



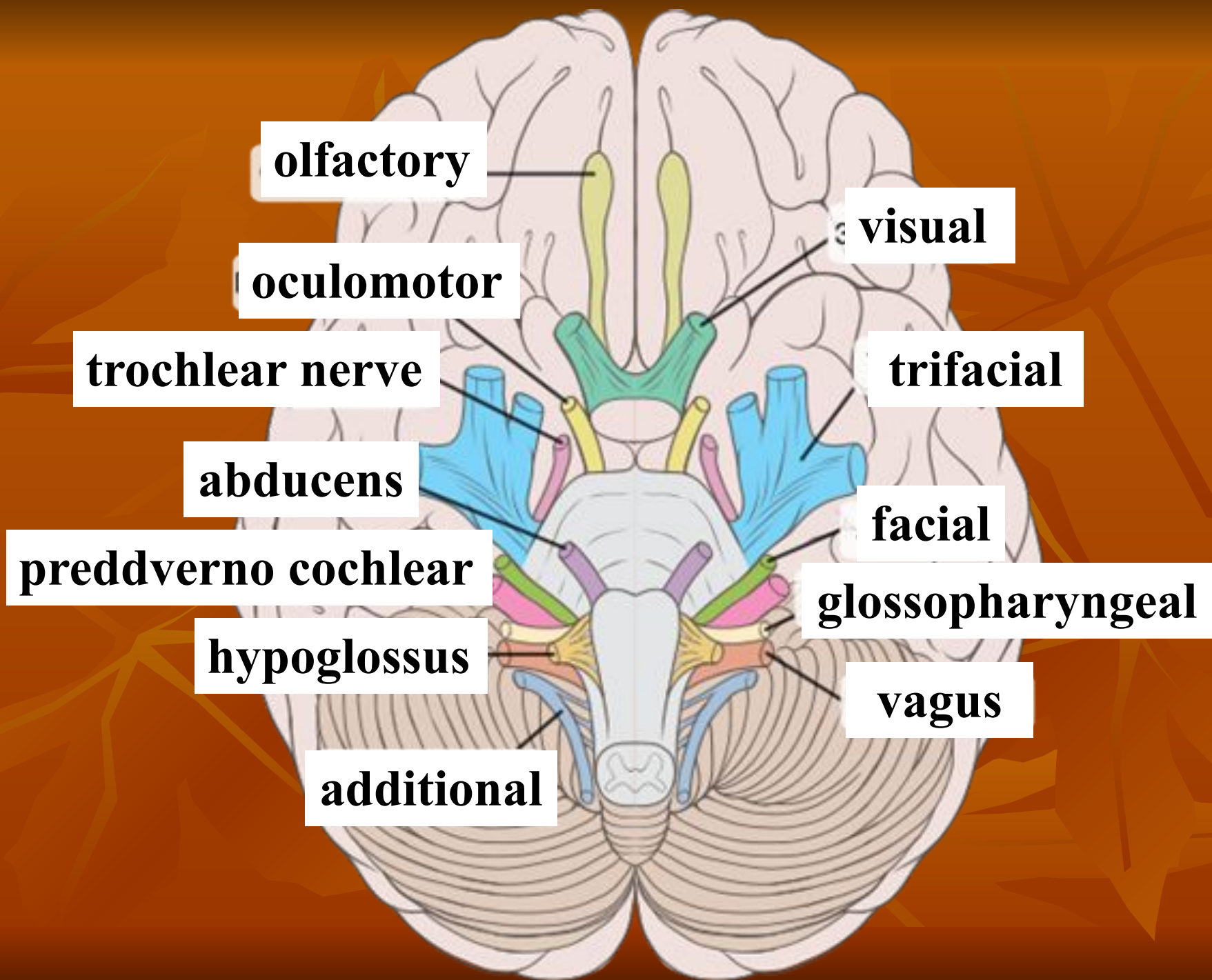
# **CRANIO-CEREBRAL NERVES**

**Cranial - cerebral nerves are nerves walking away from a cerebrum or included in him.**

**There are 12 pairs of cranio-cerebral nerves, that pierce a skin, muscles, organs of head and neck, and also the row of organs is thoracal and abdominal cavities.**

## **Distinguish:**

- **motoriuss (III, IV, VI, XI and XII of pair);**
- **mixed nerves (V, VII, IX and X of pair) containing all functional explorers;**
- **nerves of sense-organs - I and II of pair.**



The background features a warm orange gradient with faint, stylized leaf patterns in a slightly darker shade of orange, creating a textured, organic feel.

# **Motor cranial nerves**

# Classification of motorius

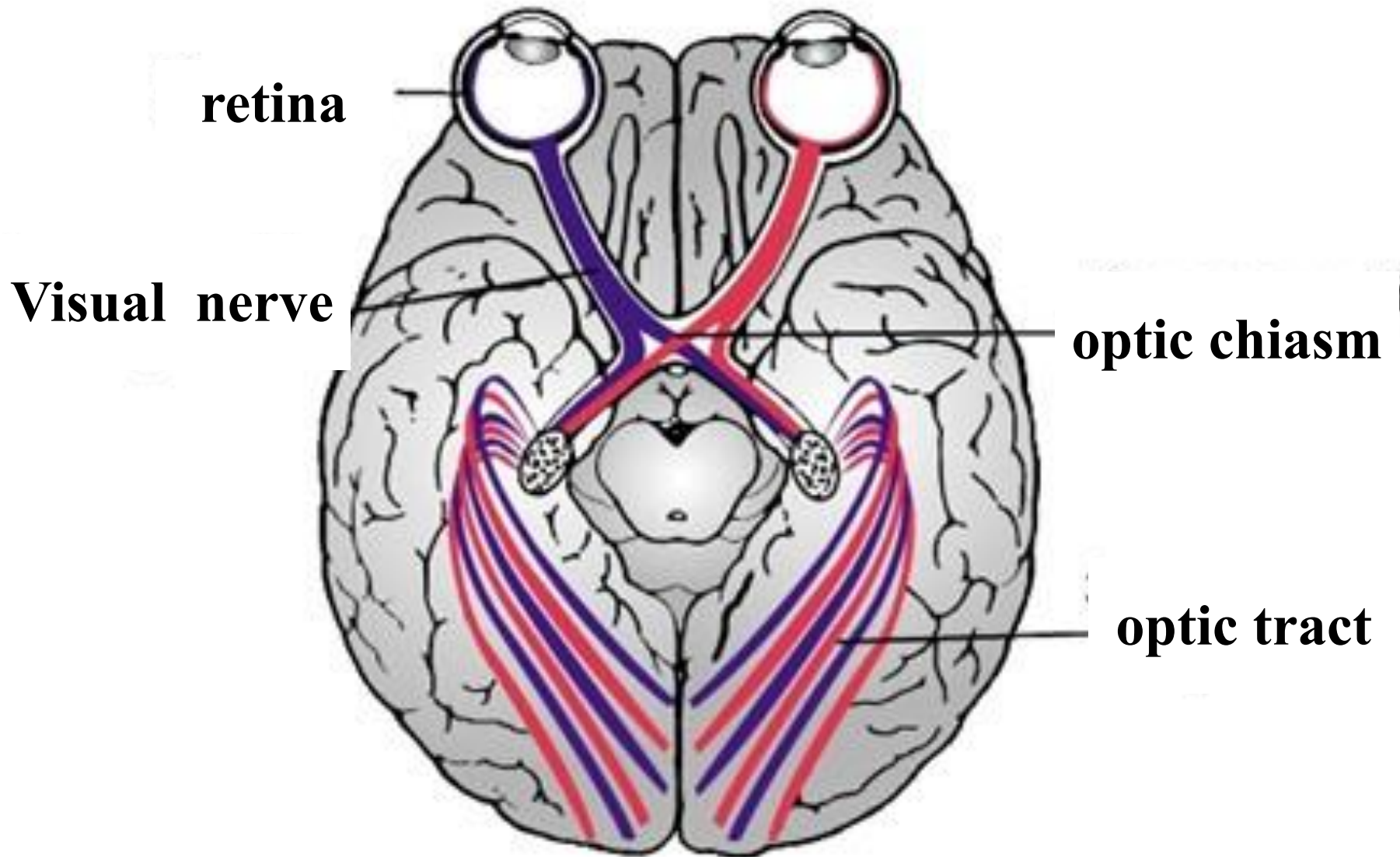
Motorius begin in the motive kernels of barrel.

