

# PRACTICE OF MEDICINE

*Presentation on*

*BELL'S PALSY*

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# CRANIAL NERVES



There are 12 pairs of cranial nerves :-

- I. = Olfactory
  - II. = Optic
  - III. = Oculomotor
  - IV. = Trochlear
  - V. = Trigeminal
  - VI. = Abducent
  - VII. = Facial
  - VIII. = Vestibulocochlear
  - IX. = Glossopharyngeal
  - X. = Vagus
  - XI. = Accessory
  - XII. = Hypoglossal
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# MOTOR NEURONS

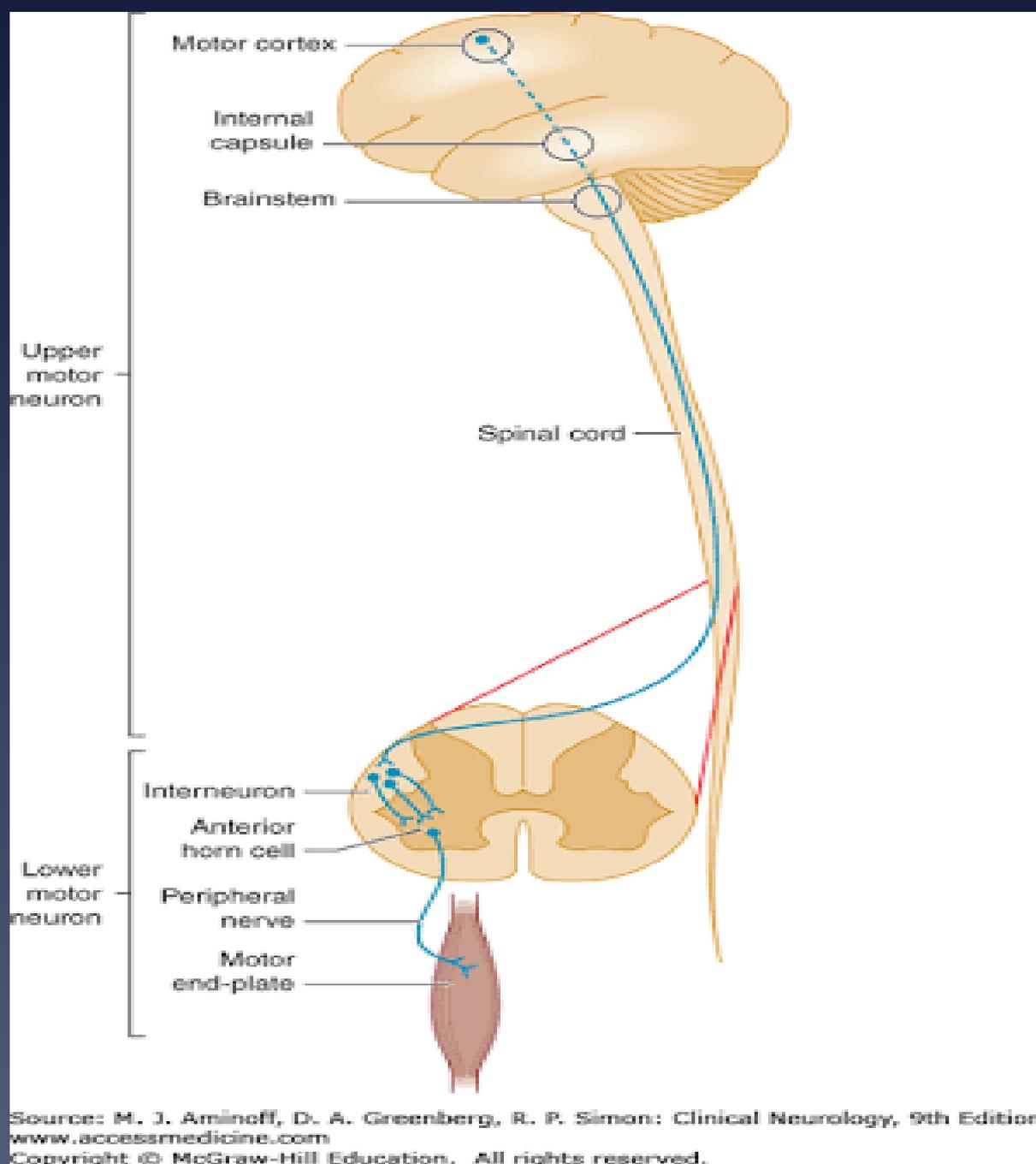


There are 2 types of motor neurons in our body:-

● **UPPER MOTOR NEURON** :- These are the neurons in the higher centers of brain which control lower motor neurons.

● **LOWER MOTOR NEURONS** :- These are the anterior grey horn cells in the spinal cord and the motor neurons of cranial nerve nuclei situated in the brain stem, which innervate the muscles directly. So, these neurons constitute '**final common pathway**' of motor system.





Source: M. J. Aminoff, D. A. Greenberg, R. P. Simon: Clinical Neurology, 9th Edition  
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# EFFECTS OF THE LESIONS IN THE MOTOR NEURONS



EFFECTS	UPPER MOTOR NEURON LESION	LOWER MOTOR NEURON LESION
1. Muscle Tone	Hypertonia	Hypotonia
2. Paralysis	Spastic type	Flaccid type
3. Wastage of Muscle	Occurs	Occurs
4. Superficial Reflexes	Lost	Lost
5. Plantar Reflexes	Abnormal plantar reflexes- Babinski sign	Absent
6. Deep Reflexes	Exaggerated	Lost
7. Clonus	Present	Absent
8. Electrical Activity	Normal	Absent
9. Muscles Affected	Group of muscles	Individual muscle
10. Fascicular Twitch in EMG	Absent	Present



7<sup>TH</sup> NERVE

(FACIAL NERVE)

