**NAME :** UKO-PETER TOROBONG

**MATRIC NUMBER :** 18/MHS02/188

**DEPARTMENT :** NURSING

**COLLEGE :** MEDICINE AND HEALTH SCIENCES

**COURSE :** ANA 210

ASSIGNMENT ANSWERS

1. The vasculature is a network of blood vessels connecting the heart with all other organs and tissues in the body. Arteries and arterioles bring oxygen-rich blood and nutrients from the heart to the organs and tissues, while venules and veins carry deoxygenated blood back to the heart. The exchange of gases and transfer of nutrients between blood and tissues take place in the capillaries. A solid understanding of how the vasculature works is key to understanding what can go wrong with it. Blood vascular and lymphatic endothelial cells have important roles in the trafficking of immune cells, controlling the microenvironment, and modulating the immune response. The immune system is one of the most complex systems within the human body, made up of both physical structures and processes, comprising a network of organs, tissues, and cells that protect the body from disease and foreign invaders. Its main function is to keep us healthy and prevent illness. The vascular endothelium plays a critical role in the health of blood vessels. In healthy individuals, the endothelium plays an important role in vascular contractility and maintenance of homeostasis by releasing various factors (endothelin 1, nitric oxide, angiotensin II, prostacyclin, etc.). However, in patients with increased inflammation, such as those with autoimmune disease, sepsis, and dysregulation of inflammasomes, these factors may alter the vascular endothelium’s properties and accelerate pathological remodeling. Vascular smooth muscle is also important with regard to mediating inflammation. It contributes to the inflammatory response by activating specific receptors, resulting in the release of proinflammatory cytokines. The respiratory tract is constantly exposed to the external environment, and therefore, must be equipped to respond to and eliminate pathogens. Viral clearance and resolution of infection requires a complex, multi-faceted response initiated by resident respiratory tract cells and innate immune cells and ultimately resolved by adaptive immune cells. Although an effective immune response to eliminate viral pathogens is essential, a prolonged or exaggerated response can damage the respiratory tract. Virus infection in vertebrates results in two general types of immune response. The first is a rapid-onset "innate" response against the virus, which involves the synthesis of proteins called interferons and the stimulation of "natural killer" lymphocytes. In some cases, the innate response may be enough to prevent a large scale infection. However, if the infection proceeds beyond the first few rounds of viral replication, the "adaptive immune response", kicks into high gear. The adaptive immune response itself has two components, the humoral response (the synthesis of virus-specific antibodies by B lymphocytes) and the cell-mediated response (the synthesis of specific cytotoxic T lymphocytes that kill infected cells).
2. The adductor canal (subsartorial canal or Hunter's canal) is about 15 cm in length and is a narrow, fascial tunnel in the thigh. It is located deep to the middle third of the sartorius muscle, it provides an intermuscular passage through which the femoral vessels pass to reach the popliteal fossa, where they become popliteal vessels. The adductor canal begins about 15 cm inferior to the inguinal ligament, where the sartorius muscle crosses over the adductor longus muscle. It ends at the adductor hiatus in the tendon of the adductor magnus muscle.

**Boundaries of the Adductor Canal**

* + Laterally: vastus medialis muscle
	+ Posteromedially: adductor longus and adductor magnus muscles
	+ Anteriorly: sartorius muscle
	+ The sartorius and the subsartorial fascia form the roof of the adductor canal.
	+ About the middle third of the thigh, a subsartorial plexus of nerves lies on this fascia. It supplies the overlying skin.

