

Learning Outcomes

- The **Scalp**
 - Layers of the Scalp
 - Bleeding from the Scalp
- The **Carotid**
 - The **Facial Artery**
- Major Muscles of the Face and Jaw(s)
 - Muscles of **Mastication**
 - Muscles of Facial **Expression**
- The **Parotid Gland**
 - Borders of the Parotid
 - Structures within the Parotid
- The **Facial (CNVII) Nerve**
 - Course of the Facial Nerve
 - Lesion(s) and Testing of the Facial Nerve



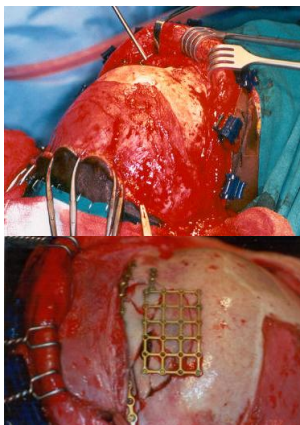
Scalp, Face, Parotid

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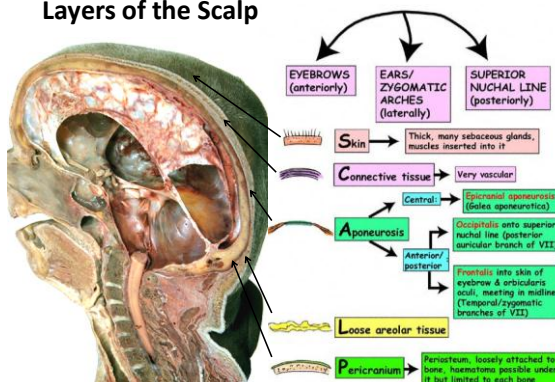
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The 3rd **aponeurotic layer** (galea aponeurotica) connects the **frontalis** and **occipitalis** muscles (epicranial muscle). This muscle is innervated by branches of **cranial nerve VII**. The frontalis muscle is instrumental in movements of the eyebrows and forehead and is an important muscle of facial expression.

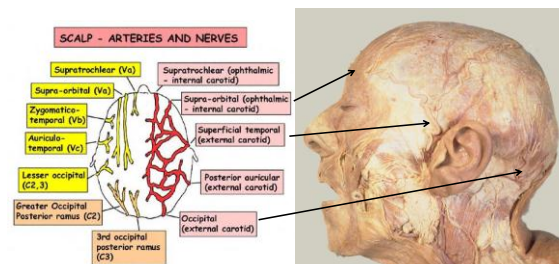
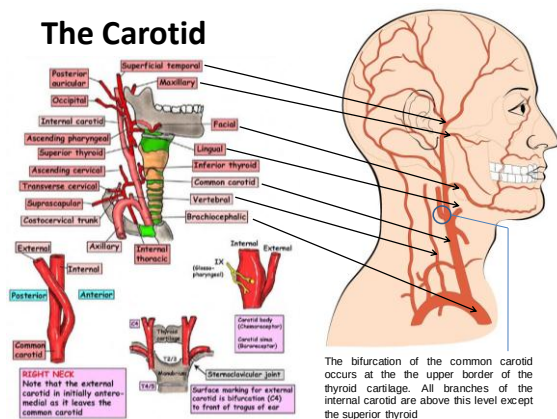
To gain access to the anterior bones of the skull a **bi-coronal flap** is raised. This exposes the superior facial bones. As the **skin is so vascular** special clips are used for haemostasis during the operation and to secure the skin flaps. Occasionally cysts can occur in the scalp, such as an **epidermoid cyst** that contains keratin. It is sometimes called a **wen** or a **sebaceous cyst** although it does not arise from sebaceous glands.



Layers of the Scalp



The Carotid



Blood supply to the scalp derives from three distinct sources:

1. **anteriorly** – the **supratrochlear** and **supraorbital** arteries, both branches of the **ophthalmic** artery
2. **laterally** – the **superficial temporal** artery, one of the two terminal branches of the external carotid artery, and
3. **posteriorly** – the ear is supplied by branches of the occipital and posterior **auricular** arteries, both branches of the external carotid.