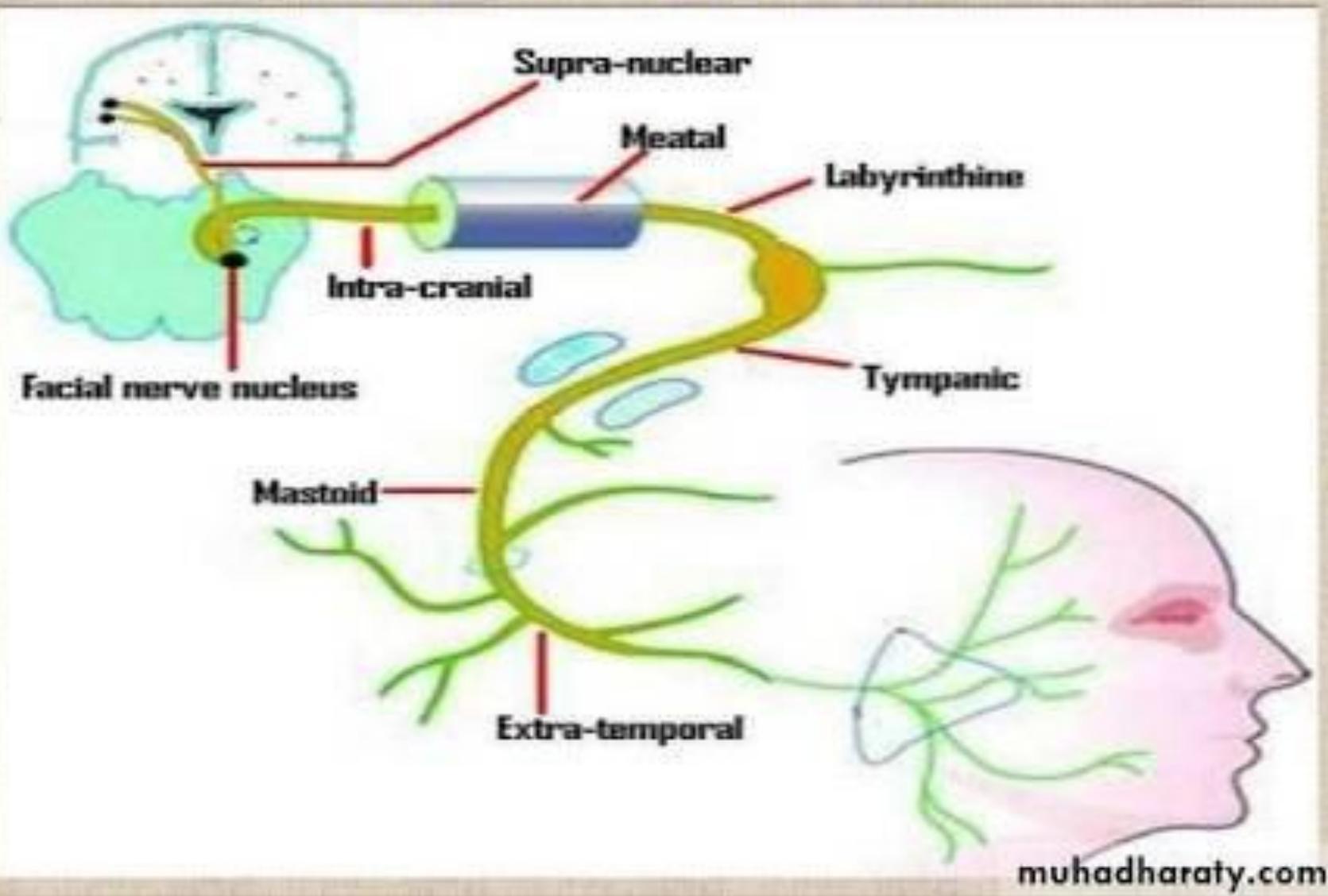


# ANATOMIC CONSIDERATIONS OF FACIAL NERVE



- ❖ The facial nerve supplies all the muscles concerned with facial expression.
  - ❖ The sensory component is small ; it conveys taste sensation from anterior 2/3 of the tongue.
  - ❖ After leaving the pons, the nerve enters the internal auditory meatus with the acoustic nerve.
  - ❖ The nerve continues its course in its own bony channel , the facial canal and exits from the skull via stylomastoid foramen.
  - ❖ It then passes through the parotid gland and subdivides to supply the facial muscles.
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# Course of facial nerve



# Bell's Palsy



# BELL'S PALSY



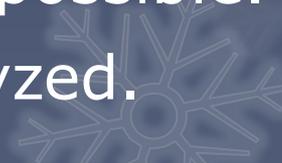
- It is the **lower motor neuron lesion** of the **7<sup>th</sup> (facial) nerve** at the stylomastoid foramen within the facial canal resulting in sudden paralysis.
- It is the most common cause of **facial weakness**.
- It affects all ages and both sexes.
- The annual incidence of this idiopathic disorder is  $\sim 25$  per 1,00,000 annually or about 1 in 60 persons in a lifetime.

# PATHOPHYSIOLOGY



- The condition follows **exposure to cold** and it is thought to be due to an **inflammation of the nerve** in its fibrous sheath within the stylomastoid foramen.
- In acute Bell's palsy, there is inflammation of the facial nerve with the mononuclear cells , consistent with the immune or infectious cause.
- **Herpes Simplex Virus (HSV) type 1 DNA** was frequently detected in endoneurial fluid and posterior auricular muscle, suggesting the reactivation of the virus may be responsible for most cases.
- **Reactivation of varicella zoster virus** is associated with Bell's palsy represent the second most frequent cause.