To mainly motive take the group of oculomotorius: oculomotor (III), block (IV), taking (VI), additional (XI), innervating sternal-clavicular-mammi-form and trapezoidal muscles, subglossal (XII), innervating muscles of language.

# Oculomotorius

This nerve is mainly motor, however, it also contains parasympathetic fibers to smooth muscle of the eyeball, sympathetic fibers and a small number of sensory fibers.

A conglomerate of nuclei III pairs located in the Central gray matter of the midbrain (at the bottom of the IV ventricle, at the level of the corpora quadrigemina).



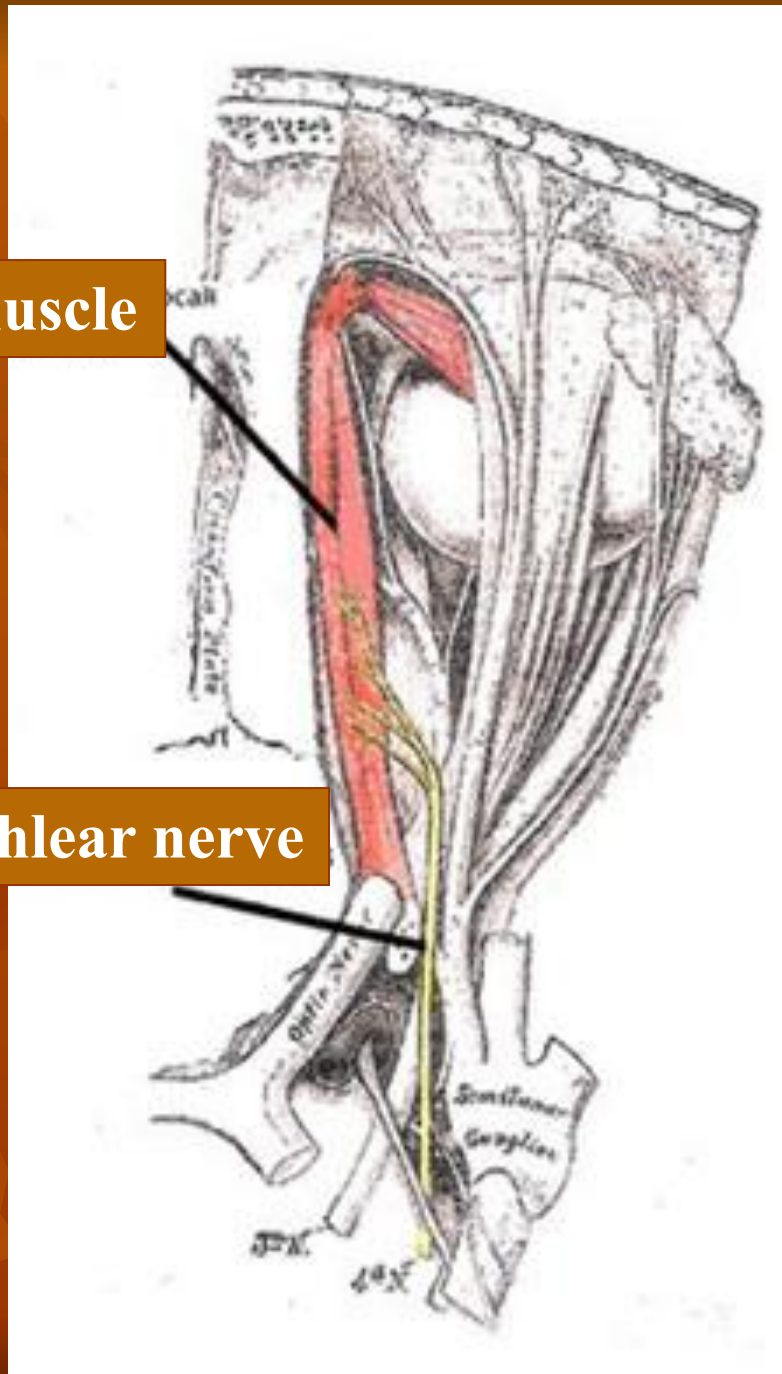


# Trochlear nerve (IV pair)

Этот нерв обеспечивает только верхнюю косую мышцу, которая двигает зрачок вперед-вниз и вбок. Все волокна нерва переходят на противоположную сторону тела между центральным ядром и мышцей. Следовательно, дисфункция одного блокового нерва будет воздействовать на противоположную мышцу.

the upper oblique muscle

trochlear nerve



# Trochlear nerve

## Anatomy

Trochlear nerve emerges from the brain stem, in the area of attachment of the sail Rostral to the caudal hills corpora quadrigemina. Together with the trigeminal nerve it enters orbital cleft, out there in the fossa and branches into the dorsal oblique muscle of the eye.

# **Pathology and clinical symptoms**

**Isolated anomalies of the trochlear nerve are rare in clinical practice and difficult to diagnose. Cats that have vertically oriented pupils, a small dorsolateral rotation of the affected eye may occur due to paralysis of the dorsal oblique muscle of the eye.**

# Abducens nerve (VI pair)

Abducens nerve provides lateral rectus, which moves the pupil laterally. Dysfunction of the nerve results in strabismus is called convergent. In this case, the nerve fibers don't cross midline of the body, and dysfunction of one abducens nerve only affects the muscle located on the same side.

