

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

# THE FACIAL NERVE

SAMI ALHARETHY

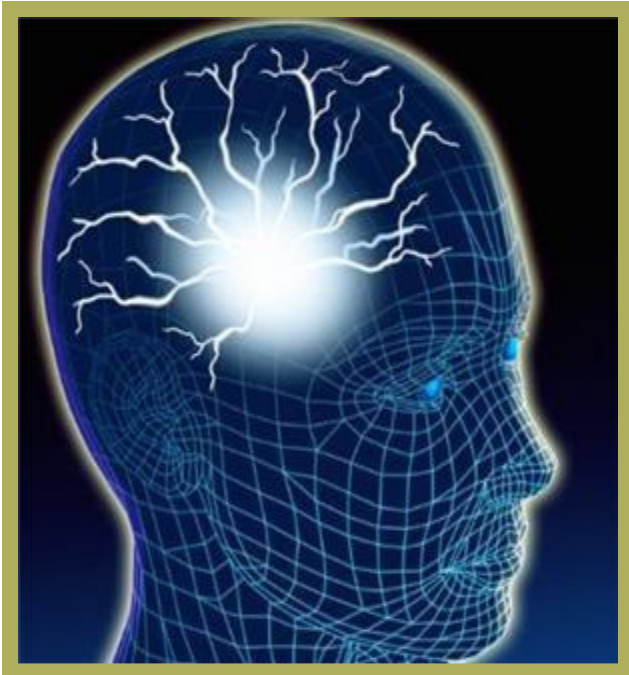
# Complications of Facial Paralysis

- **Facial paralysis severely affect:**
- **Normal facial expressions**
- **Mastication**
- **Speech production**
- **Eye protection.**



# Psychological Trauma

**The most significant complication is the social isolation these patients.**



# [ Outline ]

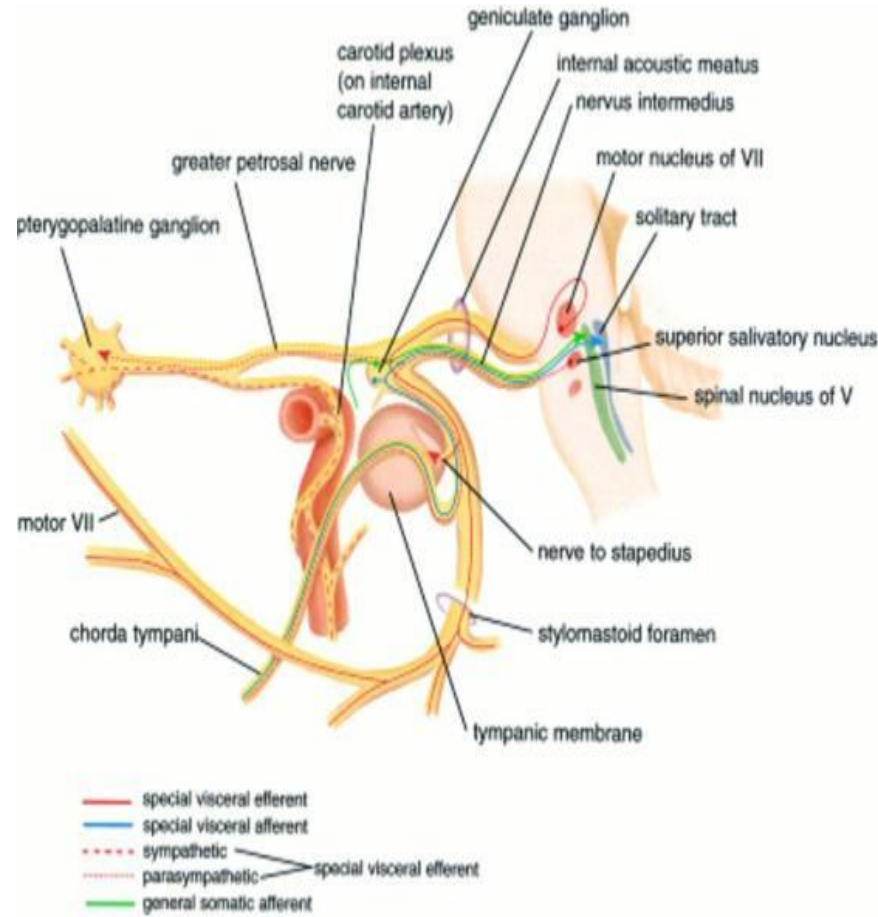
- Anatomy
- Pathophysiology
- Diagnostics
- Treatment



# Facial Nerve

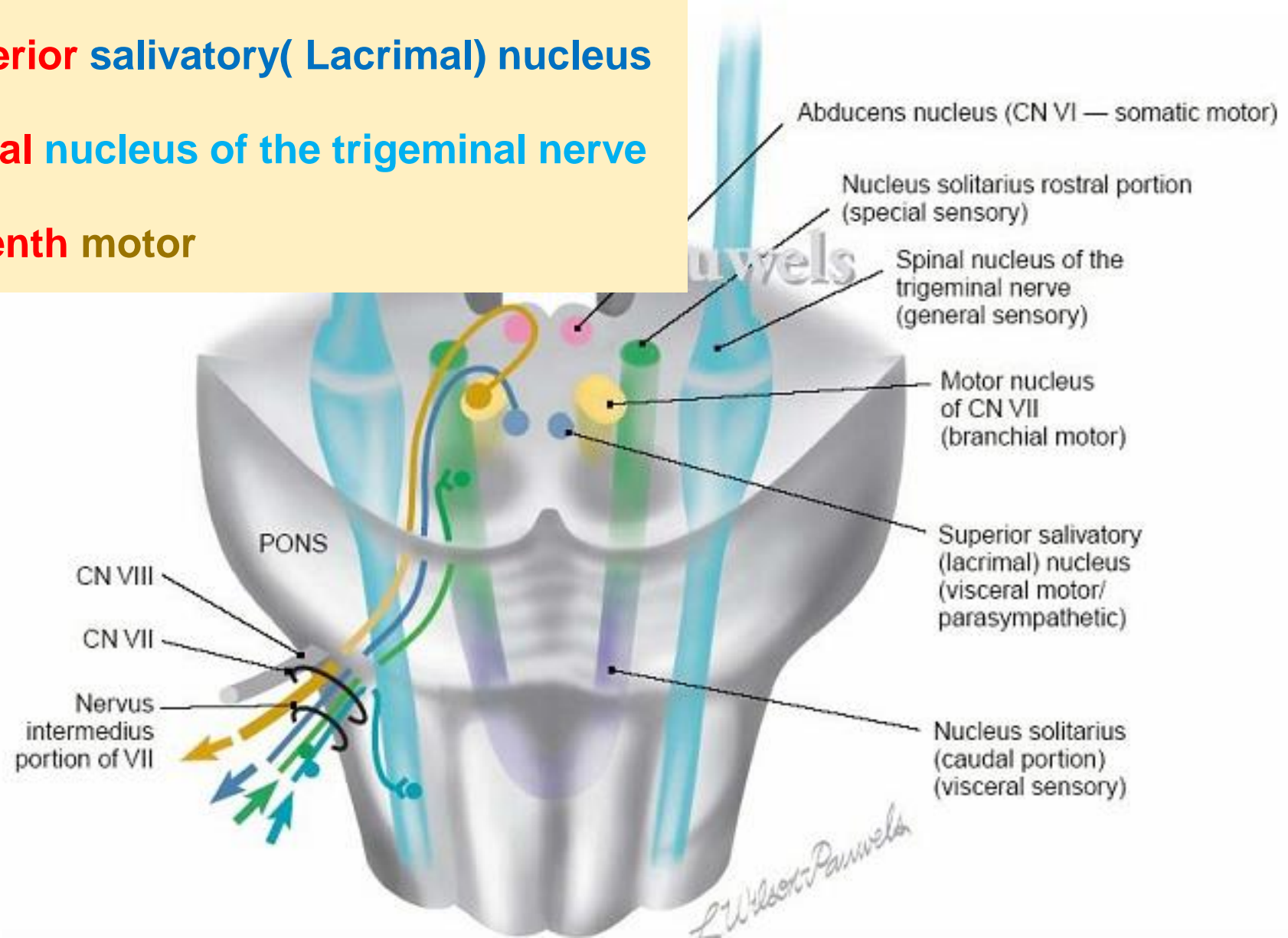
## Anatomy

- 10,000 neurons
- 7,000 myelinated facial expression.

