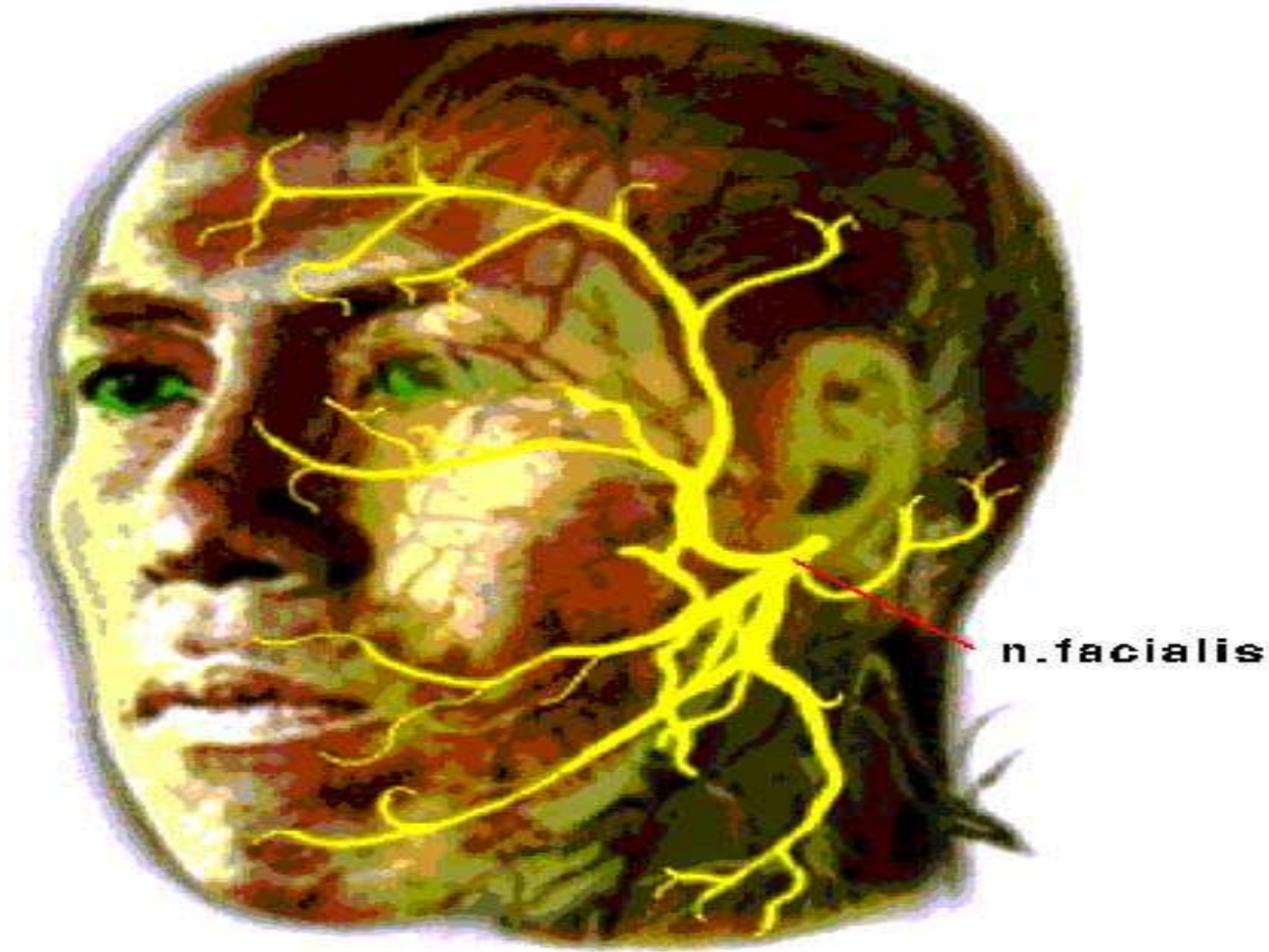


The Facial Nerve



Dr Santosh Mane



Smile



Taste



Crumble



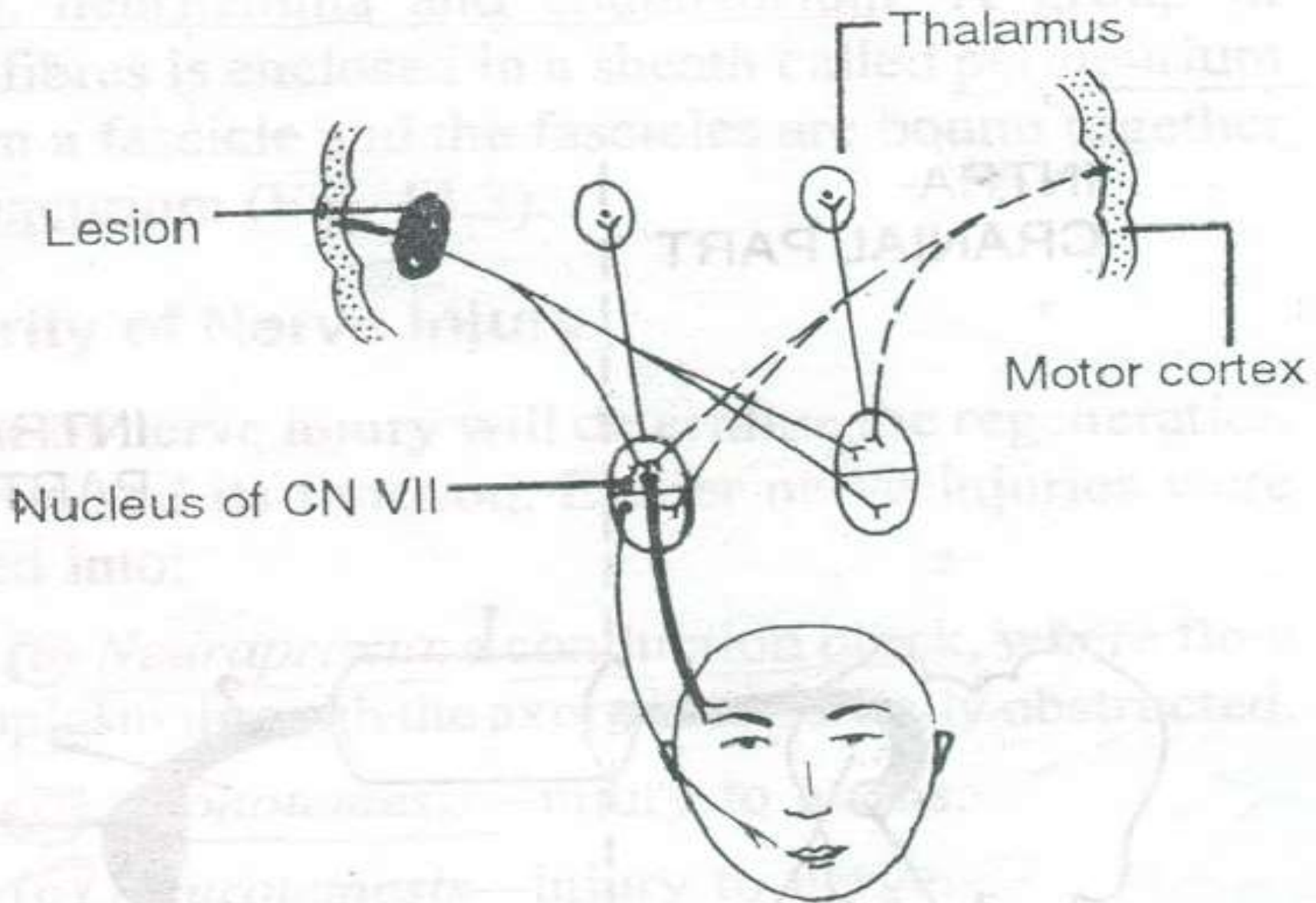
Salivate

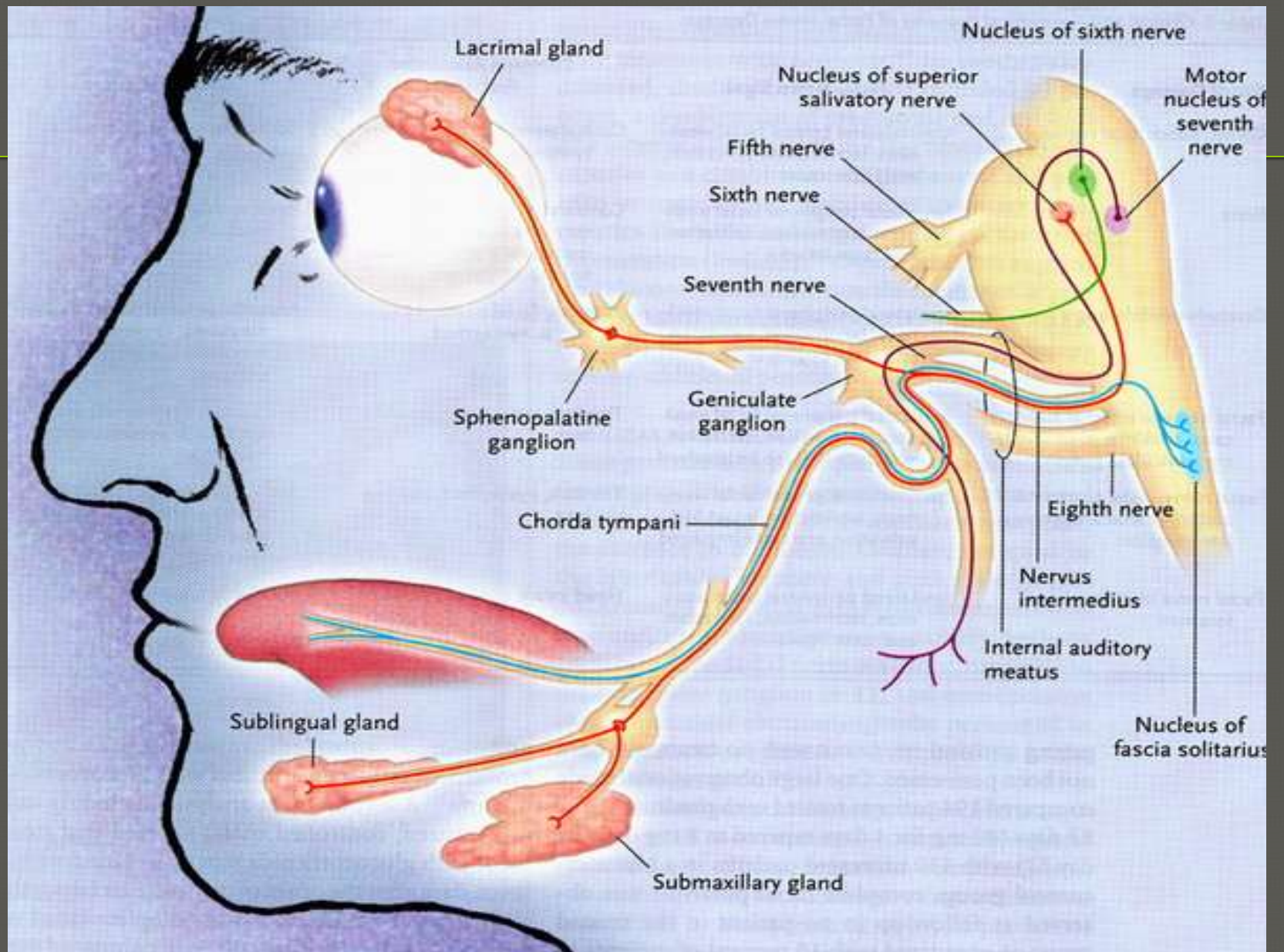
ANATOMY & FUNCTIONS OF FACIAL NERVE

- Mixed nerve having motor root & sensory root.
- Motor root – supplies mimetic muscles of face develops from 2nd branchial arch.
- Sensory root (nerve of wrisberg)
lacrimal, submandubular & sublingual.
- Carries taste from the anterior two third of tongue.

Nucleus of Facial Nerve

- Motor nucleus – in the pons
- Upper part of the nucleus which innervates forehead muscles receives fibres from both the cerebral hemispheres
- Lower part of nucleus which supplies lower face gets only crossed fibres from one hemisphere.
- Thus function of forehead is preserved in supranuclear lesion
- Fibres from the thalamus



