EXAMINATION OF FACIAL NERVE

FACIAL NERVE

The facial nerve is a **mixed cranial nerve** with motor, parasympathetic, and sensory branches

NUCLEI:
4 major nuclei located in lower Pons

1. **Motor or Branchiomotor (muscles of facial expression)**
2. **Superior salivary nucleus (parasympathetic)**
3. **Lacrimal**
4. **Nucleus of Tractus Solitarius**

Course of Facial Nerve

- Facial Nerve is formed mainly of two parts:

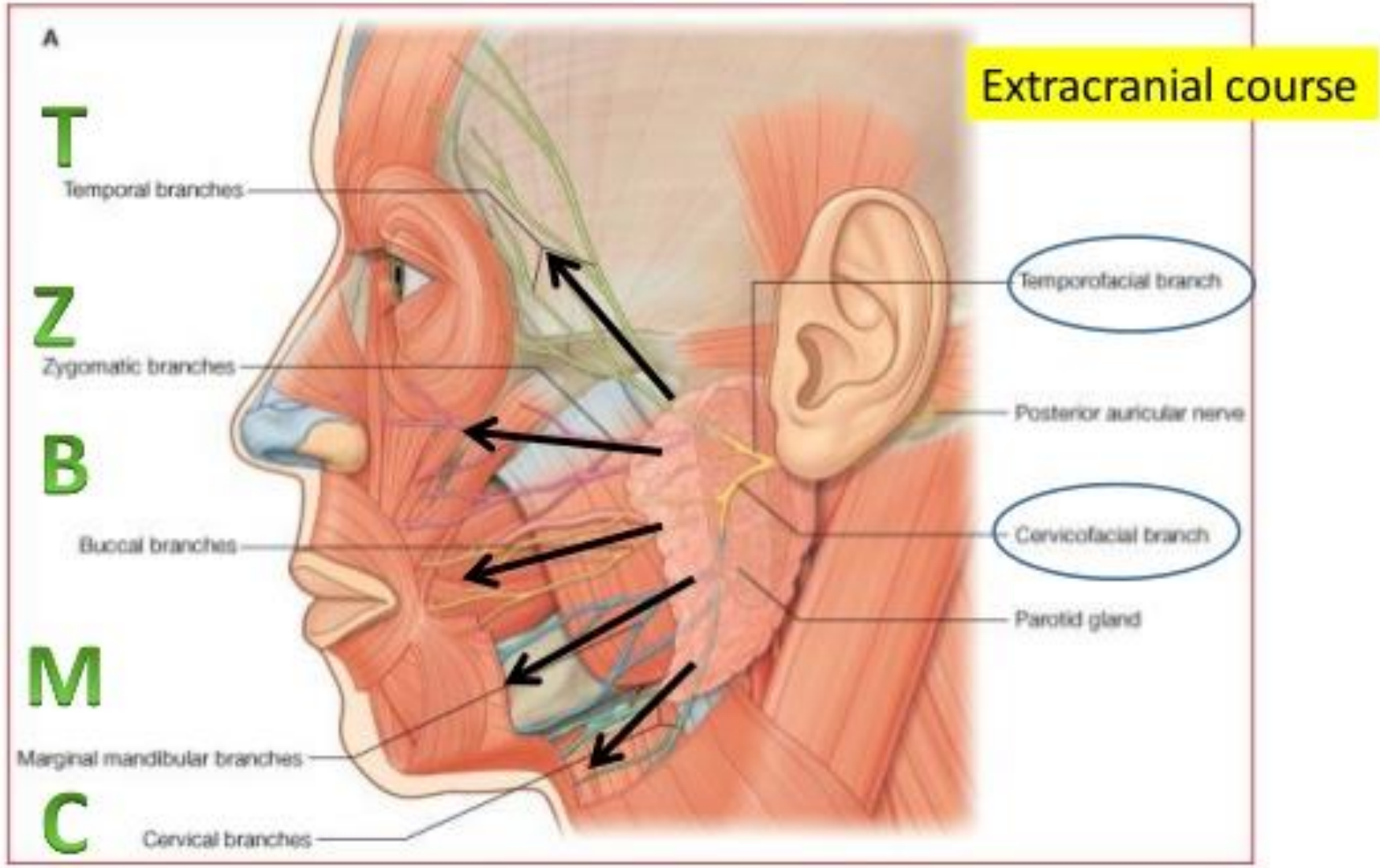
1. **Facial Nerve Proper (Motor part): arising from Facial Motor Nucleus in Pons**
2. **Nervus Intermedius: Sensory Root of Facial Nerve; Carries parasympathetic fibers (FROM superior salivatory nucleus) and and taste fibers (to NTS)**

