Danylo Halytsky Lviv National Medical University

NEUROLOGY

«Neurodentistry»

METHODICAL RECOMMENDATIONS FOR PRACTICAL CLASSES

for students of IV course of dental faculty of higher medical educational institutions

Lviv – 2020

Methodical recommendations for practical training on the subject «Neurology incl. neurodentistry», section «Neurodentistry» for students of the 4th year of the Faculty of Dentistry, training of specialists of the second (master's) level of higher education: the field of knowledge 22 «Health care» specialty 221 «Dentistry» were prepared by teachers of the Department of Neurology (Danylo Halytsky Lviv National Medical University): prof. T. Nehrych; assoc. prof. Yu. Matvienko, assoc. prof. G. Korol; assoc. prof. N. Malyarska.

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PREFACE

Taking into account the specific features of the current state of professional training and the activation of scientific-information processes, doubling the volume of scientific information, the complexity of the curriculum, increasing the pace of study, practical classes in the department of "Neurostomatology" for students of the IV year of the Faculty of Dentistry are prepared in accordance with the above-mentioned practical requirements to knowledge, skills and abilities needed for future doctors in providing medical care to patients with neurological and neurostomatological disorders.

The main purpose of the course in neurodentitry is to teach students the theoretical basics, skills of examination of neurodental patients, methodology of diagnosis of neurological disease, the choice of treatment tactics and the provision of urgent assistance in emergency situations. Students of the Faculty of Dentistry, who will study the course of neurodentistry, should know the clinical anatomy and physiology of the nervous system and the symptoms of neural lesions at the various levels.

Students must also acquire practical skills in the study of the patient's neurological status; to analyze the data of examination of neurostomatological patients; identify leading symptoms and syndromes in the most common neurological pathology; plan the tactics of managing a dental patient with neurological pathology; to carry out differential diagnostics of diseases in the clinic of neurodentistry; to carry out examination of neurostomatological patients; to make a preliminary clinical diagnosis and diagnosis in urgent conditions in a clinic of nervous diseases; to provide medical help in urgent conditions in the neurological clinic and neurodentistry.

The subject of study of the discipline is the pattern of functioning of the nervous system and features of clinical manifestations of neurostomatological diseases.

Neurology, including neurodentistry as a discipline: a) is based on and integrates the study of medical biology, biological and bioorganic chemistry, histology, physiology and pathological physiology, human anatomy and pathological anatomy; b) is based on the study of the propedeutical disciplines of therapeutic and dental profile, pharmacology, radiology and integrates with these disciplines; c) integrates with other clinical disciplines (internal medicine, dentistry, neurosurgery, oncology, psychiatry, medical genetics etc.).

In accordance with the requirements of the Higher Education Standard, the discipline ensures that students acquire the competencies presented below.

Detailing competencies according to the specific descriptors in the form of the Competence Matrix

№	Competence	Knowledge	Skill	Communication	Autonomy and responsibility
1.	Ability to evaluate data on functional anatomy and clinical physiology of the human nervous system.	Know the anatomy and function of sensitive analyzers, locomotor systems, autonomic system and higher brain functions.	Be able to interpret the data of functional anatomy and clinical physiology of the nervous system.	Use standard approaches to assessing nerve function systems.	Understanding the importance of a careful and correct study of the anatomy and function of the nervous system in future professional activity.
2.	Collection of medical history, medical information about the patient's condition.	Know the algorithm for interviewing a patient with neurological pathology.	Be able to interview and highlight major complaints, evaluate the patient's overall condition.	Comply with the requirements of ethics, bioethics and deontology in their professional activities.	Responsible for the quality of the tasks.
3.	By standard methods to distinguish leading neurological symptoms and syndromes.	Know the main symptoms and syndromes of the lesions of different parts of the nervous system.	Examination skills of patients with motor, sensitive disorders; examination of the cranial nerves, autonomic nervous system, function of the cerebral cortex.	Adhere to the method of neurological examination, appropriate ethical and legal standards.	Feeling responsible for the correctness, clarity and timeliness of diagnosis.
4.	To establish a topical diagnosis of nervous system damage by logical analysis and justification.	Know the leading syndromes of lesions of different levels of the nervous system: sensory, motor, autonomic and cortical syndromes.	Be able to investigate the neurological status of the patient, to identify leading clinical syndromes; to carry out differential diagnostics of levels of defeat of nervous system.	Follow the rules of medical deontology, humane treatment of the patient.	Responsibility for complex clinical, diagnostic tasks and correct diagnosis.

5.	The ability to determine the etiological factors and pathogenetic mechanisms of development of major neurological diseases.	Know the etiology, pathogenesis, pathomorphology of the neural affection.	Be able to list the etiological factors of the disease, to name known mechanisms of pathogenesis of neurological diseases.	Quality tasks, competent and organized actions for timely diagnosis.	Be responsible for the use of modern methodological and scientific achievements.
6.	Evaluation of the results of laboratory and instrumental research.	Know the standard techniques for conducting examinations and laboratory tests in neurological practice.	Be able to analyze the results of laboratory and instrumental studies and on the basis of them to evaluate information on the lesions of the nervous system.	Reasonably to assign and evaluate the results of examinations and laboratory tests.	Be responsible for deciding on the evaluation of laboratory examinations and their results.
7.	By making an informed decision, make the most likely clinical diagnosis.	Know the current classification, clinical picture of diseases of the nervous system, neurological syndromes in diseases of the internal organs.	Be able to supervise the patient, choose a diagnostic algorithm, interpret clinical symptoms, perform differential diagnosis and establish a clinical diagnosis.	Master the skills of making psychological contact with patients and their relatives.	Responsibility for the patient's state of health, for the timely establishment of clinical diagnosis and the provision of medical care.
8.	Diagnosis of urgent conditions	Have specialized knowledge of emergency diagnostics in neurology.	Diagnose urgent conditions according to the standard scheme.	Determine the tactics of emergency medical care according to the algorithm.	Be responsible for the development of professional knowledge and skills.
9.	Defining tactics and providing emergency medical care.	Know the methods of evaluating performance indicators.	Be able to provide the necessary assistance according to the standard.	Reasonably to carry out assistance procedures and to evaluate the results of medical procedures.	Be responsible for the development of professional knowledge and skills.

10.	Keeping medical records	Know the rules and standards of medical records. To know the basic types of medical documentation concerning the patient and the contingent of the population (card of ambulatory, inpatient patient, medical history, health resort card, official accounting documents).	Be able to complete and maintain medical records on the patient and the contingent of the population, using standard technology, based on regulatory documents.	Use standard approaches to medical records. Establish interpersonal links for efficient medical records.	Be responsible for the correctness of keeping medical records Responsible for the quality of the completion and maintenance of medical records.
11.	Processing of state, social and medical information.	Know the methods of processing state, social, medical information.	Be able to analyze and evaluate state, social, medical information.	Use standard approaches to assessing information, use computer information technology.	Responsible for processing state, social, medical information.

Learning outcomes for the discipline: to identify and spesify leading clinical symptoms and syndromes; by standard methods, using preliminary data of the patient's anamnesis, patient's examination data, knowledge about the person, his organs and systems, to establish a probable syndromic preliminary clinical diagnosis. Collection of information about the patient's general condition, evaluation the diagnostic information based on laboratory and instrumental findings.

REGULATORY CONTENTS OF PREPARATION FORMED IN TERMS OF TRAINING RESULTS

Competence	Results of study	General results of study according to specific requirements
3K1	3P1	Ability to analyze and synthesize, apply deep structural professional knowledge in practice, solve tasks.
3K2	3P2	Knowledge and understanding of the subject area of professional activity.
3K3	3P3	Ability to choose communication strategy; ability to work in a team; interpersonal skills.
3K4	3P4	Ability to communicate in their mother tongue, both orally and in writing; ability to speak a second language.
3K5	3P5	Information and communication technology skills.
3K6	3P6	Ability for abstract thinking, analysis and synthesis, ability to learn.
3K7	3P7	Ability to evaluate and ensure the quality of work performed.
3K8	3P8	Assertiveness and persistence in terms of tasks and responsibilities.
Competence	Results of study	Special (professional, subject) learning outcomes
CK1	CP1	Ability to evaluate data on functional anatomy and clinical physiology of the human nervous system. Improvement of knowledge about peculiarities of structure and functioning of different parts of nervous system. Knowledge of the anatomy and function of sensitive analyzers, locomotor systems, autonomic system and higher brain functions.
CK2	CP2	Collection of medical history, medical information about the patient's condition. Knowledge of the algorithm for interviewing a patient with a patient's neurostomatological pathology. Be able to interview and highlight major complaints, evaluate the overall condition of the patient. Ability to summarize information regarding the manifestations of nervous system pathology, subclinical signs of the disease

CK3	CP3	By standard methods to distinguish leading neurological symptoms and syndromes. To know the main symptoms and syndromes of lesions of different parts of the nervous system. Examination skills of patients with motor, sensitive disorders; examination of cranial nerves, autonomic nervous system, functions of cerebral cortex.
CK4	CP4	To establish a topical diagnosis of nervous system affectiom by logical analysis and justification. Know the leading syndromes of lesions of different levels of the nervous system: sensitive, motor, autonomic and cortical syndromes. Be able to investigate the patient's neurological status, identify leading clinical syndromes; to carry out differential diagnostics of levels of nervous system's affection.
CK5	CP5	The ability to determine the etiological factors and pathogenetic mechanisms of development of major neurological diseases. Knowledge of the etiology, pathogenesis, clinical manifestations of diseases of the peripheral nervous system, including neurostomatological diseases of the maxillofacial system, vascular diseases of the nervous system, infectious and infectious-allergic lesions of the nervous system, diseases of the autonomic nervous system.
CK6	CP6	Evaluation of laboratory and instrumental research results. Ability to interpret the results of functional methods of diagnostics, laboratory and instrumental studies, methods of neuroimaging (radiography, computed tomography, magnetic resonance imaging), ultrasound, electrophysiological research (electroencephalography, electroneuromyography), immunological studies of CSF.
CK7	CP7	By making an informed decision, make the most likely clinical diagnosis. Be able to examine patients with neurological and neurodental pathology. Know the clinical manifestations of nervous system diseases. Ability to carry out diagnostics, differential diagnostics of diseases in clinic of neurodentistry.
CK8	CP8	Diagnosis of emergency conditions. Ability to diagnose urgent conditions in neurodentistry. Study of meningeal symptoms. Assessing the degree of consciousness according to the Glasgow coma scale.
CK9	CP9	The ability to determine the tactics of emergency medical care. Emergency care skills for neurological and neurostomatological patients. Ability to prescribe modern treatment regimens, knowledge of intensive care and resuscitation of neurological patients. Surgical methods of treatment of neurostomatological patients.
CK10	CP10	Keeping medical records. Know the rules and standards of medical records. Know the basic types of medical records regarding the patient and general population (outpatients card, medical case history, etc.).
CK11	CP11	Processing of state, social and medical information. Use standard approaches to assessing information, use computer information technology.

TOPIC 1: HEADACHE

Actuality of the topic

Headache is the most common complaint of patients in medical practice. This is one of the most serious problems of medicine. It is believed that the quality of life of patients with chronic headache can be compared with the standard of living of patients with diabetes or myocardial infarction. Headache can be major and sometimes the only complaint is more than 45 different diseases.

Diagnosis of primary and secondary cephalgia is of fundamental importance for the treatment tactics, prevention of painful paroxysm and reduction of its intensity. In addition to general somatic and neurological examination, additional methods of examination (CT, MRI, fundoscopy, vascular ultrasound) should be widely used for the diagnosis of headaches and their nature.

The treatment of cephalgias is aimed at achieving the following main objectives:

1. reduction of symptoms of the disease, i.e. the intensity of headaches;
2. reducing the degree of loss of physical and mental capacity;
3. improving the quality of life of the patient.