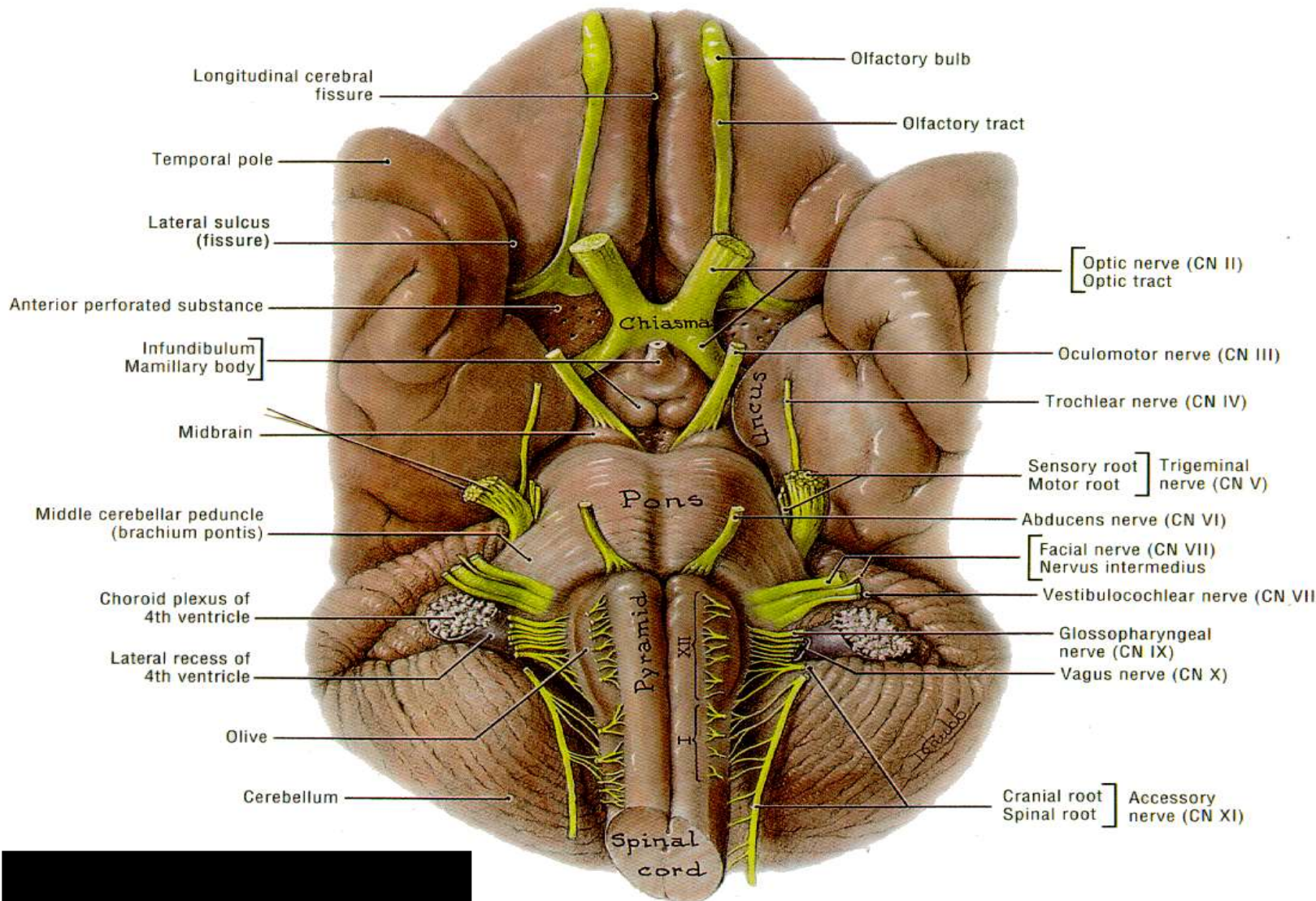


Course of Facial Nerve

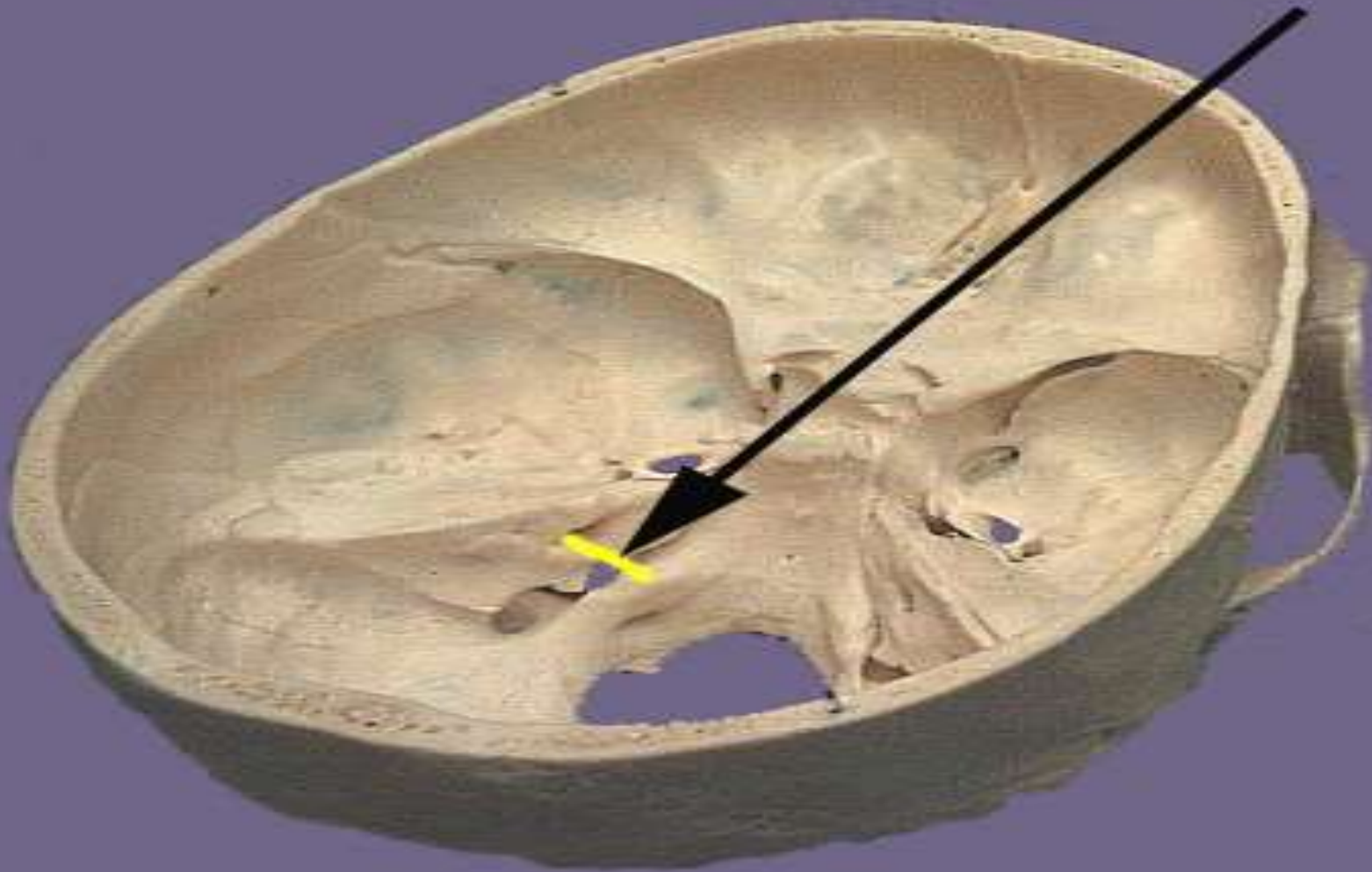
- Motor fibres from the nucleus of 7th nerve, hook round the nucleus of 6th nerve & joined by the sensory root (nerve of wrisberg)
- Facial nerve leaves the brainstem at ponto-medullary junction, travels through posterior cranial fossa & enters the internal acoustic meatus

Contd.

- Intracranial part –from pons to internal acoustic meatus (15-17mm)
- Inratemporal part- from internal acoustic meatus to stylomastoid foramen divided into
 - >Meatal segment (8-10mm)
 - >Labyrinthine segment (4mm)
 - >Tympanic or horizontal segment(11mm)
 - >Mastoid or vertical segment(13mm)
- Extracranial part



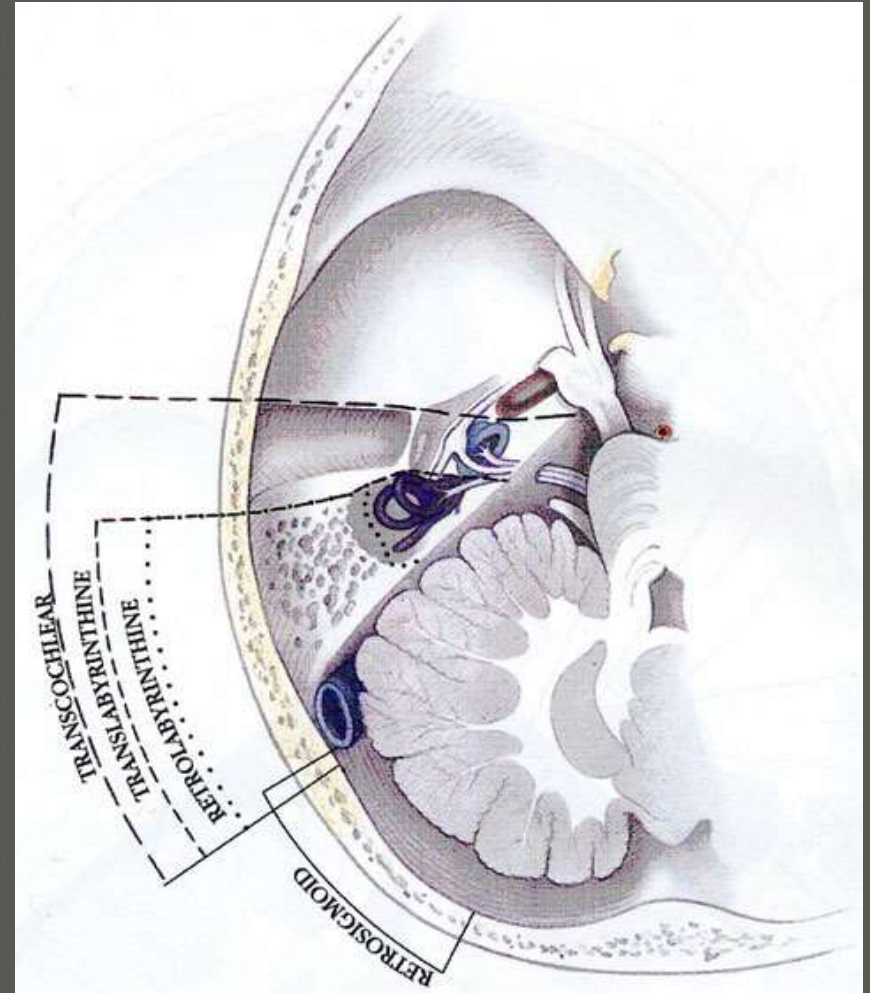
INTERNAL ACOUSTIC MEATUS



The Facial Nerve

Intracranial- Intrapetrous Course:

- Internal acoustic meatus
- Accompanied by VIII nerve & Labyrinthine vessels
- Sensory & motor roots separate
- At bottom of meatus the two roots fuse



The Facial Nerve

COURSE AND RELATIONS

- Passes through Internal Acoustic Meatus
- Comes out of Skull through Stylomastoid Foramen
- Stylomastoid Foramen divides its course