# SYMPTOMS



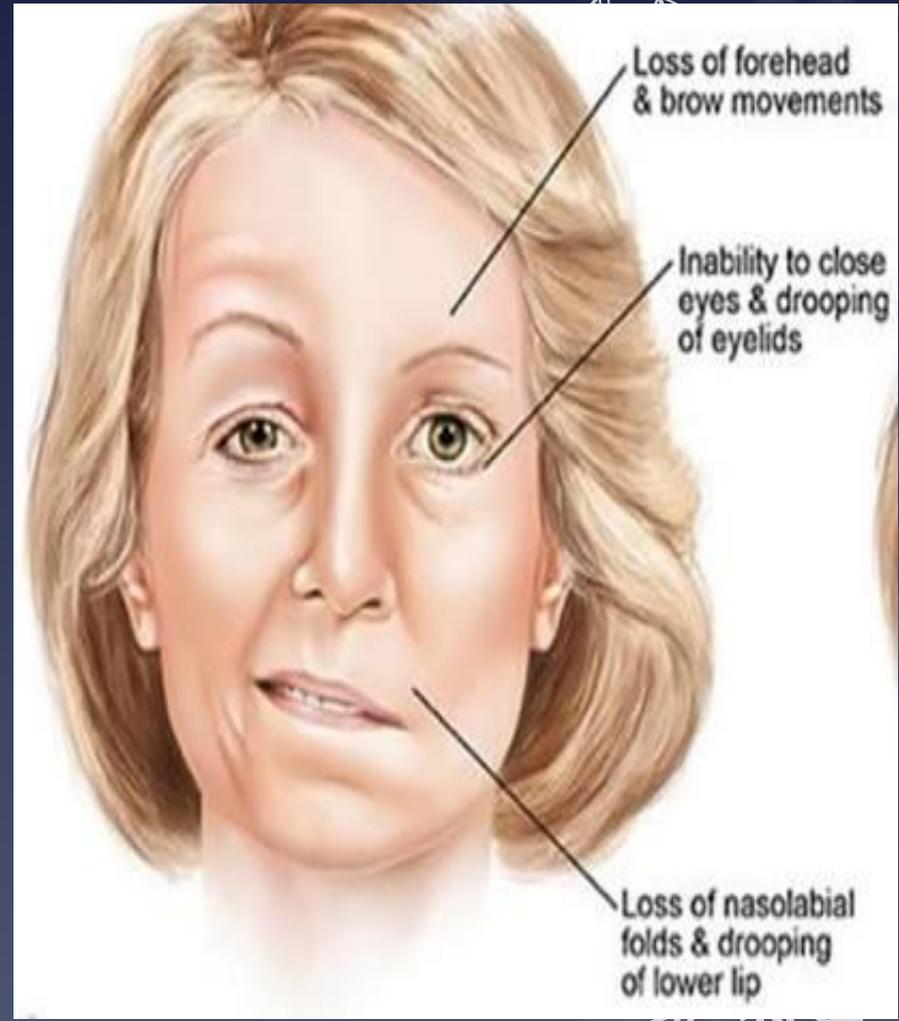
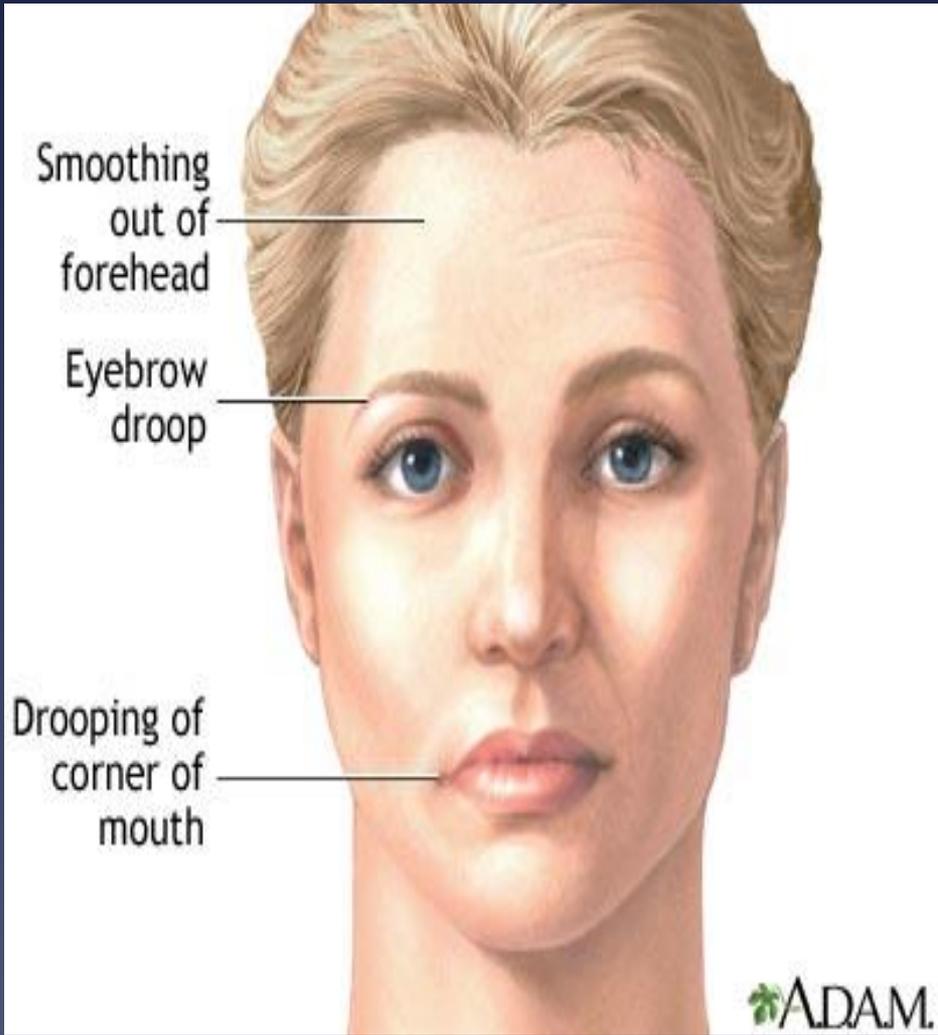
- **Prodromal Symptoms** :- Pain behind the ear or referred to occiput region after exposure to cold or without any cause . Weakness worsens for 1-2 days before stabilizing.
- **Main Symptoms:-**
  - Mostly the symptoms are **unilateral** and facial weakness occurs rapidly.
  - Spontaneous complaints of loss of sense of taste , hyperacusis and watering of eyes.
    - Less sweating on affected side.
  - In **severe cases** there is complete immobility of the upper and lower face of affected side and no voluntary or emotional movement is possible.
    - The platysma is commonly paralyzed.

# SIGNS



- Forehead** cannot be wrinkled.
- Bell's phenomenon**:- on attempting closure, eyeball turns upwards and outwards. Eyes cannot be closed.
- On showing the teeth, the lips do not separate on affected side . Whistling not possible . Articulation of labial components difficult . Naso-labial fold flattened out. Angle of mouth on affected side droops with dribbling of saliva .
- Food collects between teeth and gums. Fluid runs out while drinking.
- Base of tongue lowered.
- The paralysis become most evident when the patient tries to laugh ; the paralyzed side is stiff and mask-like.
- Speech difficulty