FACIAL NERVE

EXTRACRANIAL SEGMENT

Distal to stylomastoid foramen, the following nerves branch off the facial nerve:

Posterior auricular nerve – controls movements of some of the scalp muscles around the ear
Branch to **posterior belly of digastric muscle** as well as the **stylohyoid muscle**
Five major facial branches (**in parotid gland**) – from top to bottom:
Temporal branch
Zygomatic branch
Buccal branch
Marginal mandibular branch
Cervical branch


A
T
Temporal branches
Z
Zygomatic branches
B
Buccal branches
M
Marginal mandibular branches
C
Cervical branches
Extracranial course
Temporofacial branch
Posterior auricular nerve
Cervicofacial branch
Parotid gland

HOW TO EXAMINE?

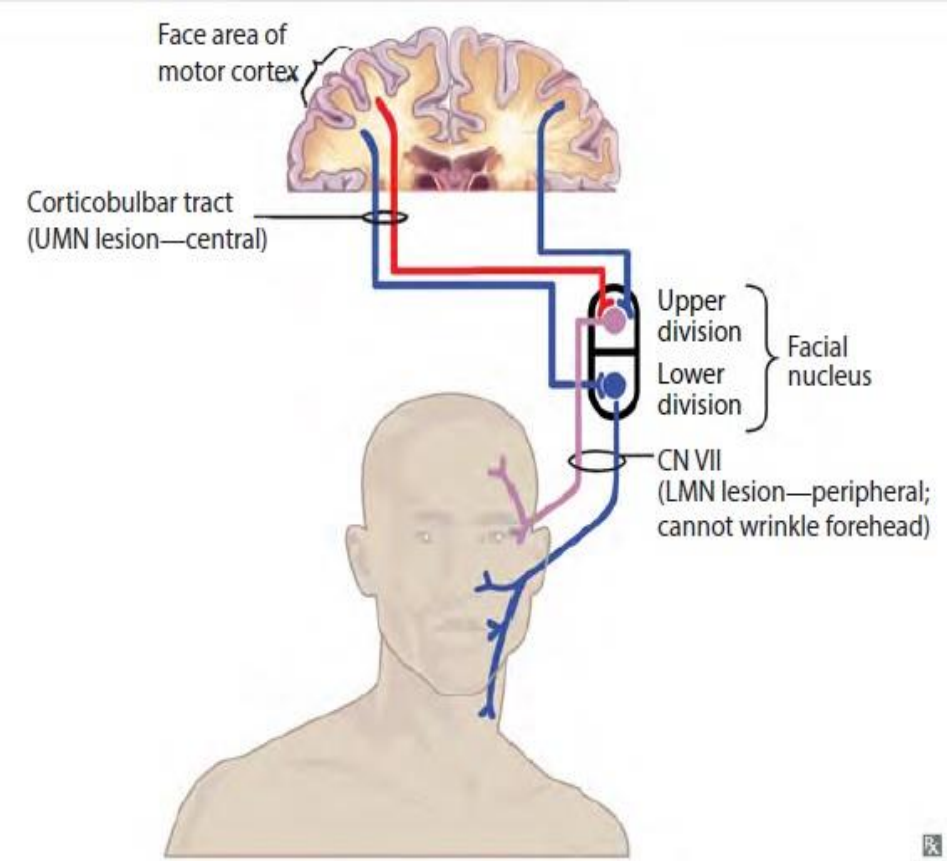
MOTOR PART