into

[

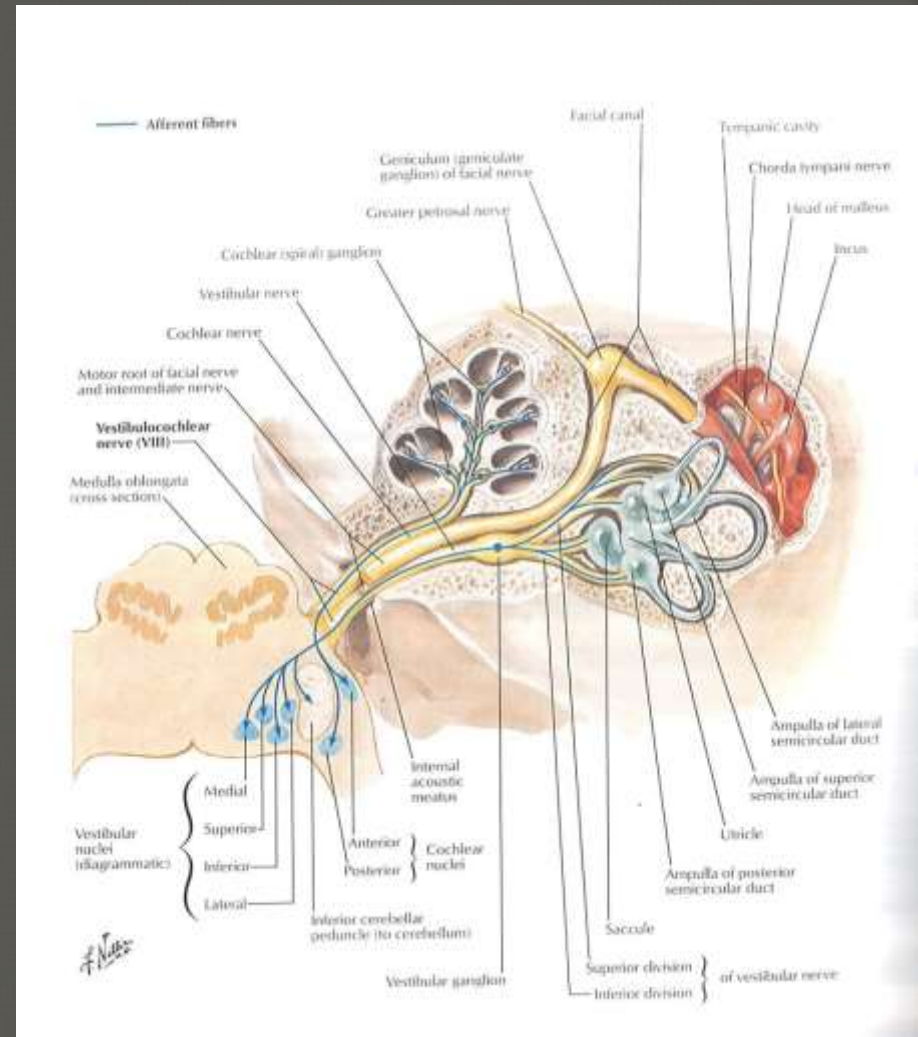
Intracranial-Intrapetrous part

Extracranial part

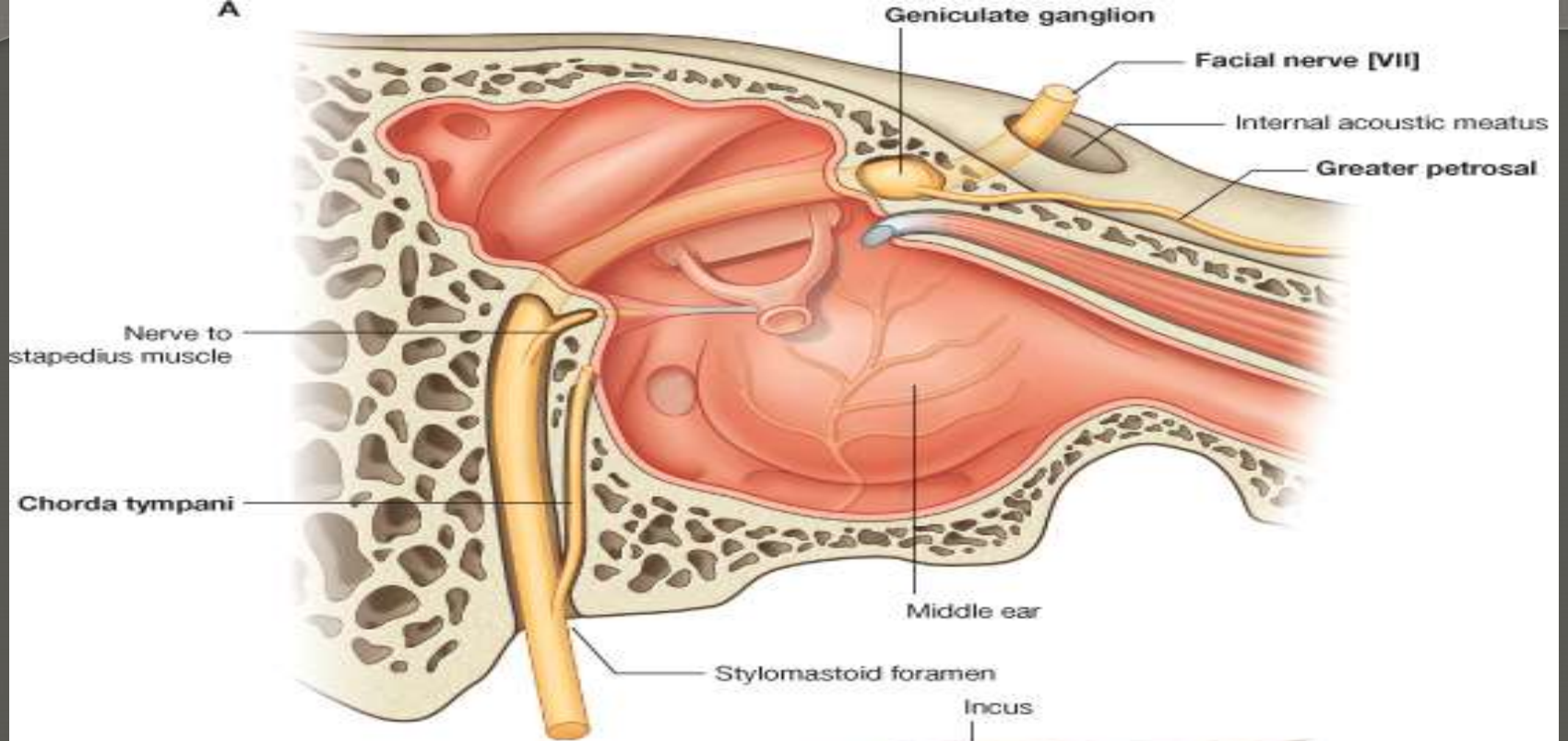
The Facial Nerve

Intracranial-Intrapetrous Course:

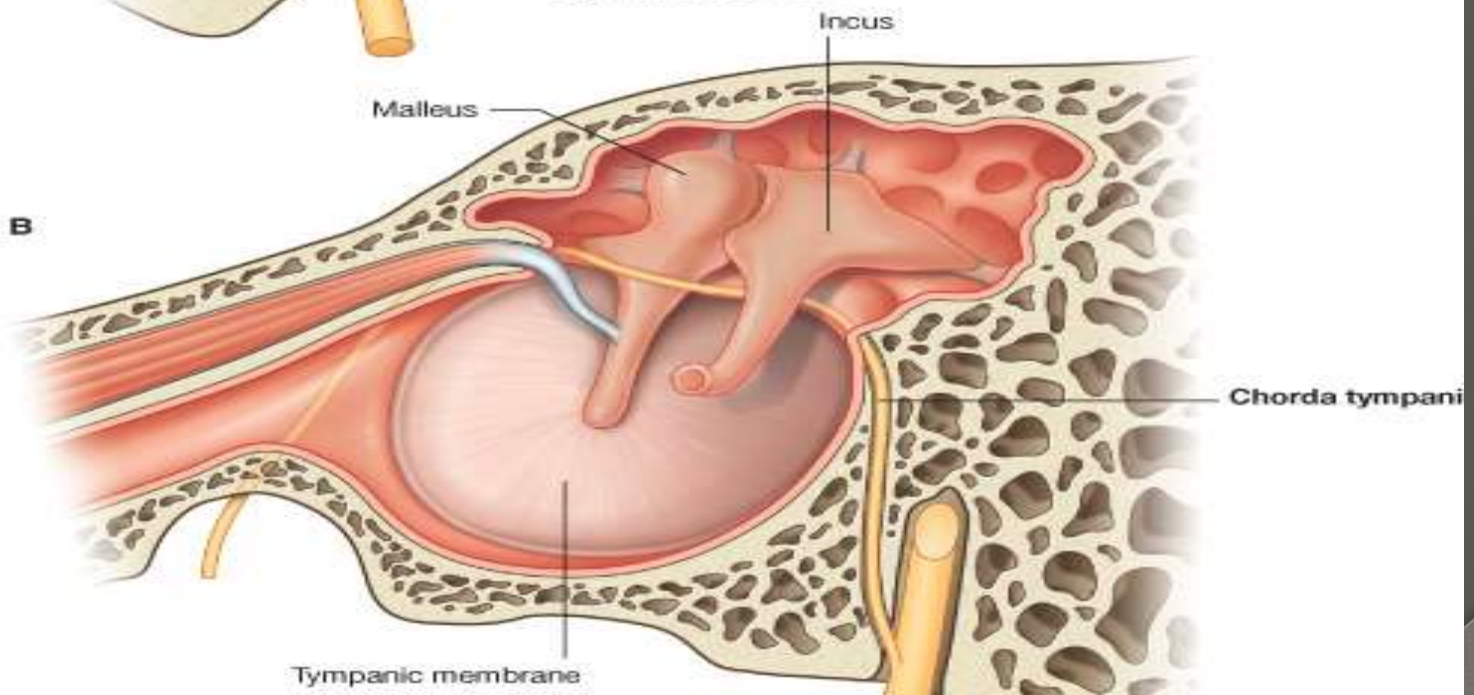
- Passes above vestibule of internal ear
- Reaches medial wall of middle ear
- Bends backwards forming Genu
- Geniculate ganglion present here
- Passes above promontory
- Passes vertically downwards along posterior wall of middle ear
- Comes out through stylomastoid foramen