# Bell Palsy

Facial weakness

Drooping

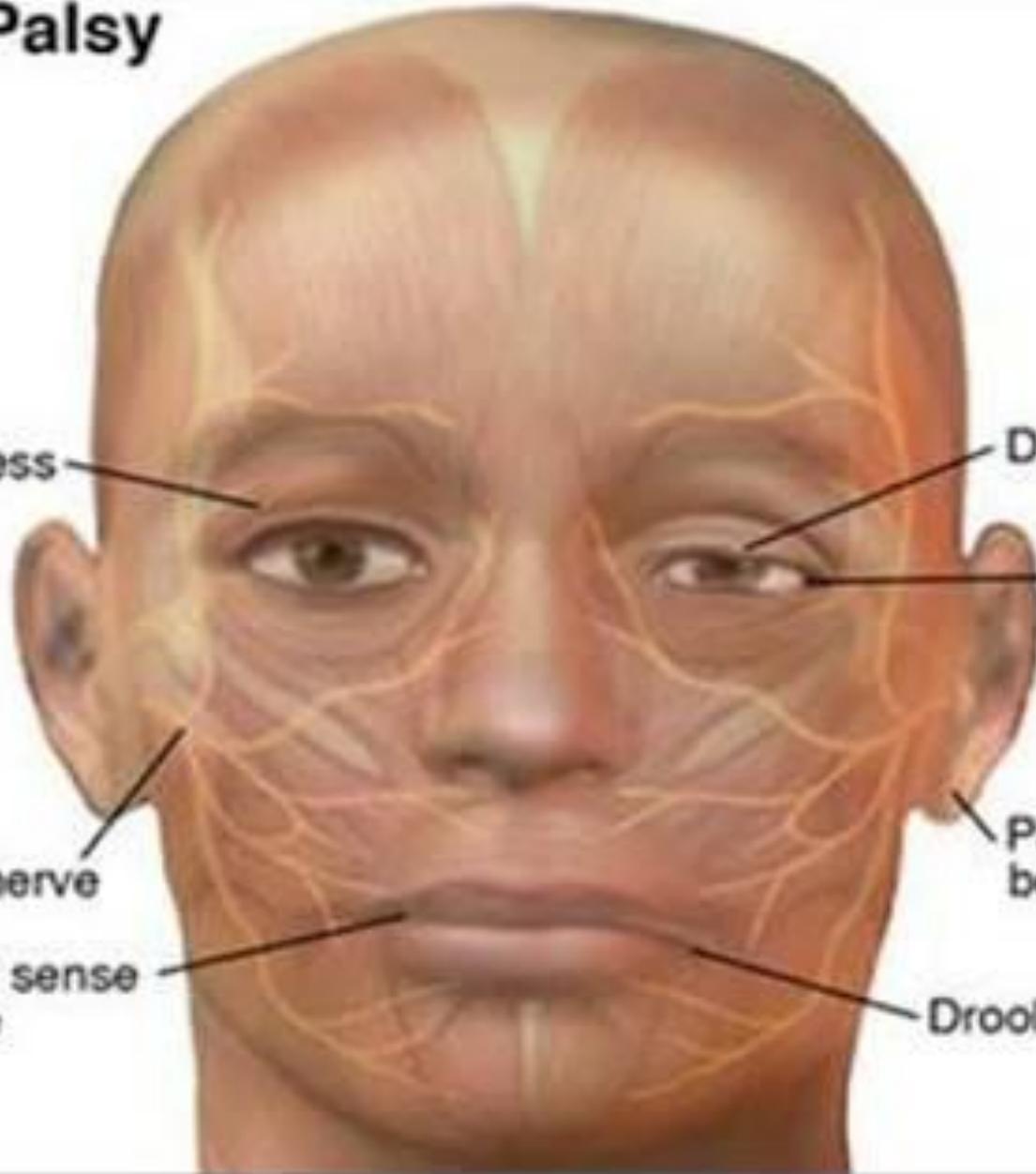
Teariness or dryness

Facial nerve

Pain in or behind the ear

Loss of sense of taste

Drooling

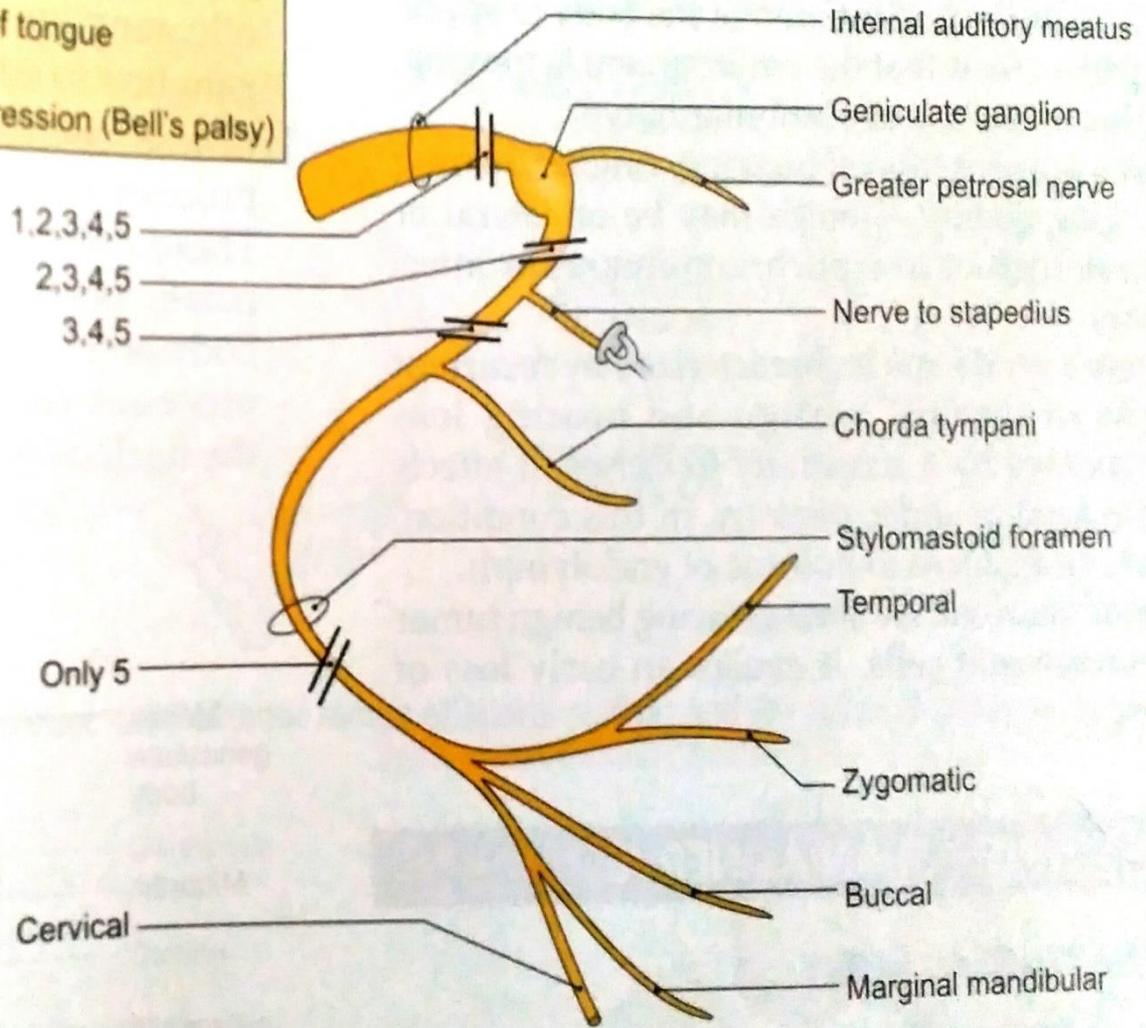


**FACIAL NERVE PALSY IN NEW BORN** :- The mastoid process is absent in new born and stylomastoid foramen is superficial. Manipulation of baby's head during delivery may damage 7<sup>th</sup> nerve. This leads to paralysis of facial nerve especially the buccinator , required for sucking the milk.