The trunk of the nerve exits the brain at the back edge of the bridge, between it and the pyramid of the medulla oblongata. Then comes the outside from the back Turcica in the cavernous sinus, which is located on the outer surface of the internal carotid artery. Then, through the top orbital cleft, he enters into the eye socket and above the ophthalmic nerve. Abducens nerve irritates the outer straight muscle of the eye.

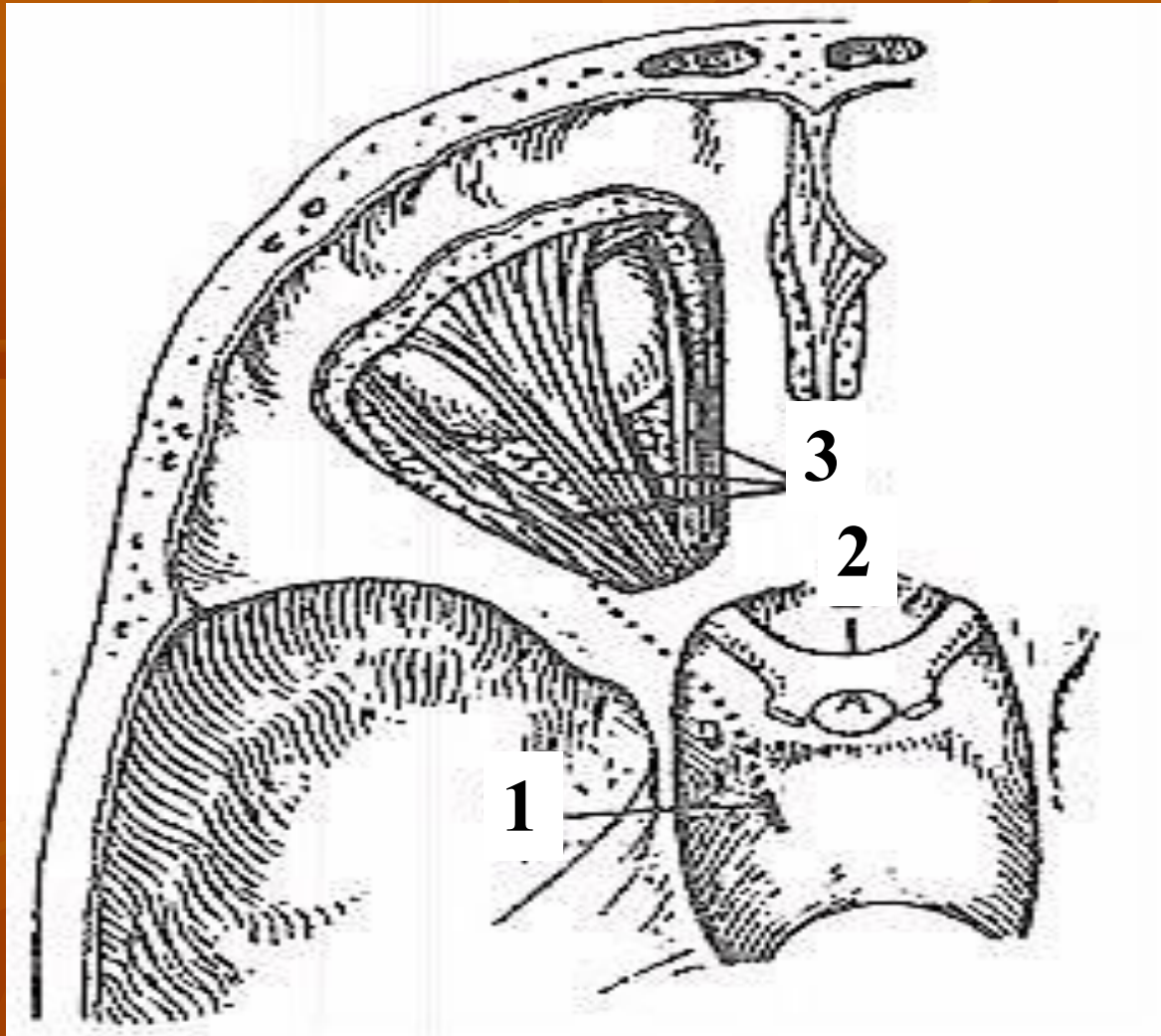
Abducens nerve has the greatest sensitivity compared to other oculomotor nerves to injury, the increased intracranial pressure. The affected nerve is often on the base of the brain.

# Abducens nerve

## Anatomy

Nucleus abducens nerve are located on both sides of the median sulcus in the caudal part of the bridge near the medulla oblongata and beneath the bottom of the IV cerebral ventricle.

Fiber abducens nerve through the orbital gap enter the orbit and Innervate the above muscles.



**1 - abducens nerve**

**2 - optic nerve**

**3 - the muscles  
of the eye**



# Hypoglossal nerve (XII pair)

Formed by processes of nerve cells of the same nucleus, which is located in the medulla oblongata. The nerve exits the skull through the hypoglossal canal of the occipital nerve, innervates muscles of the tongue and partly by some of the muscles of the neck.

Hypoglossal nerve mainly caused by gorkovatom connections with the opposite hemisphere. Central motor neuron for muscles of the tongue is the bottom portion of the precentral gyrus.