A

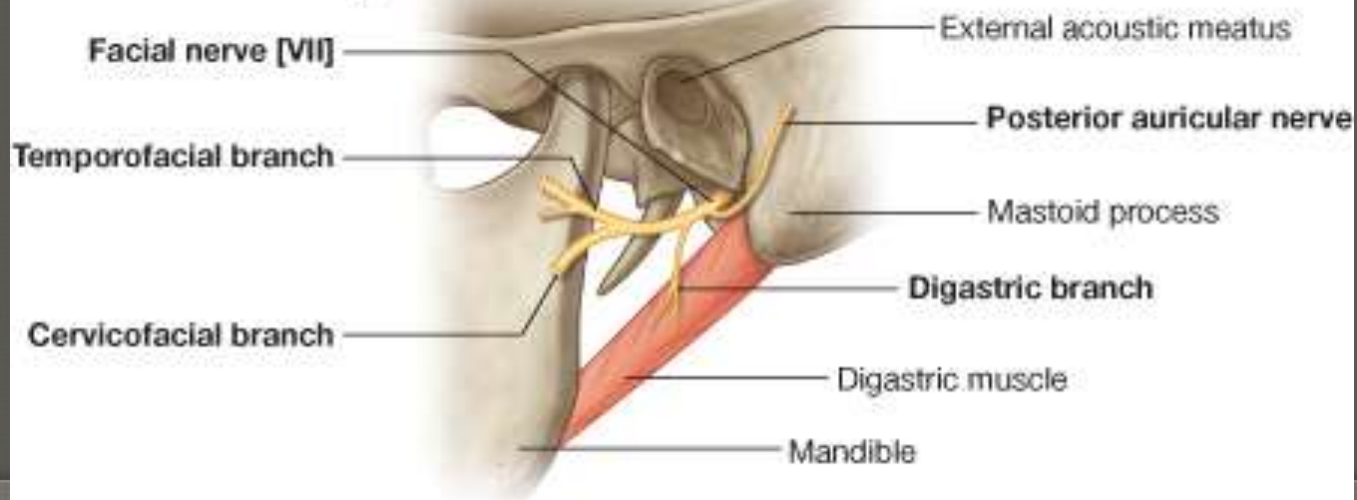
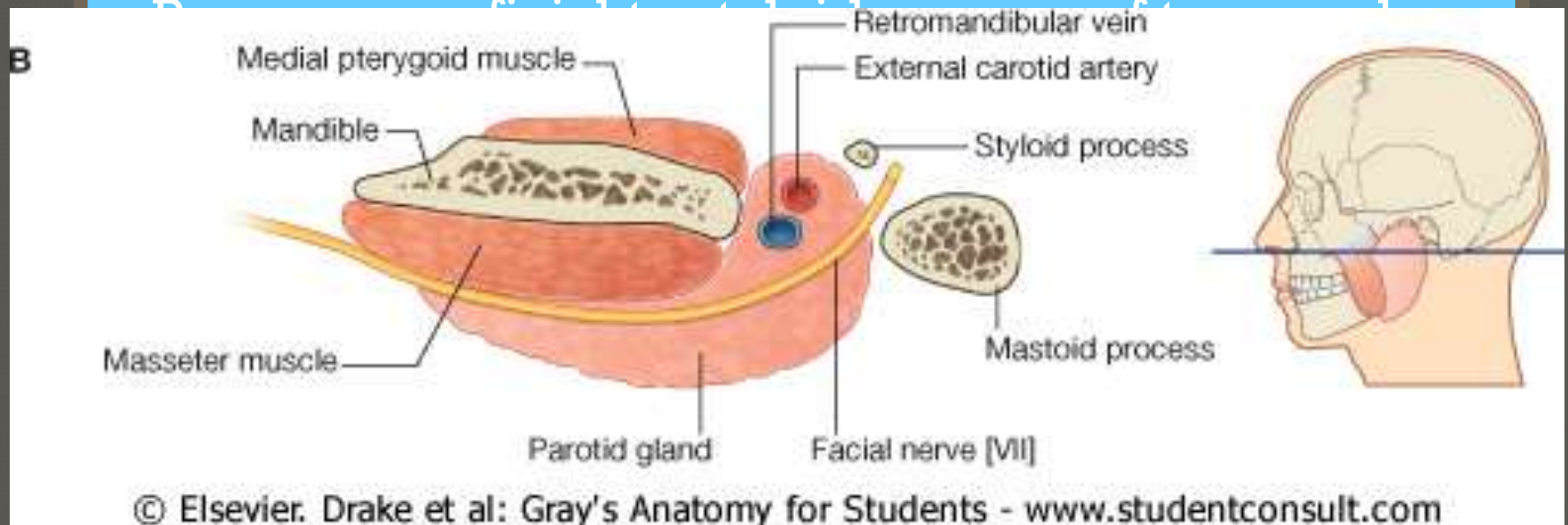