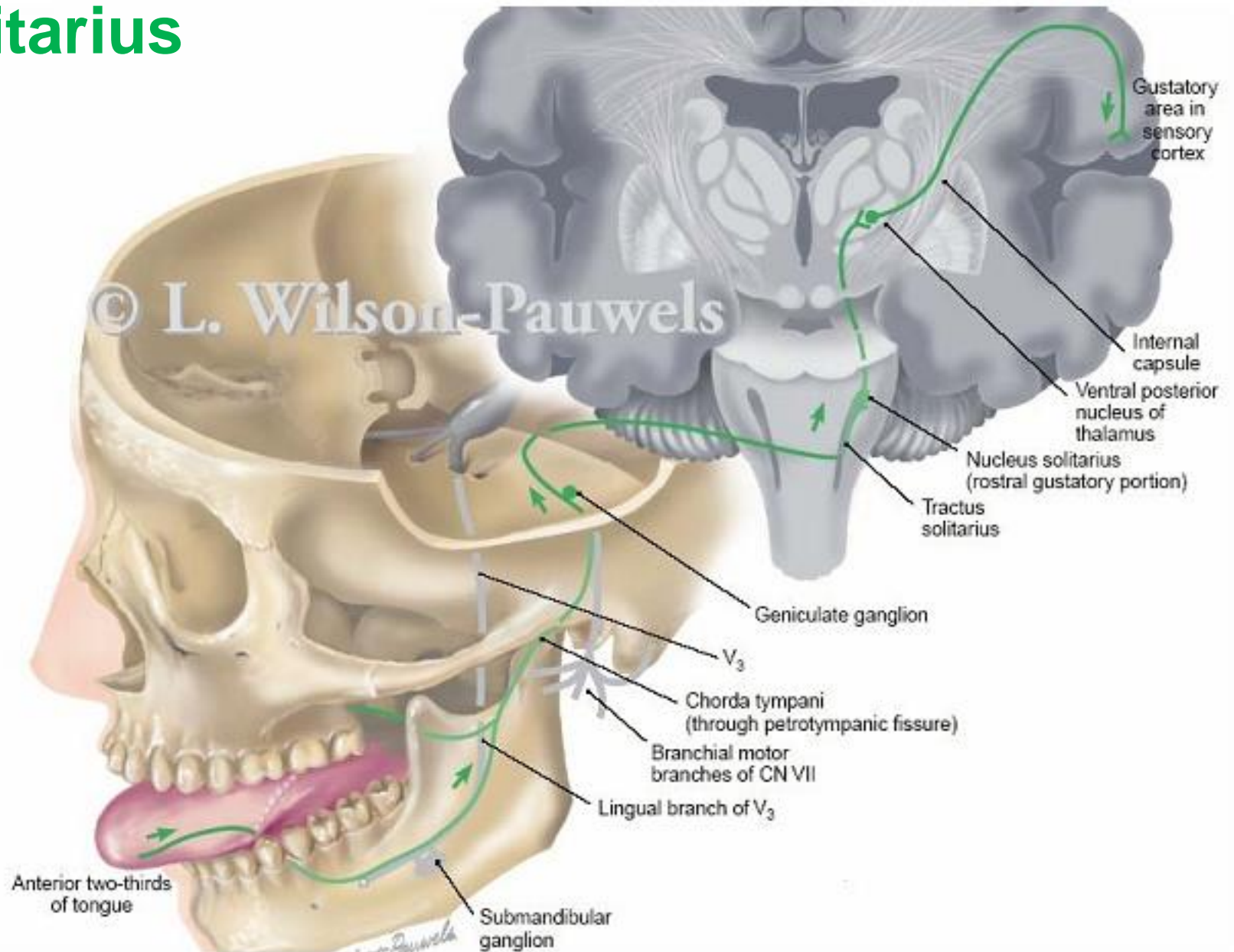


# Nuclei(PONS) 4 Ss

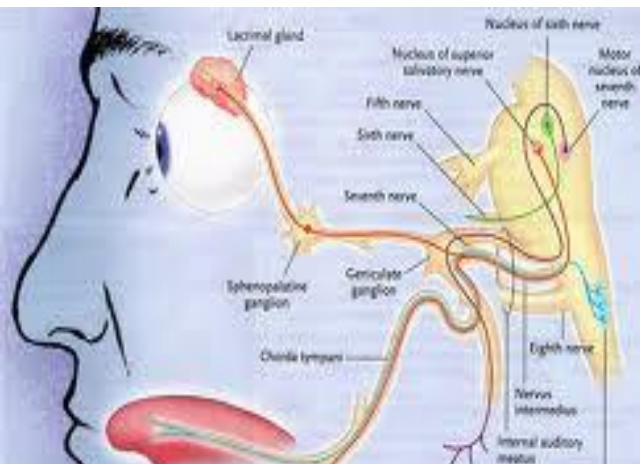
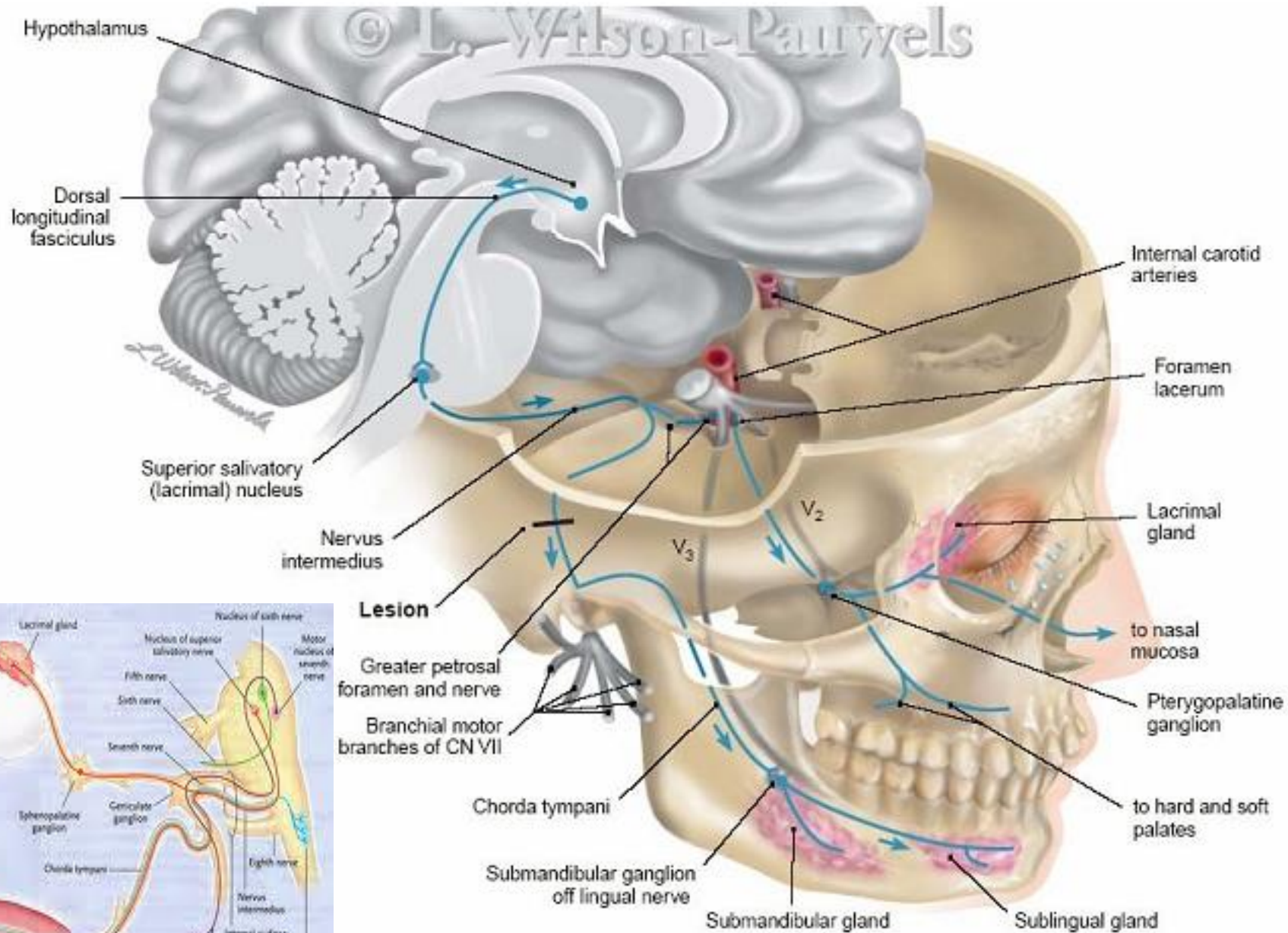
1. **Solitarius** (Taste)
2. **Superior salivatory**( Lacrimal) nucleus
3. **Spinal nucleus** of the trigeminal nerve
4. **Seventh motor**