There are numerous anastomoses between terminal branches of all of these vessels. Vascular supply to the scalp is especially rich in the fourth layer, and these vessels are the source of the robust bleeding that often accompanies scalp injury.

The Facial Artery

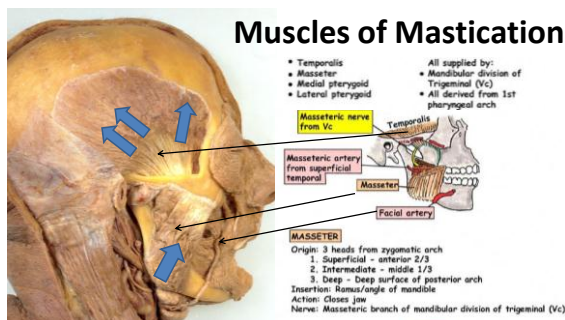
- The **facial artery** originates from the **external carotid** in the mid-neck and winds around the lateral surface of the body of the mandible, before coursing diagonally toward the corners of the mouth.
- From here, it ascends along the side of the nose and terminates near the **medial angle of the eye** (angular artery) the pulse of which is palpable in the space between the upper nose and the medial angle of the eye.
- Important branches along the way are the **inferior labial**, **superior labial**, and **lateral nasal arteries**.



The Carotid

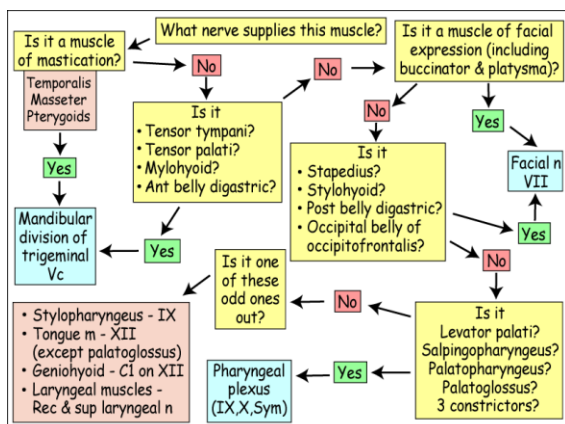
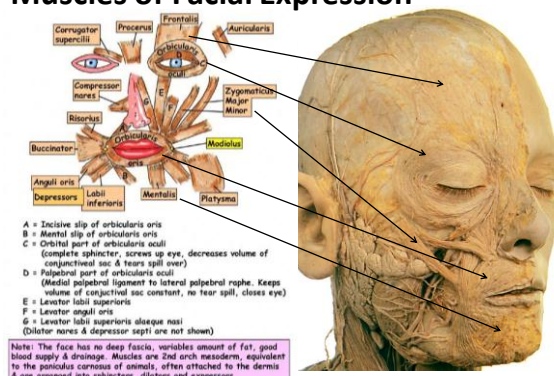
- The **common carotid** is enclosed in the **carotid sheath**. The external carotid artery leaves the sheath when the common carotid artery bifurcates.
- The common carotid artery arises on the **right** from the **brachiocephalic artery** and on the **left** from the **aortic arch**. The internal carotid artery has no branches in the neck.
- The **carotid sinus** (baroreceptor – BP) and the **carotid body** (chemoreceptor – acid-base status in blood) lie at the **bifurcation of the common carotid** artery. Both are innervated by the **glossopharyngeal nerve CNIX**.
- Each internal carotid artery separates from the parent common carotid artery at the upper border of the thyroid cartilage, **opposite C3 and C4**. The internal carotid artery ascends toward the base of the skull. The external carotid and its branches supply most of the scalp, anterior and lateral face, oral and nasal cavities, and much of the neck. Some of its terminal branches anastomose with similar terminal branches of the internal carotid system, especially those that supply the nose and the orbital region.