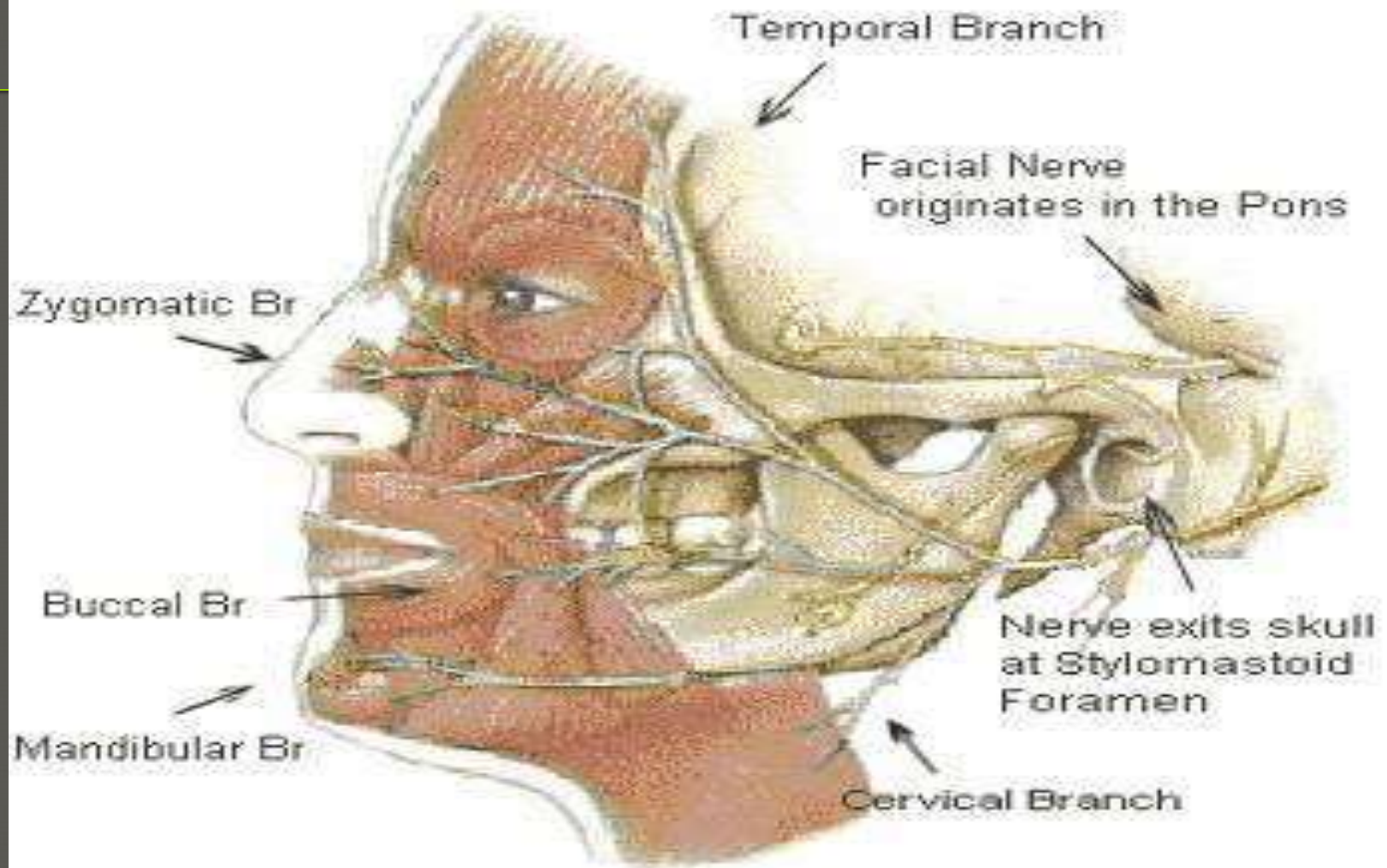
B



The Facial Nerve

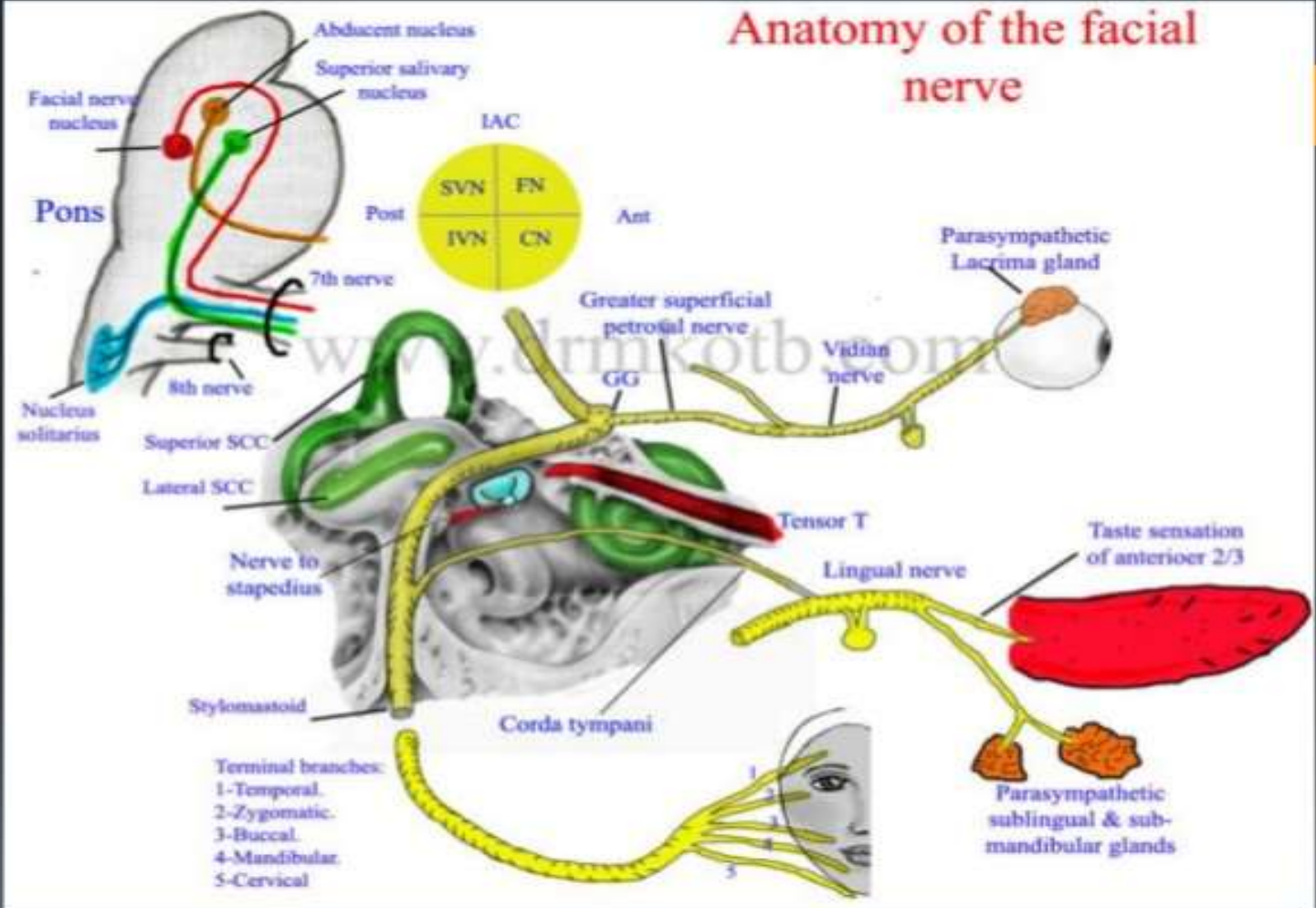
Extracranial course:





Branches of Facial Nerve

Anatomy of the facial nerve

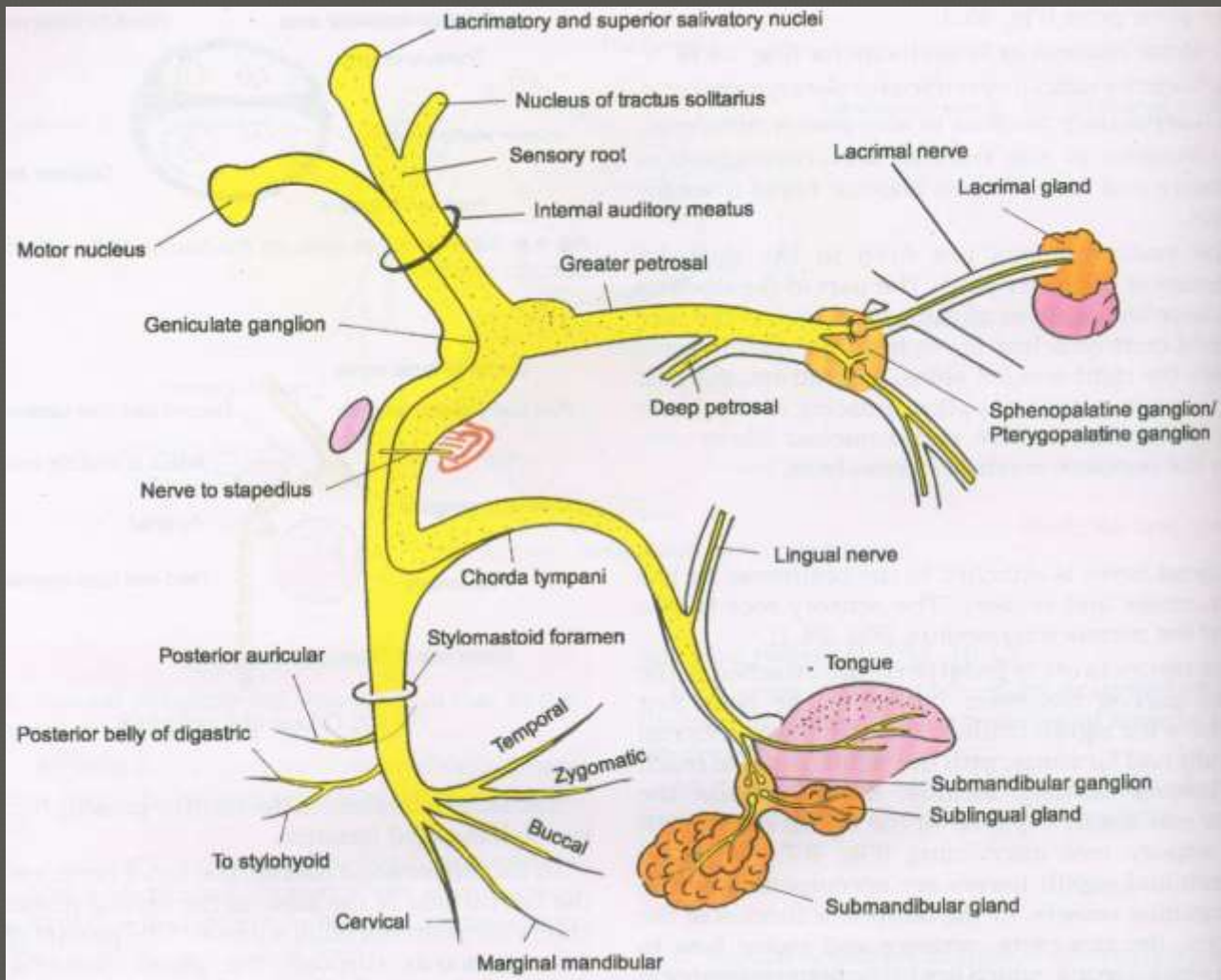


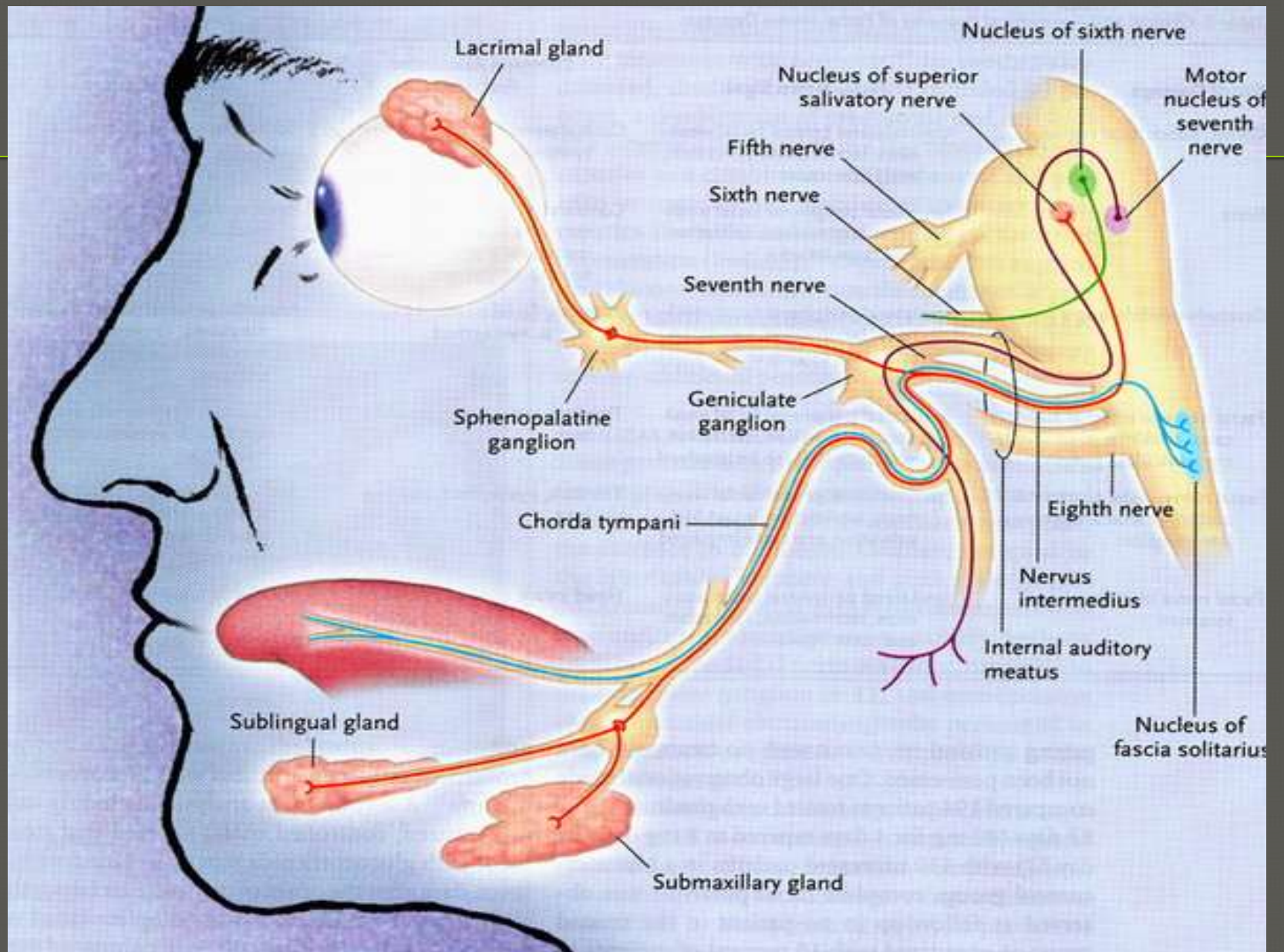
- *Greater superficial petrosal nerve* – from geniculated ganglion & carries secretomotor fibres to lacrimal gland & glands of nasal mucosa.
- *Nerve to stapedius* – second genu & supplies the stapedius muscle.
- *Chorda tympani* – middle of vertical segment, carries secretomotor fibres to submandibular & sublingual glands & brings taste from anterior two –third of tongue.

Contd.

- *Communicating branch* – supplies the concha, retroauricular groove, posterior meatus & the outer surface of tympanic membrane
- *Posterior auricular nerve* – supplies muscles of pinna, occipital belly of occipitofrontalis
- *Muscular branches* – stylohyoid & posterior belly of digastrics
- *Peripheral branches* – upper temporofacial & lower cervicofacial
- Temporal, zygomatic, buccal, mandibular & cervical all the muscles of facial expression





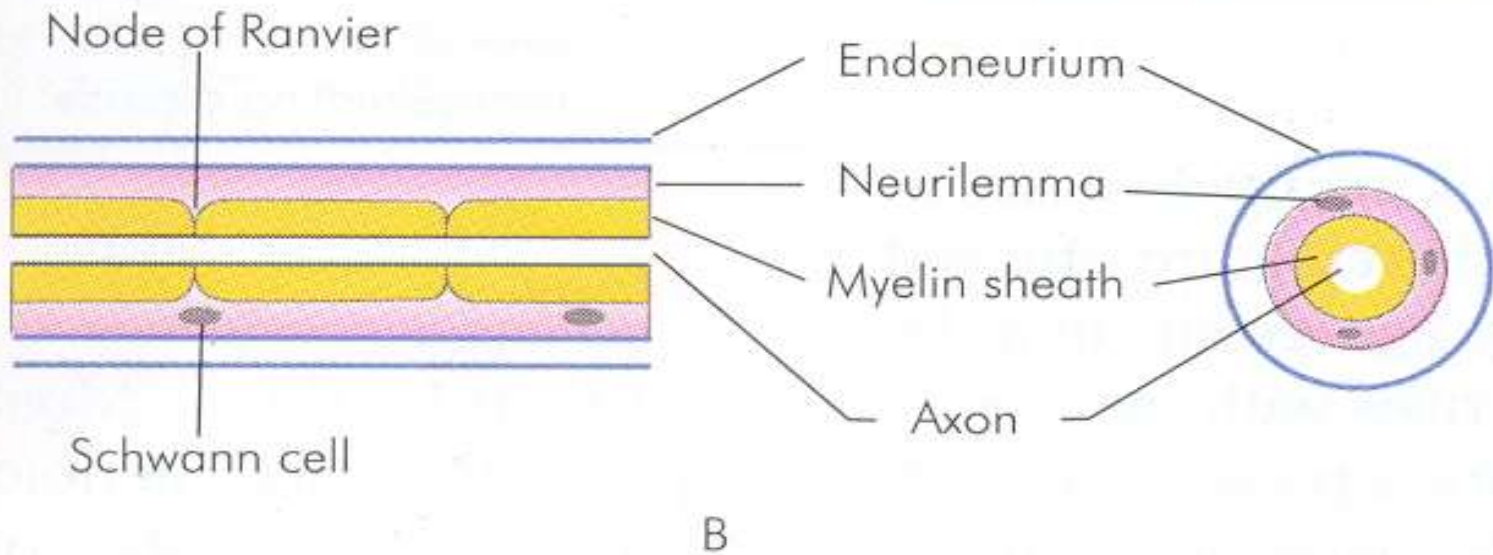
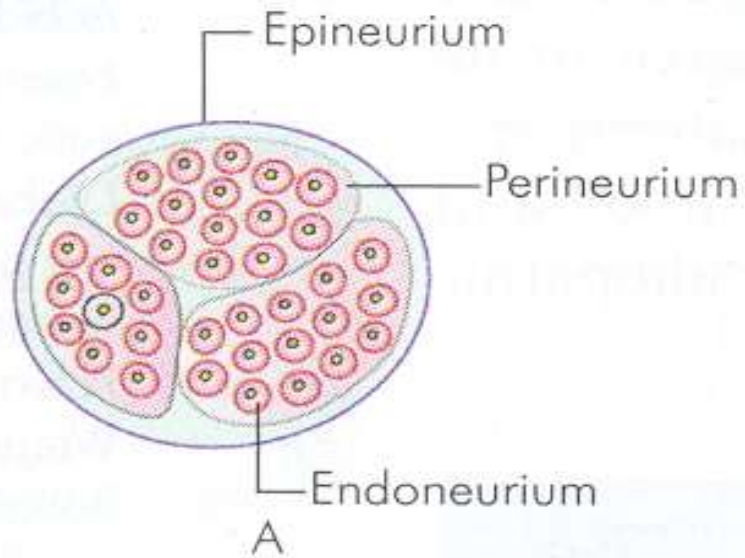


Surgical Landmarks of the Facial Nerve for Middle Ear & Mastoid Surgery

- Processus cochleariformis – geniculate ganglion
- Oval window & horizontal canal
- Short process of incus – lateral to facial nerve
- Digastric ridge – leaves the mastoid at the anterior end of digastric ridge

Structure of Nerve

- Axon, myelin sheath, neurilemma & endoneurium



Severity of Nerve Injury

- Neuropraxia, a conductive block
- Axonotemesis – injury to axons
- Neurotmesis – injury to nerve

Sunderland Classified Nerve Injuries Into 5 Degrees of Severity Based on Anatomical Structure of the Nerve