Standard approaches to treatment should be avoided, and individualization of treatment should be sought, taking into account the psychological characteristics of the patient and his or her attitude to the disease. The necessary conditions for the effectiveness of treatment are constant observation, individual approach, evaluation of treatment results with the necessary therapeutic correction.

Now there is a whole group of headaches that are caused by long-term administration of some medicines (ergotamines, barbiturates, benzodiazepines). Such pain is called abusive and it requires correction of treatment.

Therefore, the diagnosis and treatment of headaches is an important general medical, socio-economic problem that requires a thorough integrated approach, taking into account not only the medical aspects, but also the lifestyle and work of the patient, social factors.

The future doctor is obliged to detect the presence of headaches, to recognize their nature, because the timely diagnosis determines the pro-

vision of therapeutic assistance, including urgent, since cephalgias are faced not only by neurologists, but also by doctors of other specialties including dentists.

Special competences and learning outcomes:

- Ability to evaluate morphofunctional dataof the peripheral part of the nociceptive system in the area of the head and face.
- Use standard diagnostic approaches and criteria for understanding of pathophysiological mechanisms of the main clinical symptoms in headache and insomnia. To know the current classification of headache and insomnia.
- To know the algorithm of interviewing the patient during the examination: with primary headache (migraine, cluster headache, tension headache); with secondary headache; with neuropathy, facial pain and other headaches.
- To know the characteristics of the intensity of headache, unilateral or bilateral localization of pain, pulsating nature of pain, pressing, bursting character, migraine with aura, migraine without aura, cluster headache; tension headache, the presence of at least one of the following symptoms: nausea, vomiting, photo- and phonophobia.
- To be able to identify comorbid to headache mental disorders, depression, anxiety, fears, rhinitis, sinusitis, epilepsy. To be able to diagnose migraine status, migraine stroke.
- To know and to be able to apply emergency medical care to patients with migraine attacks with tryptans, ergotamine derivatives, NSAIDs, combination of drugs.

Structural and logical scheme of lesson

System of formation of pain and protection against it	
Nociceptive	Antinociceptive
Nociceptors	Nerve structures of the brainstem secreting opioid peptides
Afferent fibers types A and C of peripheral, trigeminal and vagus nerves	Serotonergic neurons of the brainstem
The posterior roots of the spinal cord, the roots of the trigeminal and vagus nerves	Downregulating system of reticular nuclei of the brainstem
Central nociceptive apparatus (thalamus, hypothalamus, limbic-reticular complex, postcentral cortex and parietal lobe)	Noradrenergic system of brainstem

Causes of headaches	
Independent pathological forms of headache	Migraine
	Cluster headache
	Tension headache
	Abusive headache
The main factors contributing to the onset of symptomatic headache	Traumatic brain injury
	Diseases of the cardiovascular system
	Intracranial processes of non-vascular nature (increase or decrease of intracranial pressure, occlusion and hydrocephalus)
	Infections (meningitis, encephalitis, cranial osteomyelitis, extracerebral infectious diseases)
	Metabolic disorders (hypoxia, hypercapnia, etc.)
	Endocrine disorders
	Diseases of the eyes, ears, paranasal sinuses, temporomandibular joint
	Damage to the cranial nerves (neuralgia of V, IX CNs)
	Intoxication and intake of various chemicals, drugs (alcohol, carbon monoxide, caffeine, vasodilators), uncontrolled use of tryptane analgesics
	Headaches unrelated to structural lesions, that disappear after termination of the causal factor (cough headache, post-coital headache etc)

Classification of migraine and its complications	
Migraine without aura (common)	
Migraine with aura (classical)	Ophthalmic (classic), ophthalmoplegic, familiar hemiplegic, retinal, basilar, migraineous aura without pain
Complications of migraine	Migraineous status, migraineous stroke

Diagnostic criteria for migraine
Unilateral localization of headache
The throbbing nature of the pain
Intensity of pain that reduces the physical activity of the patient and increases in the case of monotonous physical work and walking
The presence of at least one of the following symptoms: nausea, vomiting, phobia of light and sound
Duration of attack from 4 to 72 hours
At least 5 attacks in history
For migraines with an aura, additional signs are:
The duration of aura symptoms is not more than 60 minutes.
The complete reversibility of one or more symptoms of aura
The duration of the light interval between the aura and the onset of headache is less than 60 minutes.

Migraine treatment		
Migraine Attack	Migraine Status	Preventive
Acetylsalicylic acid and its derivatives in combination with caffeine	Seduxen intravenously, melipramine, lasix	Serotonin Antagonists (Sandomigrane)
Selective serotonin agonists (sumatriptan)	Euphilin intravenously	Beta-blockers (anaprilin)
Preparations of ergotamine	Prednisolone intravenously	Calcium channel blockers (Verapamil)
Nonsteroidal anti-inflammatory drugs	Antihistamines	Antidepressants, anticonvulsants (topiramate)
		Physical therapy

Types of headache (by pathogenetic mechanisms)	
Vascular	Hypotonic, angiospastic, venous (in case of arterial hypertension, cerebral atherosclerosis, vegetative-vascular dystonia, migraines, cluster headache)
Liquidodynamic	In case of increase or decrease of intracranial pressure (tumors and other space-occopying processes of the brain and meninges, brain edema, hydrocephalus)
Neuralgic	In case of irritation of the glossopharyngeal, trigeminal and occipital nerves
Psychological	In the presence of neuroses, latent depression
Muscular	In chronic stress, diseases of the cervical spine
Mixed	

Control tests

1. A 20-year-old female undergraduate student presents complaining of a gradual onset of right-sided headache. The headache is accompanied by nausea and photophobia and prevents her from studying for exams. Which of the following is least likely to be associated with her headache?

A. Aura
B) Birth control pills
C) Family history of similar headaches
D) Menstruation
*E) Unilateral tearing with conjunctival injection

2. What is your best approach to realize prophylactic treatment of cluster headache?

A) Sumatriptan
*B) Prednisone

C) Obtain MRI scan of the head with gadolinium contrast and then make decision
D) Carvedilol
E) Refer for neuropsychiatric testing

3. A 24-year-old woman has a 2-year history of recurrent right-sided headaches that are throbbing in nature and are preceded by 30 min of scintillating scotomas and fortifications. Describe the most likely kind of headache.

A) Complicated migraine
B) Basilar migraine
*C) Classic migraine
D) Common migraine
E) Sinusitis

4. What is the best step in the emergency management of the headaches that resemble common migraine and not respond to over-the-counter pain-killers?

A) Topiramate
*B) An oral sumatriptan
C) Combination acetaminophen / hydrocodone
D) Long acting propranolol
E) Gabapentin

5. A 42-year-old executive complains of a bandlike tightness across the temples and neck, worse in the afternoon, usually relieved by aspirin or acetaminophen. Neurological examination is normal. Match the clinical description with the most likely disease process.

*A) Tension headache
B) Cluster headache
C) Migraine headache
D) Temporal arteritis
E) Brain tumor

6. Which is likely to be true concerning cluster headache?

*A) The patient is a cigarette smoker
B) Menstrual periods affect the attack
C) The patient would feel better if she sought a quiet, cool, dark room
D) Physical therapy would be of benefit

E) Antidepressants are likely to be helpful

7. What is the cause of pain in a tension headache?

A) insufficient blood supply to brain;
B) increased intracranial pressure;
C) vascular spasm of extracranial vessels;
D) vascular spasm of intracranial vessels;
*E) sustained cranial muscles' contraction.

8. What are the best drugs for a tension headache attack?

A) common analgetics;
B) NSAIDs;
C) muscular relaxants;
*D) all mentioned above is suitable;
E) nothing of mentioned above is suitable.

9. What other symptoms among those listed are often observed in migraine besides headache?

A) tachycardia and heartache;
*B) nausea and vomiting;
C) vertigo and syncope;
D) polyuria and urinary incontinence;
E) confusion and agitation.

10. What classes of drugs are the best for prevention of migraine attacks?

A) beta-blockers and calcium channel blockers;
B) anticonvulsants and antidepressants;
C) antipsychotics and lithium carbonate;
*D) items A and B;
E) items B and C.

Clinical cases for self-control of knowledge

1. Patient M. came to the reception of a neurologist with complaints of throbbing pain in half of the head, lasting up to two days, accompanied by nausea, tinnitus, dizziness, and exacerbated by load. Duration of attacks is up to 72 hours. There were 2-3 attacks per six months. Similar attacks were observed in the mother and grandmother. During neurological examination, focal neurological

symptoms were not detected. Additional tests data are unchanged. What is the form of migraine in this patient? A) basilar B) retinal C) hemiplegic D) abdominal E) chronic	A
2. Patient O. came to the reception of the neurologist with complaints of throbbing pain in half of the head, lasting up to 72 hours, accompanied by nausea, photophobia and increased with strain. During neurological examination, focal neurological symptoms were not detected. EEG, MRI – normal. Atttacks bother the patient 5-6 times a month. Which of the drugs would be the most appropriate for migraine prevention? A) ibuprofen B) sumatriptan C) topiramate D) aspirin E) valerian	C
3. Patient M. came to the neurologist with complaints of throbbing pain in half of the head, lasting up to two days, accompanied by nausea, photophobia and aggravated by strain. The doctor diagnosed a migraine. What is the most informative way to diagnose this condition? A) medical history and neurological examination B) brain CT or MRI C) ReoEG, Echo-EG D) ENMG, EEG E) spinal tap	A

Control questions for self-study on the topic of the lesson

1. Classification of headache.
2. Migraines. Pathogenesis. Signs. Diagnosis. Treatment.
3. Tension headache. Pathogenesis. Signs. Diagnosis. Treatment.
4. Diagnostic tactics for the first-time sudden severe headache.
5. Headache due to excessive consumption of medicines.

6. Secondary headache.
7. Cluster headache. Clinical picture. Diagnosis. Treatment.
8. Diagnostic and therapeutic tactics for patients with headache.
9. Complications of migraine.

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TOPIC 2: PATHOLOGY OF THE AUTONOMIC NERVOUS SYSTEM

Actuality of Topic

Vegetology is an important part of neurology and, at the same time, an interdisciplinary problem. On the basis of anatomical and functional data, it is customary to divide the nervous system into a somatic one, which is responsible for the organism's connection with the external environment, and a vegetative (autonomic) one that regulates the physiological processes of the internal environment, ensuring its constancy and adequate reactions to the influence of the external factors. It innervates not only the internal organs but also the sensory organs and the muscular system. The trophotropic function is aimed at supporting the physicochemical, biochemical, enzymatic, humorous and other constants of the internal environment of the organism, and the ergotropic – at the vegetative-metabolic provision of various forms of adaptive purposeful behavior (mental and physical activity, motivations of fear and aggression, adaptation to changing environmental conditions). Clinical symptoms of autonomic dysfunction are among the most common symptoms in medical (including dental) practice.

Special competences and learning outcomes

Ability to evaluate functioning of ANS

- To know:

1) anatomical and functional features of the ANS;

2) the structure of segmental and supra-segmental levels of ANS;

3) to know the technique of ANS examination;

4) to know the normal state of the ANS and its possible changes in various pathologies;

5) to know the clinical picture of changes in functioning in different pathological conditions related to ANS.

- To be able:

1) analyze the anatomical and functional features of the ANS;

2) to evaluate the structure of ANS;

3) to analyze the normal state of the ANS and possible changes in various pathologies.

- To use standard communication approaches in the course of examination and evaluation of data of ANS functioning.

- Understanding the importance of carefully and correctly studying the data of ANS in future professional activity.