Muscles of Mastication

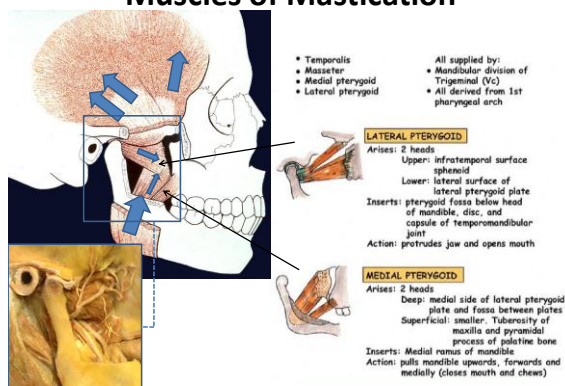


Note: The 'unofficial' muscle(s) of mastication are the buccinator and digastric muscles. Mastication is aided by others involved in the act of chewing e.g., muscles of the tongue.

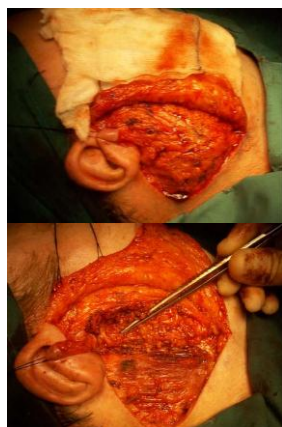
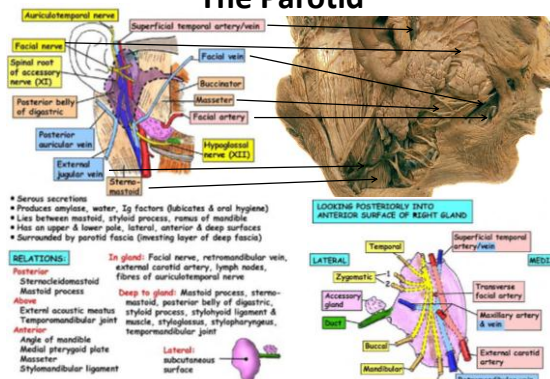
Muscles of Facial Expression



Muscles of Mastication



The Parotid

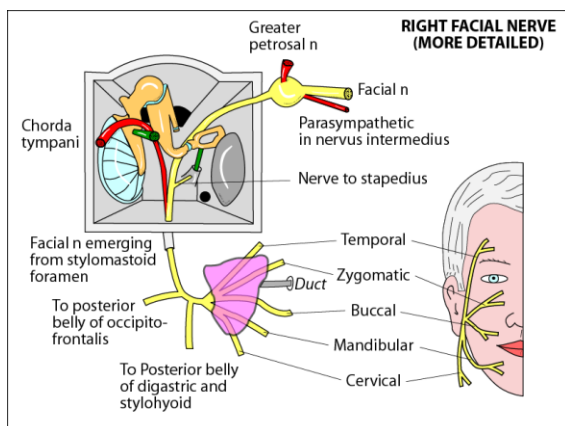
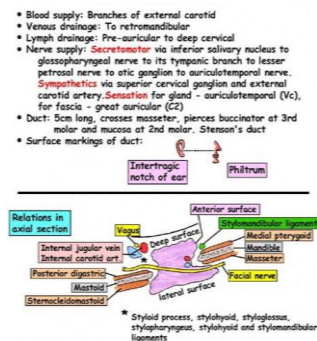


- The parotid is subject to a number of diseases and conditions:
 - **Mumps** – other glands can also be involved including the reproductive organs with resulting sterility.
 - **Sjögren's syndrome** – which is an autoimmune disease associated with rheumatoid arthritis and dry eyes.
 - Obstructed by **calculi** (stones).
 - Chronic or ascending **infections**.
 - **Anorexia nervosa** the glands swell as a response to starvation.
 - **Tumours**, which need to be removed.
- Parotidectomy** is carried out via an extended facelift incision. The parotid is carefully dissected from its bed and may be either wholly or partially removed as in a **superficial parotidectomy** that reaches down to the facial nerve and its branches. The great auricular nerve is usually sacrificed but leaves little sensory loss. One unusual complication of a parotidectomy is **Frey's syndrome** where gustatory sweating breaks out on the face.