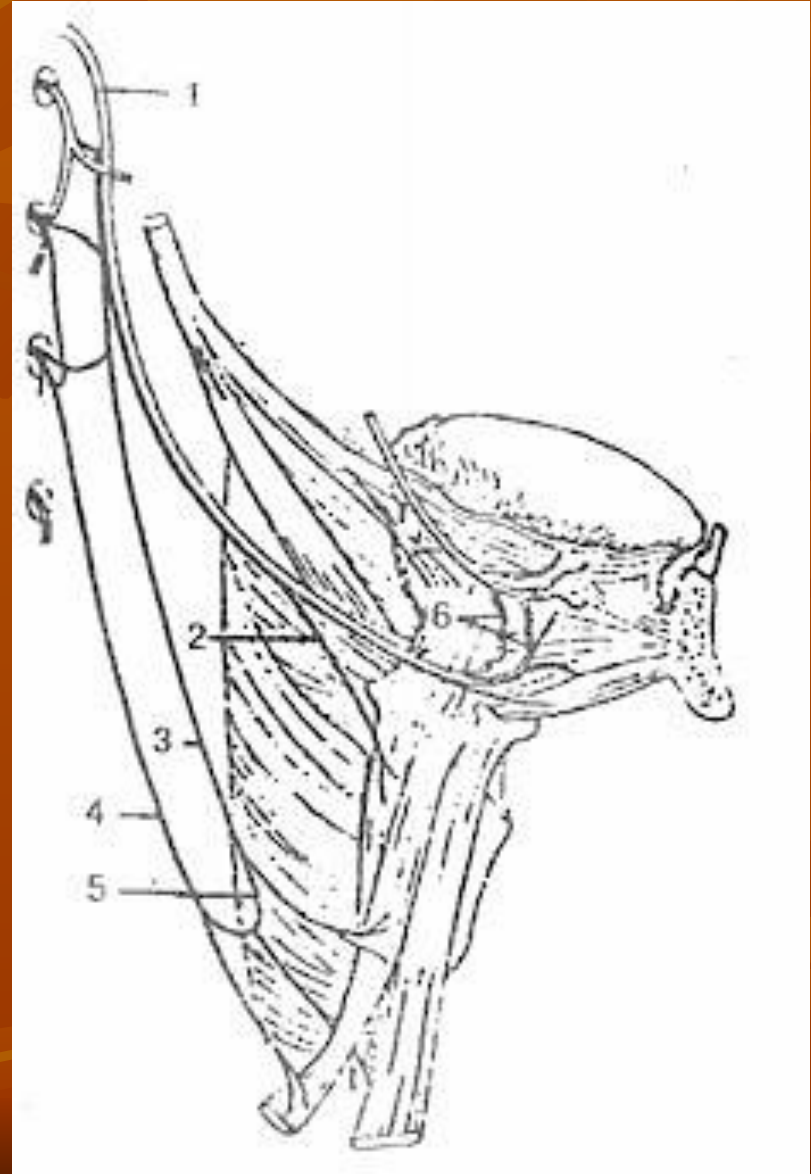
# Hypoglossal nerve (XII pair)

## Anatomy

The neurons forming the hypoglossal nerve originate from the hypoglossal nerve centre in the medulla oblongata, at the level of the fourth ventricle.

# Hypoglossal nerve and cervical (hyoid) loop:

- 1 - hypoglossal nerve;
- 2 - thyrohyoid branch;
- 3 - forward spine;
- 4 - dorsal root;
- 5 - cervical (hyoid) loop;
- 6 - speaking branch.



# Hypoglossal nerve

## Pathology and clinical symptoms

Damage to hypoglossal nerve leads to the weakening of the retraction of the tongue in response to his pulling from the mouth, and visible asymmetry with displacement in the direction of the affected muscle, i.e. in the direction of the hearth.

In chronic course of the disease on the affected side note atrophy and reaction of degeneration of muscles of the tongue. Bilateral lesions of nerve manifested by limited or complete immobility of the language.

While suffering hypoglossal nerve centre, atrophy and reaction of degeneration of muscles of the tongue is not determined.



# Mixed cranial nerves

**Mixed  
cranial  
nerves**

**Trifacial  
nerve**

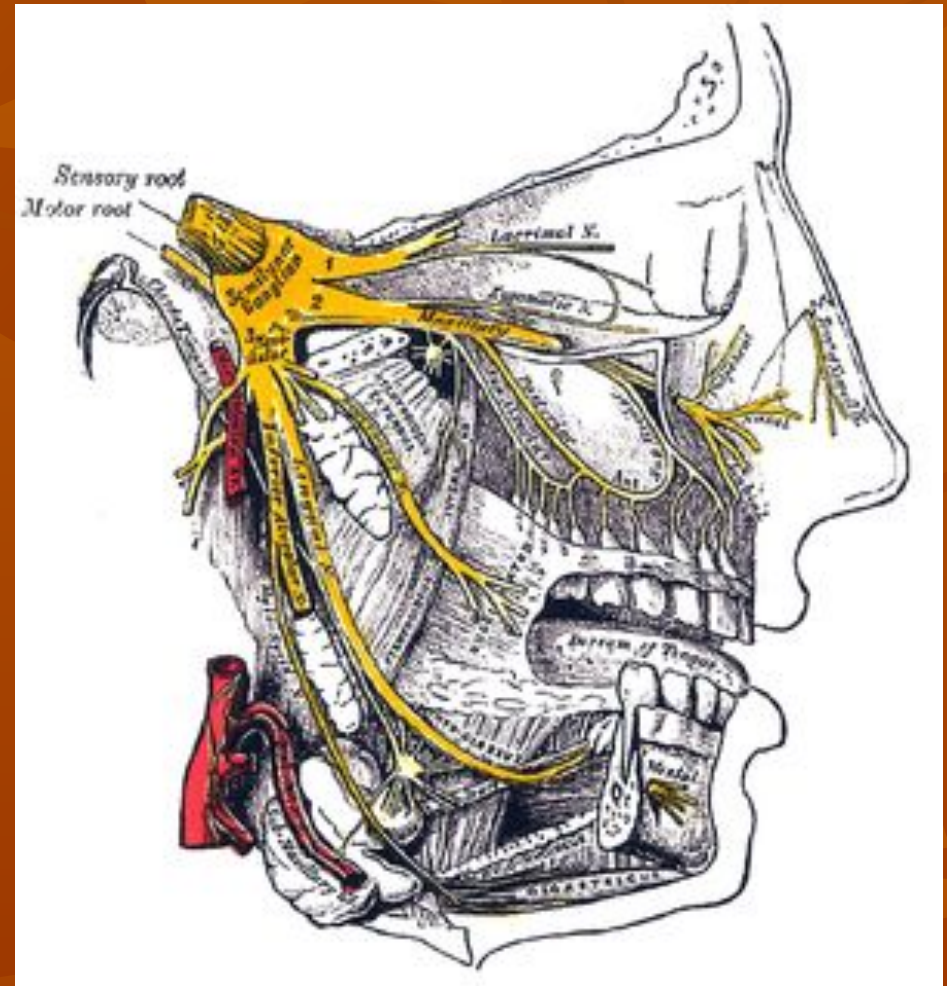
**THE FACIAL  
NERVE**

**GLOSSO-  
PHARYNGEAL NERVE**

**Vagus  
nerve**

# Trifacial nerve

Trigeminal nerve  
(from lat. nervus trigeminus)  
V pair  
of cranial nerves mixed  
character.



Ternary nerve (shown in yellow)

The trigeminal nerve consists of three branches: the upper branch of the orbital nerve (lat. ramus ophthalmicus, V1), the middle branch is the maxillary (Malar) nerve (lat. ramus maxillaris, V2), the lower branch of the mandibular nerve (lat. ramus mandibularis V3).

Branch of the trigeminal nerve carry motor and sensory innervation. Sensory fibers coming from the skin of the face, anterior scalp, mucosa of the nasal and oral cavities, tongue, eyeball, meninges. Motor fibers Innervate muscles of mastication. With the defeat of the sensitive branches of the trigeminal nerve upset skin sensitivity of the person, sometimes with attacks of pain.