Structural and logical scheme of the topic

Levels of autonomic organization		
Suprasegmental: hypothalamus, reticular formation, amogdala, limbic system, thalamo-limbic-reticular complex	**Segmental sympathetic part**: neurons of the lateral horns (C8 – L2 segments)	**Segmental parasympathetic part**: nuclei of III, XIII, IX, X cranial nerves; sacral part: lateral horns of S3-S5 segments

DISORDERS OF DIFFERENT LEVELS OF THE AUTONOMIC NERVOUS SYSTEM		
Functional disorders of the suprasegmental part of the autonomic nervous system		
Paroxysmal states	Permanent disorders	
Sympathoadrenal and vagoinsular crises	Vasomotor, neuroendocrine, vegetative-vascular, neurodystrophic, neuromuscular, disorders of homeostasis and thermoregulation	Sleep and wakefulness disorders memory impairment disturbance of emotions temporal lobe epilepsy
Functional disorders of the sympathetic part of the autonomic nervous system		
trophic disorders of skin, nails, hair, osteoarthropathies	lateral horns (C8-Th1) – ptosis, miosis, enophthalmos	

Functional disorders of the parasympathetic part of the autonomic nervous system			
III pair: exophthalmos, mydriasis, widening of the ocular fissure	X pair: vasomotor, secretory, cardiac disorders	VII, IX pairs: taste, lacrimation, salivation, cardiac disorders	Sacral centers: disorders of urination and bowel movements

METHODS OF FUNCTIONAL RESEARCH OF THE AUTONOMIC NERVOUS SYSTEM		
Clinical tests: reflexes (oculocardial, clinostatic, orthostatic, pilomotor), dermographism, cold test	Drug tests: aspirin, pilocarpine, adrenaline, atropine tests	Instrumental tests: thermoregulation studies, capillaroscopy, plethysmography, rheography, electroencephalography, electrocardiography

Control tests

1. What is the basic neuromediator of the sympathetic nervous system?

*A) norepinephrine;
B) serotonin;
C) dopamine;
D) GABA;
E) epinephrine.

2. What is the basic neuromediator of the parasympathetic nervous system?

A) epinephrine;
B) histamine;
*C) acetylcholine;
D) serotonin;
E) substance P.

3. Where is the sympathetic part of the ANS located?

A) cervical segments C2-C7;
B) medulla and pons;
C) pons and midbrain;
*D) spinal segments C8-L2;
E) sacral spinal segments.

4. Which of the following is elicited by activation of the sympathetic part of ANS?

A) polyuria;
*B) dilation of the pupils;
C) diarrhea;

D) anosmia;
E) bradycardia.

5. Which of the following is elicited by activation of the parasympathetic part of ANS?

A) hypertensive crisis;
B) oliguria;
*C) bronchial spasm;
D) anxiety;
E) sexual frigidity.

6. What areas constitute parasympathetic ANS?

A) thalamic and hypothalamic;
B) cervical and thoracic;
C) subcortical and cortical;
D) sacral and coccygeal;
*E) cranial and sacral.

7. Cranial portion of the parasympathetic ANS is concerned with which cranial nerves among the following?

*A) 3, 7, 9, 10;
B) 1, 3, 5, 12;
C) 9, 10, 11, 12;
D) 6, 7, 9, 11;
E) 1, 2, 8, 12.

8. In which spinal segments is the sacral portion of the parasympathetic ANS located?

*A) S3-S5;
B) S1-S2;
C) S2-S3;
D) S4-S5;
E) S1-S5.

9. Which of the following is innervated from the sacral portion of the parasympathetic ANS?

A) renal capsules;
*B) rectum;
C) renal calices;
D) adrenals;
E) skeletal muscles of the pelvic floor.

10. What belongs to the suprasegmental parts of ANS among the neural structures mentioned below?

A) caudate nucleus;
B) amygdala;
*C) hypothalamus;
D) corpus callosum;
E) internal capsule.

Clinical cases for self-control of knowledge

1. Patient C, 35 years old, who has been suffering from multiple sclerosis for ten years, experiences dizziness, increased weakness in the left lower extremity, becomes concerned about frequent urination - he wakes up every two hours at night and visits the toilet. Objectively: BP - 130/85 mm Hg, pulse rate - 80 beats/min. Heart tones are somewhat weakened. Vesicular respiration. Neurological status - consciousness is preserved, emotionally labile. Asymmetry of nasolabial folds, slight deviation of the tongue to the left. Muscle strength is reduced in the lower extremities, muscle tone is increased there. The tendon reflexes on the hands are reduced, at the lower extremities – brisk knee jerks, polykinetic Achilles reflexes. Abdominal reflexes are not elicited. Hypotrophy of the tibial muscles. Conductive type of sensitivity disorders from the level of the inguinal fold on the left leg. Pathological Babinsky's and Chaddock from both feet. What is the type of urinary disorder patient has? A) urinary retention B) involuntary emptying of the bladder C) periodic urinary incontinence D) urgent urge for urination E) paradoxical incontinence	D
2. Grade 10 student periodically began to miss classes at school because of poor health. She complaints of frequent headache, the intensity of the pain intensifies in the afternoon, mainly after training in school and the basketball games. She worried about dizziness, general weakness, reduced memory, sleep disorders, increased sweating, palpitations. Careful study of somatic and neurological statuses was performed, heredity is not burdened. Pallor of the skin, general and local hyperhidrosis mainly in the distal extremities. Breathing is rhythmic – 20/min, BP - 115/60 mm Hg. Pulse instability - 84-90 beats/min.	

Heart tones are rhythmic. Vesicular respiration. The abdomen is soft, not painful on palpation. In neurological status – focal pathology was not detected. What is the leading pathological syndrome: A) transient ischemic attacks B) vegetative-vascular dystonia C) panic attacks D) absences E) drop attacks	B
3. Patient M., 54 years old, who has diabetes mellitus, type II, experienced pain, weakness in the legs, mainly in the lower legs and feet, feeling of constipation, tingling, burning in soles, frequent cramping in the toes and calf muscles, inability to walk long distances due to sharp pain in the calf, which causes frequent stops. At night the pain intensifies. Consciousness is clear. Cranial nerves – reduced visual acuity, slight asymmetry of nasolabial folds. Movements are restricted in the lower extremities. Muscle strength is reduced in the feet and toes. The tendon reflexes on the upper extremities are elicited, identical on both sides, on the lower ones – reduced knee reflexes, the Achilles ones are not elicited. Hypesthesia in the area of the legs and feet. In the same areas, the skin temperature is lowered – cold sensation on the touch; cyanosis, edema, hyperkeratosis of the sole, deformation of the nails on the toes. Identify trophic disorders on the feet. A) paleness, cyanosis of soles B) severe pain, tingling C) hyperkeratosis of soles D) hypoesthesia of the legs and feet E) a positive cold test	C

CONTROL QUESTIONS ON THE TOPIC

1. Anatomical and physiological features and functions of the autonomic nervous system.

2. The segmental part of the autonomic nervous system. Sympathetic and parasympathetic nervous systems.

3. Supra-segmental part of vegetative functions. Ergotropic and trophotropic activity.

4. Methods of research of vegetative functions. Syndromes of affection of the supra-segmental part of the autonomic nervous system. Vegetative dystonia syndrome.

5. Psycho-vegetative syndrome. Permanent and paroxysmal course (panic attacks, neurogenic hyperventilation syndrome).

6. Hypothalamic syndrome.

7. Segmental lesions of the segmental autonomic nervous system.

8. Complex regional pain syndrome.

9. Horner's syndrome.

10. Levels of regulation of pelvic functions and their disorders.

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TOPIC 3: TRIGEMINAL, FACIAL AND VESTIBULO-COCHLEAR CRANIAL NERVES AND SIGNS OF THEIR LESIONS

Actuality of the topic

The study of the function of V, VII and VIII cranial nerves and identification of symptoms of their affection makes it possible to conduct a topical diagnosis of diseases of the nervous system. Symptoms of the sensory cranial nerves involvement are often the first and only symptoms in some neurological diseases: abscesses and tumors of the brain, multiple sclerosis, head trauma, spinal tuberculosis, arachnoiditis, encephalitis.

Symptomatic lesions of this group of cranial nerves are observed not only in neurological diseases, but also in neurosurgical, diseases of the ear, throat and nose, in ophthalmic, dental, somatic and infectious diseases. Therefore, knowledge of topical diagnostics of this group of cranial nerves helps in the diagnosis of diseases not only by neurologists, but also by specialists of other specialties including dentists.

Special competences and learning outcomes

Ability to evaluate functional anatomy and clinical physiology of the 5, 7, 8 cranial nerves.

- To know: the structure of special sensory analyzers and their projections to other parts of CNS as well as anatomy of facial innervation.
- To be able to interpret functional anatomy and clinical physiology data of the special senses and trigeminal nerve.

To know the basic symptoms and syndromes of affection of the cranial nerves 5, 7, 8.

To be able to investigate hearing, vestibular function, sensory and motor innervation of face.

- Follow the rules of medical deontology, humane treatment of the patient.
- Understanding the importance of a thorough and correct study of the anatomy and function of the sensory cranial nerves and facial nerve in future professional activity. Adhere to the method of neurological examination, appropriate ethical and legal standards.

Structural and logical scheme of the topic

Nerves	Signs of lesion	Examination
Trigeminal	Pain, anesthesia, paresthesias, areflexia, chewing muscle paresis	Sensitivity, pain points, reflexes, chewing muscle tension, mandibular movements, trophics
Auditory	Tinnitus, anacusia, hypoacusia	Auditory acuity, Rinne's and Weber's tests
Vestibular	Dizziness, vomiting, nystagmus, ataxia	Nystagmus, Romberg test, coordination, gait, rotation tests

Pathology of the facial nerve system	
Symptoms of corticonuclear pathway damage	Heterolateral central paralysis of facial muscles (the lower face is affected), often is combined with central paralysis of the muscles of the tongue and extremities.
	Heterolaterally – local motor epilepsy (irritation of the cortex of the precentral gyrus).

Symptoms of damage to the nucleomuscular pathway	Ipsilaterally – peripheral paresis of mimic muscles of the entire facial half
Symptoms of a lesion at the level of the pons in the area of the VII nerve nucleus	Ipsilaterally – hemispasm (due to irritation of the nucleus)
	Millard–Gubler syndrome
Symptoms of lesions in the temporal bone	Ipsilaterally – peripheral paresis of facial muscles
	Change of lacrimation
	Hyperacusia
	Taste disorders on the anterior 2/3 of the tongue
Symptoms of lesions at the level of the pontocerebellar angle	Homolaterally – peripheral paresis of facial muscles
	Horizontal nystagmus
	Vestibular ataxia
	Hyperacusia
	Facial pain
	Convergent strabismus

Control tests

1. Through which foramen of the cranial base does the ophthalmic branch of trigeminal nerve leave the cranial cavity?

*A) fissura orbitalis superior;
B) fissura orbitalis inferior;
C) foramen rotundum;
D) foramen ovale;
E) foramen jugulare.

2. What branch of the trigeminal nerve assumes double (motor and sensory) function?

A) maxillary;
B) ophthalmic;
C) ophthalmic and maxillary;
*D) mandibular;
E) ophthalmic and mandibular.

3. What sensory symptoms are we going to see in a patient due to the unilateral damage of the trigeminal gasserian ganglion?

*A) ipsilateral herpetic rash + facial anesthesia;
B) contralateral anesthesia + ipsilateral rash;
C) ipsilateral anesthesia according to Solder's zones;
D) contralateral anesthesia according to Solder's zones;
E) bilateral herpetic rash.

4. Appearance of the sensory deficit according to Solder's zones testifies to the affection of what structure within the trigeminal nerve's system?

A) mesencephalic nucleus;
*B) spinal nucleus;
C) principal sensory nucleus;
D) gasserian ganglion;
E) items C and D.

5. Where is the auditory cortex located?

*A) temporal lobe;
B) parietal lobe;
C) frontal lobe;
D) occipital lobe;
E) items C and D.

6. Due to the destruction of the left auditory cortex by a tumor where are we going to see hearing loss?

A) contralaterally;
*B) nowhere;
C) ipsilaterally;
D) bilaterally;
E) bilaterally with ipsilateral domination.

7. Which among the symptoms listed below is not observed due to the affection of the vestibular portion of the 8th nerve?

A) vertigo;
B) nausea;
C) nystagmus;
*D) ataxia aggravated with closed eyes;
E) vomiting.