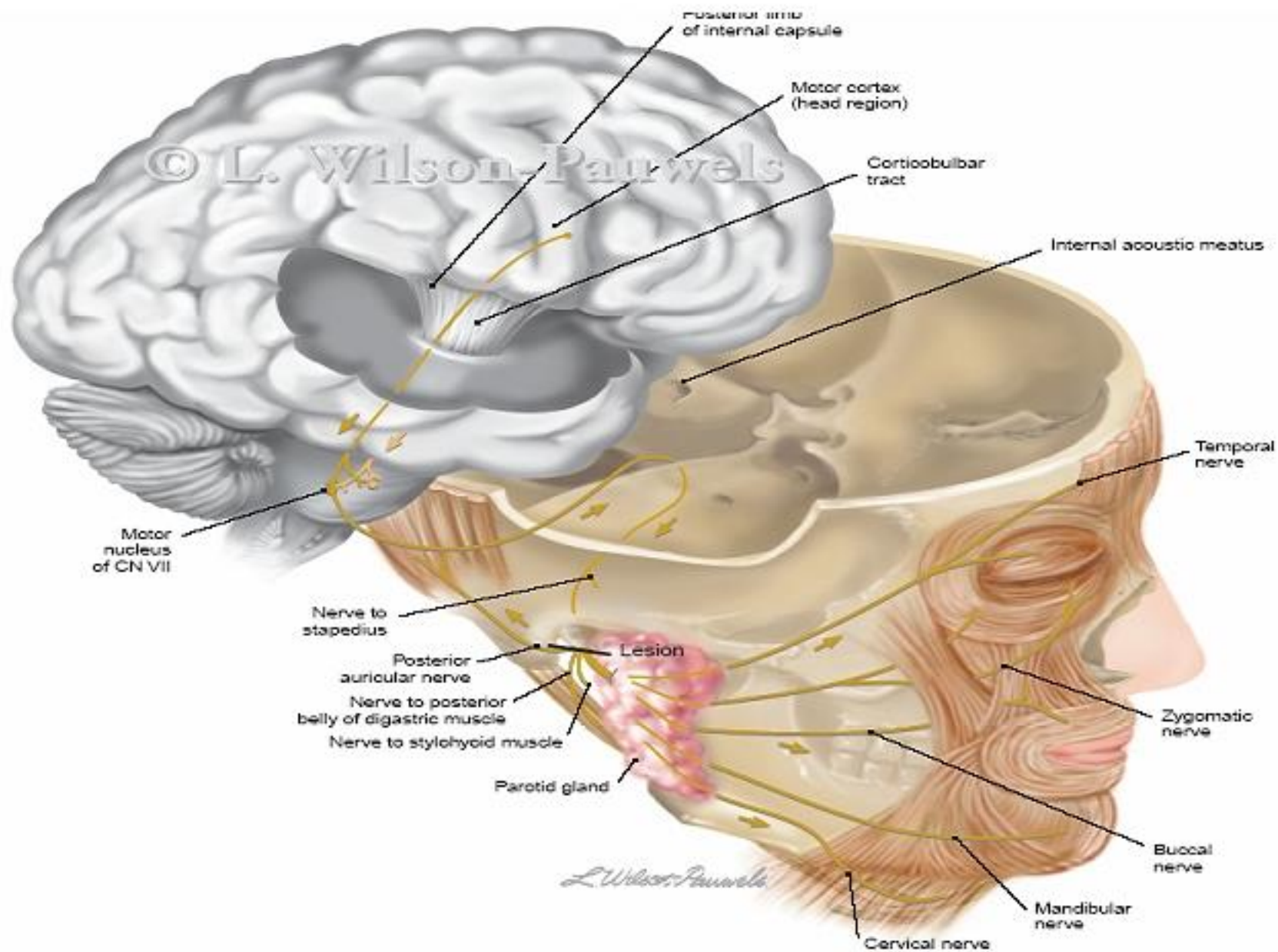
# Solitarius



# Superior salivatory nucleus







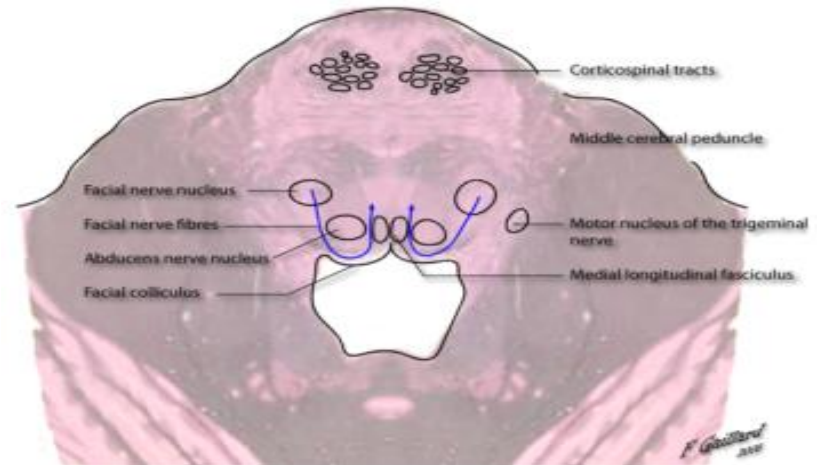
# [ FACIAL NERVE FIBERS ]

- Motor
  - to the stapedius and facial muscles
- Secreto-motor
  - to the submandibular, sublingual salivary glands and to the lacrimal glands
- Taste
  - from the anterior two thirds of tongue and palate
- Sensory
  - pain, temperature, and touch from the external auditory canal

# Facial Nerve

## Segments

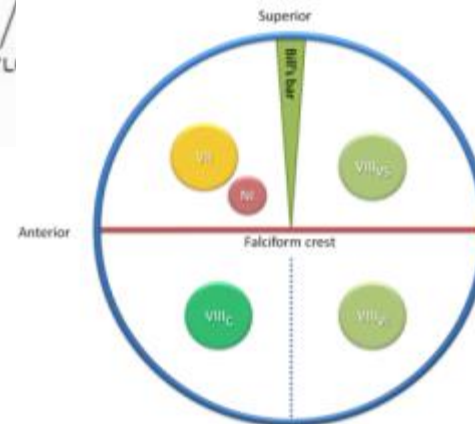
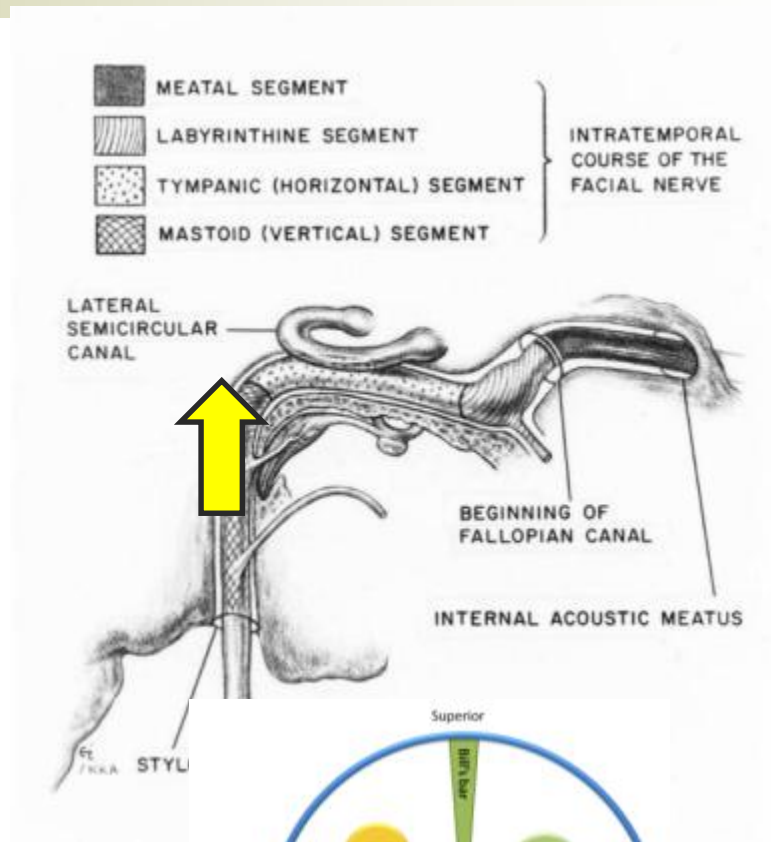
- Intracranial
- Meatal
- Labyrinthine
- Tympanic
- Mastoid
- Extratemporal



# Facial Nerve Segments

- Intracranial
- Meatal
- Labyrinthine
- Tympanic
- Mastoid
- Extratemporal

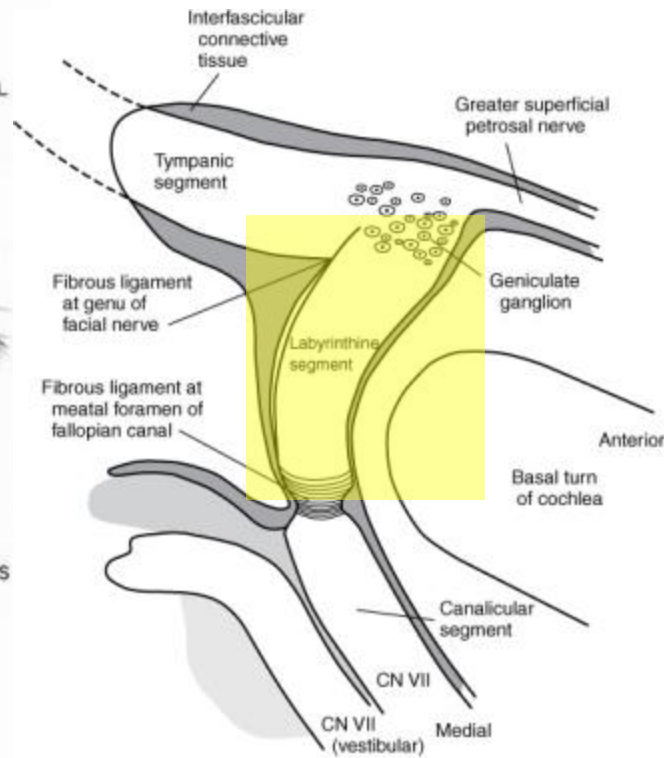
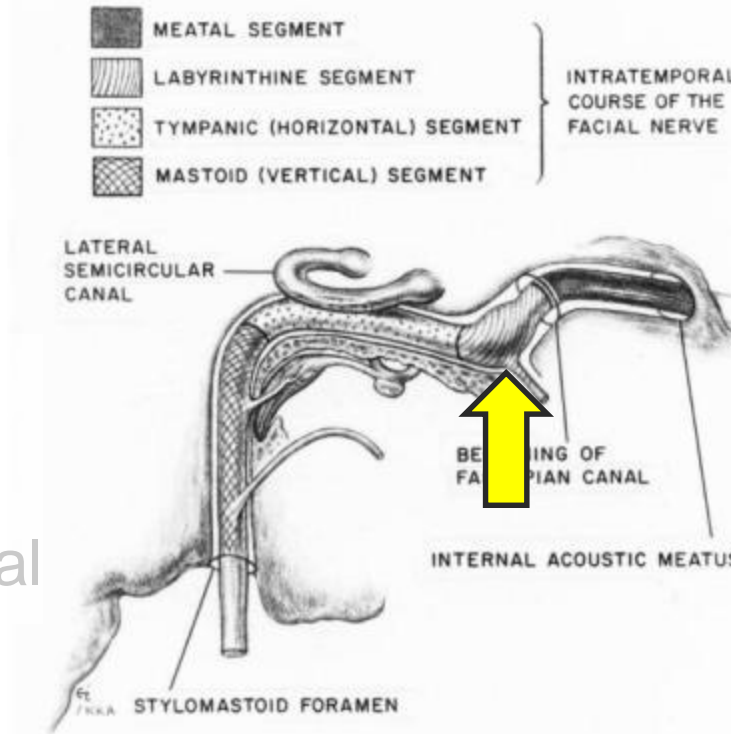
- Internal auditory canal (IAC)
- 7 UP
- Zero branches