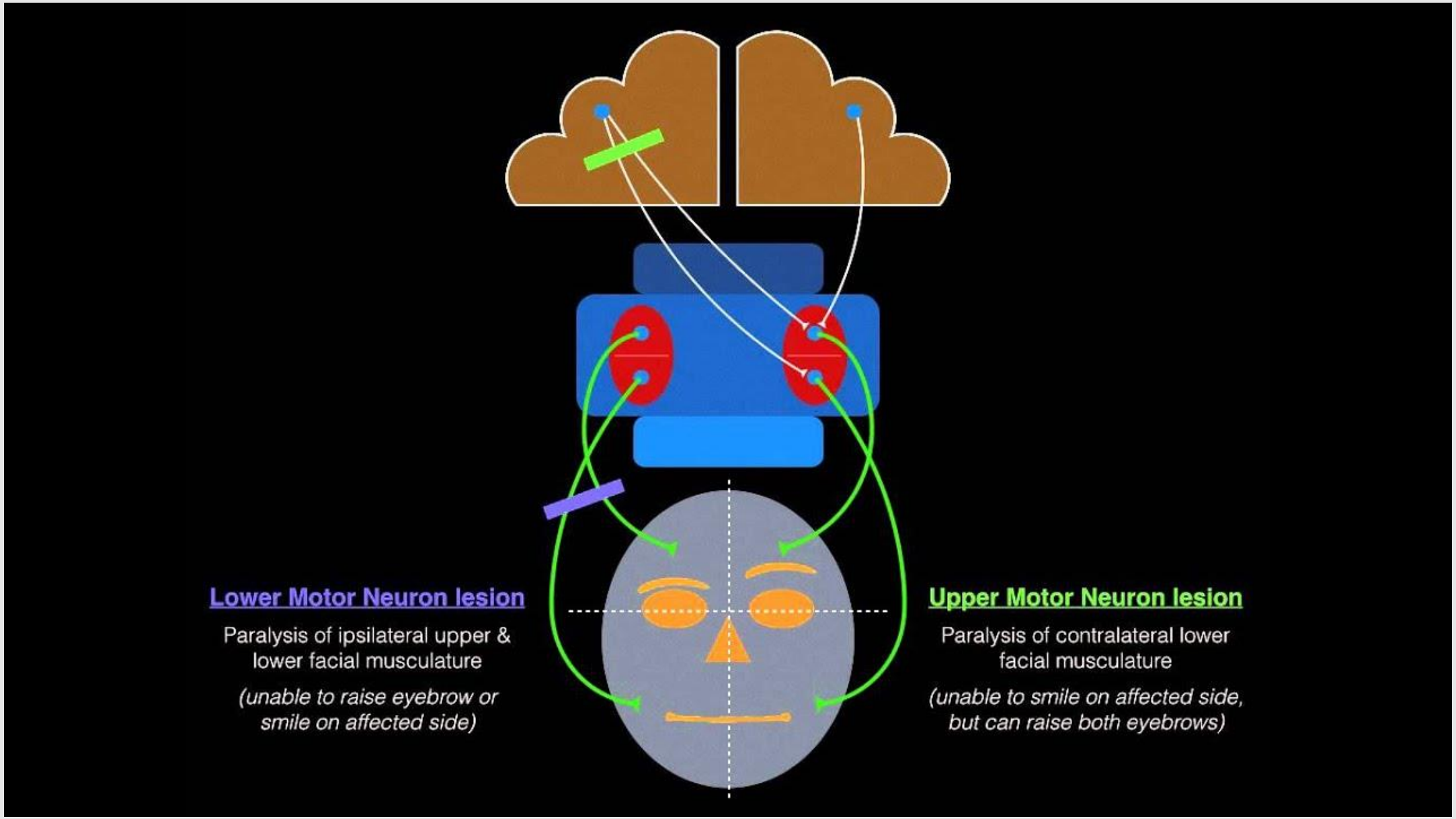
- HOW TO EXAMINE
- Look for **facial expression**, **furrows over forehead**, **nasolabial fold**, **angle of the mouth** and **width of palpebral fissure**
- The patient is asked to **look towards the ceiling with the head kept in front** and **unmoved** by the examiner. The **eyebrows are raised and wrinkled**
- Ask the subject to **shut his eyes as tightly** as he can. Then try to open the subject's eyes while the subject attempts to keep them closed
- Ask the subject to **whistle**
- Ask him to **smile or show his upper teeth**, The mouth is then drawn to the healthy side
- Ask him to **inflate his mouth** with air and blow out his cheeks. Tap with the finger on each inflated cheek