8. What are the basic functions of the facial nerve?

A) motor;
B) sensory;
C) autonomic;
*D) everything listed above;
E) nothing listed above.

9. What is the number of intracranial and extracranial branches of the facial nerve?

*A) 3, 5;

B) 5, 3;
C) 4, 4;
D) 2, 6;
E) 3, 3.

10. During the neurological examination of a patient the doctor reveals left-sided immobility of muscles in the lower half of face. What type of palsy can be suspected?

A) right-sided peripheral palsy of the facial nerve;
B) left-sided peripheral palsy of the facial nerve;
C) right-sided central palsy of the facial nerve;
*D) left-sided central palsy of the facial nerve;
E) nothing mentioned above is true.

Clinical cases for self-control of knowledge

1. Patient 48 years old, complains of tinnitus in the left ear, left-sided loss of hearing, as well as dizziness in the form of loss of balance (blood pressure – 130/70 mm Hg, pulse 72 beats/minute). Loss of the left corneal reflex, left-sided hearing loss (whispering speech on the right – 6 m, left – 2 m). Bone conduction of sound shortened on the left. What is the disease of patient? A) auditory neuroma B) auditory neuritis C) trigeminal neuralgia D) tumor of the ponto-cerebellar angle E) Wallenberg's syndrome	B
2. A 45-year-old patient complains of dizziness, accompanied by nausea; it occur several times a year. It is known from the anamnesis that one cannot ride in a car, fly in an airplane. The last attack was more severe than the previous ones: dizziness lasted for several hours, vomiting was observed. Neurological status: the patient lies with eyes closed, asks not to worry. When examining the function of the oculomotor nerves deterioration of the state is observed. Nystagmus, uncertainty while performing finger-to-nose test and adiadochokinesis on both sides were revealed. Romberg test is failed to make. When one tries to get up – dizziness increases, there are urges for vomiting. Sensitivity disorders were not detected. The tendon and periosteal reflexes are symmetrical.	

Decreased hearing loss on the right ear. Name the type of ataxia that has developed in the patient. A) cerebellar B) vestibular C) frontal D) sensitive E) hystionic	B
3. The young man of 26 years, after hypothermia ceased to close his left eye, mouth skewed to the right, horizontal folds on the forehead vanished, no mimic movements on the entire left half of the face. The examining physician confirmed the loss of the supraorbital and corneal reflexes on the left side. Tendon reflexes are symmetrical. No pathological reflexes were detected. Sensitivity and coordination disorders are not observed. Specify the location of the lesion. A) medulla oblongata B) facial nerve C) intermediate nerve D) facial nerve's nucleus E) nerve in the fallopian canal	B

CONTROL QUESTIONS ON THE TOPIC

1. What are the symptoms of lesions of 1 branch of the trigeminal nerve?
2. What are the symptoms of lesion of 2 branch of the trigeminal nerve?
3. What are the symptoms of lesions of 3 branch of the trigeminal nerve?
4. What are the symptoms of Gasserian ganglion affection?
5. The facial nerve, its characteristics.
6. Name the nuclei and locations of facial nerve nuclei in the brain.
7. List the functional parts of the facial nerve.
8. The areas of innervation of the facial nerve.
9. Differential diagnosis between central and perepheral mimic palsy.
10. The vestibulo-cochlear nerve, its characteristics.
11. Name the centers of the auditory and vestibular analyzer in the brain.
12. Weber and Rinne tests – their diagnsotic value.
13. Symptoms of lesions of the different parts of vestibulo-cochlear nerve.

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TOPIC 4: PATHOLOGY OF IX-XII CRANIAL NERVES. BULBAR AND PSEUDOBULBAR SYNDROMES. ALTERNATING SYNDROMES

Actuality of Topic

The study of function of the motor and mixed cranial nerves and the identification of symptoms of damage to these nerves is important for the topical diagnosis of diseases of the nervous system. Clinical syndromes of lesions of the cranial nerves or their nuclei are often observed in disorders of cerebral circulation in the brainstem, syringobulbia, tumors of the posterior cranial fossa, craniospinal tumors, pharyngeal tumors, amyotrophic lateral sclerosis and other diseases of the nervous system. Neurologists and neurosurgeons, ophthalmologists and otolaryngologists, general and emergency doctors, pediatricians and dentists often face this problem in their practice. Doctors of many specialties need to know the symptoms of lesions of these cranial nerves, to be able to differentiate between bulbar and pseudobulbar syndromes, as well as alternating syndromes.

Special competences and learning outcomes

Ability to evaluate functional anatomy and clinical physiology of the bulbar cranial nerves. By standard methods to distinguish the typical signs of bulbar, pseudobulbar and alternating syndromes, palsies of throat, tongue and major cervical muscles.

- To know: the structure of bulbar cranial nerves and their projections to other parts of CNS.

- To be able to interpret functional anatomy and clinical physiology data of the bulbar cranial nerves.

- To know the basic symptoms and syndromes of affection of the cranial nerves 9-12 CNs.

- To be able to investigate swallowing, speech, autonomic functions.

- Follow the rules of medical deontology, humane treatment of the patient.

- Understanding the importance of a thorough and correct study of the anatomy and function of the bulbar cranial nerves in future professional activity. Adhere to the method of neurological examination, appropriate ethical and legal standards.

Structural and logical scheme of the topic

Bulbar nerves	Signs of lesion	Studies of nerve
Glossopharyngeal	Ageusia of the posterior 1/3 of the tongue, anesthesia of the upper half of the pharynx, dysphagia	Taste, swallowing
Vagus	Soft palatal paresis, aphonia, pharyngeal and palatal reflexes' loss, dysphagia, tachycardia	Fonation, swallowing, fibrillations of soft palate reflexes: pharyngeal, palatal heart and respiration rate
Accesory	Peripheral paresis of the sternocleiomastoid and trapezius muscles	Elevating shoulders, muscular trophics
Hypoglossal	Peripheral muscle paresis of half the tongue	Tongue protrusion Trophics of lingual muscles

	Bulbar palsy	**Pseudobulbar palsy**
Signs of lesion	Dysarthria dysphagia atrophy of the lingual muscles fibrillations areflexia the reaction of degeneration tachycardia	Dysarthria dysphagia hyperorality reflexes involuntary laughter and crying

ALTERNATING SYNDROMES		
Peduncular		
	Ipsilateral signs	Contralateral signs
Weber's syndrome	peripheral paresis of the oculomotor nerve	central limbs' paralysis

Benedikt syndrome	peripheral paresis of the oculomotor nerve	choreoathetosis, intention tremor
Claude's syndrome	peripheral paresis of the oculomotor nerve	Extrapyramidal hyperkinesis, cerebellar symptoms
Pontine		
Foville's syndrome	peripheral paresis of the abducens and facial nerves	spastic hemiplegia
Millard–Gubler syndrome	peripheral paresis of the facial nerve	spastic hemiplegia
Brissaud-Sicard syndrome	fibrillations of facial muscles	spastic hemiplegia
Raymond-Céstan syndrome	Paresis of gaze, choreoathetosis, ataxia	spastic hemiplegia
Medullary		
Jackson's syndrome	peripheral paresis of the hypoglossal nerve	spastic hemiplegia
Avellis syndrome	peripheral paresis of IX, X, XII pairs of cranial nerves	spastic hemiplegia
Schmidt syndrome	peripheral paresis of IX, X, XI, XII pairs of cranial nerves	spastic hemiplegia
Wallenberg syndrome	palsy of soft palate, vocal cords, Horner's syndrome, nystagmus, segmental sensitivity disorders on face	spastic hemiplegia, hemianesthesia

Control tests

1. What are the basic functions of the glossopharyngeus nerve?

A) motor;
B) sensory;
C) autonomic;
*D) all mentioned above;
E) sensory and autonomic.

2. What portion of the tongue receives sensory (gustatory) innervation from the glossopharyngeus nerve?

A) middle 1/3;
B) anterior 1/3;
*C) posterior 1/3;
D) anterior 2/3;
E) posterior 2/3.

3. Affection of what cranial nerve from the bulbar group poses the most severe risk to human life?

*A) vagus;
B) glossopharyngeus;
C) accessory;
D) hypoglossal;
E) items C and D.

4. Which anatomical structure among those listed below doesn't receive motor innervation from the vagus nerve?

A) pharynx;
B) larynx;
*C) tongue;
D) soft palate;
E) items B and D.

5. What symptoms among the choices below are not observed due to the affection of the vagus nerve's motor portion?

A) dysarthria;
*B) glossoplegia;
C) dysphagia;
D) dysphonia;
E) items A and D.

6. What triad of symptoms is observed due to palsy of the vagus nerve's motor portion?

A) dysarthria, shortness of breath, dysphagia;
B) dysphagia, dysphonia, glossoplegia;
C) dysphagia, dry mouth, glossoplegia;
D) items A and C;
*E) dysarthria, dysphagia, dysphonia.

7. What among the choices below is not used for the assessment of the vagus nerve's autonomic function?

*A) assessment of pupillary light reflexes;
B) BP measurement;
C) PR measurement;
D) RR measurement;
E) items C and D.

8. What are we going to observe in a case of unilateral peripheral palsy of the accessory nerve?

A) inability to strain platysma muscle;
B) inability to move the tongue;
C) inability to turn head ipsilaterally;
*D) inability to turn head contralaterally;
E) inability to swallow.

9. What pathologic condition among those mentioned below is associated with the development of bulbar syndrome?

*A) unilateral affection of medulla;
B) total affection of medulla;
C) unilateral affection of cerebral hemispheres;
D) bilateral affection of cerebral hemispheres;
E) unilateral affection of the spinal cord.

10. The presence of what pathologic signs listed below is important for distinguishing between bulbar and pseudobulbar syndrome?

A) sensory deficit;
B) facial nerve affection;
*C) involuntary laughing and weeping;
D) tonic-clonic seizures;
E) hallucinations.

Clinical cases for self-control of knowledge

1. In a patient, 57 years old, during examination the muscles of the right half of the tongue are atrophied, during protrusion the tongue deviates to the right. The right half of the soft palate is dropped, the right vocal cord is completely paralyzed. The pharyngeal reflex is absent. The speech is slurred, swallowing is complicated. What pathological syndrome is described? A) Horner's B) Argyll-Robertson C) pseudobulbar D) bulbar E) Weber's	D
2. Patient, 46 years old, develops right central hemiplegia, right hemianesthesia, peripheral paralysis of facial muscles of the left half	

of the face; the left supraorbital reflex is not elicited. Determine the localization of the lesion. A) right pons B) left pons C) left cerebral peduncles D) inner capsule E) left medial loop	B
3. A patient, 65 years old, has a history of hypertension. There was a hypertensive crisis this morning. On objective examination: peripheral paralysis of the left facial muscles, deviation of the tongue during protrusion. Right-sided hyperreflexia. Babinsky's and Strumpell's on the right. Specify pathological syndrome. A) Horner's B) Wallenberg C) Muillard-Gubler D) Weber's E) Argyll-Robertson	C

CONTROL QUESTIONS ON THE TOPIC

1. The glossopharyngeal nerve, its characteristics.
2. Name the glossopharyngeal nerve nuclei and their location in the brain.
3. Specify of exit of the glossopharyngeal nerve from the skull.
4. List the main branches of the IX pair and the areas of their innervation.
5. The vagus nerve, its characteristics.
6. Name the nuclei and locations of vagus nerve nuclei in the brain.
7. List the functional parts of the vagus nerve.
8. The areas of innervation of the vagus nerve.
9. Accesory nerve, its characteristics.
10. Name the accesory nerve nuclei and their locations in the brain.
11. Identify the sites of innervation of the XI pairs of cranial nerves.
12. The hypoglossal nerve, its characteristics.
13. Name the nuclei and localizations of the hypoglossal nerve nuclei in the brain.
14. What are the exctracranial branches of the hypoglossal nerve what do they innervate?
15. Symptoms of lesion of the glossopharyngeal nerve.
16. Symptoms of lesions of the vagus nerve.