# Facial Nerve

## Segments

- Intracranial
- Meatal
- Labyrinthine
- Tympanic
- Mastoid
- Extratemporal

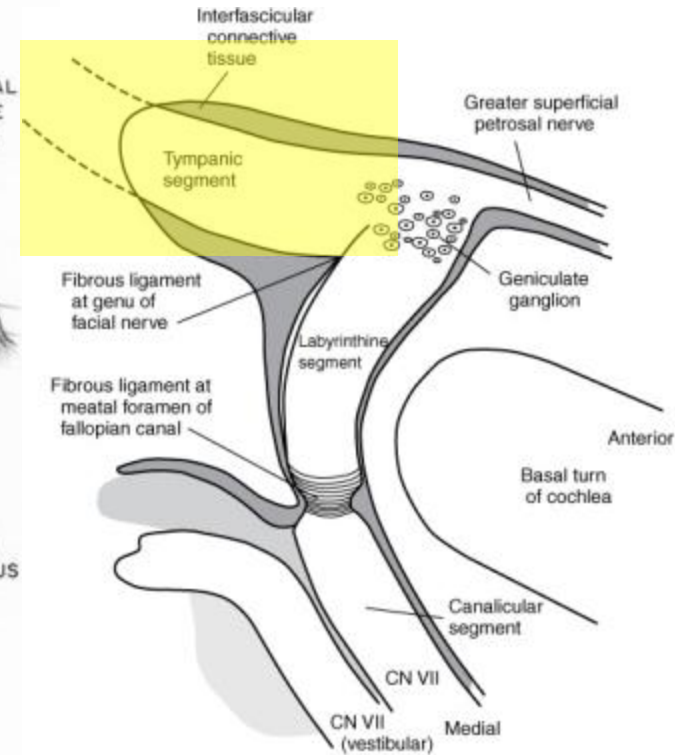
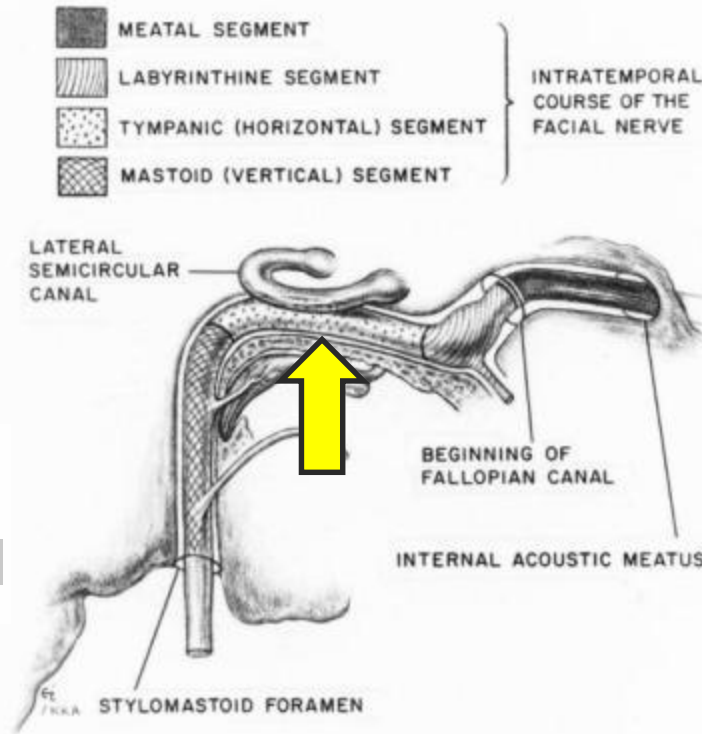


- IAC to geniculate ganglion
- 3-4mm
- Only segment that lacks arterial anastomosis

# Facial Nerve

## Segments

- Intracranial
- Meatal
- Labyrinthine
- Tympanic
- Mastoid
- Extratemporal

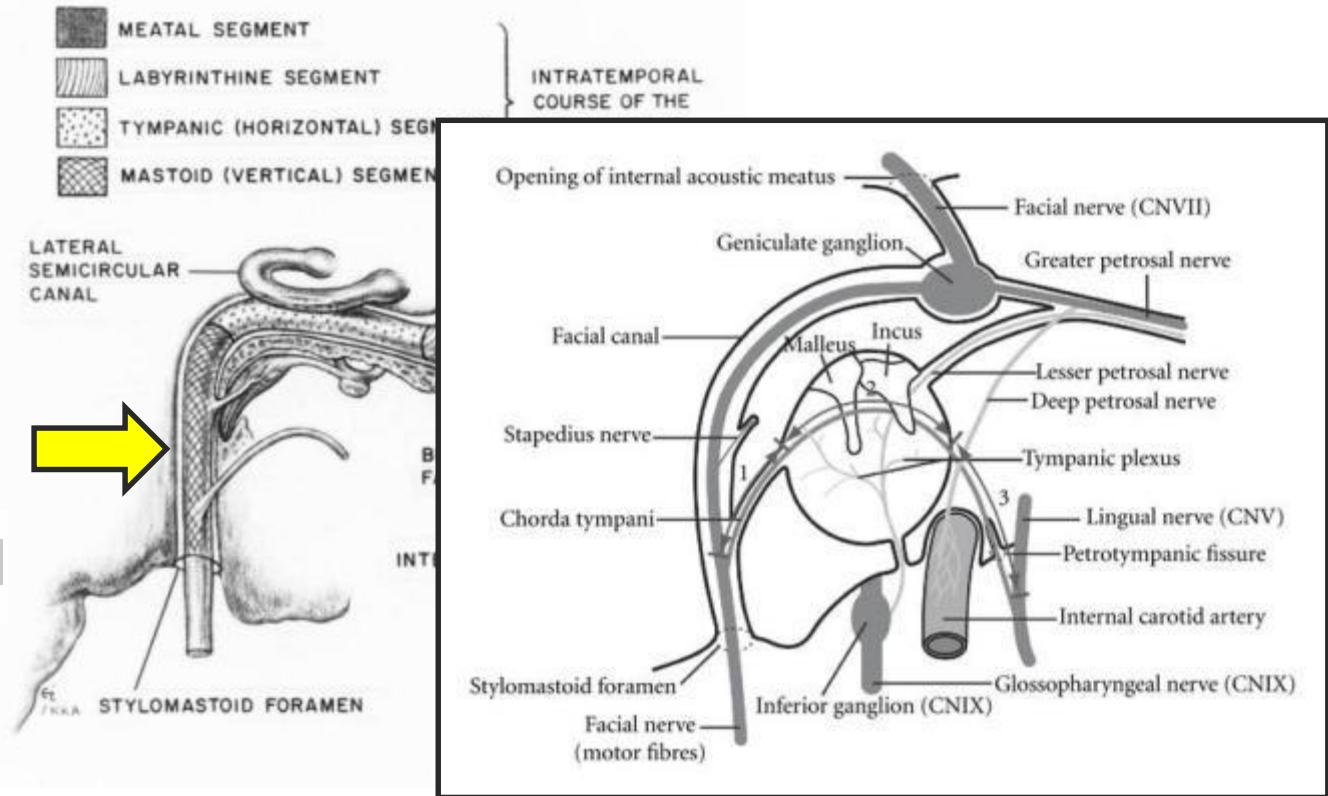


- Geniculate ganglion to pyramidal eminence
- 50% dehiscent
- Zero branches

# Facial Nerve

## Segments

- Intracranial
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- Labyrinthine
- Tympanic
- Mastoid
- Extratemporal