Disorder of motor fibers causes paralysis of the masticatory muscles, which dramatically restricts the movement of the lower jaw, impeding mastication and articulation.

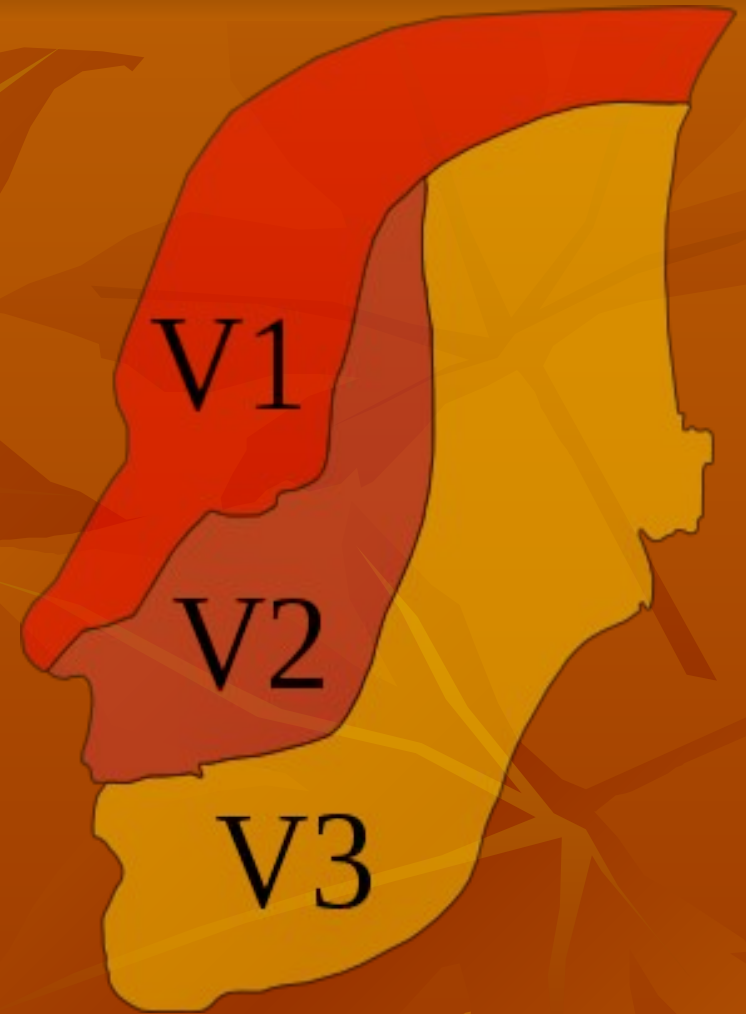


Diagram of the zones of innervation of the trigeminal nerve



# Anatomy

The nerve center of the trigeminal nerve is weakly expressed anatomically, it is located in the lateral reticular formation at the level of the Rostral legs of the cerebellum, dorsal to trapezoidal body.

Motor axons pass through the trigeminal ganglion and the foramen ovale, are connected with the maxillary nerve tract and Innervate the temporal, chewing, medial and lateral pterygoid muscles and the Rostral part of the digastric.

Sensory pathways of the facial parts presented in the three branches. The maxillary branch innervates the nose, the upper jaw; eye branch provides the sensitivity of the eyeball and cornea; and the mandibular branch is the nerve of General sensibility to the temporal region and region of the lower jaw, and motor – to chewing muscles.

Each branch needs to be checked for sensitivity.

# **Pathology**

**Disease affecting the sensory and motor functions of the trigeminal nerve: infectious diseases; injuries; tumors; vascular disease.**

**Neurological deficit is manifested in the decrease in muscle tone and inability to close the mouth. Bilateral trigeminal motor paralysis was observed at rabies and idiopathic neuritis of the trigeminal nerve.**

**Bilateral damage causes paralysis of the muscles of the mouth, resulting in lost the ability to close the mouth. Unilateral damage can lead to decreased tone masticatory muscles, accompanied by atrophy of this muscle group.**

**However, unilateral damage rarely have an impact on eating animals. Sometimes, polyneuropathy can affect the trigeminal nerve, leading to atrophy of the masticatory muscles.**

**The diagnosis can be confirmed by electromyography.**

**However, it should be noted that the most common cause of bilateral atrophy of the masticatory muscles is myositis. In such cases it is necessary to differentiate myositis and neuropathy.**

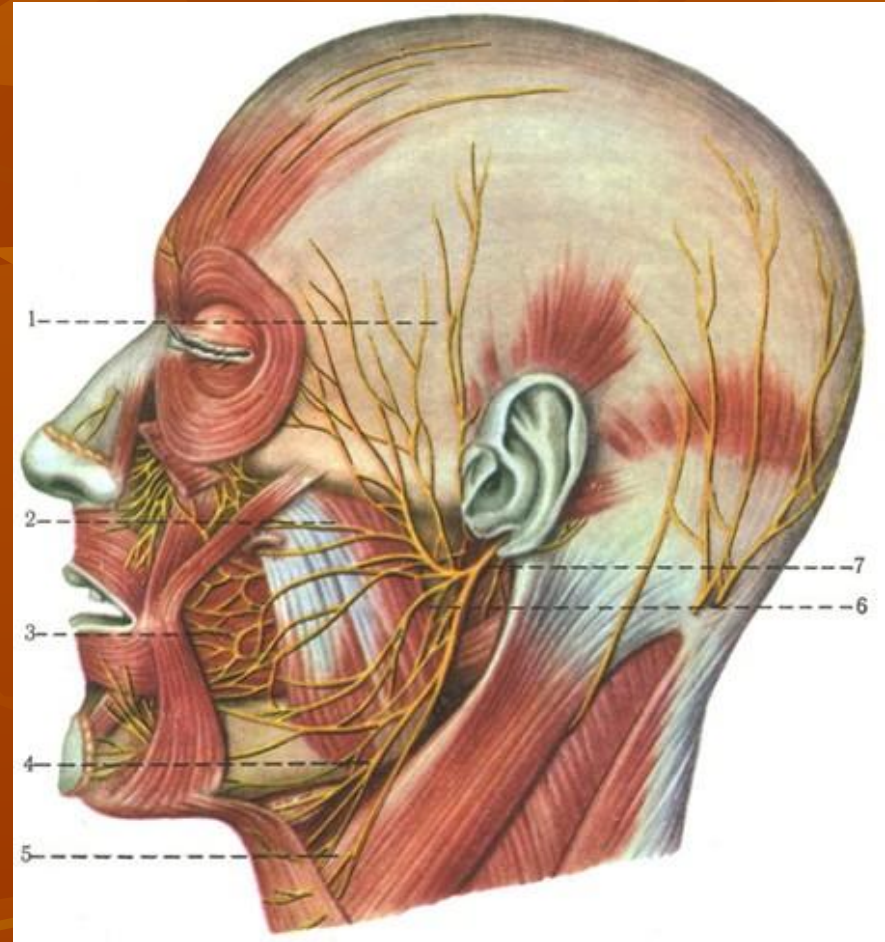
## **Regeneration of the trigeminal nerve**