# SYMPTOMS ACCORDING TO LEVEL OF INJURY TO FACIAL NERVE

LEVEL OF LESION	SYMPTOMS
Lesion above the origin of chorda tympani nerve	Bell's palsy Loss of taste from anterior 2/3 of the tongue.
Lesion above the origin of nerve to stapedius	Loss of lacrimation. Loss of stapedial reflex. Hyperacusis.
Lesion above the origin of greater petrosal nerve	Loss of lacrimation. Loss of stapedial reflex. Loss of taste Lack of salivation Bell's palsy.
Lesion above stylomastoid foramen	Bell's palsy

1. Loss of lacrimation
2. Loss of stapedial reflex
3. Loss of taste from anterior 2/3rd of tongue
4. Lack of salivation
5. Paralysis of muscles of facial expression (Bell's palsy)



**Fig. 24.43:** Symptoms according to the level of injury to cranial nerve VII

# COMPLICATION

- Bell's palsy is **self treatable disease**, generally it resolved itself in 3-4 weeks or months.
- If the peripheral facial palsy has existed for sometime and recovery of motor function is **incomplete**, a continuous diffuse contraction of facial muscles may appear. **Synkinesis or hemifacial spasm** can occur.
- **Anomalous regeneration of nerve fibers** may result in -1. Closure of lids may cause retraction of mouth if fibers innervate the orbicularis oris.
  2. If fibers innervate the lacrimal gland, anomalous tearing (**crocodile tears**) may occur with any activity of facial muscles.
  3. Another synkinesia is triggered by jaw-opening causing closure of eyelids on the side of facial

# INVESTIGATIONS



- 1) There is mild cerebrospinal fluid lymphocytosis.
- 2) MRI – reveals **swelling and uniform enhancement of geniculate ganglion** and in some cases entrapment of the swollen nerve in the temporal bone.
- 3) Absence of cutaneous lesions of herpes zoster in the external ear canal .
- 4) A normal neurological examination with exception of the facial nerve.
- 5) Electromyography may help in prognosis.

# DIFFERENTIAL DIAGNOSIS



Bell's palsy can be differentiated with following diseases :-

1. Supranuclear lesion of facial nerve

2. Ramsay-Hunt syndrome

3. Lyme Disease

4. Leprosy

5. Guillain-Barre Syndrome

6. Melkersson-Rosenthal Syndrome

7. Hemifacial Spasm

8. Facial Hemiatrophy

9. Moebius Syndrome



## SUPRANUCLEAR LESION OF FACIAL NERVE

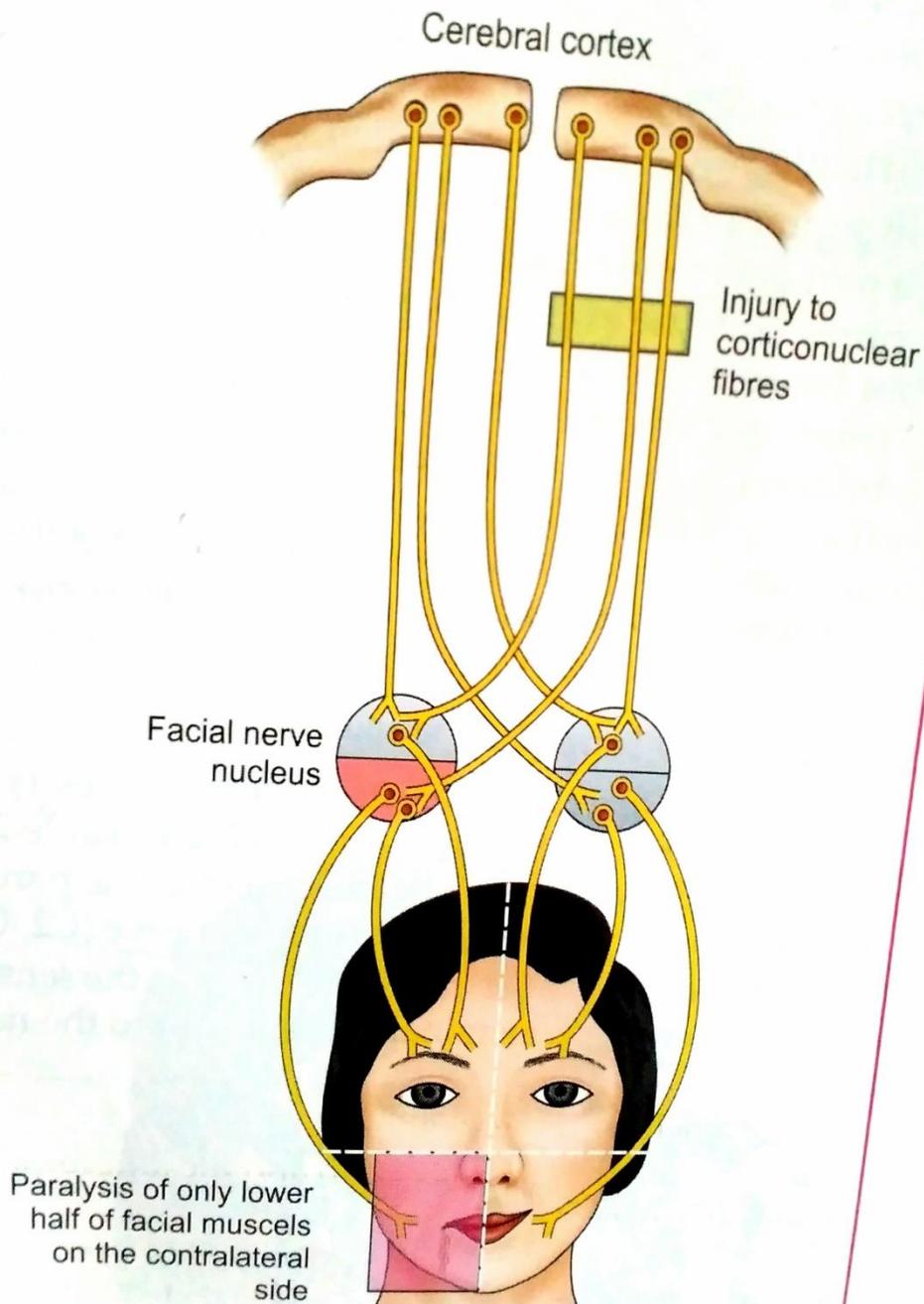
## HEMIFACIAL SPASM

## FACIAL HEMATROPY

1. Caused by **occlusion of small penetrating** arteries providing blood to brain's deep structure affecting fibers in the internal capsule going to facial nucleus.
2. Paralysis of only **lower half of facial muscles on the contralateral side** occurs.
3. Most patients lost voluntary control of muscle movement in face, however muscles in the face involved in the spontaneous emotional expression remain intact and patient also have difficulty in communication.