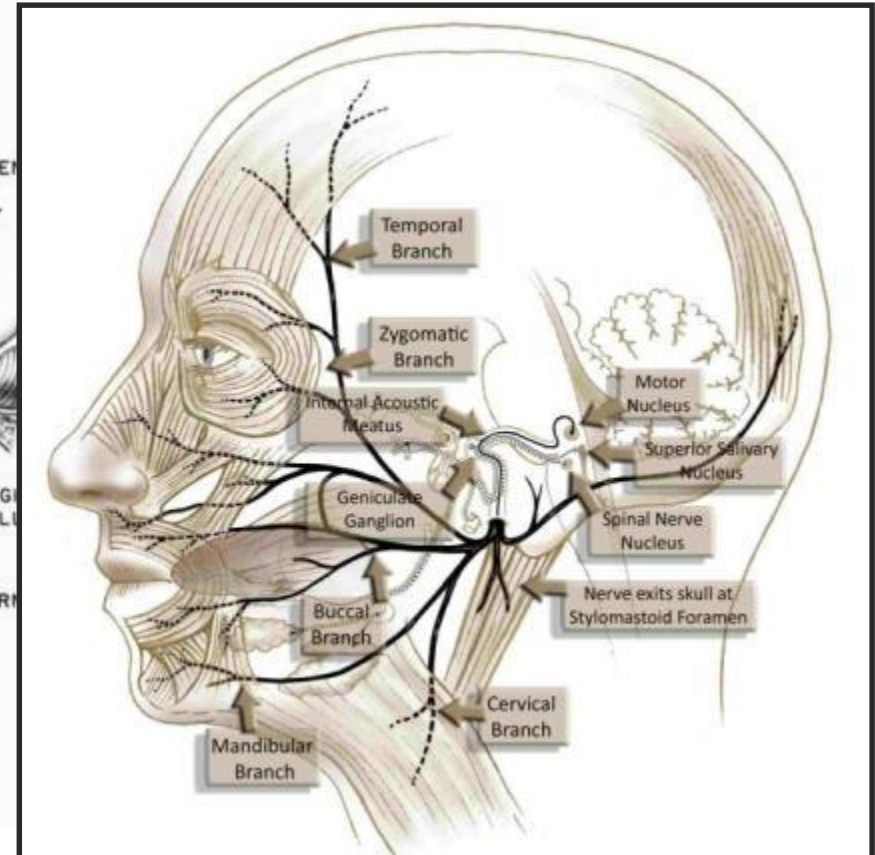
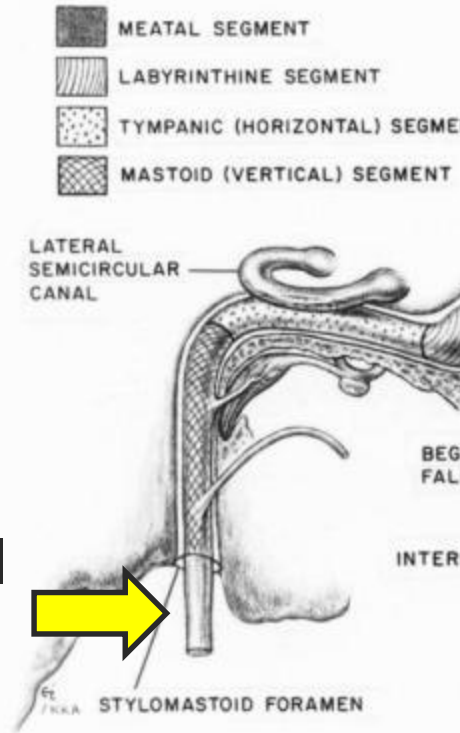


- Pyramidal eminence to stylomastoid foramen
- 8-14mm

# Facial Nerve

## Segments

- Intracranial
- Meatal
- Labyrinthine
- Tympanic
- Mastoid
- Extratemporal



- Stylomastoid foramen to major branches
- 15-20mm

(www.facialparalysisinstitute.com)



## Branches of the Facial Nerve



# CLINICAL MANIFESTATIONS

- **Paralysis of facial muscles**
  - Asymmetry of the face
  - Inability to close the eye
  - Accumulation of food in the cheek
- **Phonophobia**
- **Dryness of the eyes**
- **Loss of taste**

# Diagnos

## History and Physical Examination

- Hearing loss or vertigo
  - audiological function
  - acoustic reflex
- Timing
  - Sudden onset
  - Evolution over 2-3 weeks
- Presence of ear disease
- Vesicular eruption
- Bilateral
- Recurrence



# Diagnos

## History and Physical Examination

- Hearing loss or vertigo
- Timing
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# Diagnos

## History and Physical Examination

- Hearing loss or vertigo
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- Chronic otitis media
- Cholesteatoma



# Diagnos

## History and Physical Examination

- Hearing loss or vertigo
- Timing
  - Sudden onset
  - Evolution over 2-3 weeks
- Presence of ear disease
- Vesicular eruption
- Bilateral
- Recurrence



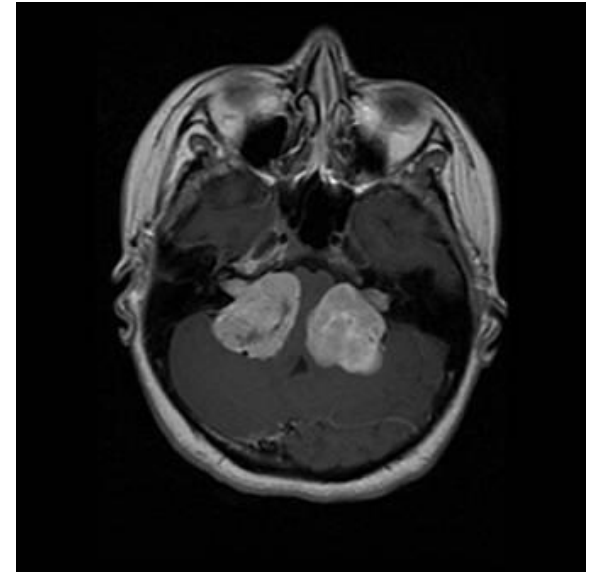
■ Ramsay-Hunt syndrome



# Diagnos

## History and Physical Examination

- Hearing loss or vertigo
- Timing
  - Sudden onset
  - Evolution over 2-3 weeks
- Presence of ear disease
- Vesicular eruption
- Bilateral
- Recurrence



- Guillain-Barre syndrome
- Lyme disease
- Intracranial neoplasm

(ent.uci.edu)

# Diagnos

## History and Physical Examination



- Recurrence



- Melkersson-Rosenthal syndrome



# House-Brackmann Scale

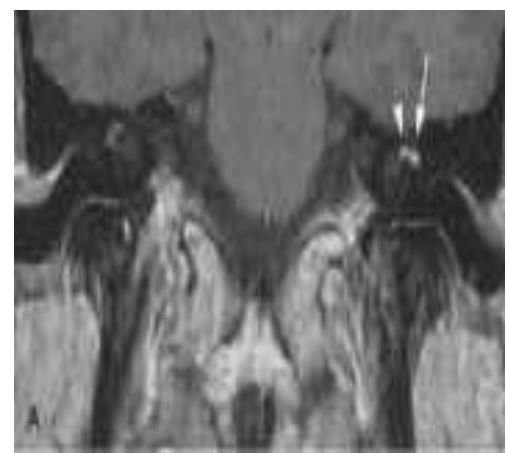
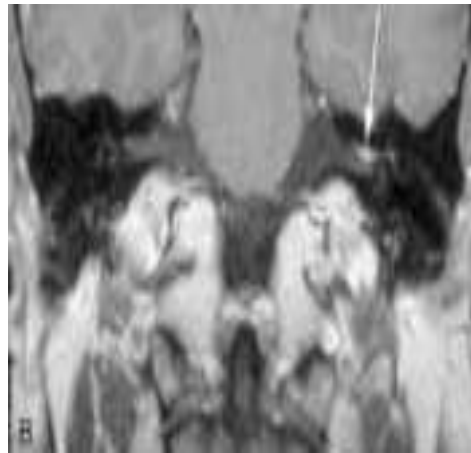
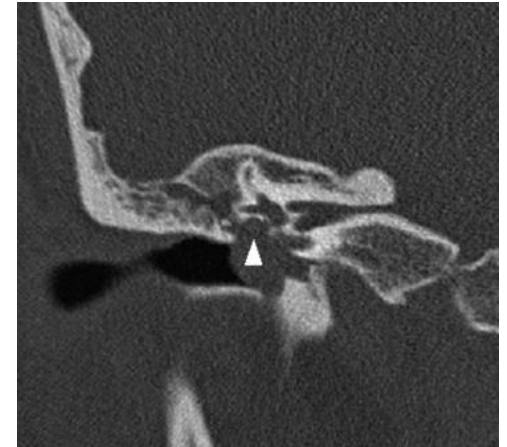
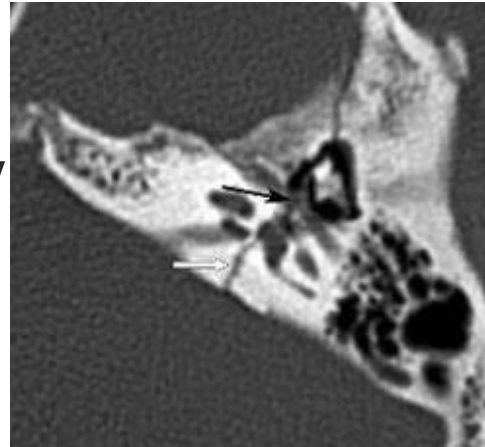
(House 1985)