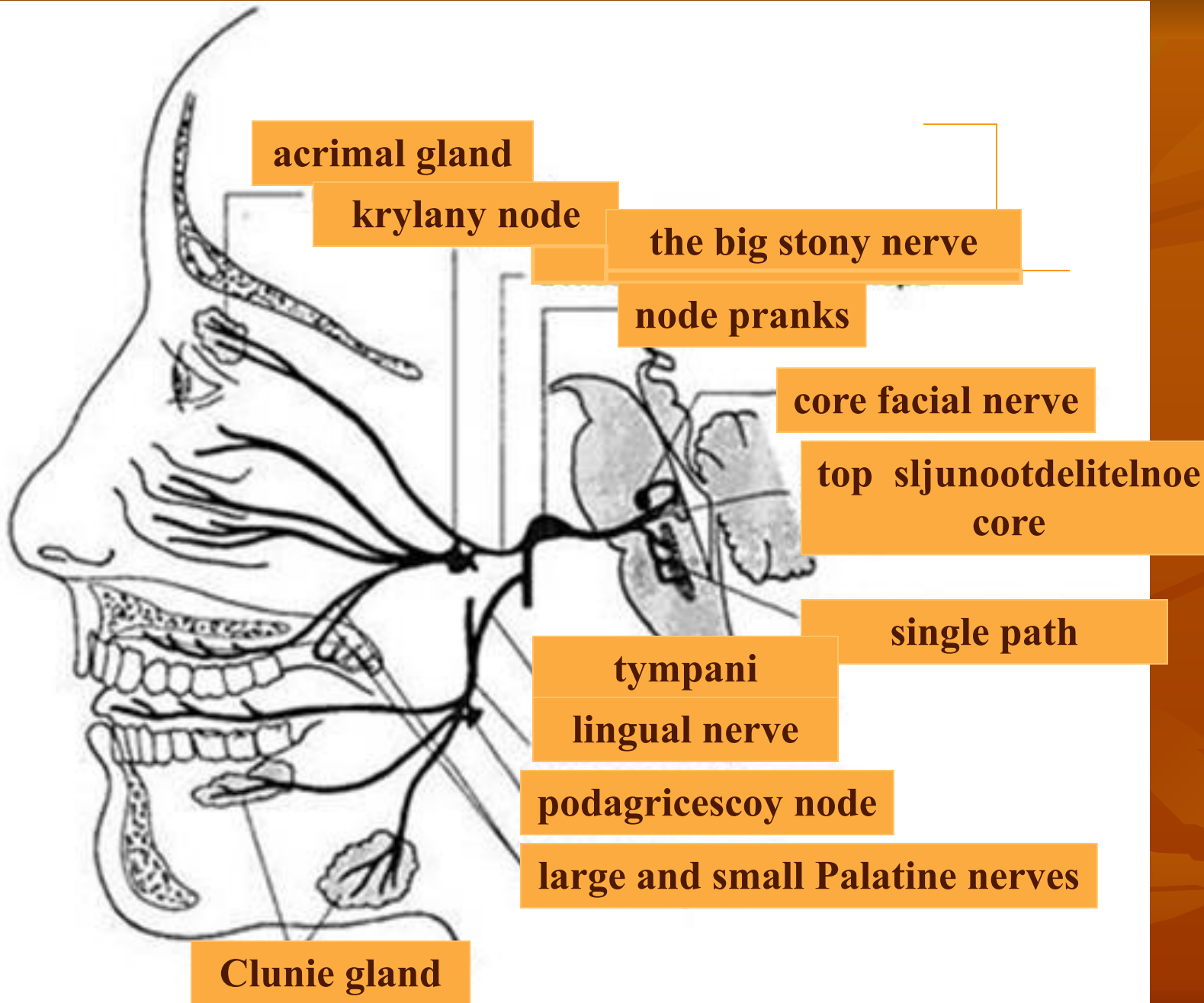


## **Neurology of the trigeminal nerve**

# The facial nerve

The facial nerve enters the temporal bone through the internal auditory hole. Deep in the temporal bone it goes through the facial canal (lat. canalis facialis) and exits via the stylomastoid hole, (lat. foramen stylomastoideum), and then divides into five branches. Despite the fact that the facial nerve runs through parotid gland (lat. glandula parotidea), it does not innervates it. This task is performed by the glossopharyngeal nerve.