17. Symptoms of lesions of the hypoglossal nerve.
18. Bulbar paralysis.
19. Pseudobulbar paralysis.
20. Alternating brainstem syndromes.

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TOPIC 5. TRIGEMINAL NEURALGIA.
IATROGENIC TRIGEMINAL NEUROPATHIES

Relevance of the topic

In the process of evolution, the sensing apparatus becomes extremely complicated, is transformed into complex afferent systems, which allows the body to more accurately analyze and synthesize a variety of information coming from both external and internal environment. Receptors have become mediators between the external environment and the nervous system. The most versatile are pain receptors, which are irritated by mechanical, temperature and chemical agents. The earliest and most noticeable sign of lesion of the trigeminal nerve is the occurrence of intense pain in the facial area, which may be associated with sensory disorders, autonomic disorders and impaired masticatory function. A

large number of paratrigeminal syndromes also occur in diseases of the facial skull and soft facial tissues.

Medical science believes that there is no more severe pain than the trigeminal nerve pain. The pain of half of the face, accompanied by the feeling of electric discharge, is provoked by chewing, brushing teeth, in the cold wind, is a classic in this pathology. The pain never goes to the other half of the face, does not refers to the neck, tongue, behind the ear. The trigeminal neuralgia is often treated by dentists trying to remove the teeth on the appropriate half of the jaw.

However, there are a variety of effective treatment options for this pathology. Therefore, if a patient has trigeminal neuralgia, it does not mean that he is destined to live a life full of pain. Future doctors should know how to diagnose and effectively treat trigeminal neuralgia and other prosopalgia with medications, injections, or surgery.

Special competences and learning outcomes

- Be able to interpret data on functional anatomy and clinical physiology of the trigeminal system.
- By standard methods, identify the leading sensory and motor symptoms and syndromes of the trigeminal nerve.
- To know the main symptoms and syndromes of lesions of different branches of the trigeminal nerve.
- Be able to study pain, tactile, temperature and deep sensitivity in the face area; palpation of points of exit of branches of a trigeminal nerve and motor function of chewing muscles.
- Establish a topical diagnosis of lesion of the trigeminal system by logical analysis and justification.
- Be able to examine the neurological status of the patient, to perform differential diagnosis of levels of lesions of the trigeminal nerve and pain syndromes.
- Know the factors that can lead to iatrogenic trigeminal neuropathies.
- Choose a diagnostic algorithm for neurological syndromes and perform differential diagnosis of trigeminal neuralgia with other prosopalgias.
- Choose the optimal treatment for the trigeminal neuralgia and its branches.

Structural and logical scheme of the topic

Clinical picture of trigeminal neuralgia	
	Clinical signs
Trigeminal neuralgia	Trigeminal neuralgia - a chronic disease that goes with remissions and exacerbations, is characterized by attacks of extremely intense, shooting pain in the zones of innervation of II, III or, very rarely, I branches of the trigeminal nerve. The pain is paroxysmal in nature, reminiscent of «electric discharges» in intensity. Pain is short-term, preferably 10-15 seconds, and does not exceed 2 minutes. Exacerbation pain has a permanent localization within the area of a certain branch of the trigeminal nerve. Classical neuralgia is characterized by the presence of «trigger» zones (when you touch this area there is an attack of sharp pain). Clear localization of these zones – nasolabial triangle, upper lip, alveolar processes. There is a characteristic absence of a sensitive defect. Diagnostic pain points – supraorbital, infraorbital, mental ones.
Secondary (symptomatic) trigeminal neuralgia	Symptomatic neuralgia develops as a manifestation of other diseases of the central nervous system (multiple sclerosis, brainstem stroke, medullary glioblastoma, tumors of the ponto-cerebellar angle, etc.). Symptomatic trigeminal neuralgia clinically does not differ from the classical idiopathic neuralgia, symptomatic nature is linked to a gradually increasing sensory deficit in the innervation zone of the corresponding branch of the trigeminal nerve. In multiple sclerosis a frequent change in the side of neuralgia is observed.
Neuralgias of other trigeminal branches:	
Infraorbital neuralgia (neuropathy)	Infraorbital neuralgia is a symptomatic state, which is caused by an inflammatory process in the maxillary sinus or lesion of this nerve due to complex dental procedures. Pain has slight intensity, dominated by the numbness of mucous membrane of the upper jaw and the infraocular area.
Post-herpetic trigeminal neuralgia	Preferably, the ophtalmic branch is involved in the process (this nerve is poorly myelinated comparing to the maxillary and mandibular branches). Persistent pain, which occurs 3 months after Herpes zoster infection.
Lingual neuralgia	Lingual neuralgia occurs as a result of prolonged irritation of the tongue with a prosthesis, sharp tooth edge, etc. Moderate pain in half of the tongue is constant and periodically is exacerbated by eating, talking, fast facial movements.
Neuralgia (neuropathy) of the lower alveolar nerve	It occurs with injuries and inflammatory diseases of the mandible, with the penetration of the filling material below the top of the tooth, with the simultaneous removal of several teeth. It is characterized by moderate persistent pain in the teeth of the mandible, in the area of the chin and lower lip.

PREVALENT PROSOPALGIAS		
	Peripheral trigeminal neuralgia	Central trigeminal neuralgia
Causes	Intracranial arterio-venous malformations, compression of the loop of the upper cerebellar artery in the ponto-cerebellar angle with aneurysm, congenital defects or acquired narrowing of the infraorbital or mandibular canal, compression of the peripheral branches in the round and oval foramina, ponto-cerebellar angle's neoplasms, tuberculosis, herpetic infection, multiple sclerosis, sinusitis, dental diseases, cerebral arachnoiditis, neurosarcoidosis	Dysfunction of brainstem and subcortical-cortical areas due to disruption of regional circulation
Pathogenesis	Demyelination of fibers, mainly of deep sensitivity of the maxillary and mandibular nerves leads to disruption of the afferent sensory flow with the subsequent formation of an allogenic system of paroxysmal type in the central structures of the affected nerve (peripheral and central factors of pathogenesis)	
Clinical picture	Short-term, paroxysmal, irradiating, shooting, burning, lancinating and other facial pain, which usually occurs in the daytime, are provoked by irritation of the lips, face, jaws and accompanied by painful grimace, trismus, edema, tear, scleral hyperemia.	
Diagnostic	Radiography of teeth, jaws, facial area, brain CT, MRI (+ ngiography)	Carotid ultrasound, brain MRI, perfusion CT, MRI, fMRI, MRS, PET
Management	Anticonvulsants (carbamazepine, gabapentin), muscle relaxants (baclofen), belladonna derivatives, neurosurgical nerve decompression Sedatives, antidepressants, diuretics (furosemide), vasoactive, metabolic drugs, non-pharmacological methods: physiotherapy, massage, acupuncture	
Iatrogenic trigeminal neuropathies		
Causes	Alcohol-novocaine blockades, neuroexesis, destruction of the trigeminal ganglion	
Anatomy	II and III branches of the trigeminal nerve	
Clinical picture	- Constant, aching, burning, stinging dull pain in the area of innervation of the affected nerve - Neuralgic paroxisms with pain irradiation to Zelder's zones - Different types of paresthesias on the skin of the face (numbness, heartburn, formication - Sensitivity disorders (hyperpathy or hypersthesia) - Trophic changes of the oral mucosa (gingivitis), dentition (progressive periodontitis) and facial skin (pigmentation or depigmentation, dryness, flaking, soft tissue atrophy) - Autonomic reactions (redness and swelling of the skin, local hypethemia, elevated lacrimation and salivation) - Jaw cramps - Not expressed trigger areas - Neuralgic status	

Control tests

1. Patient diagnosed with lupus erythematosus complaints of pain in the face for several hours, mood swings, sleep disturbance. What is the underlying pathology?

*A) atypical prosopalgia
B) typical prosopalgia
C) Charlene syndrome
D) hereditary neurodegeneration
E) trigeminal neuralgia

2. A woman of 47 years complained of periodic severe pain in the upper jaw on the right, which arose after hypothermia a month ago, sometimes accompanied by edema. What is the leading symptom of neuralgia?

A) trism
B) facial asymmetry
C) the presence Zelder's zones
*D) trigger zones
E) hypalgesia

3. A 70-year-old patient complains of frequent prolonged pain in the face, anxiety, increased blood pressure, and sleep disorders. The patient calls an ambulance. What is the pathology of the patient?

*A) psychalgia
B) Frey's syndrome
C) Gray's syndrome
D) Crocodile tears' syndrome
E) dental plexalgia

4. A 38-year-old patient complains of severe, long-lasting aching pain in the upper jaw area on the left, cannot sleep, is confused. Has undergone rehabilitation at the dentist. What kind of affection can you think of?

A) psychalgia
*B) pulpitis
C) Gay-Lusak syndrome
D) periodontitis
E) Brudzinski's syndrome

5. Which of the following is the most common cause of trigeminal neuralgia?

A) trauma
B) ischemia in the area of the ponto-cerebellar angle
*C) compression with intracranial aneurysm
D) exogenous intoxication
E) sleep deprivation

6. The patient has frequent attacks of pain of a shooting nature about 30 seconds duration, trismus, autonomic manifestations, anxious thoughts. Which of the following is recommended for the prophylactic treatment of these conditions?

A) typical neuroleptics
B) analgesic
*C) anti-epileptic
D) antidepressants
E) bromine preparations

7. Spasm in what muscles does take place in case of trigeminal neuralgia?

A) mimic ones;
*B) masticatory ones;
C) cervical ones;
D) lingual ones;
E) oculomotor ones.

8. In the case of trigeminal neuralgia painful paroxysm is elicited with irritation of the so-called "trigger zones". Where is their exact location?

*A) perioral area;
B) projection of the parotid gland;
C) forehead;
D) nasal mucous membrane;
E) throat.

9. At what age do we observe the onset of primary trigeminal neuralgia?

*A) 50 years and more;
B) teenagers' age;
C) children;
D) 20-40 years;
E) 65 years and more.

10. What drugs from the list below are supposed to be the best for preventive treatment of trigeminal neuralgia?

A) chlorpromazine, haloperidol;
B) aspirin, diclofenac;
*C) carbamazepine, gabapentin;
D) amitriptyline, fluoxetine;
E) lithium carbonate.

Clinical cases for self-control of knowledge

1. Patient F., 63 years old, retired, complains of frequent pain attacks in the right upper jaw, occurring in the daytime, lasting about 1-2 minutes, spreading to half of the face and accompanied by the secretion of tears, congestion of the nose, redness, face swelling; it starts in the morning, caused by eating and talking. The patient is sick for 6 years, the onset of illness is associated with colds. Treatment with help of neurologist did not give effect. Objectively: internal organs are without pathology. Blood pressure - 150/85 mm Hg., pulse - 75 beats /minute. Neurological status: the pupils are symmetrical, the cranial nerves - a slight pain on palpation of the left infraorbital foramen. The movements in the extremities are preserved. Sensitivity is not compromised, including the area of the face. The tendon reflexes on the arms and legs are symmetrical, somewhat brisk. Pathological reflexes are not found and cerebellar symptoms are not present. Meningeal signs are absent. Make a clinical diagnosis? A) facial neuropathy C) trigeminal neuralgia C) facial nerve neuralgia D) laryngeal neuralgia E) neuralgia of intermediate nerve	B
2. Patient S., 68 years old, was admitted to the neurological department with complaints of bursting, burning pain in the left forehead. 3 weeks before hospitalization he was treated in the outpatient department by a neurologist for pain in this area, that developed after hypothermia and was accompanied by vesicular rash. On objective examination; body temperature - 36,8°C, heart rate – 88 beats/minute, arrhythmic, blood pressure - 140/80 mm Hg. Pupils are of the same size, the left eye slit is slightly narrowed, the reaction of the pupils to the light is	

lively. Swallowing and phonation not broken. The tongue protrudes along the middle line. Active movements and strength in all extremities are preserved in full range. Tendon and periosteal reflexes on the arms and legs S=D, brisk. Pathological reflexes are absent. There is a decrease in pain and temperature sensitivity, pigmentation of the forehead on the left. What is your clinical diagnosis? A) postherpetic neuralgia B) Charlin's syndrome C) facial neuropathy D) glossopharyngeal neuralgia E) Horner's syndrome	A
3. The patient, 54 years old, complains of burning, aching, throbbing pains with radiation in his lower jaw. Attacks of pain are accompanied by hyperemia of the skin in the area of the auricle and hyperhidrosis in the form of large drops of sweat in the area of innervation of the auricular temporal nerve. Pain occurred while eating. What is the syndrome that the patient has: A) Charlin's C) Frey's C) Sluder's D) myofascial E) Brissaud's	B

Control questions for self-study on the topic of the lesson

1. Classification of neuro-stomatological syndromes.
2. Trigeminal neuralgia – causes, pathogenesis, clinical presentation.
3. Trigeminal neuralgia – diagnosis, differential diagnosis, medical and surgical management.
4. Post-herpetic neuralgia – causes, clinical presentation diagnosis, management.
3. Trigeminal neuropathy – causes, pathogenesis, clinical presentation, diagnosis, management.
5. Dental conditions leading to neurodental syndromes.