All Muscles of:	Are supplied by:	Except:	Which is/are supplied instead by:
Pharynx	Pharyngeal plexus (IX, X, symp)	Stylopharyngeus	Glossopharyngeal (IX)
		Cricopharyngeus	Recurrent laryngeal
Palate	Pharyngeal plexus	Tensor palati	Off n to med pterygoid (Vc)
Tongue	Hypoglossal (XII)	Palatoglossus	Pharyngeal plexus
Mastication	Mandibular (Vc)	Buccinator	Facial (VII)
Larynx	Recurrent laryngeal (X)	Cricothyroid	Ext br of superior laryngeal (X)
Facial expression & buccinator	Facial (VII)	Levator palpebrae superioris	Oculomotor (III) & sympathetic
Eye	Oculomotor (III)	Superior oblique	Trochlear (IV)
		Lateral rectus	Abducent (VI)
Strap group	Ansa cervicalis	Thyrohyoid	C1 fibres on hypoglossal

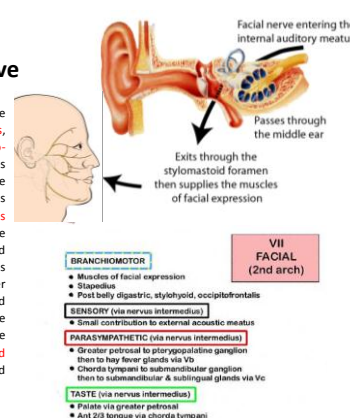
The Parotid

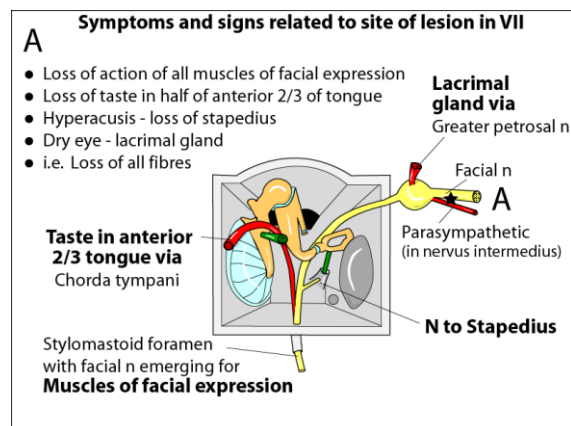
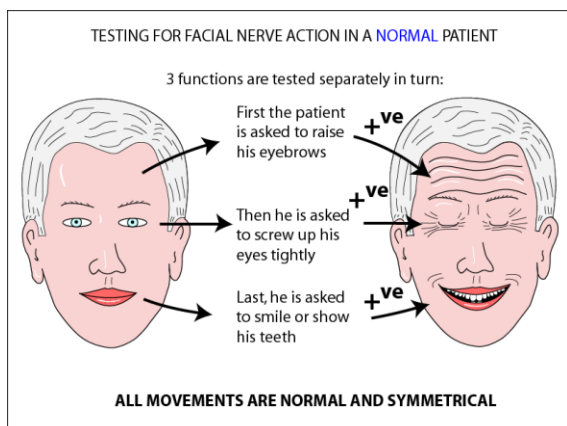
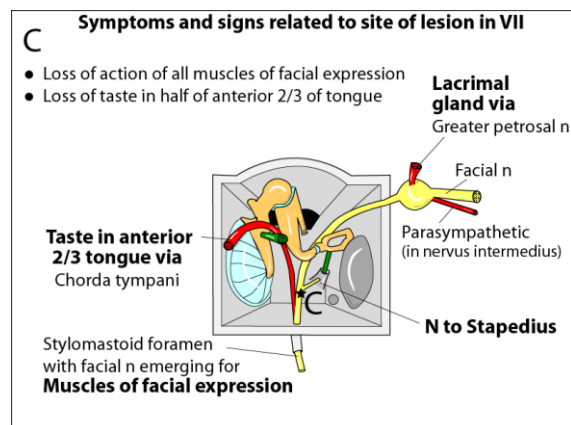
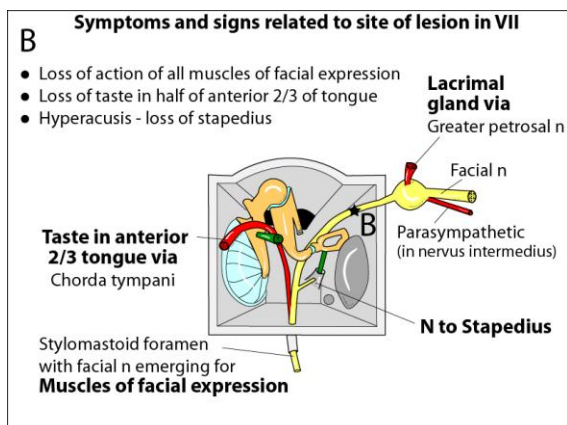
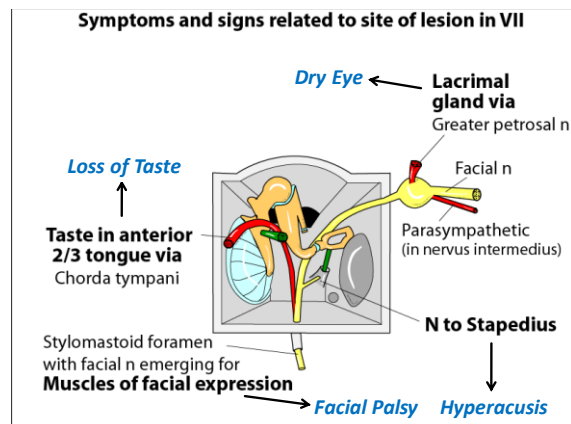
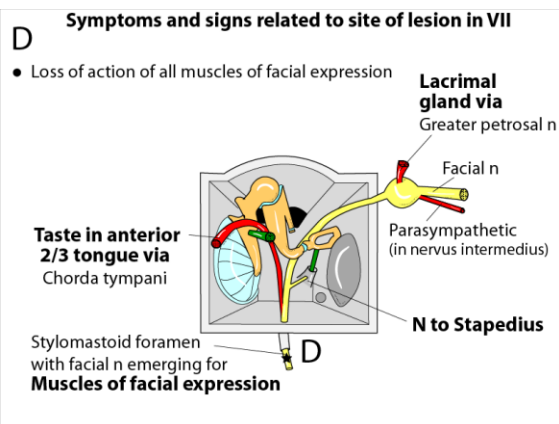
- The parotid gland has **3 major structures** within its substance:
- Most **superficial** is the **facial nerve** – After emerging from the stylomastoid foramen, the CNVII enters the gland. Travelling forward, it emerges as two major trunks, which subsequently divide into the five major branches of the CNVII.