SENSORY PART

- HOW TO EXAMINE
- To test the sense of taste, patient is asked to protrude the tongue and apply one solution (sugar solution, common salt, citric acid, quinine) at a time on both sides of the tongue
- Patient should be able to identify

Innervation of Facial Nerve Nuclei

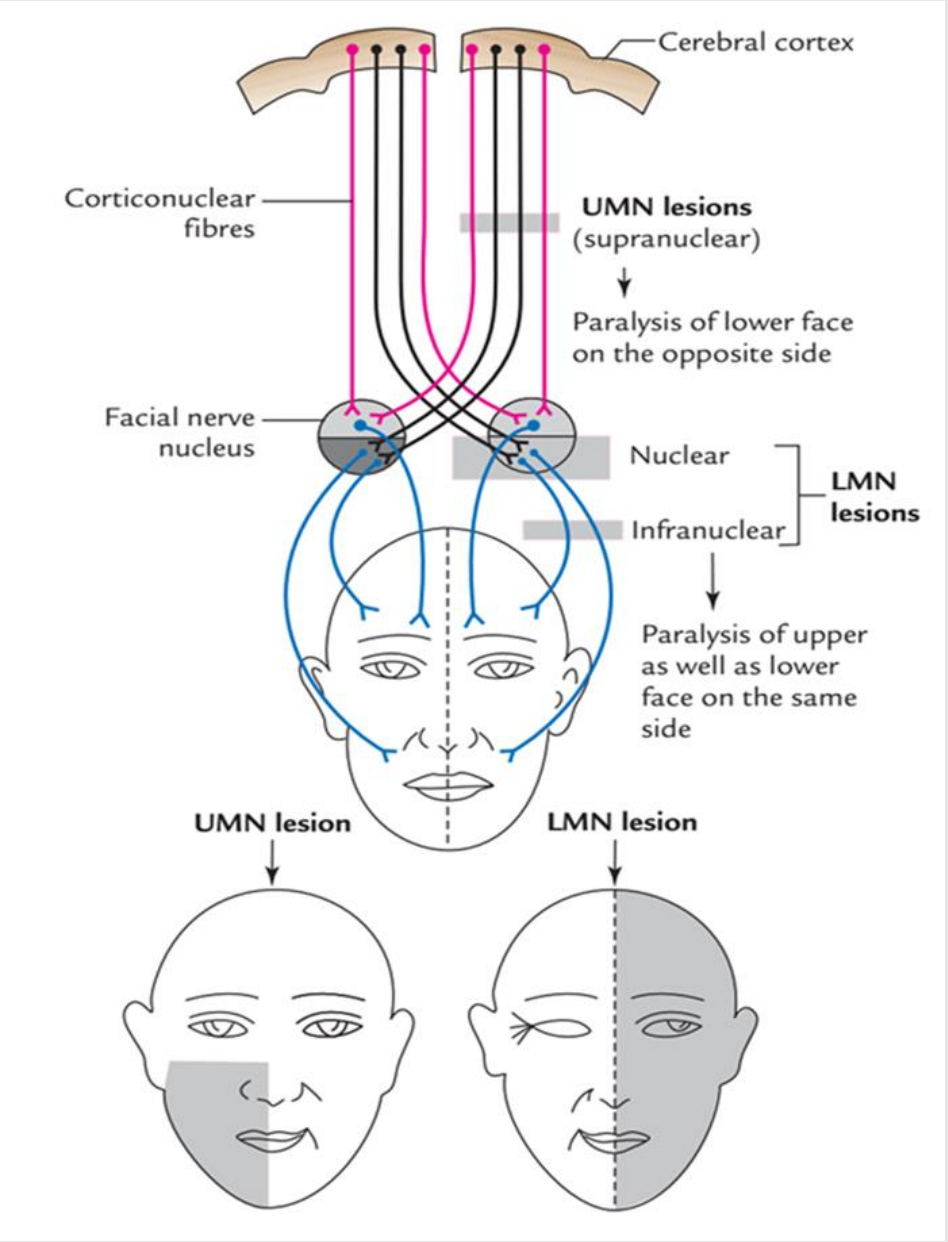



Lower Motor Neuron lesion
Paralysis of ipsilateral upper & lower facial musculature
(unable to raise eyebrow or smile on affected side)
Upper Motor Neuron lesion
Paralysis of contralateral lower facial musculature
(unable to smile on affected side, but can raise both eyebrows)