Grade	Appearance	Forehead	Eye	Mouth
I	normal	normal	normal	normal
II	slight weakness normal resting tone	moderate to good movement	complete closure minimal effort	slight asymmetry
III	non-disfiguring weakness normal resting tone	slight to moderate movement	complete closure maximal effort	slight weakness maximal effort
IV	disfiguring weakness normal resting tone	none	incomplete closure	asymmetric with maximal effort
V	minimal movement asymmetric resting tone	none	incomplete closure	slight movement
VI	asymmetric	none	none	none

# Diagnosics

## Radiology

- **Localize lesion**
- **Computed tomography**
  - Trauma
  - Mastoiditis
  - Cholesteatoma
- **Magnetic resonance imaging (MRI)**
  - Nerve enhancement
  - Exclude neoplasm



# Diagnositics

## Topography

- Schirmer test → greater superficial petrosal
- Stapedial reflex → stapedial branch
- Electrogustometry → chorda tympani
- Salivary flow → chorda tympani



# Diagnosics

## Audiology

- Evaluate for pathology of eighth cranial nerve
- Bell's palsy
  - Symmetric audiological function
  - Absent ipsilateral acoustic reflex
- Retrocochlear pathology
  - Asymmetrical thresholds



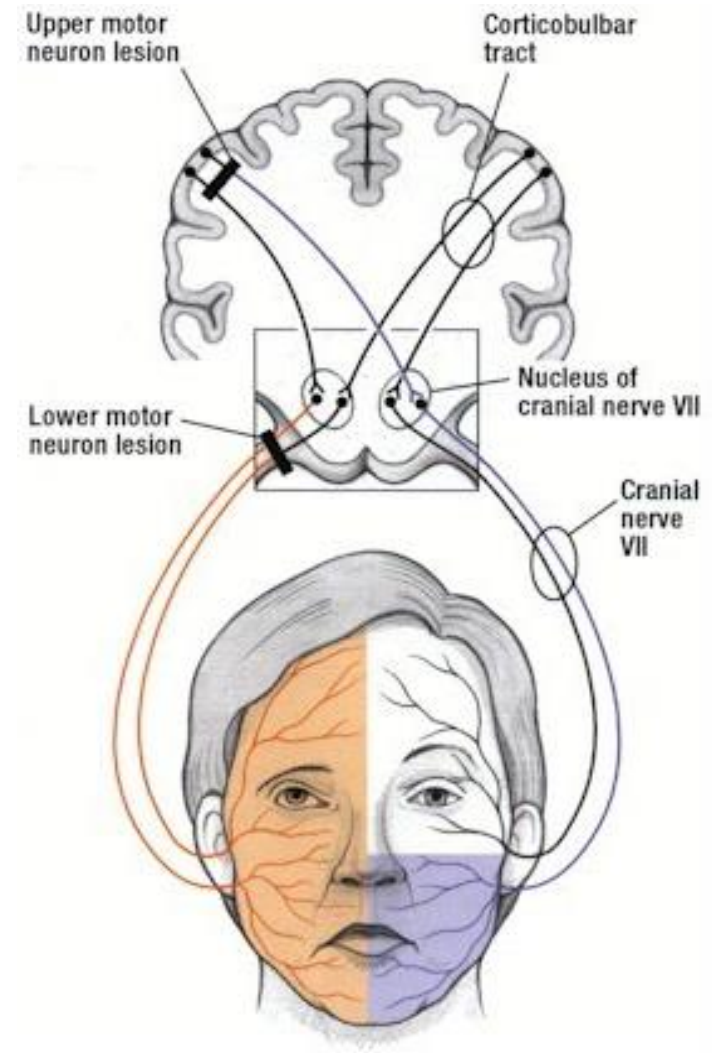
# Diagnosics

## Electrophysiology

- Provides prognostic information
  - Not used for paresis only
- Tests
  - Nerve excitability test (NET)
  - Maximum stimulation test (MST)
  - Electroneuronography (ENoG)
  - Electromyography (EMG)



- Upper motor lesions spare the upper facial muscles and affect the contralateral lower face
- Lower motor lesions affect all the ipsilateral facial muscles



# [ BELL'S PALSY ]

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- Most common diagnosis of acute facial paralysis
- Diagnosis is by exclusion

# [ PATHOLOGY ]

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- Edema of the facial nerve sheath along its entire intratemporal course (Fallopian canal)



# [ ETIOLOGY ]

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- Vascular vs. viral

# [ CLINICAL FEATURES ]

- Sudden onset unilateral FP
- Partial or complete
- No other manifestations apart from occasional mild pain
- May recur in 6 – 12%

# [ PROGNOSIS ]

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- 80% complete recovery
- 10% satisfactory recovery
- 10% no recovery

# [ TREATMENT ]

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- Reassurance
- Eye protection
- Physiotherapy
- Medications ( steroids, antivirals  
vasodilators)
- Surgical decompression in selected cases

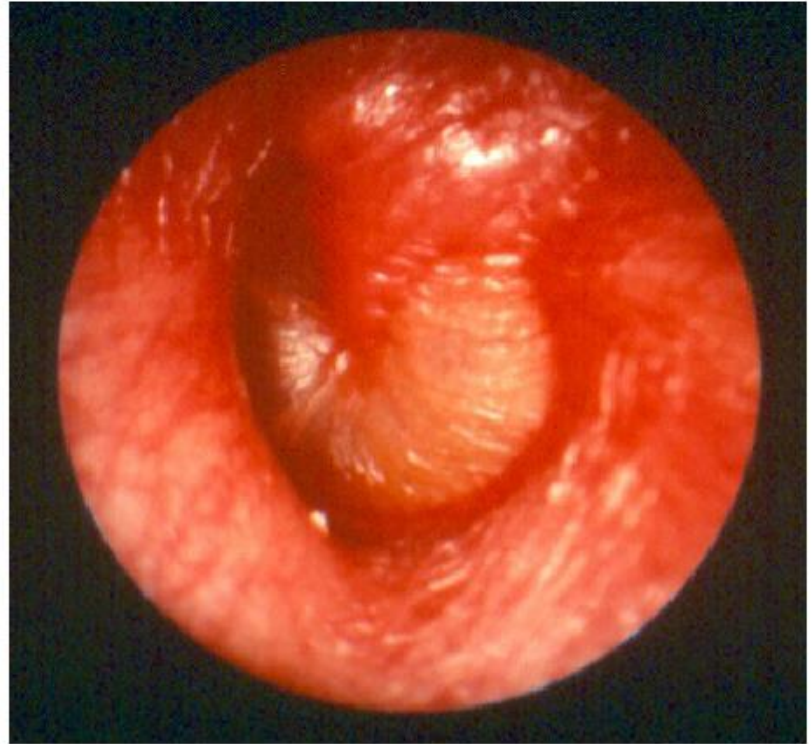
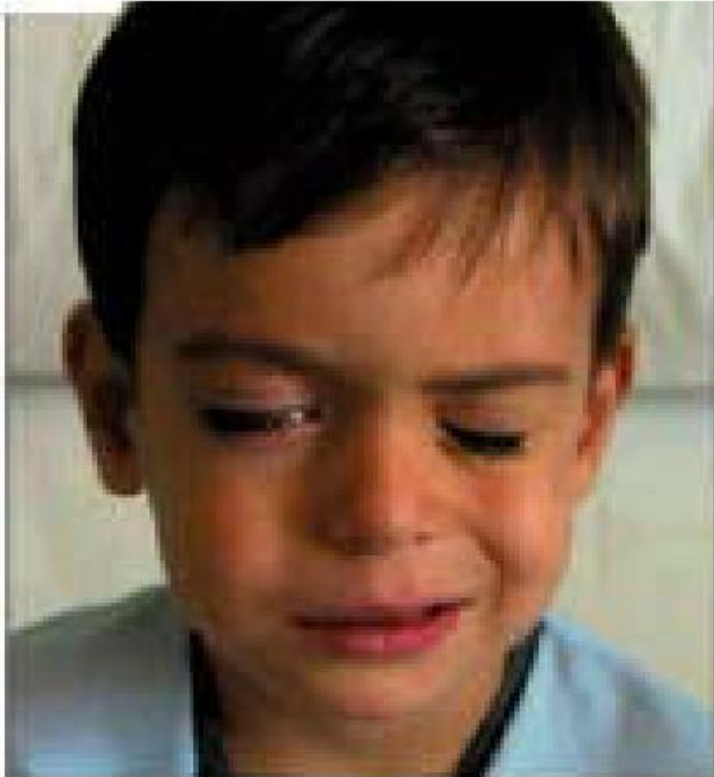


# INFLAMMATORY CAUSES OF FACIAL PARALYSIS

# [ Facial Paralysis in **AOM** ]

- Mostly due to pressure on a dehiscent nerve by inflammatory products
- Usually **partial** and sudden in onset
- Treatment is by **antibiotics and myringotomy**

