“The face is crucial for human identity, and it is located in front of the head that features three of the head's sense organs, eyes, nose, and mouth, and through which human express many of their emotions.”
Resources

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The Scalp
- It is the soft tissue covering the skull vault.
- It is formed of (Five) layers.
  - **Skin**
    - Thick hairy with numerous sebaceous and sweat glands.
  - **Connective Tissue (Vascular layer)**
    - It is a fibro-fatty layer which is adherent to the skin and to the underlying aponeurosis by fibrous septa.
    - It is richly supplied with vessels and nerves embedded within it.
  - **Aponeurosis**
    - Thin, tendinous sheet that connects the frontal and occipital bellies of occipitofrontalis muscle.
    - It is attached laterally to the temporal fascia
  - **Loose areolar tissue (Dangerous layer)**
    - It occupies the subaponeurotic space.
    - It contains few arteries and the important emissary veins.
  - **Pericranium**
    - It is the periosteum of the skull.
    - The first three layers of the scalp are regarded as a single layer because they remain together when part of the scalp is torn off (Scalping)
### Occipitofrontalis Muscle

- **Frontal Bellies**
  - Origin from the skin and subcutaneous tissue of the eyebrows.
  - Action: elevate the eyebrows giving the face a surprised looking and produce transverse wrinkles of the forehead.

- **Occipital Bellies**
  - Arise from the highest nuchal lines.
- Scalp has a rich supply of blood to nourish the hair follicles.
- Arteries lie in the superficial fascia, moving laterally from midline anteriorly.
- 10 arteries supply the scalp, 5 on each side.
- From anterior to posterior, they are:
  - **Supratrochlear** and **Supraorbital**
    - from *internal carotid artery*.
  - **Superficial temporal**, **Posterior auricular** and **Occipital**
    - These are from the *external carotid artery*.
    - They are freely anastomosing with each other.
▪ The **loose connective tissue layer** is considered the danger area of the scalp because it is containing the emissary veins.

▪ These veins have **no valves** which connect the **extracranial veins** of the scalp to the **intracranial dural venous sinuses**.

▪ The emissary veins are a potential pathway for the spread of **infection** from the scalp to the intracranial space.
The most anterior region of the head is the face.

The human face is a unique aspect of everyone.

The face contains many structures that contribute to the display of emotions, feeding, seeing, smelling, and communicating.

One of the most distinguishing qualities of the face is that it is used for personal identity from person to person.

Identity is essential since the face is usually the first aspect of a human that is noticeable during encounters with other individuals.
The anatomy of the face can divide into three main regions:

- **Upper face**
- **Middle face**
- **Lower face**

The entire face is covered by **skin** superficially, while the deep anatomy contains **muscles, fat pads, nerves, vessels,** and **bones.**
▪ The region that is considered the upper face starts from the **hairline superiorly** and ends just under the **lower eyelid**.

▪ The lateral borders of the upper face terminate around the **temporal region**.

▪ The upper face region contains the **forehead**, **eyes**, and **temporal region**.
- The **forehead** is the superior region of the upper face region.
- The superficial layer of the forehead is made up of **skin**.
- Deeper to the skin layer of the forehead is the **fat pads**.
- The bony structure of the forehead is made up of the **frontal bone**, while the lateral region of the upper face that corresponds to the temporal part forms from the **temporal** and **sphenoid bones**.
- The muscular layer of the upper face is underneath the fat pads.
- The procerus, frontalis, depressor supercillii, and corrugator supercillii muscles form the majority of the forehead, while the temporal part contains the temporalis muscle.
- The **frontalis muscle** spans the majority of the forehead.
- The frontalis muscle originated from the galea aponeurosis superiorly and inserts and blends into the orbicularis oculi muscle.
- When the frontalis muscle contracts, it **elevates** the eyebrows and **wrinkles** the forehead.
The procerus muscle is shaped like a pyramid and spans from the inferior part of the nasal bone to the middle part of the forehead.

The procerus muscle is situated between the eyebrows and attaches to the frontalis muscle.

The contraction of the procerus muscle allows for the elevation of the eyebrows.
The **depressor supercilli** muscle originates from the medial orbital rim and inserts at the medial part of the bony orbit.

The action of the depessor supercilli muscle is to **depress** the eyebrows.
The **corrugator supercilii** muscle is a small muscle that originated from the supraorbital ridge and inserts on the skin of the forehead close to the eyebrows.