**Contents of the Adductor Canal**

* The femoral vessels enter the adductor canal where the sartorius muscle crosses over the adductor longus muscle, the vein lying posterior to the artery.
* The femoral artery and femoral vein leave the adductor canal through the tendinous opening in the adductor magnus muscle, known as the adductor hiatus.
* As soon as the femoral vessels enter the popliteal fossa, they are called the popliteal vessels.
* The profunda femoris artery and vein do not enter the adductor canal.
* The perforating branches of these deep vessels pierce the fibres of the adductor muscles to reach the posterior aspect of the thigh.
* The saphenous nerve, a cutaneous branch of the femoral nerve, accompanies the femoral artery through the adductor canal.
* It enters the adductor canal lateral to the artery, crosses it anteriorly, and lies medial to it at the distal end of the canal.
* The saphenous nerve does not leave the adductor canal via the adductor hiatus.
* It passes between the sartorius and gracilis muscles, pierces the deep fascia on the medial aspect of the knee, and passes down the medial side of the leg with the great saphenous vein.
* The nerve to the vastus medialis muscle accompanies the femoral artery through the proximal part of the adductor canal and then divides into the branches that supply this muscle and the knee joint.

 3. The extraocular muscles (also extrinsic muscles of eyeball, extra-ocular muscles, latin: musculi externi bulbi oculi) are a set of seven muscles located within each orbit and connected with the eye. There are six extraocular muscles responsible for the eye movements and one providing the elevation of the upper eyelid.

The six extraocular muscles include four rectus muscles - superior rectus, inferior rectus, medial rectus, lateral rectus, and two oblique muscles - superior oblique and inferior oblique. There is the seventh extraocular muscle that provides the elevation of the upper eyelid, and that is the levator palpebrae superioris.

* Upgaze, or turning the eye upward, is primarily the work of the superior rectus muscle, with some contribution by the inferior oblique muscle.
* Downgaze, or turning the eye downward, is primarily the work of the inferior rectus, with some contribution by the superior oblique.
* Abduction, or turning the eye outward toward the ear, is primarily done by the lateral rectus.
* Adduction, or turning the eye inward toward the nose, is primarily done by the medial rectus.

The eye is rotated medially by the superior rectus and superior oblique, and is rotated laterally by the inferior rectus and inferior oblique. In addition, the levator palpebrae superioris muscle elevates the eyelid.

 The motor innervation of the extraocular muscles is provided by three cranial nerves: oculomotor (CN III), trochlear (CN IV), and abducens (CN VI). The oculomotor nerve supplies five extraocular muscles: three out of the four rectus muscles (superior, inferior, medial), inferior oblique muscle, and levator palpebrae superioris muscle. The trochlear nerve innervates only the superior oblique, while the abducens nerve supplies the lateral rectus muscle.

  **The intraocular muscles** include the ciliary muscle, the sphincter pupillae, and the dilator pupillae. The ciliary muscle is a smooth muscle ring that controls accommodation by altering the shape of the lens, as well as controlling the flow of aqueous humor into Schlemm's canal.

The ciliary muscle is attached to the zonular fibers which suspend the lens. Upon contraction of the ciliary muscle, the tension on the lens is lessened which causes it to adopt a more spherical shape to focus on near objects. Relaxation of the ciliary muscle has the opposite effect, optimising distant focus. The sphincter pupillae and dilator pupillae are also composed of smooth muscle. The sphincter pupillae encircles the pupil and is responsible for the constriction of its diameter, while the dilator muscle is arranged radially and increases the pupillary diameter. The ciliary muscle and both pupillary muscles are cranial neural crest derivatives and develop from mesenchyme of the choroid. The ophthalmic nerve (CN V: V1) branches into the frontal, nasociliary, and lacrimal nerves. The ciliary ganglion is made up of postsynaptic parasympathetic nerve cell bodies associated with the ophthalmic nerve. The short ciliary nerves originate from the ciliary ganglion and carry parasympathetic and sympathetic fibers to the iris and ciliary body. The long ciliary nerves branch off of the nasociliary nerve and carry postsynaptic sympathetic fibers to the dilator pupillae and afferent fibers from the cornea and iris. The sphincter pupillae is parasympathetically-stimulated while the dilator pupillae is sympathetically-stimulated.