# Otitis media







# Mastoiditis



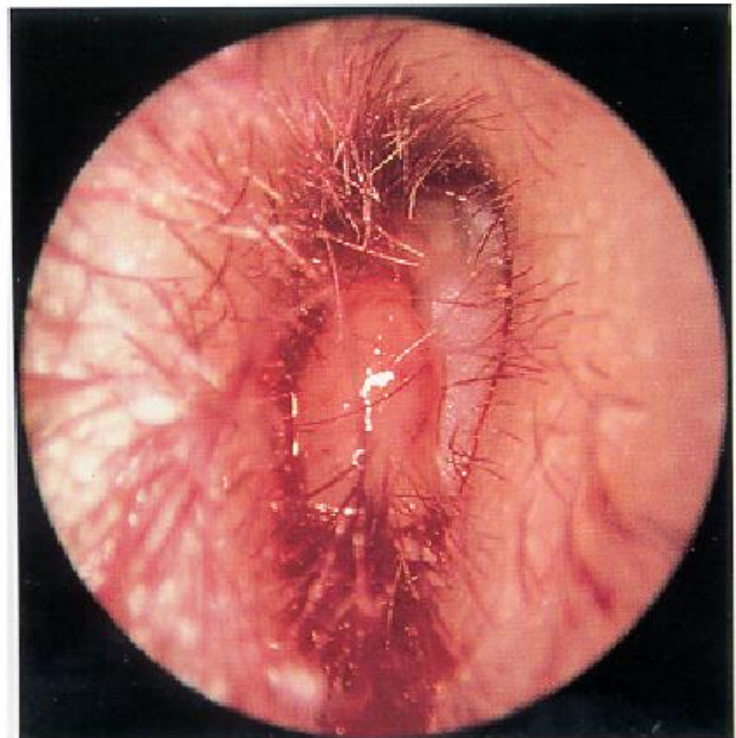
# [ Facial Paralysis in CSOM ]

- Usually is due to pressure by cholesteatoma or granulation tissue
- Insidious in onset
- May be partial or complete
- Treatment is by immediate surgical exploration and “proceed”

# Malignant Otitis Externa

## 4 Ds

- **D**iabetes mellitus
- **D**ischarge (Purulent )
- **D**iscomfort
- **D**ysfunction Cranial nerve
  
- Granulation obscured TM



# HERPES ZOSTER OTICUS (RAMSAY HUNT SYNDROME)

- Herpes zoster affection of cranial nerves VII, VIII, and cervical nerves
- Facial palsy, pain, **skin rash**, SNHL and vertigo



# HERPES ZOSTER OTICUS (RAMSAY HUNT SYNDROME)

- Vertigo improves due to compensation
- SNHL is usually irreversible
- Facial nerve recovers in about 60%
- Treatment by: Acyclovir, steroid and symptomatic

# [ Traumatic Facial Injury ]

- Birth trauma
- Iatrogenic
- Temporal bone fracture

# [ Congenital Facial Palsy ]

- 80-90% are associated with birth trauma
- 10 -20 % are associated with developmental lesions



# [ Iatrogenic Facial Nerve Injury ]

- Operations at the CP angle, ear and the parotid glands



Sc7  
SE/M  
SL5



et

FH -36 feet

# Iatrogenic Facial Nerve Palsy

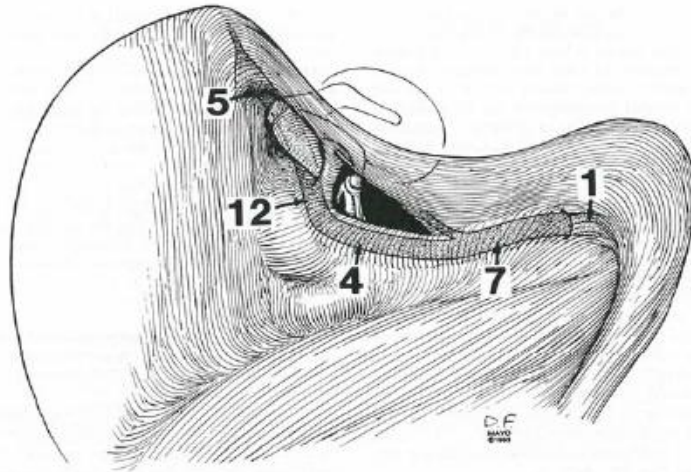
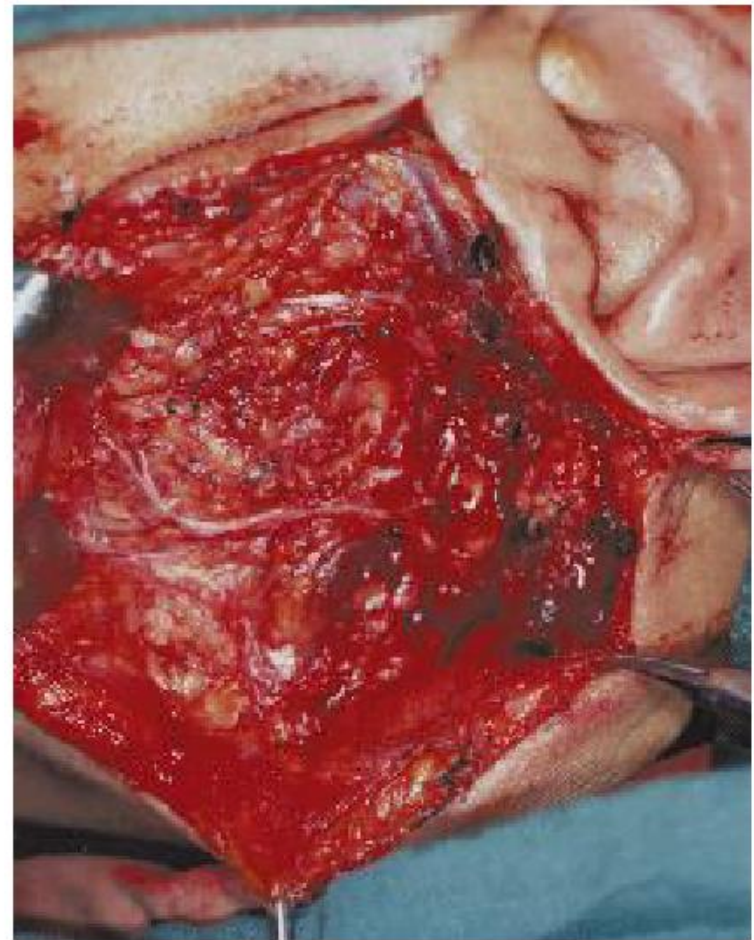
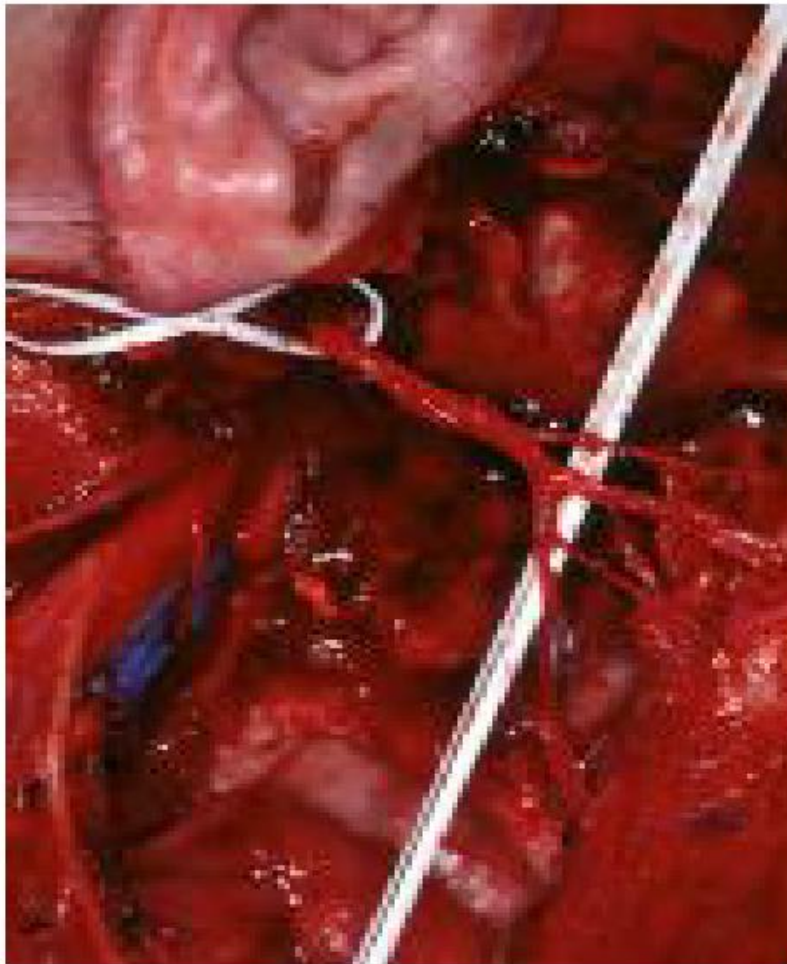


Fig. 1. The course of the facial nerve with a number of injuries for each segment. (By permission of the Mayo Foundation.)