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TOPIC 6: SYNDROMS OF AFFECTION OF FACIAL, GLOSSOPHARYNGEAL, VAGUS AND HYPOGLOSSAL NERVES

Relevance of the topic

In the frequency of lesions of the cranial nerves, facial neuropathy occupies up to 40% of all cases of neuropathy and neuralgia, ranks second among diseases of the peripheral nervous system. The disease was first described in the literature in 1836 by Bell, and is sometimes referred to as Bell's paralysis. Not only neurologists (brainstem encephalitis, pathological processes of the ponto-cerebellar angle), but also other specialists: otolaryngologists (mesothympanitis, otitis, mastoiditis), neurosurgeons (brain injury, brain tumors), dentists (fractures of the pyramid of the temporal bone, nerve injury during facial surgery or local anesthesia). It is also important for the future dentists to be able to differentiate between central and peripheral paralysis of facial muscles in order to promptly refer the patient to a neurologist in case of central lesion.

With pathology of IX, X and XII pairs of cranial nerves are encountered not only neurologists (brainstem encephalitis, pathological processes of the ponto-cerebellar angle, polyneuritis), but also other specialists: otolaryngologists (lesions of the vocal cords in inflammatory processes, cancer of the larynx), neurosurgeons (brain injury, brainstem tumors), infectious doctors, pediatricians (bulbar syndrome after diphtheria), dentists (glossopharyngeal neuralgia). Each specialist needs to know the symptoms of lesions of the bulbar group of the cranial nerves, to be able to differentiate the lesions of the nerves and nuclei, bulbar

and pseudobulbar syndromes, to be able to correctly make a topical and clinical diagnosis and, most importantly, to direct patients to proper doctors.

Special competences and learning outcomes

- Be able to interpret the functional anatomy and clinical physiology of VII, IX-XII cranial nerves.
- By standard methods, identify the leading sensory and motor symptoms and syndromes of lesions of the facial, glossopharyngeal, vagus, and hypoglossal nerves.
- Know the etiological factors, clinical manifestations, methods of diagnosis and differential diagnosis of lesions of the VII cranial nerve.
- Know the etiological factors, clinical manifestations, methods of diagnosis and differential diagnosis of lesions of IX-XII pairs of cranial nerves.
- Know the diagnostic criteria for neuralgia or neuropathy of IX-XII cranial nerves.
- Master the skills of interpreting additional tests in the case of peripheral and central lesions of these nerves.
- To be able to draw up a treatment plan for patients with peripheral nervous system lesions.

Structural and logical scheme of the topic

Facial neuropathy (Bell's palsy)	
Causes	1) idiopathic (develops after hypothermia, seasonal); 2) infectious-allergic, developing on the background of infectious diseases (tonsillitis, mumps, pneumonia); 3) ischemic, developing as a result of circulatory disorders in the nerve trunk (in case of collagenosis, diabetic angiopathy, arterial hypertension, vasculitis); 4) otogenic (mesothympanitis, otitis, mastoiditis); 5) traumatic (due to fractures of the pyramid of the temporal bone, nerve injuries during facial surgery and anesthesia); 6) hereditary (autosomal dominant type of inheritance with low penetrance).
Pathogenesis	Under the influence of one of the etiological factors there is a disturbance of blood circulation in the vessels of the nerve. As a result, hypoxia of the membrane and nerve trunk occurs with the development of edema and nerve entrapment in the narrow facial canal. Due to the fact that the facial nerve passes in the canal along with the intermediate nerve, in the clinical picture there are also signs of involvement of the latter.

Clinical picture	The clinical picture of neuropathy of the facial nerve depends on the level of its lesion and is characterized by paralysis of facial muscles, sensitive and autonomic disorders. The main clinical manifestation is the weakness of the facial muscles of half of the face (prosoparesis), or the immobility of these muscles (prosoplegia). The patient on the affected side cannot close the eye (lagophthalmus), wrinkle his forehead, raise his eyebrows. When you try to close your eyes on the side of the lesion appears a white strip of the sclera (Bell's symptom), the patient can not inflate his cheeks, to brush his teeth (a symptom of «exclamation mark»), the face is skewed to the healthy side. **Central paresis of the facial nerve.** The cortico-nuclear pathway of the facial nerve makes a partial intersection, so in the case of its unilateral lesion there is a violation of innervation of facial muscles only innervated by the inferior nucleus of the facial nerve on the opposite side of the lesion (facial muscles located below the corner of the eye). In this case, patients can not symmetrically inflate their cheeks, smile, blow a «candle», at rest the angle of the mouth is slightly lowered. Central paresis occurs in encephalitis, strokes, brain tumors and so on. **Nuclear affection**. In such cases, patients have signs of alternating syndromes (paresis of the facial nerve on the side of the lesion and hemiparesis on the opposite side – Muillard-Gubler syndrome), which is associated with involvement in the pathological process pyramidal pathway located near the nucleus. In the case of such a lesion, there is sometimes a twitching of the facial muscles on the side of the lesion (hemispasm), which is associated with irritation of the cell bodies of still living neurons (Brissaud-Siquard syndrome). In the case of involvement in the pathological process of nuclei of VII and VI CNs alternating Fovilles' syndrome develops. **Lesions of the root of the facial nerve in the area of exit from the brainstem**. In such cases, in patients with paresis of facial muscles, signs of vestibulochlear nerve damage (hearing loss, dizziness) are revealed. Lesions of the facial nerve **in the canal before branching n. petrosus major**. Along with prosoparesis, signs of involvement of the intermediate nerve (xerophthalmia, hyperacusis, xerostomia, taste disturbance) are revealed. Facial nerve lesion **after branching n. petrosus major**. The clinical picture has the same symptoms except for xerophthalmia. Instead, due to irritation of n. lacrimalis and weakness of the circular muscle of the eye tearing develops. Facial nerve lesions **after branching n. stapedius**. In these patients there are no signs of xerophthalmia and hyperacusis, but along with prosoparesis xerostomia, intensive lacrimation and impaired taste are observed. Nerve lesions **when leaving the canal**. In such cases, patients have only prosoparesis, often with lacrimation.
Diagnostics	Electromyography, brain MRI (according to indications)
Management	Anti-inflammatory antibacterial and vasoactive drugs, diuretics, vitamin therapy. With significant impaired nerve function, glucocorticoid therapy can be used. Prednisone is prescribed on a 5-day regimen, starting from 30-60 mg per day (every 5 days the dose is reduced by 5 mg). In the acute period (the first 12-14 days) anticholinesterase inhibitors cannot be used. After 2 weeks prescribe physiotherapy, acupuncture, mimic massage, anticholinesterase inhibitors

Geniculate ganglion syndrome (Ramsay Hunt syndrome)	
Causes	The disease is caused by Herpes zoster virus, which enters the sensory nodes of the cranial nerves and is activated in various conditions, accompanied by a decrease in the activity of the host immune system.
Clinical picture	1. Pain that is localized in the area of the external auditory canal, sometimes – soft palate. 2. Herpetic rash in the area of innervation of the intermediate nerve (tympanic cavity, eardrum, external auditory canal, soft palate, and sometimes – tonsils). 3. Prozoparesis. 4. Autonomic manifestations in the form of scleral injection, lacrimation, edema of the buccal mucous membrane on the side of the lesion
Diagnostics	Virological tests
Management	Antiviral therapy – zovirax intravenously and topically (ointments), drugs that increase the formation of endogenous interferon: curantil – 0.025 g bid, dibazole (powder) – 0.02 g bid. For analgesia – pain killers, cyanocobalamin 1000 mg intramuscularly daily, novocaine intradermally before external auditory stroke or via electrophoresis.

Vidian nerve neuralgia (Veil's syndrome) The vidian nerve is a connection of the greater superficial and deep petrosus nerves. The first is the branch of the facial nerve, and the second is the branch of the sympathetic plexus of the internal carotid artery	
Causes	Inflammatory processes of the paranasal sinuses and pyramids of the temporal bone, injury to the temporal bone, systemic disorders of the metabolism.
Clinical picture	Attacks of pain in the area of the eye and nose with irradiation to the teeth, face, ear, neck. Due to the fact that the nerve is connected to the pterigopalatine ganglion, the pain can spread to the corresponding half of the face and the occipital area. The pain occurs at night, lasting from a few minutes up to several hours.
Diagnostics	ENT consultation, radiography of the paranasal sinuses
Management	Analgesics. Depending on the etiological factor one prescribes antibiotics and anti-inflammatory drugs. The vitamins from B group (thiamine, cyanocobalamin) are indicated.

Glossopharyngeal neuralgia	
Causes	Tonsillar trauma with the enlarged temporal styloid process, calcification of the stylohyoid ligament, tumor of the ponto-cerebellar angle and larynx, aneurysm of the internal carotid artery. Metabolic disorders, atherosclerotic processes, prolonged intoxication, chronic purulent processes in the tonsils play some role too.

Clinical picture	Painful paroxysms lasting up to a few minutes, beginning with the root of the tongue and tonsils and extending to the throat, ear, sometimes refer in the corner of the mandible, eye, neck. The onset of pain is triggered by conversation, eating hot or cold dishes, irritation of the root of the tongue and tonsils. The pain is always unilateral. During the attack – dryness in the mouth and throat, after the attack – hypersalivation on the side of painful paroxysm.
Diagnostics	Radiography of the cervical spine, brain MRI + angiography.
Management	Carbamazepine (according to special regimen), neuroleptics, antidepressants, tranquilizers, injections of 2% solution of novocaine into the root of the tongue, neurosurgical decompression of the nerve.

Neuralgia of tympanic nerve (Reichert syndrome)	
Causes	The most likely role is assigned to infection and vascular disorders
Clinical picture	Attacks of acute, shooting pain in the external auditory canal. Attacks occur up to 5-6 times a day.
Diagnostics	ENT consultation, brain MRI.
Management	Non-opioid analgesics, neuroleptics, tranquilizers, antihistamines, B group vitamins

Neuralgia of otic nerve	
Causes	The disease occurs with angina, influenza, syphilitic infection.
Clinical picture	An attack of pain localized in the area of the external auditory canal and eardrum. The pain is accompanied by nausea, sometimes – vomiting.
Diagnostics	ENT consultation.
Management	Antibiotics, non-steroidal anti-inflammatory drugs, B group vitamins.

Upper laryngeal neuralgia	
Causes	In chronic pharyngitis, as well as after tonsilectomy and strumectomy.
Clinical picture	Pain paroxysms occur in the larynx. The pain is unilateral, often resulting from eating or swallowing, sometimes in the lower jaw or ear. There is a painful point on the lateral surface of the neck, above the thyroid cartilage. During the attack, cough and general weakness occur.
Diagnostics	ENT consultation, radiography of the cervical spine.
Management	Analgesics in combination with antihistamines, anesthetics (0.5% novocaine intravenously), cyanocobalamin - 1000 mcg per day IM, thiamine.