The contraction of the corrugator supercilii muscle results in the **wrinkling** of the forehead.
- The **temporalis muscle** originates from the parietal and sphenoidal bones, and inserts on the coronoid process and the retromolar fossa.
- The contraction of the temporalis muscle results in the **elevation** and **retraction** of the mandible.
- The eyes situate in the **orbital sockets** in the upper face region.
- The skin that is directly superior to the orbits is also the region where the **eyebrows** are found.
- Surrounding and covering the eyes are the **eyelids** with upper and lower portions to provide protection.
- At the edges of the eyelids are the **eyelashes**.
The bony structures that make the eye region are

- The **frontal** bone superiorly.
- The **nasal** bone medially.
- The **maxillary** bone inferomedially
- The **zygomatic** bone inferiorly and laterally.
There is one muscle that encircles the orbit which is the **orbicularis oculi** muscle.

It **originated** from the frontal bone, lacrimal bone, and medial palpebral ligament, and **inserted** into the lateral palpebral raphe.

The function of the **orbicularis oculi** muscle is to **close** the eyelids.

In contrast, the muscle that opens the eyelids is the **levator palpebrae superioris** muscle.

Eye movement is under the control of six muscles.
- Superior and inferior rectus muscle.
- Medial and lateral rectus muscle.
- Superior and inferior oblique muscle.
- The middle face region starts superior at the **lower eyelid** and spans inferior terminating just above the **upper lip**.
- The **ears** enclose the lateral borders of the central face.
- The central face region contains the nose, cheeks, and ears.
The **nose** is a midline structure that protrudes from the face.

- It is made from cartilage inferiorly, but the superior portion of the nose is made from the nasal bones.
- The nose is covered with skin superficially and has no underlying fat pads.
- The bony part of the nose has the **nasalis** muscle on top of it.
- The action of the nasalis muscle is to **depress** the tip of the nose, **compression** of the nasal bridge, and **elevation** of the nostrils.
- The cheeks are lateral to the nose.
- They are covered with skin superficially, but deep to the skin, the cheeks contain a lot of fat pads.
- The muscular layer of the cheek contains many muscles including muscles of mastication.
- The **buccinator muscle** originates from the alveolar process of the maxilla and mandible, and inserted into the orbicularis oris and the skin of the lips.
- The **action** of the buccinator muscle is to **compress** the food against the buccal mucosa during mastication.
- Lateral to the buccinator is the **masseter muscle**.
- The **masseter muscle** originates from the zygomatic arch and the maxillary process on the zygomatic bone, and then it inserts at the ramus of the mandible.
- The **action** of the masseter muscle is to **elevate** and protrude the mandible during mastication.
- The masseter muscle and the region anterior the ear contains the **parotid gland** superficially.
- The **parotid gland** produces **digestive enzymes** and is the structure the facial nerve penetrates before it divides into five nerve branches.
The lateral structures that outline the middle face region are the ears.

The ears are made from cartilage and function to funnel in sound.

The ears have three muscles that act on it.

The muscles that act on the ears are the auricular muscles (anterior, posterior, and superior).

The auricular muscles originate from the galea aponeurosis and inserts onto the pinna of the ear.

The action of the auricular muscles is to wiggle the ears.

The bone structure that allows for the ears to protrude from is the temporal bone.
- The **lower face** starts superiorly at the **upper lip** and ends inferiorly at the **lower border of the chin**.
- The lateral border of the lower face is made up of the **angle of the mandible**.
- The lower face region contains the **lips**, **chin**, and **jaws**.
The lips are the most noticeable structures in lower face.

The bony structures of the lips are made from the maxilla superiorly and mandible inferiorly.

Lips are divided into upper and lower lips.

The function of the lips is the articulation of speech, eating, kissing, and sensory structures.

The orbicularis Oris muscle surrounds the lips.

It is a sphincter muscle that originates from the mandible and maxilla then inserts onto the skin of the lips.

The action of the muscle is to alter the shapes of the lips for eating, speaking, kissing, and more.

Most of the muscles in the lower face region will act predominantly on the lower lip.
- The **chin** appears on the midline of the mandible.
- The lower border of the chin and jawline have the **platysma muscle**.
- The **platysma muscle** is a superficial muscle that originates from the **infraclavicular** and **supraclavicular** regions then inserts onto the **mandible, cheek, and mouth**.
- The action of the platysma muscle is to **depress** the corners of the mouth and **pull** the neck skin superiorly.
- The platysma muscle also acts as a **protective muscular layer** for the vital structures such as the trachea, esophagus, carotid arteries, jugular veins, and nerves that are beneath the platysma muscle.
The following are the muscles of the face:

- Occipitofrontalis muscle
- Temporals muscle
- Procerus muscle
- Nasalis muscle
- Depressor septi nasi muscle
- Orbicularis oculi muscle
- Corrugator supercilii muscle
- Depressor supercilii muscle
- Auricular muscles (anterior, superior and posterior)
- Orbicularis oris muscle
- Depressor anguli oris muscle
- Risorius muscle
- Zygomaticus major muscle
- Zygomaticus minor muscle
- Levator labii superioris muscle
- Levator labii superioris alaeque nasi muscle
- Depressor labii inferioris muscle
- Levator anguli oris muscle
- Buccinator muscle
- Mentalis muscle
- Platysma muscle
- Masseter muscle
The primary blood supply to the face derives from the **external carotid artery**.

