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DEPT:NURSING

COURSE: ANATOMY

**1.Describe the importance vasculature in relation to immune system and outbreak of pandemic covid-19 on the human body**

Vasculation plays an important role in the respiratory system, as blood flows through the capillaries in the lungs. The covid-19 pandemic has turned the worlds attention to the immune system, Vasculature helps the body fight against disease causing bacteria, viruses and other organism that we come in contact with, inhale or ingest every day. Our innate immune system fight against diseases causing intruders for examples is our skin, the mucous and the hairs in our nose and the acid in our stomach.

Adaptive immunity develops over a lifetime of contact with pathogens and vaccines, preparations which helps our immune system to distinguish friend and foe.

Vaccination safely teaches our adaptive immune systems to repel a wide range of diseases, and thus protect ourselves and others.

There is currently no vaccine for coronavirus, and we may not see one [for 18 months](https://www.weforum.org/agenda/2020/03/vaccine-covid-19-coronavirus-pandemic-healthcare/) or longer. So, for now, our immune systems must adapt unaided to this potentially deadly threat.

**How to help your immune system**

A healthy lifestyle – not smoking, drinking little or no alcohol, sleeping well, eating a balanced diet, taking regular moderate exercise and reducing stress – helps our immune systems to be in the best shape possible to tackle pathogens.

**2. Subsartorial canal is an important area in the lower limb, discuss**

The **adductor canal** (Hunter’s canal, subsartorial canal) is a narrow conical tunnel located in the thigh.

It is approximately 15cm long, extending from the apex of the [femoral triangle](https://teachmeanatomy.info/lower-limb/areas/the-femoral-triangle/) to the adductor hiatus of the adductor magnus. The canal serves as a **passageway** from structures moving between the anterior thigh and posterior leg.

**Borders**

The adductor canal is bordered by muscular structures:

* **Anteromedial:**Sartorius.
* **Lateral**: Vastus medialis.
* **Posterior**: Adductor longus and adductor magnus.

The adductor canal runs from the apex of the femoral triangle to the **adductor hiatus** – a gap between the adductor and hamstring attachments of the adductor magnus muscle.

 The adductor canal serves as a **passageway** for structures moving between the anterior thigh and 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.

As the femoral artery and vein exit the canal, they are called the **popliteal artery** and **vein** respectively.

**Clinical Relevance - Adductor Canal Block**

In the adductor canal block, local anaesthetic is administered in the adductor canal to block the **saphenous nerve** in isolation, or together with the nerve to the vastus medialis.

The block can be used to provide sensory anaesthesia for procedures involving the distal thigh and femur, knee and lower leg on the medial side. The sartorius and **femoral artery** are used as anatomical landmarks to locate the saphenous nerve.

**Clinical Relevance - Adductor Canal Compression Syndrome**

Adductor canal compression syndrome describes entrapment of the neurovascular bundle within the adductor canal. A rare condition, it is usually caused by hypertrophy of adjacent muscles such as **vastus medialis**.

It is most common in young males, who may present with **claudication** symptoms due to femoral artery occlusion (more common) or neurological symptoms due to entrapment of the saphenous nerve.

**3.Describe the extraocular and intraocular muscles and their nerve supple**

Eye movements are controlled by muscles innervated by cranial nerves III, IV and VI. The most common symptom of damage to these nerves is double vision. The oculomotor nerve has the additional function of control of the pupil.

***Cranial nerves III, IV, VI. Ocular Motility***

Oculomotor function can be divided into two categories: (1) extraocular muscle function and (2) intrinsic ocular muscles (controlling the lens and pupil). The extraocular muscles include: the medial, inferior, and superior recti, the inferior oblique, and levator palpebrae muscles, all innervated by the oculomotor nerve (III); the superior oblique muscle, innervated by the trochlear nerve (IV); and the lateral rectus muscle, innervated by the abducens nerve (VI). The intrinsic eye muscles are innervated by the autonomic systems and include the iris sphincter and the ciliary muscle (innervated by the parasympathetic component of cranial nerve III), and the radial pupillodilator muscles (innervated by the ascending cervical sympathetic system with its long course from spinal segments T1 through T3).

**Extraocular muscle function**

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

**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**](https://teachmeanatomy.info/head/cranial-nerves/oculomotor/)**(CN III)** – A lesion of the oculomotor nerve affects most of the extraocular muscles. The affected eye is displaced laterally by the lateral rectus and inferiorly by the superior oblique. The eye adopts a position known as ‘down and out’.
* [**Trochlear nerve**](https://teachmeanatomy.info/head/cranial-nerves/trochlear-nerve/)**(CN IV)**– A lesion of CN IV will paralyse the superior oblique muscle. There is no obvious affect 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 the lesion.

[**Abducens nerve**](https://teachmeanatomy.info/head/cranial-nerves/abducens-nerve/)**(CN VI)**– A lesion of CN VI will paralyse the lateral rectus muscle. The affected eye will adducted by the resting tone of the medial rectus.

There are seven extraocular muscles – the levator palpebrae superioris, superior rectus, inferior rectus, medial rectus, lateral rectus, inferior oblique and superior oblique. Functionally, they can be divided into two groups:

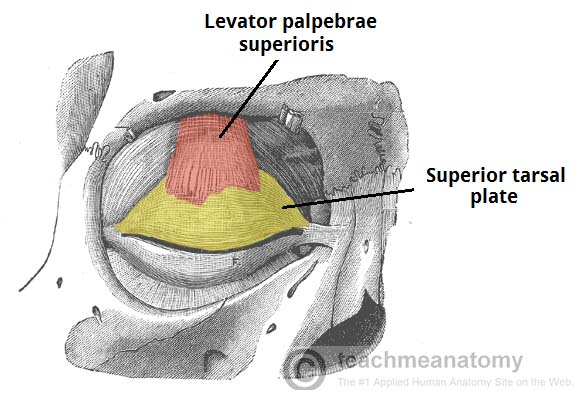
* **Responsible for eye movement**– Recti and oblique muscles.
* **Responsible for superior eyelid movement**– Levator palpebrae superioris.