- 1⁰ - Partial block to flow of axoplasm; no morphological changes are seen. Recovery of function is complete (neurapraxia).
- 2⁰ - Loss of axons, but endoneurial tubes remain intact. During recovery, axons will grow into their respective tubes, & the result is good (axonotemesis)
- 3⁰ - Injury to endoneurium. During recovery axons of one tube can grow into another. Synkinesis can occur (neurotemesis)
- 4⁰ - Injury to perineurium in addition to above. Scarring will impair regeneration of fibres (partial transection)

- 5⁰ – injury to epineurium in addition to above (complete nerve transection)
- The first three degrees are seen in viral & inflammatory disorders ,fourth & fifth are seen in surgical or accidental

FACIAL PALSY



CAUSES OF FACIAL PARALYSIS

- ◉ May be central or peripheral
- ◉ Peripheral lesion may involve nerve in its intracranial, intratemporal or extratemporal parts
- ◉ More common & about two-thirds of them are of idiopathic variety

Testing of Facial Nerve

TOPOGNOSTIC TESTING

1. Schirmer test for lacrimation (GSPN)
2. Stapedial reflex test (Stapedial branch)
3. Taste testing (Chorda tympani nerve)
4. Salivary flow rates & pH (Chorda tympani)

ELECTROPHYSIOLOGIC TESTS

Nerve excitability test (NET)

Electromyography(EMG)

Maximal stimulation test (MST)

Electroneuronography (ENoG)

Topodiagnostic tests schirmers test



Electrodignostic Test

- ◎ *Minimal nerve excitability test :*
 1. Nerve is stimulated at steadily increasing intensity till facial twitch is just noticeable.
 2. Compared with the normal side.
 3. When the difference between two sides exceeds 3.5 millamperes ,the test is positive for degeneration.