The external carotid artery branches into:

- Superior thyroid artery
- Lingual artery
- Facial artery
- Ascending pharyngeal artery
- Occipital artery
- Posterior auricular artery
- Maxillary artery
- Superficial temporal artery

The **facial**, **superficial temporal**, and **maxillary** arteries are the main vessels that provide blood to the face.

The **superficial temporal** supplies the structures mainly in the temporal and forehead territories.

The **facial artery** is responsible to supply blood to the majority of the face.

The **maxillary artery** provides some blood to the cheek region.
Face is drained mainly by **facial** and **retromandibular** veins.

**Anterior facial vein:**
- Formed close to medial angle of the eye by union of:
  - supratrochlear & Supraorbital veins
  - Descends in the face behind the facial artery.
  - In the neck it joins the anterior branch of retromandibular to form common facial that ends in internal jugular vein (IJV).

**Retromandibular vein:**
- Formed inside the parotid by union of superficial temporal and maxillary veins.
- In the parotid it lies deep to facial nerve branches
- It divides into 2 branches;
- Anterior branch which joins the ant facial vein to form the common facial that ends in IJV.
- Posterior branch which joins the posterior auricular to form the external jugular vein EJV.
- The face has two main nerve innervations from two cranial nerves.
- The **trigeminal nerve** provides mainly sensory innervation to the face.
- The **facial nerve** is responsible mainly for motor innervation.
The trigeminal nerve branches into three nerve branches.

These branches are the ophthalmic, maxillary, and mandibular nerves.

The ophthalmic nerve travels toward the forehead and provides sensory innervation to the forehead and eye region.

The maxillary nerve travels toward the maxilla bone and provides sensory innervation to the cheek and nose.

The mandibular nerve travels with the mandible and provides sensory innervation to the jaw and lips.

The trigeminal nerve also innervates the masseter muscle that contributes to the fullness of the cheeks.

The eyes also receive additional innervation from the optic, oculomotor, trochlear, abducens, and facial nerves.

The nose also receives special sensory innervation from the olfactory nerve.

The ears funnel in sound and convert it into audible sound via the vestibulocochlear nerve.
Compression, degeneration or inflammation of the 5th cranial nerve may result in a condition called \textit{trigeminal neuralgia} (spasmodic contraction of the muscles in the face).

This condition is characterized by recurring episodes (recurrent attacks) of intense stabbing pain radiating from the angle of the jaw along a branch of the trigeminal nerve.

Usually involves maxillary & mandibular branches, rarely in the ophthalmic division.

Usually, the problem comes from the contact between a normal blood vessel and the trigeminal nerve at the base of the brain. This contact puts pressure on the nerve and causes it to malfunction.

Trigeminal neuralgia can occur as a result of aging, or it can be related to multiple sclerosis or a similar disorder that damages the myelin sheath protecting certain nerves.

Trigeminal neuralgia can also be caused by a tumour compressing the trigeminal nerve.
- The facial nerve is responsible for the innervation of the muscles that participate in facial expression.
- The facial nerve penetrates through the parotid gland and then branches into five nerves: temporal, zygomatic, buccal, mandibular, and posterior cervical.
- The temporal branch of the facial nerve travels toward the temporal and forehead region.
- The zygomatic branch of the facial nerve travels along the zygoma and cheek region.
- The buccal branch of the facial nerve travels toward the buccal region.
- The marginal mandibular branch of the facial nerve travels toward the mandible.
- The posterior cervical branch of the facial nerve travels toward the cervical region.
Damage of the facial nerve results in paralysis of muscles of facial expressions:

- Facial (Bell’s) palsy; lower motor neuron lesion (whole face affected).

Face is distorted:

- Drooping of lower eyelid,
- Sagging of mouth angle,
- Dribbling of saliva,
- Loss of facial expressions,
- Loss of chewing,
- Loss of blowing,
- Loss of sucking,
- Unable to show teeth or close the eye on that side.
The danger triangle of the face consists of the triangular area bounded by the medial angle of the eye, side of nose and upper lip.

Due to the special nature of the blood supply to the human nose and surrounding area, the retrograde infection from the nasal area may spread to the brain causing cavernous sinus thrombosis, meningitis or brain abscess.
QUESTIONS?

alkhaleel@ksu.edu.sa