- The **superficial temporal** and **maxillary veins** form the **retro-mandibular vein**, deeper within the gland. The vein emerges from the gland and joins posteriorly with the posterior auricular vein to form the **external jugular vein**.
- Deepest** is the **external carotid artery**. It enters the gland and divides into the **superficial temporal** and **maxillary arteries**. Both of these emerge from the antero-superior surface of the gland and continue on to provide blood supply to the temporal fossa and scalp (superficial temporal artery) and the deep structures of the face and nose (maxillary artery).



Facial (CNVII) Nerve

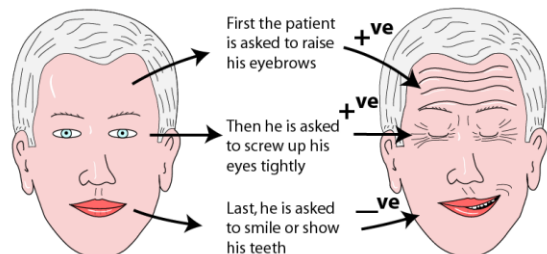
The two roots of the facial nerve enter the **internal acoustic meatus**, accompanied by the **vestibulo-cochlear nerve**. The sensory root lies between the motor root and the vestibulo-cochlear nerve and is therefore called the **nervus intermedius**. This has its ganglion, the **geniculate ganglion**, at the lateral end of the meatus. The nerve then turns forwards, and downwards. After giving off the **nerve to stapedius**, and the **chorda tympani** (the nerve carrying taste fibres) the facial nerve leaves the skull at the **stylomastoid foramen** and enters the parotid gland.