# The facial nerve (VII nerve)

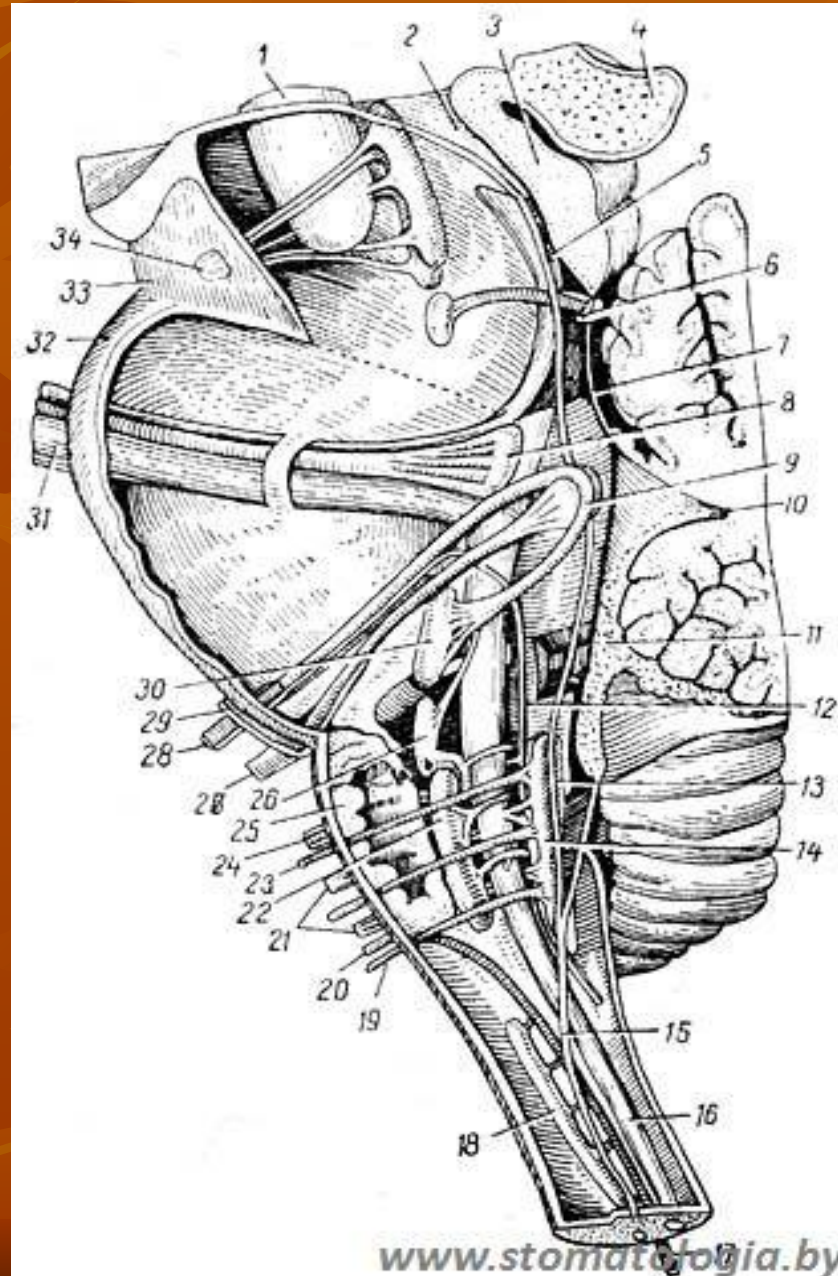
## Anatomy

The facial nerve is a mixed nerve, which unites the two nerve: the facial and intermediate. The nucleus of the facial nerve occur within the boundaries of the bridge of the brain.

After leaving the brain stem in the furrow between the Pons and medulla oblongata, and facial nerve enters the internal auditory meatus and, passing through the facial canal, exits via the stylomastoid hole and Innervate the muscles of the ears, eyelids, nose, cheeks, lips, and the caudal portion of the digastric

## The location of the nuclei of the facial nerve and its root in the brainstem (Browse):

1 red nucleus, 2 — cellview water (cavity of the midbrain), 3 — the lamina quadrigemina, 4 — pineal gland, 5 — srednedushevoj the path of the trigeminal nerve, 6 — trochlear nerve, 7 — bridle front brain sails, 8 — motor trigeminal nucleus, 9 is the knee of the facial nerve (loop n. facialis covering - abducens nerve), 10 — the roof of the IV ventricle or tent, 11 — plexus meninges of the IV ventricle, 12 — the single way, the 13 - gray wing (the nucleus of the vagus nerve), a 14 - hypoglossal nerve, 15 is the Central channel, 16 — spinal path of trigeminal nerve, 17 — accessory nerve, an 18 - accessory nerve, 19 — hypoglossal nerve, 20 — accessory nerve, 21 — vagus nerve, 22—, double -, 23 — hypoglossal nerve, 24 — glossopharyngeal nerve, the 25 — bottom - olive, 26 — sljunootdelitelnoe -, 27 — acoustic nerve 28 facial nerve, 29 — abducens nerve, the 30 - facial nerve, 31 — trigeminal nerve, 32 — varolii bridge, 33 — leg of the cerebellum, 34 — oculomotor nerve



# The divisions of the facial nerve

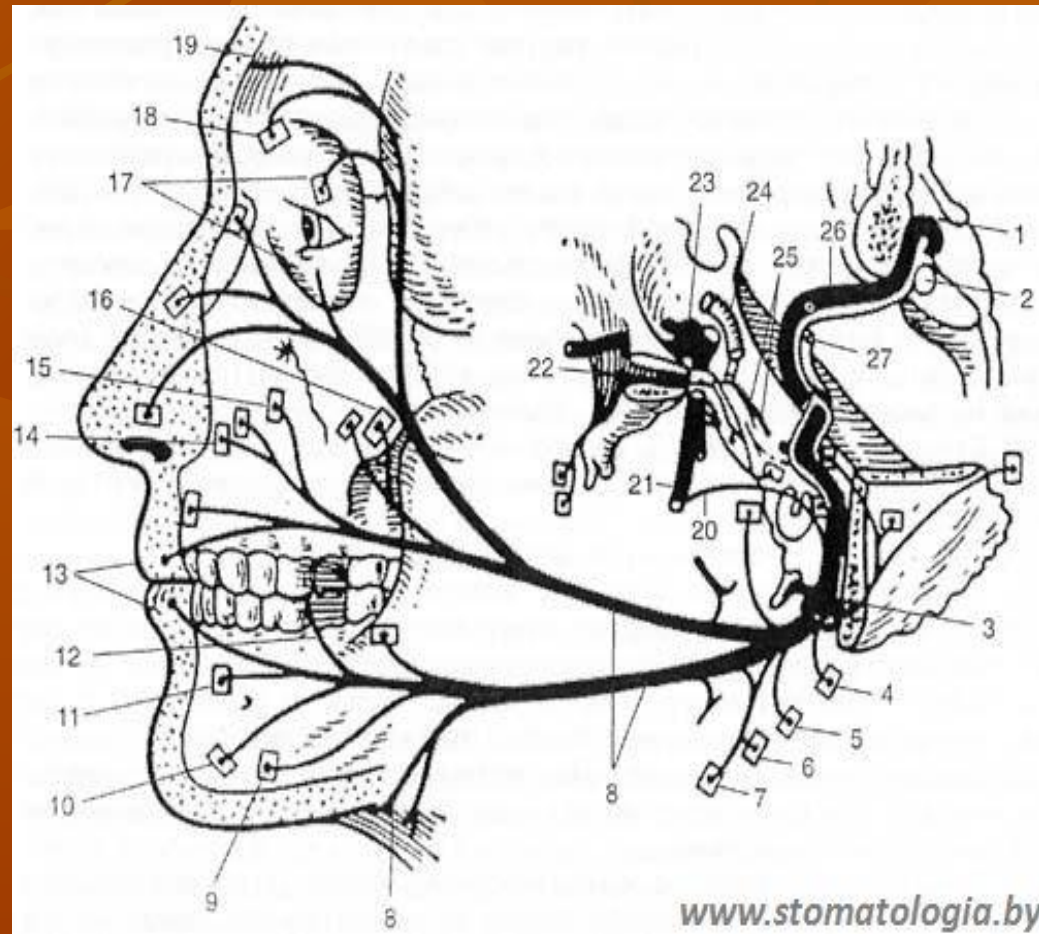
In the facial canal the nerve divides into several branches:

- great stony nerve, which carries parasympathetic fibers to pterygoid-Palatine site;
- it emerges from the channel through the hole on the upper surface of the pyramid;
- drum string the mixed nerve departs from the facial nerve via berrancominas the gap and goes forward and down to the junction with the lingual nerve. The nerve contains the afferent taste fibers from the anterior part of the tongue and sljunootdelitelnye parasympathetic fibers to the sublingual and submandibular salivary glands;
- tremendou nerve - the motor nerve, innervates tremendous muscle of the tympanic cavity.