1. Caused by **vascular compression of exiting facial nerve in the pons**. It can also develop as sequela of bell's palsy or secondary to compression or demyelination of nerve .
2. Patient **face painless irregular involuntary contractions on one side** of face.

1. Its cause is unknown. Occurs mainly in women. **It is slowly progressive disease.**
2. Characterized by **disappearance of fat in dermal and subcutaneous tissues on one side of face.**
3. In its advanced form , the affected side of the face is **gaunt and skin is wrinkled and brown**. Facial hair may turn white and fall out and sebaceous gland become atrophic. **Bilateral involvement** may occur



**Fig. 2.21:** Supranuclear lesion of right facial nerve

## Clinical Appearance of Hemifacial Atrophy



- Note, hollowing of the cheek & atrophy of jaw bones of the affected side.

## Central facial palsy

Preservation of forehead & brow movements



Loss of nasolabial folds & drooping of the lower lip

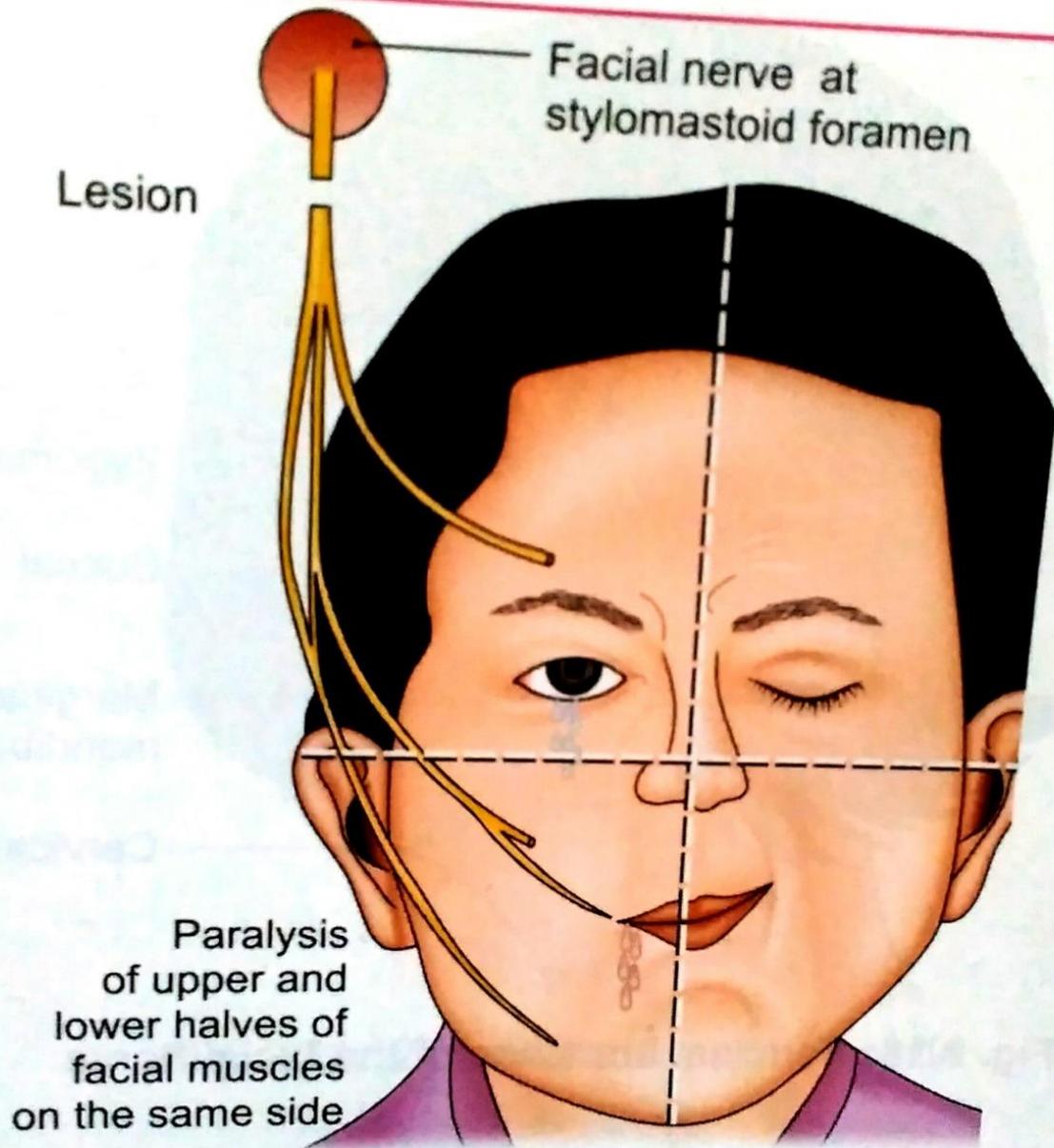
## Peripheral facial palsy

Loss of forehead & brow movements



Inability to close eyes & drooping of eyelids

Loss of nasolabial folds & drooping of the lower lip



**Fig. 2.20:** Infranuclear lesion of right facial nerve or Bell's palsy



RAMSAY HUNT SYNDROME	GUILLAIN –BARRRE SYNDROME	MELKERSSON ROSENTHAL SYNDROME
<ol style="list-style-type: none"><li>1. Caused by <b>involvement of geniculate ganglia by herpes zoster</b> .</li><li>2. It shows in following symptoms :- <u>Hyperacusis</u> <u>Loss of lacrimation</u> <u>Loss of sensation of taste in anterior 2/3 of tongue</u> <u>Bell's palsy and loss of salivation</u> <u>Vesicles on auricle.</u></li></ol>	<ol style="list-style-type: none"><li>1. It is an <b>auto-immune</b> disorder in which immune system attacks healthy nerve cells in peripheral nervous system.</li><li>2. Distal paresthesia and pain precede muscle weakness that <b>ascends rapidly from lower to upper limbs.</b></li><li>3. <b>Bilateral facial</b> and bulbar weakness occurs.</li></ol>	<ol style="list-style-type: none"><li>1. The cause is unknown but there may be <u>genetic predisposition</u>.</li><li>2. It consists of <u>recurrent facial paralysis</u> and eventually permanent – <b>facial edema</b> and less constantly , plication of tongue.</li></ol>