TESTING FOR FACIAL NERVE ACTION IN AN **ABNORMAL** PATIENT

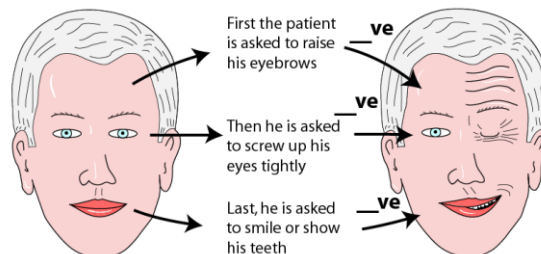
3 functions are tested separately in turn:



MOVEMENTS OF UPPER FACE ARE NORMAL & SYMMETRICAL BUT NO MOVEMENT IN LOWER FACE INDICATES A "UPPER MOTOR LESION"

TESTING FOR FACIAL NERVE ACTION IN AN **ABNORMAL** PATIENT

3 functions are tested separately in turn:



ALL MOVEMENTS ARE MISSING IN THE RIGHT SIDE OF THE FACE INDICATING A "LOWER MOTOR LESION"

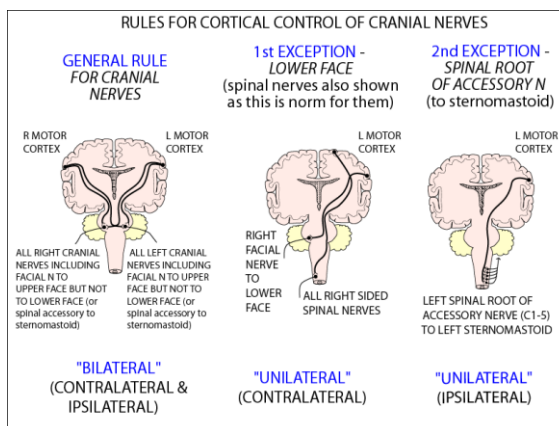
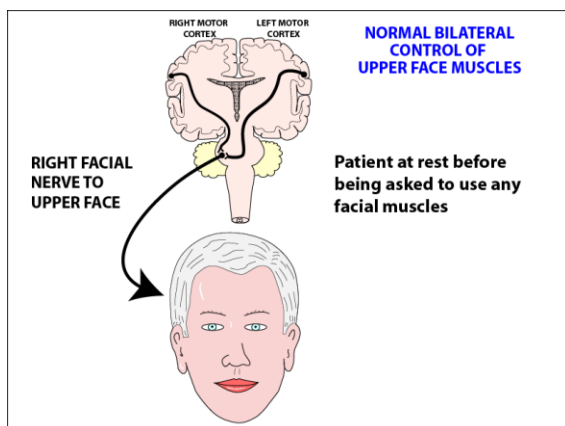
Why is the Lower Face only affected in a Stroke?