## Anatomo-topographic diagram of the structure of the facial nerve:

1 — the bottom of the IV ventricle, 2 — nucleus of the facial nerve, 3 — stylomastoid hole, 4 — posterior auricular muscle, 5 — occipital Vienna, 6 — posterior belly digastric, 7 — chilopoda muscle, 8 — branches of the facial nerve to the facial muscles and subcutaneous muscle of the neck, 9 — muscle, lowering the angle of the mouth, 10 — mentalis, 11 — muscle, lowering the lower lip, 12 — buccal muscle, 13 — circular muscle of the mouth, 14, 15 — muscle lifting the upper lip 16 — the zygomatic muscle, 17 — the circular muscle of the eye, 18 muscle, the corrugator supercilium, 19 — frontal muscle, 20 — tympani, 21 — lingual nerve, a 22 — Kralovny node, 23 — trigeminal site, 24 — internal carotid artery, 25 — intermediate nerve, 26 — the facial nerve, a 27 — predverno-cochlear nerve



## Pathology and clinical symptoms

Clinical symptoms depend on the level of the lesion. For example, if the damage is external to the facial canal, there will be signs of paralysis of the facial muscles:

- inability to close the eye gap;
- paresis or paralysis of commissary lip on the affected side;
- impairment of movement of the ear on the damaged side;
- an asymmetric deviation of nasal mirrors to the healthy side, as a result of muscle tone in the nose, not the greeters counter;
- sometimes a small enlargement of the pupil, due to a decrease in tone spherical eye muscle on the affected side. Facial paralysis can be unilateral or bilateral and is not always associated with a lesion of the facial muscles.

# Facial nerve palsy

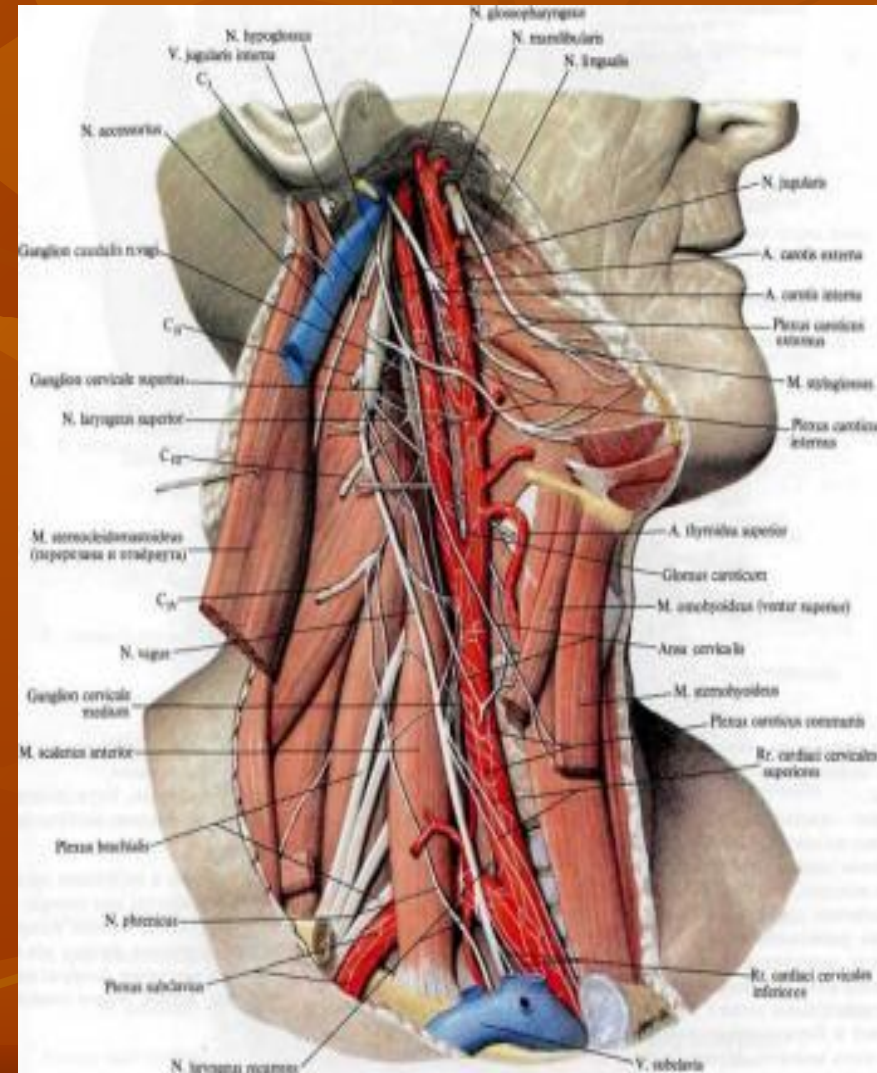


# Diagnostic methods of neurology facial nerve

- Clinical neurological examination
- Instrumental methods
- Electromyography
- Doppler ultrasound with assessment of blood circulation in vertebral-basilar pool
- CT scan of the brain
- MRI of the brain

# Glossopharyngeal nerve

**Glossopharyngeal nerve IX pair of cranial nerves (n. glossopharyngeus) mixed nerve contains motor, sensory and parasympathetic (secretory) fibers, has 4 cores, which are located in the posterior part of the medulla oblongata.**



# Symptoms

Slight unilateral paresis of the soft palate.  
Disorders of swallowing is usually mild.  
The decrease in the secretion of the parotid gland.

A decrease in the sensitivity of the posterior pharyngeal wall and soft palate.  
Loss of taste on the posterior third of the tongue.

Can develop spasm glossopharyngeal muscles of laryngospasm  
Increased salivation.



**With the defeat of motor nuclei of the vagus nerve disturbances of swallowing, phonation, articulation, breathing, and bulbar disorders. They occur in bulbar paralysis, amyotrophic lateral sclerosis, myelo-encephalitis and other diseases.**

# Sensitive cranial nerves

Anatomy of the Chemoreceptors of the nasal mucosa recognize various odors and transmit sensory information aksonam the olfactory nerve, which enters the cranial cavity through the ethmoid bone and enters the olfactory bulb.

## Pathology and clinical symptoms

Damage to the olfactory nerve are rare and difficult to diagnose. The most common cause hyposmia is a chronic rhinitis, which affects the olfactory cells of the nasal mucosa. A tumor of the nasal cavity can also be the reason a weak sense of smell.

Sometimes, the canine distemper virus can destroy as neuroepithelial cells of the olfactory receptors of the nasal mucosa and neurons in the olfactory bulb.





**Thank you for your attention!**