerve to the vastus medialis and the saphenous nerve (the largest cutaneous branch of the femoral nerve).

**3.** The extraocular muscles are located within the orbit, but are extrinsic and separate from the eyeball itself. They act and control the movements of the eyeball and superior eyelid.

There are seven extraocular muscles:

***. The levator palpebrae superioris -*** Originates from the lesser wing of the sphenoid bone, immediately above the optic foramen. It attaches to the superior tarsal plate of the upper eyelid. ***innervated*** by the oculomotor nerve (CN III).

***. Superior rectus –***  Originates from the superior part of the common tendinous ring and attaches to the superior and anterior aspect of the sclera. ***Innervated*** by oculomotor nerve (CN III).

**. *Inferior rectus-*** Originates from the inferior aspect of the common tendinous ring and attaches to the inferior and anterior aspect of the sclera. ***Innervated*** by oculomotor nerve (CN III).

**. *Medial rectus-*** Originates from the medial part of the common tendinous ring and attaches to the anteromedial aspect of the sclera. ***Innervated*** by oculomotor nerve (CN III).

**. *Lateral rectus-*** Originates from the lateral part of the common tendinous ring and attaches to the anterolateral aspect of the sclera. ***Innervated*** by abducens nerve (CN VI).

**. Inferior oblique*-*** Originates from the anterior aspect of the orbital floor, attaches to the sclera of the eye, posterior to the lateral rectus. ***Innervated*** by the oculomotor nerve (CN III).

**. *Superior oblique-***  Originates from the body of the sphenoid bone; its tendon passes through a trochlear and then attaches to the sclera of the eye. ***Innervated*** by trochlea nerve (CN IV).

**THE CLINICAL RELEVANCE: Cranial Nerve Palsies**

The extraocular muscles are innervated by three cranial nerves. Damage to one of the cranial nerves will cause paralysis of its respective muscles. This will alter the resting gaze of the affected eye. Thus, a lesion of each cranial nerve has its own characteristic appearance.

OCULOMOTOR NERVE (CN III) – A lesion of the oculomotor nerve affect most of the extraocula muscles, the affected eye is displaced laterally by the lateral rectus and inferiorly by the superior oblique. The eye adopts the position called “*down and out”.*

TROCHLEAR NERVE (CN IV) - A lesion of CN *IV* will paralyze the superior oblique muscle. There is no obvious effect of the resting orientation of the eyeball. However, the patient will complain of diplopia (double vision), and may develop a head tilt away from the site of lesion.

ABDUCENS NERVE (CN VI) – A lesion of CN VI will paralyze the lateral rectus muscle. The affected eye will be adducted by the resting tone of the medial rectus.

***The intraocular muscle-*** Are responsible for pupil accommodation and reaction to light. The intraocular muscles include: -\**THE CILIARY MUSCLE \*THE SPHINCTER PUPILLAE* \**THE DILATOR PUPILLAE*

The ciliary muscle is a ring of smooth muscle in the eye’s middle layer that controls accommodation for viewing objects at varying distances and regulates the flow of aqueous humour into Schlemm’s canal. It originates from the longitudinal fibres of scleral spur and inserts into the longitudinal fibres ciliary process.

The sphincter can be classified into anatomical and functional sphincters. The sphincter pupillae is supplied by parasympathetic fibres by the way of the short ciliary nerves and its contraction results in constriction of the pupil.

The dilator pupilae consists of smooth muscles anterior to the pigmented epithelium on the posterior aspect of the iris, which constitutes the iridial part of the retina. The dilator pupillae is supplied by sympathetic fibres, and its contraction results in dilation of the pupil. This sympathetic innervation arises as preganglionic nerve fibres leaving the spinal cord in the upper anthoracic ventral roots.