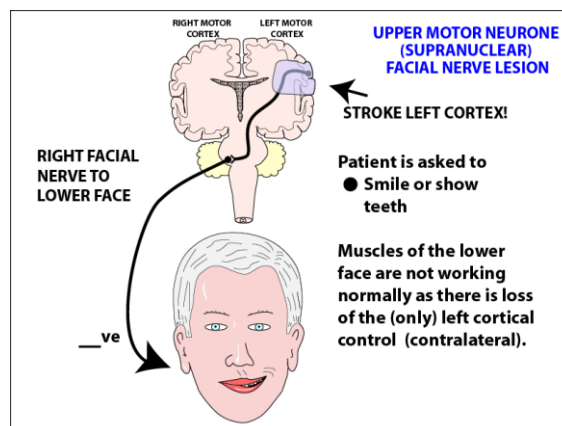
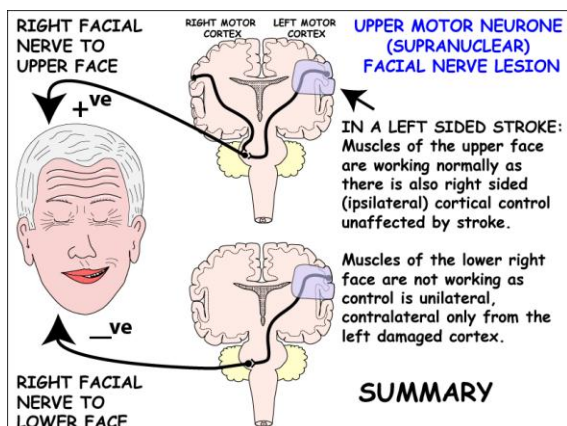
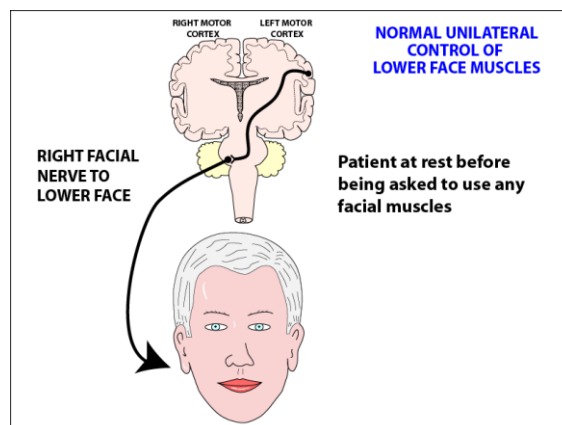
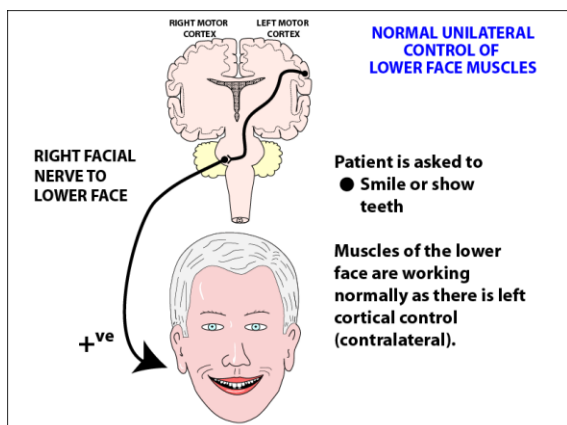
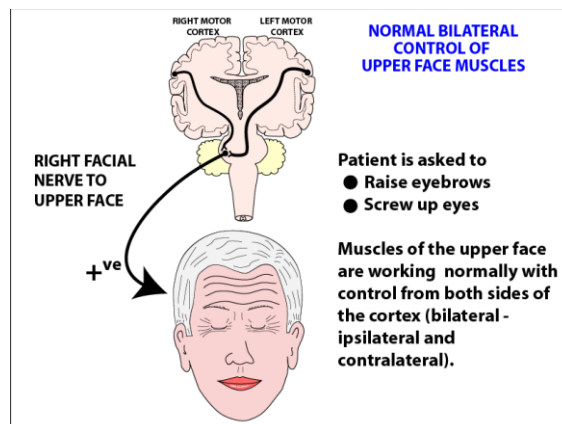
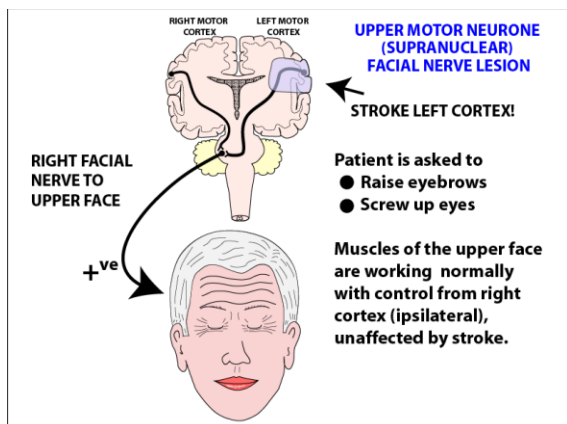
(Upper Motor Neurone Lesion)