Hypoglossal neuropathy	
Causes	Infectious diseases (angina, meningitis, encephalitis, inflammatory processes of the dentition), traumas (surgical interventions in the oral cavity, concretive sialoadenitis of the submandibular salivary gland), intoxication, tumors of the oral cavity.
Clinical picture	Paralysis or paresis of the muscles of the tongue is manifested by: deviation of the tongue towards the affected muscle, atrophy of the muscles of the tongue, fibrillations (in the case of nuclear damage) on the side of the lesion, dysarthria, dysphagia. In case of bilateral lesions, paralysis of the muscles of the tongue (glossoplegia) occurs, which leads to sharp violations of the act of chewing and swallowing, dysarthria and the inability to protrude the tongue out of the mouth.
Diagnostics	Brainstem MRI + angiography
Management	Treatment of the underlying disease

Control tests

1. What process is the most attributive factor resulting in the development of facial nerve injury (Bell's palsy)?

*A) local cooling and viral infection;
B) trauma and operation in the facial area;
C) specific infections (syphilis and tuberculosis);
D) tumors or proliferative processes of the cranial cavity;
E) rheumatoid angiitis of the brain vessels.

2. Which among those listed below is possible to observe in facial nerve injury (Bell's palsy)?

A) ptosis;
*B) lagophthalmos;
C) numbness of face;
D) hearing decrease;
E) blindness.

3. What paraclinical method is very important in assessment the outcome in facial nerve injury (Bell's palsy)?

*A) ENMG;
B) titer of antiherpetic antibodies;
C) cranial X-ray;
D) ultrasonography of the cervical arteries;
E) brain MRI.

4. Which among the pharmacological classes listed below is the most optimal choice for Bell's palsy management in the acute stage?

A) antibiotics, sulphonamides, antifungal drugs;
*B) corticosteroids, diuretics, antiherpetic drugs;
C) antidepressants, neuroleptics, benzodiazepines;
D) enzymes, iodine drugs, biostimulators;
E) interferons, immune globulins, thymus-derived substances.

5. The etiological factor for the development of Ramsay Hunt syndrome is:

A) Streptococcus
B) meningococcus
C) Epstein-Bar virus
D) mycoplasma
*E) herpes virus

6. Name the speech disorder that occurs when the hypoglossal nerve is affected:

A) aphasia
B) scanning speech
*C) dysarthria
D) aphonia
E) quiet, monotonous speech

7. Specify clinical symptoms of upper laryngeal neuralgia:

A) pain in the face
B) pain in the area of the ear
C) hemicrania
*D) laryngeal pain
E) pain in the root of the tongue

8. Specify the clinical sign of differential diagnosis of the trigeminal neuralgia and glossopharyngeal neuralgia:

A) pain localized behind the ear
*B) paroxysmal pain in the root of the tongue
C) hemicrania
D) glossalgia
E) glossoplegia

9. Nuclear lesion of the hypoglossal nerve from its supernuclear

lesion differs in the presence of:

A) the deviation of the tongue
B) limitation of tongue mobility
*C) fibrillations
D) concomitant lesions of the vagus nerve
E) speech disorders

10. Glossopharyngeal neuralgia is characterized by:

A) a piercing pain in half of the face
*B) paroxysmal pain based on the tongue root
C) distortion of the face to the healthy side
D) distortion of the face to the patient's side
E) forced crying and laughter

Clinical cases for self-control of knowledge

1. The young man of 26 years, after hypothermia ceased to close his left eye, mouth skewed to the right, horizontal folds on the forehead vanished, no mimic movements on the entire left half of the face. The examining physician confirmed the loss of the supraorbital and corneal reflexes on the left side. Tendon reflexes are symmetrical. No pathological reflexes were detected. Sensitivity and coordination disorders are not observed. Specify the location of the lesion. A) medulla oblongata B) facial nerve C) intermediate nerve D) facial nerve's nucleus E) nerve in the fallopian canal	B
2. Patient S., 51, was admitted to the neurological department with complaints of attacks of night pain in the area of the eye hole and nose with irradiation in the teeth, face, ear, neck. He continued to be treated for sinusitis. On examination of changes in the cranial nerves were not detected. What syndrome has the patient developed? A) Muillard-Gubler B) Veil's C) Hunt's D) Brissaud-Sicard E) Fovilles'	B

3. Patient K., 30 years old, was admitted to the department of maxillofacial surgery for operation due to right-sided tumor of the submandibular area. After the operation, difficulty of speech and swallowing developed. The examination revealed choking while swallowing, decreased pharyngeal reflex, deviation of the tongue to the right, left-sided hemiparesis. What pathological syndrome has the patient developed? A) pseudobulbar B) Weber's C) Muillard-Gubler E) bulbar E) Horner's	D

Control questions for self-study on the topic of the lesson

1. Classification of neuro-stomatological syndromes.
2. Bell's palsy – causes, pathogenesis, clinical presentation.
3. Bell's palsy – diagnosis, differential diagnosis, management.
4. Glossopharyngeal neuralgia – causes, clinical presentation, diagnosis, management.
5. Hypoglossal neuropathy – causes, clinical presentation, diagnosis, management.
6. Ramsay Hunt syndrome - causes, clinical presentation, diagnosis, management.
7. Veil's syndrome - causes, clinical presentation, diagnosis, management.
8. Reichert syndrome - causes, clinical presentation, diagnosis, management.
9. Bulbar and pseudobulbar syndromes – anatomy, clinical presentation and differential diagnosis.

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TOPIC 7: AUTONOMIC PROSOPALGIAS AND OTHER NEUROGENIC FACIAL DISEASES

Actuality of the topic

Vegetative prosopalgia and neurogenic diseases account for a significant percentage of neurostomatological diseases. In the structure of their leading place belongs to ganglionitides. Neurogenic facial pain is associated with various pathological processes that lead to irritation of nerves or vegetative nodes. These are inflammation, trauma, metabolic and degenerative processes in adjacent bone structures, compression of nerves in congenital narrow or pathologically altered canals. The appearance or exacerbation of neuralgia results from local changes in blood circulation, hypothermia, infectious and allergic diseases, endogenous and exogenous intoxication, metabolic disorders, vitamin deficiency. The vast majority of patients suffer greatly, have difficulty in working, and thus their quality of life is deteriorating. Therefore, the issues of prevention and treatment of patients with vegetative prosopalgia and neurogenic diseases of the face are not only medical but also of great social importance.

The future dentist is obliged to detect the presence of prosopalgia, to recognize their nature, since the timely and correct diagnosis influences upon the provision of therapeutic measures.

Special competences and learning outcomes

- Be able to interpret functional anatomy and clinical physiology of autonomic facial innervation.
- By standard methods, identify the leading symptoms and syndromes of vegetative nerves' damage.
- Know the etiological factors, clinical manifestations, diagnostic methods and differential diagnosis of neurostomatological diseases.
- Know the classification of vegetative prosopalgia and neurogenic diseases of the face.

- Know the diagnostic criteria for neuralgia, neuropathy, vegetative prosopalgia and neurogenic diseases of the face.

- Master the skills of interpreting additional tests in neurostomatological diseases of the face.

- Be able to draw up a treatment plan for patients with vegetative prosopalgia and neurogenic diseases of the face.

Structural and logical scheme of the topic

Disease or syndrome	**1. Nasociliary neuralgia (Charlin's syndrome, ciliary ganglion syndrome**)
Etiology and pathogenesis	Ethmoiditis. Thrombosis of the internal carotid artery. Tuberculosis, syphilis, malaria, diabetes. Visual overstrain. Consequences of eye injury. Diseases of the conjunctiva and cornea, glaucoma.
Features of clinical manifestations	Severe pain in the medial corner of the eye with irradiation in the back of the nose. Edema, hyperesthesia and unilateral hypersecretion of the nasal mucosa. Injection of sclera, iridocyclitis, keratitis. Tear, photophobia. The differential diagnostic criterion is is the disappearance of all symptoms after application of cocaine upon nasal mucosa.
Differential diagnosis	Trigeminal neuralgia (I branch). Sinusitis of the frontal or maxillary sinus. Sluder's syndrome. Acute glaucoma. Horton's syndrome. Harris' syndrome. Syndrome of the internal carotid artery.
Treatment	Anesthesia of mucous membrane of the eye with dicaine, that of of the nose – with lidocaine. Tablets: non-opioid analgesics, antihistamines, antispasmodics, B group vitamins, corticosteroids.
Disease or syndrome	**2. Auriculotemporal syndrome (Frey's syndrome)**
Etiology and pathogenesis	Irritation of the autonomic fibers of the auriculo-temporal area, caused by diseases of the salivary gland.
Features of clinical manifestations	Hyperemia of the skin and increased sweating in the temporal area during food intake. Sometimes there are hyperesthesia, burning, tingling in the area of hyperhidrosis. Imitating chewing movements are not accompanied by such signs.
Differential diagnosis	Diseases of the salivary glands
Treatment	Analgesics in combination with tranquilizers, vitamins from B group and C, aloe, novocaine blockades, lidase, ultrasound, paraffin applications. In case of ineffective conservative treatment - the incision of the auriculo-temporal nerve.
Disease or syndrome	**3. Ciliary ganglionitis (Oppenheim's syndrome)**
Etiology and pathogenesis	Irritation of the autonomic fibers of the ciliary node caused by orbital diseases.

Features of clinical manifestations	Paroxysms of intense burning pain in the eyeball lasting from 30 minutes to several hours, accompanied by tearing and photophobia, herpetic rashes on the skin of the nose and forehead, keratitis, conjunctivitis.
Differential diagnosis	Nasociliary neuralgia. Trigeminal neuralgia (I branch). Sinusitis of the frontal or maxillary sinus. Sluder's syndrome. Acute glaucoma. Horton's syndrome. Harris' syndrome. Syndrome of the internal carotid artery.
Treatment	Antiepileptic drugs (carbamazepine, pregabalin, gabapentin), B group vitamins, novocaine blockades, antihistamines, ganglion blockers.
Disease or syndrome	**4. Pterygopalatine ganglionitis (Sluder's syndrome)**
Etiology and pathogenesis	Irritation of the autonomic fibers of the pterygopalatine gangion.
Features of clinical manifestations	Intense attack-like burning pain in the upper jaw, nose, irradiating into the inner corner of the eye, ear, temple, neck lasting from several hours to 1-2 days, accompanied by tearing, skin hyperemia and salivation, swelling, sometimes – by dizziness and nausea.
Differential diagnosis	Nasociliary neuralgia. Trigeminal neuralgia (I branch). Sinusitis of the frontal or maxillary sinus. Acute glaucoma. Horton's syndrome.
Treatment	Antiepileptic drugs (carbamazepine, pregabalin, gabapentin), B group vitamins, novocaine blockades, antihistamines, ganglion blockers.
Disease or syndrome	**5. Otical ganglionitis**
Etiology and pathogenesis	Irritation of the otical ganglion when intaking cold or hot food, hypothermia on the background of tonsillitis, sinusitis, dental diseases.
Features of clinical manifestations	Paroxysms of intense burning pain and herpetic eruptions in the area in front of the auditory canal, irradiating into the mandible, chin, teeth, stuffiness of the ear, hypersalivation on the side of the disease, lasting from a few minutes up to an hour.
Differential diagnosis	Nasociliary neuralgia. Trigeminal neuralgia (I branch). Sinusitis of the frontal or maxillary sinus. Acute glaucoma. Horton's syndrome.
Treatment	Antiepileptic drugs (carbamazepine, pregabalin, gabapentin), B group vitamins, novocaine blockades, antihistamines, ganglion blockers.
Disease or syndrome	**6. Ganglionitis of the submandibular and sublingual ganglia**
Etiology and pathogenesis	Irritation of the corresponding ganglion when intaking cold or hot food, hypothermia on the background of tonsillitis, sinusitis, diseases of the teeth.
Features of clinical manifestations	Permanent pain in the submandibular or sublingual area and tongue, with burning character, accompanied by hypersalivation or dry mouth, lasting from a few minutes up to an hour.
Differential diagnosis	Trigeminal neuralgia (2-3 branch).