Contd.

- ◎ *Maximal stimulation test (MST):*
 1. The current level which gives maximum facial movement is determined & compared with the normal side.
 2. Response is visually grades as equal, decreased or absent.

Contd.

- *Electroneurography (ENoG)*:
 1. A sort of evoked electromyography.
- Electromyography

Idiopathic

- *Bell's palsy* – idiopathic, peripheral facial paralysis of acute onset

Aetiology

- Viral infection
- Vascular ischaemia
- Hereditary
- Autoimmune disorder

Clinical Features

sudden onset, unable to close the eye, eye ball rolls up (Bells' phenomenon), saliva dribbles, facial asymmetry, epiphora, pain in the ear, noise intolerance, loss of taste, complete/incomplete paralysis...recurrent in 3%.

DIAGNOSIS

By exclusion of all other known causes of peripheral facial palsies...careful history, complete otological & head & neck examination, x-ray, blood tests....

Nerve excitability tests daily to monitor nerve degeneration

Topodiagnosis.

TREATMENT

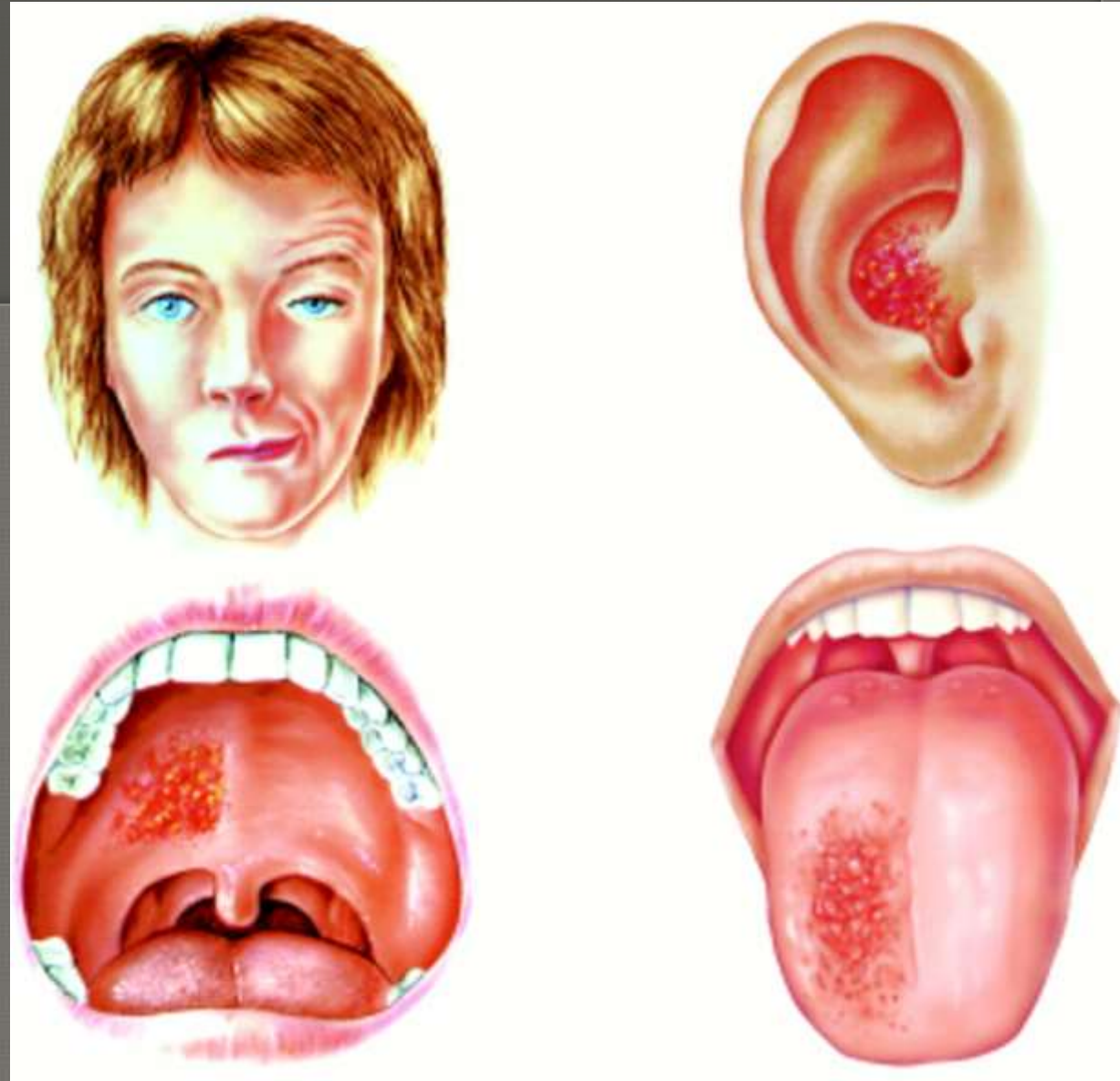
- TREAT THE CAUSE
- Bells palsy
 - Steroids
 - Antiviral drugs
 - Physiotherapy
 - Care of eyes.

Herpes zoster oticus

Ramsay Hunt syndrome type II

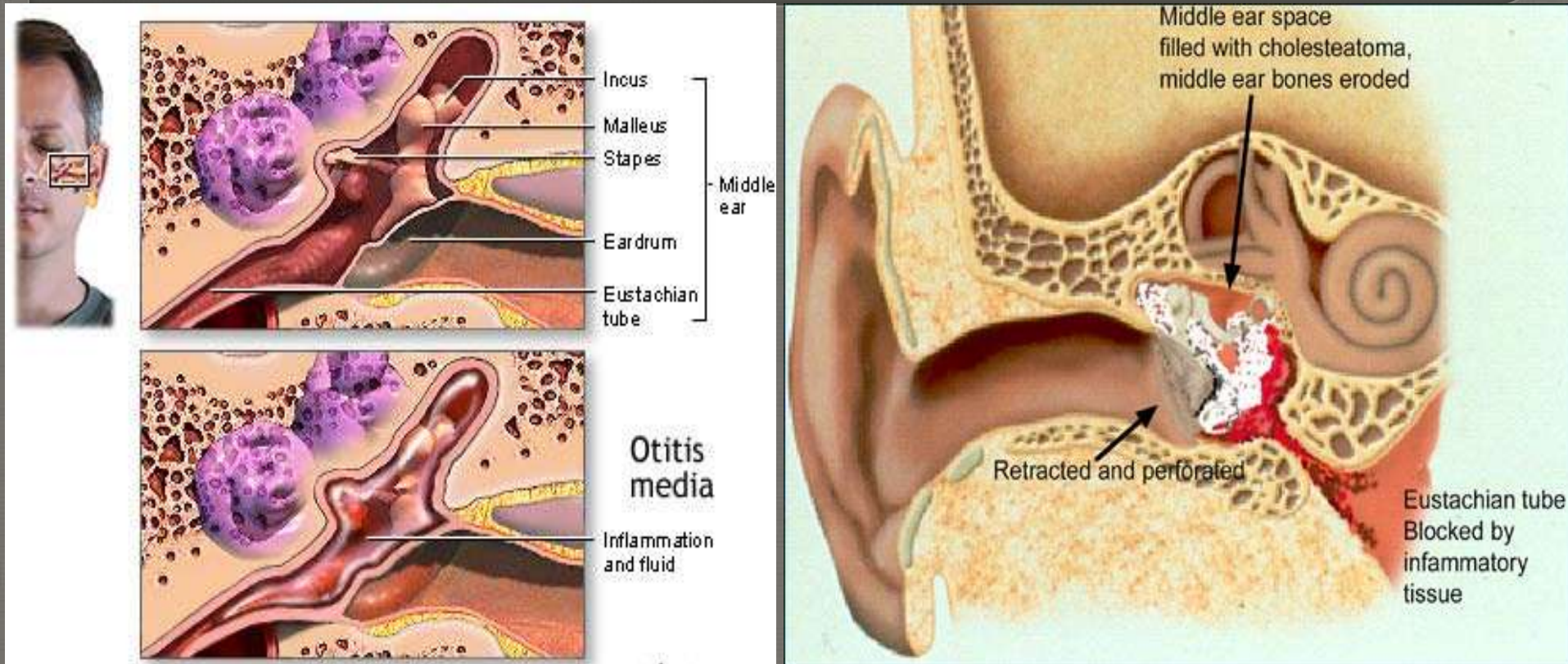
Symptoms:

- Facial paralysis
- Ear pain
- Vesicles
- Sensorineural hearing loss
- Vertigo



Acute and chronic *otitis media*

Otitis media is an infection in the middle ear, which can spread to the facial nerve and inflame it, causing compression of the nerve in its canal.



THANK YOU