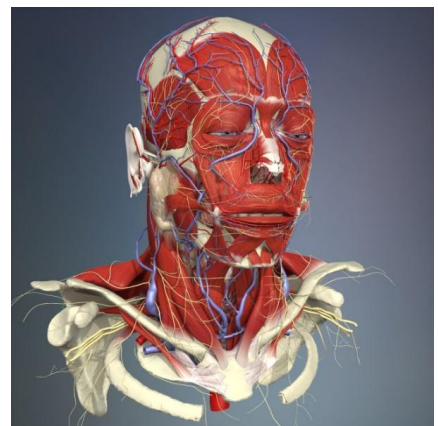
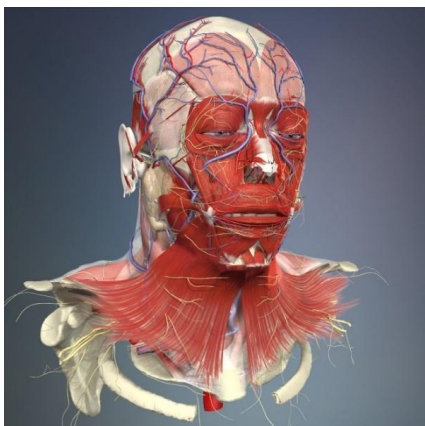
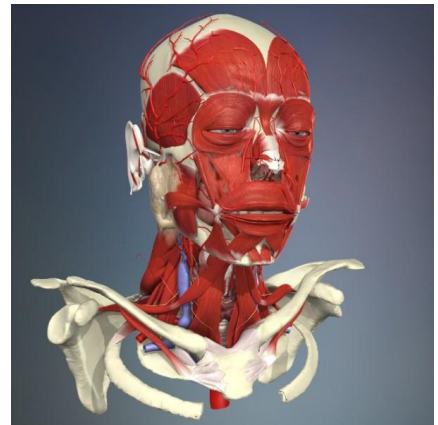
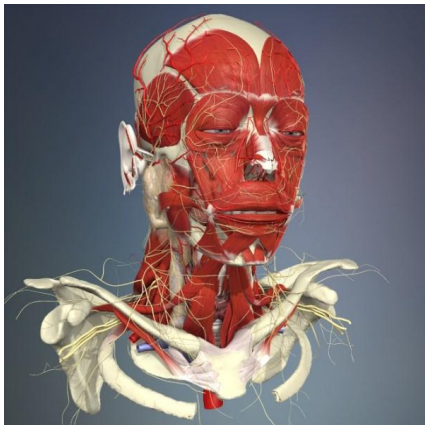
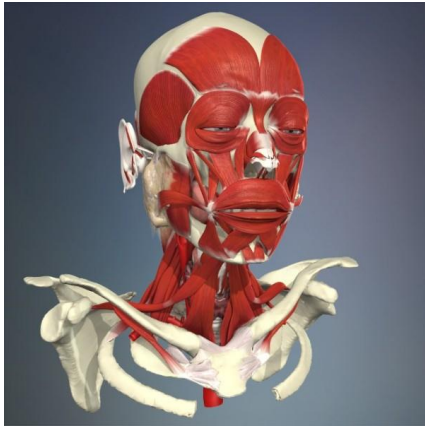
Bell's Palsy



- Named after Scottish anatomist and Surgeon Sir Charles Bell (1774-1842), who first described it.
- Bell's palsy is an **idiopathic unilateral facial nerve paralysis**, which is of rapid onset but usually self-limiting. It is the most common acute **mono-neuropathy**, and is the most common cause of **acute facial nerve paralysis**.
- No readily identifiable cause has been found, but clinical and experimental evidence suggests viral infection(s) may play a role. It is also thought that an inflammatory component leads to swelling of the facial nerve (nervus facialis) which causes compression in the narrow bone canal are thought to lead to nerve inhibition, damage or even death.
- Most people recover spontaneously and achieve near-normal to normal functions but clinicians still prescribe anti-inflammatory (corticosteroids) and anti-viral drugs. Early treatment is necessary for the drug therapy to have effect.
- The eye on the affected side must be protected from drying up, or the cornea may be permanently damaged.







End