The muscles of the eye are designed to stabilize and move the eyes. All eye muscles have a resting muscle tone that is designed to stabilize eye position. During movements, certain muscles increase their activity while others decrease it. The movements of the eye include: adduction (the pupil directing toward the nose); abduction (the pupil directed laterally); elevation (the pupil directed up); depression (the pupil directed down); intorsion (the top of the eye moving toward the nose); and extorsion (the superior aspect of the eye moving away from the nose). Horizontal eye movements are rather simple. Increased activity of the lateral rectus will direct the pupil laterally, while increased activity of the medial rectus will direct it medially. However, movements of the eyes above or below the horizontal plane are complicated and require, at the minimum, activation of pairs of muscles. This is because the orbit is not directed straight forward in the head and, therefore, there is no one muscle positioned to direct the eye straight up or down without the simultaneous occurrence of unwanted movements. Because of this, the protocol for testing eye movements is somewhat more complicated than might be expected.

**Levator Palpebrae Superioris**

The levator palpebrae superioris (LPS) is the only muscle involved in raising the superior eyelid. A small portion of this muscle contains a collection of smooth muscle fibres – known as the superior tarsal muscle. In contrast to the LPS, the superior tarsal muscle is innervated by the sympathetic nervous system.

* **Attachments:**Originates from the lesser wing of the [sphenoid](https://teachmeanatomy.info/head/osteology/sphenoid-bone/) bone, immediately above the optic foramen. It attaches to the superior tarsal plate of the upper eyelid (a thick plate of connective tissue).
* **Actions:**Elevates the upper eyelid.
* **Innervation:**The levator palpebrae superioris is innervated by the [oculomotor nerve](https://teachmeanatomy.info/head/cranial-nerves/oculomotor/) (CN III). The superior tarsal muscle (located within the LPS) is innervated by the sympathetic nervous system.



**Muscles of Eye Movement**

There are six muscles involved in the control of the eyeball itself. They can be divided into two groups; the four recti muscles, and the two oblique muscles.

**Recti Muscles**

There are four recti muscles; superior rectus, inferior rectus, medial rectus and lateral rectus.

These muscles characteristically originate from the **common tendinous ring**. This is a ring of fibrous tissue, which surrounds the optic canal at the back of the [orbit](https://teachmeanatomy.info/head/organs/eye/bony-orbit/). From their origin, the muscles pass anteriorly to attach to the sclera of the eyeball.

The name recti is derived from the **latin** for ‘straight’ – this represents the fact that the recti muscles have a direct path from origin to attachment. This is in contrast with theoblique eye muscles, which have an angular approach to the eyeball.

**Superior Rectus**

* **Attachments**: Originates from the superior part of the common tendinous ring, and attaches to the superior and anterior aspect of the sclera.
* **Actions**: Main movement is elevation. Also contributes to adduction and medial rotation of the eyeball.
* **Innervation**: [Oculomotor nerve](https://teachmeanatomy.info/head/cranial-nerves/oculomotor/)(CN III).

**Inferior Rectus**

* **Attachments**: Originates from the inferior part of the common tendinous ring, and attaches to the inferior and anterior aspect of the sclera.
* **Actions**: Main movement is depression. Also contributes to adduction andlateral rotation of the eyeball.
* **Innervation**: [Oculomotor nerve](https://teachmeanatomy.info/head/cranial-nerves/oculomotor/)(CN III).
* **Medial Rectus**
* **Attachments**: Originates from the medial part of the common tendinous ring, and attaches to the anteromedial aspect of the sclera.
* **Actions**: Adducts the eyeball.
* **Innervation**: [Oculomotor nerve](https://teachmeanatomy.info/head/cranial-nerves/oculomotor/) (CN III).
* **Lateral Rectus**
* **Attachments**: Originates from the lateral part of the common tendinous ring, and attaches to the anterolateral aspect of the sclera.
* **Actions:** Abducts the eyeball.
* **Innervation:** Abducens nerve (CN VI).

### Oblique Muscles

There are two oblique muscles – the superior and inferior obliques. Unlike the recti group of muscles, they do not originate from the common tendinous ring.

From their origin, the oblique muscles take an **angular** approach to the eyeball (in contrast to the straight approach of the recti muscles). They attach to the posterior surface of the sclera.

**Superior Oblique**

* **Attachments**: Originates from the body of the [sphenoid](https://teachmeanatomy.info/head/osteology/sphenoid-bone/)bone. Its tendon passes through a trochlear, and then attaches to the sclera of the eye, posterior to the superior rectus.
* **Actions**: Depresses, abducts and medially rotates the eyeball.
* **Innervation**: [Trochlear nerve](https://teachmeanatomy.info/head/cranial-nerves/trochlear-nerve/) (CN IV).

**Inferior Oblique**

* **Attachments**: Originates from the anterior aspect of the orbital floor. Attaches to the sclera of the eye, posterior to the lateral rectus
* **Actions**: Elevates, abducts and laterally rotates the eyeball.
* **Innervation**: [Oculomotor nerve](https://teachmeanatomy.info/head/cranial-nerves/oculomotor/) (CN III).

**INTRAOCULAR MUSCULES**

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.