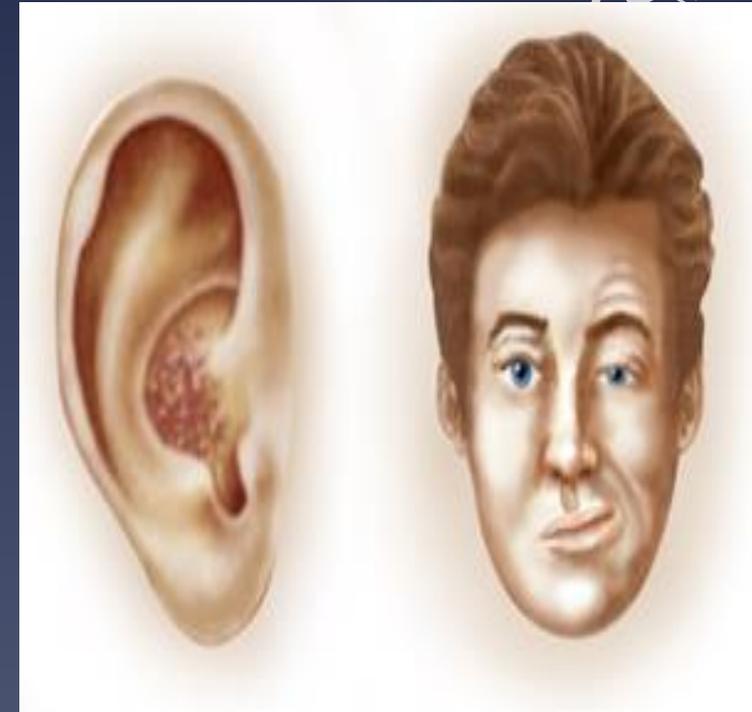


# GUILLAIN BARRE SYNDROME

# RAMSAY HUNT SYNDROME



Figure 1: (a) Bell's palsy on left side at presentation. (b) Facial diplegia on 2<sup>nd</sup> day



# ROSENTHAL SYNDROME



## SARCOIDOSIS

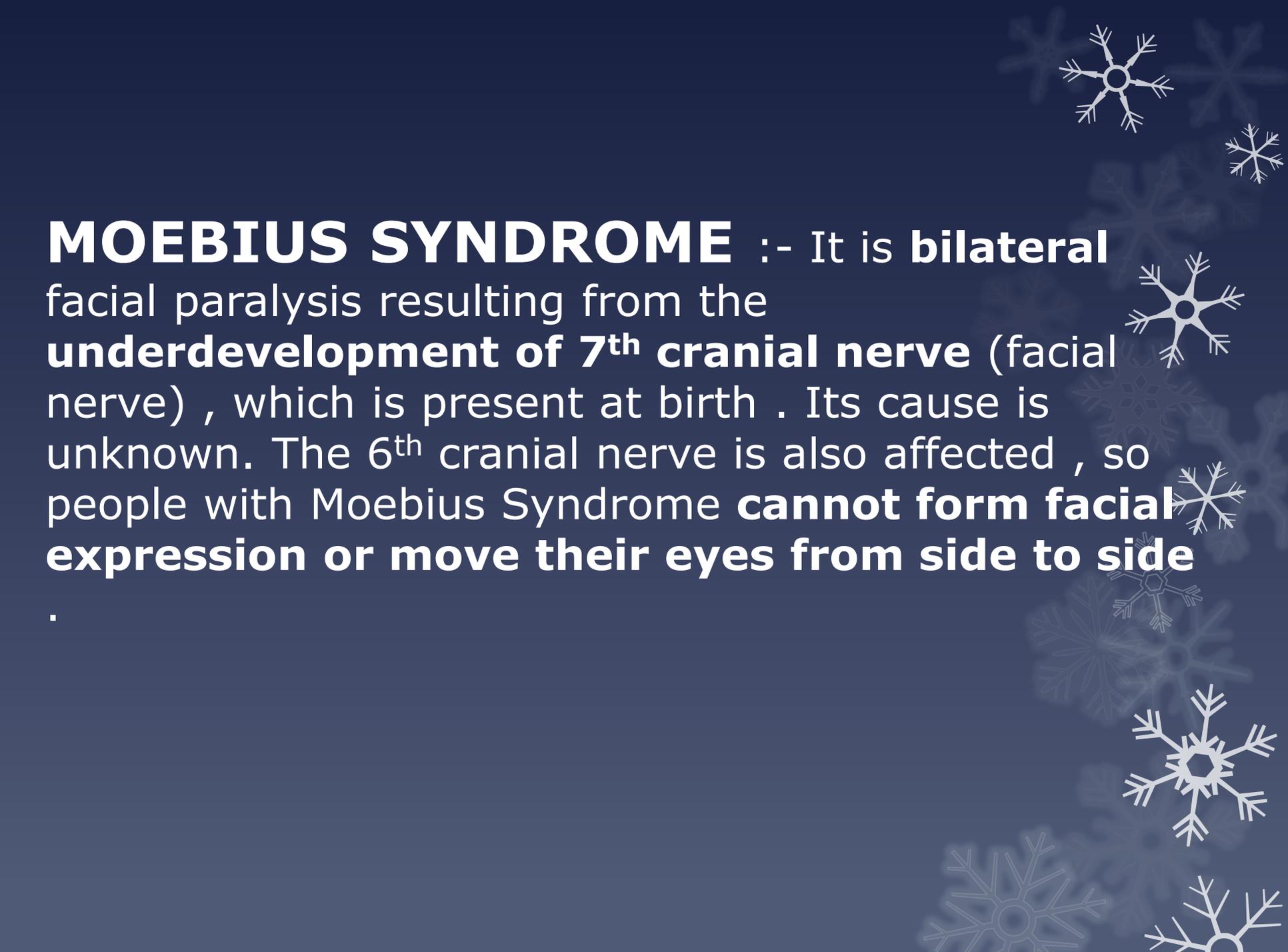
1. It is an inflammatory disease characterized by **presence of noncaseating granulomas**. Its cause is unknown.
2. Neurologic disease is reported in 5-10% of sarcoidosis patients. Any part of the central and peripheral nervous system can be affected. Facial nerve paralysis can be transient and mistaken for Bell's palsy.
3. The presence of granulomatous inflammation is visible on MRI.

