****Assignment Title:**** Nose and Oral cavity
****Course Title:**** Gross Anatomy of Head and Neck
****Course Code:**** ANA 301

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****Question****

1) Discuss the Anatomy of the tongue and comment on its applied anatomy

2) write an essay on the air sinuses

**Answer.**

**1**

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****.

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.

In this article, we shall look at the anatomy of the extraocular muscles – their attachments, innervation and actions.

## **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 the oblique 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 and lateral 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](https://teachmeanatomy.info/head/cranial-nerves/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 trochlea 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).

**2**

The paranasal sinuses are air-filled ****extensions**** of the respiratory part of the nasal cavity. There are ****four****paired sinuses, named according to the bone in which they are located; maxillary, frontal, sphenoid and ethmoid.

The function of the sinuses is not clear. It is thought that they may contribute to the ****humidifying****of the inspired air. They also reduce the weight of the skull.

Sinuses are formed in childhood by the nasal cavity ****eroding**** into surrounding bone. As they are outgrowths of the nasal cavity, they all drain back into it – ****openings****to the paranasal sinuses are found on the ****roof**** and ****lateral**** walls of the nasal cavity. The inner surface is lined by a respiratory mucosa.

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Fig 1.1 – Diagram showing the location of the paranasal sinuses.1 – Frontal sinuses2 – Ethmoid sinuses3 – Sphenoid sinuses4 – Maxillary sinuses

****Frontal Sinuses****: These are the most ****superior**** in location, found under the forehead. The frontal sinuses are variable in size, but always triangular-shaped. They drain into the nasal cavity via the****frontonasal duct****, which opens out at the hiatus semilunaris on the lateral wall.

****Sphenoid Sinuses****:  The sphenoid sinuses also lie relatively superiorly, at the level of the spheno-ethmodial recess.  They are found more ****posteriorly****, and are related superiorly and laterally to the ****cranial cavity****. The sphenoid sinuses drain out onto the roof of the nasal cavity.  The relationships of this sinus are of clinical importance – the****pituitary gland**** can be surgically accessed via passing through the nasal roof, into the sphenoid sinus and through the sphenoid bone.

****Ethmoidal Sinuses****: There are three ethmoidal sinuses; anterior, middle and posterior. They empty into the nasal cavity at different places:

* Anterior – Hiatus semilunaris
* Middle – Ethmoid bulla
* Posterior – Superior meatus

****Maxillary Sinuses:****The largest of the sinuses. It is located laterally and slightly ****inferiorly**** to the nasal cavities. It drains into the nasal cavity at the ****hiatus semilunaris,**** underneath the ****frontal sinus**** opening. This is a potential pathway for spread of infection – fluid draining from the frontal sinus can enter the maxillary sinus.