LESIONS OF FACIAL NERVE

- SUPRANUCLEAR LESIONS
- affect **upper motor neurons** proximal to the motor nucleus
- affects the contralateral lower face but spares the forehead and brow muscles

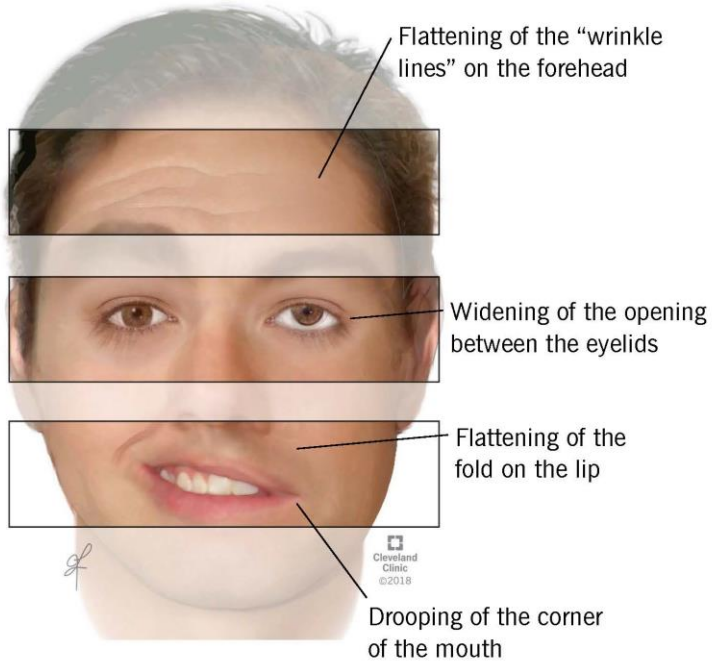
- INFRANUCLEAR LESIONS
- distal to the facial nerve nucleus or involves the nucleus
- affects the ipsilateral upper and lower face (bell's palsy)



	Upper motor neuron lesion	Lower motor neuron lesion
Lesion location	Motor cortex, connection from motor cortex to facial nucleus in pons	Facial nucleus, anywhere along CN VII
Affected side	Contralateral	Ipsilateral
Muscles involved	Lower muscles of facial expression	Upper and lower muscles of facial expression
Forehead involved	Spared, due to bilateral UMN innervation	Affected
Other symptoms	None	Incomplete eye closure (dry eyes, corneal ulceration), hyperacusis, loss of taste sensation to anterior tongue

WHAT IS BELL'S PALSY ?

Bell's palsy is a condition that causes a temporary weakness or paralysis of the muscles in the face. It can occur when the nerve that controls your facial muscles becomes inflamed, swollen, or compressed.In most cases, Bell's palsy is temporary and symptoms usually go away after a few weeks.



BELL'S PALSY

Olfactory Nerve

- Pure sensory Nerve
- The central process from the olfactory epithelium (present in the upper one-third of nasal mucosa) passes to olfactory area of cerebral cortex (the uncus of the parahippocampal gyrus)

How to test?

- Before starting, ensure that both nasal passages are patent (ask the subject to close one nostril, inhale and exhale. Repeat for the other side).
- Ask the subject to close eyes.
- 3 vials, one containing **oil of clove**, second with **oil of peppermint**, and third with some **tincture of asafetida.**
- Ask subject to close one nostril, and open vial of the volatile substance and hold it close to the nostril and ask the subject to inhale and identify the odor. Same procedure is repeated in the other nostril.
- Before starting with next odor, allow subject to rest for one minute

Clinical Correlate

- Anosmia: absence of sense of smell
- Hyposmia: reduction of sense of smell.
- Parosmia: perversion of sense of smell


THANK YOU