## LYME DISEASE

1. Caused by **B. burgdorferi** , a flagellated spirochaetal bacteria which infect humans after bites from ticks or lice.
2. It has **3** stages –
  - a. Early localised disease
  - b. Early disseminated disease
  - c. Late disease.**Unilateral or bilateral facial palsy occurs in 2<sup>nd</sup> stage** of disease.

## LEPROSY

1. Caused by **Mycobacterium leprae** . It is a chronic granulomatous disease affecting skin and nerves.
2. Peripheral nerve trunks are affected at '**sites of predilection**'. It affects facial nerve (zygomatic arch) .
3. Tuberculoid leprosy has early and marked nerve damage than lepromatous leprosy.



**MOEBIUS SYNDROME** :- It is **bilateral** facial paralysis resulting from the **underdevelopment of 7<sup>th</sup> cranial nerve** (facial nerve) , which is present at birth . Its cause is unknown. The 6<sup>th</sup> cranial nerve is also affected , so people with Moebius Syndrome **cannot form facial expression or move their eyes from side to side** .



# HOMOEOPATHIC THERAPEUTICS



ACONITUM NAPELLUS	AGARICUS MUSCARIUS	BELLADONNA
<ol style="list-style-type: none"> <li>1. Complaints and tension caused by <b>exposure to dry, cold weather , draught of cold air , checked perspiration.</b></li> <li>2. Great fear , anxiety and worry. Fears death but believes that he will soon die; predicts the day.</li> <li>3. <u>Red, hot , flushed and swollen face. On rising the face becomes deathly pale.</u> Neuralgia of <b>left side</b> with tingling and numbness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Patient is <b>sensitive to pressure and cold air.</b></li> <li>2. Signs, talks but does not answer. Aversion to work. Fearlessness. Delirium begins with paroxysms of yawning.</li> <li>3. <u>Facial muscles feel stiff ; twitch : face itches and burns.</u> <u>Lancinating , tearing pain in cheeks as of splinters.</u> Neuralgia <b>as if cold needles ran through nerves and sharp ice touched them.</b></li> </ol>	<ol style="list-style-type: none"> <li>1. It stands <b>for violence of attack and suddenness of onset.</b></li> <li>2. Patient lives in the world of his own. Hallucinations; hideous faces. Desire to escape. Acuteness of all senses.</li> <li>3. <u>Red, bluish-red hot, swollen , shining , convulsive motion of muscles of face.</u> <u>Facial neuralgia with twitching of muscles flushed face and inability to speak .</u> <b>Exacerbation at 2PM or 3 PM and again at 11 PM.</b></li> </ol>

## CADMIUM SULPHURATUM

1. Symptoms appear **after catching cold** after failure of causticum.
2. Vertigo ; room and bed seem to spin around. Hammering in head and heat.
3. Painful drawing in face , inability to close eyes, distortion of mouth to one side,(mostly on **left side**) difficulty in talking and swallowing.

## CAUSTICUM

1. Chronic paralysis **from dry, cold weather , especially during the intense cold of winter,** of single parts or of single nerves. Gradually appearing palsies.
2. Mental ailments from long lasting grief , sudden emotions. Thinking of complaints aggravates.
3. Paralysis of **right side** of face. Pain in facial bones, jaws , with difficulty in opening mouth.

## COCCULUS

1. Complaints caused by **loss of sleep, night watching, mental excitement.** Shows a special attraction to light haired women.
2. Mentally, there is slowness of comprehension. Time passes too quickly. Very anxious about the health of others.
3. Paralysis of facial nerve . **Cramp like pain in masseter muscle;** worse opening mouth.

DULCAMARA	IGNATIA AMARA	MEZEREUM
<ol style="list-style-type: none"> <li>1. Caused by <b>exposure to cold, getting wet in rain , damp cold weather washing checked perspiration; when the days are hot and nights are cold.</b></li> <li>2. Mentally , patient is confused, rejects things asked for.</li> <li>3. <u>Tearing in cheek extending to ear, orbit and jaw preceded by coldness of parts and attended by canine hunger.</u> Facial neuralgia worse slightest exposure to cold.</li> </ol>	<ol style="list-style-type: none"> <li>1. It has marked <b>hyperesthesia of all senses and a tendency to clonic spasms.</b> Chief remedy for <b>hysteria.</b></li> <li>2. It is remedy of great contraindication, rapidly changing mental condition caused by ill effects of bad news, fright anger, grief, disappointed love.</li> <li>3. <u>Twitching of muscles of face and lips .</u> Color changes when at rest.</li> </ol>	<ol style="list-style-type: none"> <li>1. Patient is sensitive to <b>cold air.</b> Pains of various kinds with chilliness .</li> <li>2. Mentally the patient is hypochondriacal , sad and despondent . Weak memory with absent mindedness and great aversion to talking.</li> <li>3. Facial neuralgia <b>after zona (eruptive disease) ;</b> <u>toothache when the pains are aggravated by eating, leaves numbness running towards ear, at night better near hot stove.</u></li> </ol>

PLATINA	VERBASCUM	ZINCUM PICRICUM
<p>1. It is primarily a women remedy having <b>hysterical and sanguine temperament.</b> Suited to women of dark hair, complexion and having rigid fibers.</p> <p>2. Mental disturbances after fright, grief, onanism and pride. Superiority complex is highest and alternate mental and physical symptoms.</p> <p>3. <u>Coldness , creeping and numbness in</u> <b>whole right side of face.</b> Pain at the root of nose . <u>Pains increase gradually and decrease gradually.</u> <u>Preconception</u></p>	<p>1. Neuralgia affecting <u>zygoma, temporo maxillary joint and ear,</u> particularly <b>left side</b> with lacrimation ,coryza and sensation as <b>if parts were crushed with thongs.</b> <u>Talking, sneezing and change of temperature aggravates the condition.</u> Pains come in flashes excited by <b>least motion , occurring periodically at same hour in morning and afternoon each day.</b></p>	<p>1. Zincum has great affinity to nerves so it also has.</p> <p><b>2. Facial paralysis, brain fag.</b> Redness and itching eruptions on chin. <u>Tearing in the facial bones.</u></p>

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THANK  
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