# Iatrogenic Facial Nerve Palsy



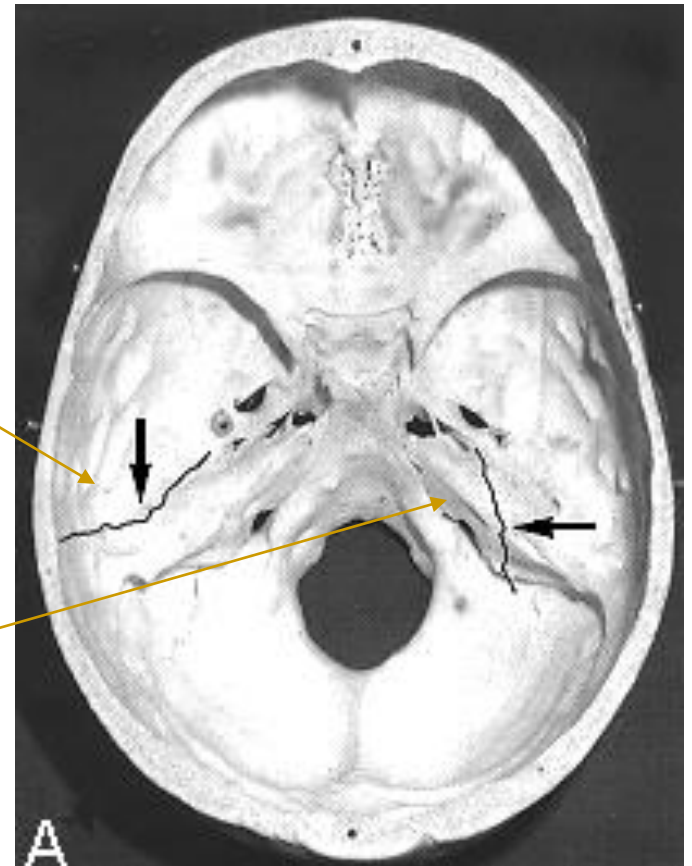
# Temporal Bone Fracture

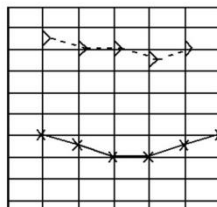
## Longitudinal

- 80% of Temporal Bone Fractures
- 15-20% Facial Nerve involvement

## Transverse

- 20% of Temporal Bone Fractures
- 50% Facial Nerve Involvement





# Raccoon eyes sign



# Battle's sign



# [ Pathology ]

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- Edema
- Transection of the nerve



# Management of Traumatic Facial Nerve Injury

- If it is delayed in onset, it is usually incomplete and is due to edema
  - Conservative
- If of immediate onset, it is usually complete and due to transection of the nerve
  - Surgical repair

[

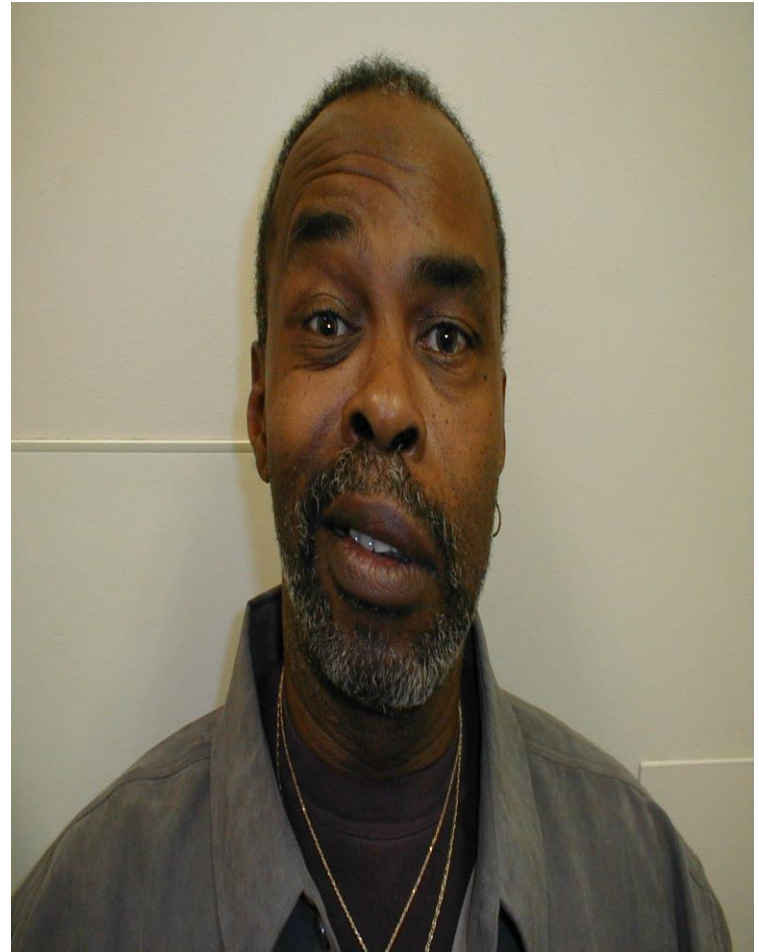
]

?!

# [ What do you think? ]

What is the most likely diagnosis?

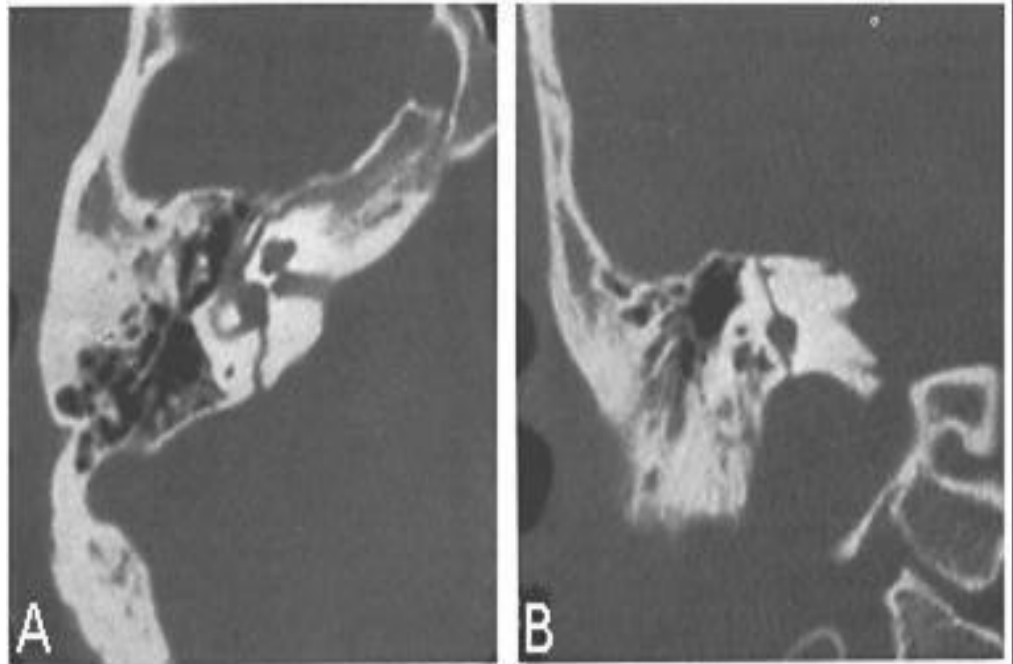
Mention 2 common causes?



# [ 36 years old man with RTA: ]

What is your diagnosis?

Mention 2 clinical findings?



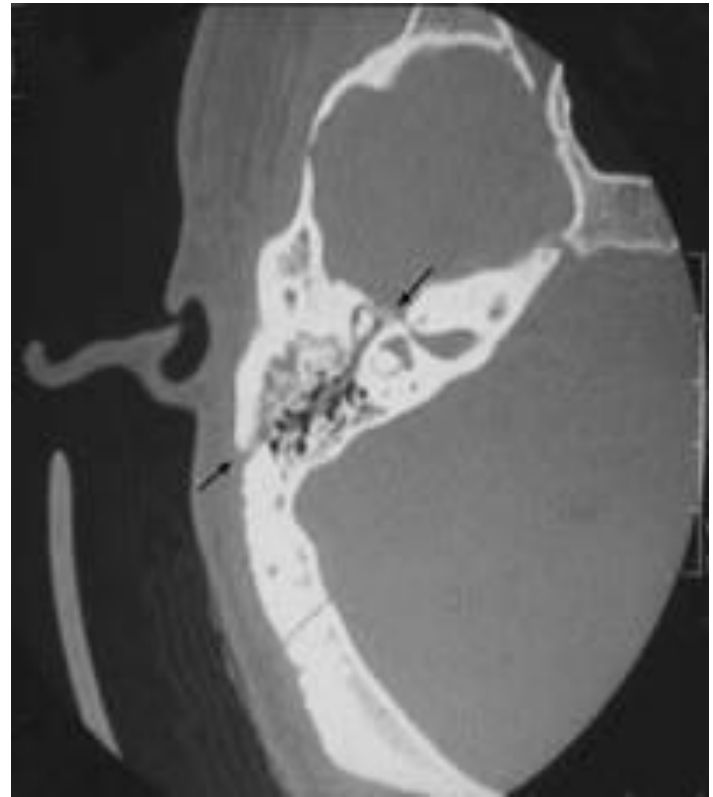
34 yrs old with LMN facial paralysis.

- A- what is your diagnosis?
- B- what is your management?



24 yrs old man involved in RTA.

- A- what is your diagnosis?
- B- mention 2 other clinical findings?





THANK YOU