Treatment	Antiepileptic drugs (carbamazepine, pregabalin, gabapentin), B vitamins, novocaine blockades, antidepressants, antihistamines, ganglion blockers
Disease or syndrome	**7. Ganglionitis of cervical sympathetic ganglia**
Etiology and pathogenesis	In the case of ipsilateral lesions of the lateral horns of the VIII cervical and I thoracic segments of the spinal cord, cervical part of the sympathetic trunk, connections between them, and the descending nerve pathways to the lateral horns of these segments in the brainstem and spinal cord.
Features of clinical manifestations	Permanent or aching burning pain in submandibular region, neck, with hyperesthesia or segmental type hyperpathy, trophic disorders, Horner's syndrome.
Differential diagnosis	Trigeminal neuralgia (2-3 branch). Horton's syndrome.
Treatment	Antiepileptic drugs (carbamazepine, pregabalin, gabapentin), B vitamins, novocaine blockades, antidepressants, antihistamines, ganglion blockers
Disease or syndrome	8. Cluster headache (Horton's syndrome)
Etiology and pathogenesis	The attack is provoked by stress, fatigue, histamine, hypothermia
Features of clinical manifestations	Sharp unilateral non-pulsating, half-head, seizure-like burning pain localized in the eye, forehead, temples, ears, accompanied by lacrimation, hyperemia of the skin and mucous membranes, swelling of the nose, rhinorrhea, sometimes nausea, trophic disorders. Psychomotor agitation. The attack lasts for 10 minutes - 3 hours, duration of cluster – 2-4 weeks
Differential diagnosis	Trigeminal neuralgia, migraine, tension headache.
Treatment	Antimigraine drugs – tryptans. Anti-epileptic drugs (carbamazepine, pregabalin, gabapentin), B group vitamins, novocaine blockades, antidepressants, antihistamines
Disease or syndrome	9. Recurrent facial paralysis (Rosolimo-Melkerson-Rosenthal syndrome, Melkerson syndrome)
Etiology and pathogenesis	Constitutional disease with primary lesion of the lymphatic system of the head. Partial manifestation of Beniere-Beck-Schauman syndrome (chronic generalized granulomatosis), as histologically it is observed a tuberculoid structure.
Features of clinical manifestations	Initially recurrent, then persistent swelling of the lips and face («tapir's face»). Recurrent facial nerve palsy. Folded tongue. Granulomatous glossitis. Early signs may be: paraesthesia of the fingertips, migraine attacks, lacrimation, scotoma, hyperacusis, decreased intelligence, manifestations of rheumatic disease. Sometimes found in combination with granulomatous cheilitis.

Differential diagnosis	Asher's syndrome. Nonne-Milroy-Maige trophic edema. Acute angioneurotic edema of the skin – Quincke edema. Irysipelas inflammation of the face. Elephant-like lips. Cavernous hemangioma.
Treatment	Glucocorticosteroids, antihistamines, B group vitamins, diuretics, anticholinesterase drugs, biogenic stimulants
Disease or syndrome	10. Syndrome of dry mucous membranes (Sjögren syndrome)
Etiology and pathogenesis	Collagenosis. May have autosomal recessive inheritance. The etiology and pathogenesis have not been studied.
Features of clinical manifestations	Chronic systemic disease with deficiency of all glands of external secretion. The disease mainly occurs in menopause, as well as among young women with ovarian insufficiency. The onset of the disease is gradual with the development of dryness and keratosis of the mucous membranes: lack of lacrimation, dry conjunctivitis, keratitis, dry rhinitis, pharyngotracheobronchitis, dry vulvitis, xerostomia, burning sensation. The course is recurrent.
Differential diagnosis	Mikulicz syndrome.
Treatment	Rinsing the oral cavity with isotonic saline, instillation of «artificial tears», cholinomimetics
Disease or syndrome	11. Facial hemiatrophy (Romberg's syndrome, Parry-Romberg's syndrome, Romberg's trophoneurosis)
Etiology and pathogenesis	May have autosomal recessive inheritance. The etiology and pathogenesis have not been studied. Inflammatory processes (tonsillitis, complicated caries), local trauma are suspected. The triggering factors are smoking, alcohol consumption, hypothermia.
Features of clinical manifestations	Gradually on one half of the face the skin, subcutaneous tissue, muscles and later bones start get atrophied. Sometimes, the vocal cords are involved, half of the larynx and tongue, often hair, eyelashes and eyebrows fall out.
Differential diagnosis	Progressive lipodystrophy. Limited scleroderma. Neuropathy of the lingual nerve, glossalgia.
Treatment	There is no radical treatment. For trigeminal pain – carbamazepine. Surgical treatment. Analgesics, tranquilizers and vegetotropic agents (ganglion blockers). Novocaine blockadess. In some cases, therapy is identical to that used in submandibular ganglionitis.

Control tests

1. What is a dangerous symptom of Quinke's edema?

A) swelling of the mucous membranes of the skin and the fatty layer of the lips

*B) swelling of the mucous membranes of the mouth, tongue, larynx and epiglottis

C) edema of the subcutaneous tissues of orbit
D) swelling of the mucous membranes of the gastrointestinal tract
E) swelling of the tongue

2. What immediate measures are used to suppress asphyxia in Quincke edema?

A) cerebrolysin
B) metamizole
C) ampicillin
*D) dexamethasone
E) Piracetam

3. Which of the clinical features is characteristic of Rossolimo-Melkerson-Rosenthal syndrome?

A) trigeminal neuritis
B) herpetic rash
*C) macrocheilia
D) glossalgia
E) amblyopia

4. What is the symptom characteristic of Rossolimo-Melkerson-Rosenthal syndrome?

A) deviation of the tongue
*B) facial asymmetry
C) divergent strabismus
D) herpetic rashes
E) subcortical symptoms

5. What triad is characteristic of Sjogren's syndrome?

A) ptosis, miosis, enophthalmos
B) facial nerve neuritis, facial edema, folded tongue
*C) parotitis, keratoconjunctivitis, arthritis
D) xerostomia, glossodynia, dysarthria
E) ptosis, mydriasis, exophthalmos

6. What complaints are typical in Sjogren's syndrome?

*A) no tears
B) facial asymmetry
C) bouts of pain in the tongue
D) lip swelling
E) ear pain

7. Sjogren's syndrome in the later stages is characterized by:

A) hypoacusia
*B) anosmia
C) sympathalgia
D) lingual paresis
E) hemianopsia

8. Ciliary ganglionitis (Oppenheim's syndrome) is characterized by the following clinical symptoms:

A) pain in the temple area
B) pain in the mandible
C) tongue pain attacks
*D) orbital pain attacks
E) pain in the throat

9. With pterygopalatine ganglionitis (Sluder's syndrome) localization of pain is more characteristic in the following areas:

*A) eye, nose, upper jaw
B) eyes, nose, ears
C) nose, ears, tongue
D) eye, tongue, mandible
E) occipital region, neck, tongue

10. What is the nature of pain observed in ganglionitis of the cervical sympathetic nodes?

A) shooting
B) aching
*C) burning
D) pressing
E) expanding

Control questions for self-study on the topic of the lesson

1. Patient, aged 49, complains of paroxysmal pain of intense, burning, tearing nature, localized in the right half of the face (area of the upper jaw and nose), which becomes red during the attack and swells. The patient also complains of lacrimation, hypersalivation, secretion from the right half of the nose. The pain has been worrying more often in the spring and fall over the last few years. They last from a few minutes up to several hours, more often at night. What is your diagnosis?

A) Sluder's syndrome B) Oppenheim's syndrome C) Cluster headache D) Frey's syndrome E) Ganglionitis of the cervical sympathetic nodes	A
2. Patient, 39 years old, complains of attacks of burning pain in the area of the left eyeball, lacrimation, conjunctival hyperemia, photophobia. The attack lasts about 1 hour. Rash on the nose and forehead and tenderness when pressed on the left eye are also noted. From anamnesis – recently treated by ENT doctor for sinusitis. What is your diagnosis? A) Sluder's syndrome B) Oppenheim's syndrome C) Cluster headache D) Frey's syndrome E) Cervical sympathetic ganglionitis	B
3. Patient, 35 years old. complains of pain of burning, aching, pulsating character in the area of the left ear and temples, that is accompanied by hyperemia of the skin and increased sweating of the area. Pain is often triggered by food, physical labor, smoking. What is your diagnosis? A) Oppenheim's syndrome B) Cluster headache C) Frey's syndrome D) Cervical sympathetic ganglionitis E) Ganglionitis of submandibular and sublingual ganglia	C

Control questions for self-study on the topic of the lesson

1. Classification of neuro-stomatological syndromes.
2. Nasociliary neuralgia (Charlin's syndrome) – causes, clinical presentation, diagnosis, management.
3. Auriculotemporal syndrome (Frey's syndrome) – causes, clinical presentation, diagnosis, management.
4. Ciliary ganglionitis (Oppenheim's syndrome) – causes, clinical presentation, diagnosis, management.
5. Pterygopalatine ganglionitis (Sluder's syndrome) – causes, clinical presentation, diagnosis, management.

6. Otical ganglionitis – causes, clinical presentation, diagnosis, management.

7. Ganglionitis of the submandibular and sublingual ganglia – causes, clinical presentation, diagnosis, management.

8. Ganglionitis of cervical sympathetic ganglia – causes, clinical presentation, diagnosis, management.

9. Recurrent facial paralysis (Rosolimo-Melkerson-Rosenthal syndrome) – causes, clinical presentation, diagnosis, management.

10. Syndrome of dry mucous membranes (Sjögren syndrome) – causes, clinical presentation, diagnosis, management.

11. Facial hemiatrophy (Parry-Romberg's syndrome) – causes, clinical presentation, diagnosis, management.

12. Autonomic prosopalgias – implications for dentists.

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TOPIC 8: DISEASES OF PERIPHERAL NERVOUS SYSTEM

Actuality of the topic

Diseases of the peripheral nervous system are quite diverse in their localization, clinical manifestation, etiology and pathomorphology. These include lesions of individual nerve trunks, their multiple lesions, lesions of nerve plexuses, spinal nodes, and spinal cord roots.

Patients with diseases of the peripheral nervous system, including vertebrogenic diseases, are common among neurological, medical or surgi-

cal patients. Osteochondrosis of the spine is known to affect up to 80% of the adult population and is responsible for 90% of disability in the structure of neurological diseases between the ages of 25 and 55 years. Thus, osteochondrosis of the spine from a purely medical problem becomes a social one.

It is also important to know that pain is the most common symptom that occurs when peripheral nerve structures are damaged. Therefore, treatment and prevention of exacerbations, emergency care is an important task for doctors of all specialties including dentists. Despite the fact that there are highly effective methods of treatment of this contingent of patients, doctors of different specialties use them very little. Recently, new aspects of the pathogenesis, diagnosis, therapy and rehabilitation of these diseases have emerged that need to be rethought in the field of medical science.

Special competences and learning outcomes:

- To study the classification of diseases of the peripheral nervous system.
- Learn how to examine patients with peripheral nervous system lesions.
- To be able to identify clinical signs of neuropathy, neuralgia, polyneuropathy, radiculopathy.
- To know the issues of etiology, pathogenesis of cerebral and cranial nerve lesions.
- To be able to interpret the etiology, pathogenesis, clinical symptoms of polyneuropathies and polyradiculoneuropathy (Guillain-Barre syndrome).
- Identify vertebrogenic reflex and root syndromes of cervical, thoracic and lumbosacral levels.
- Diagnose non-vertebrogenic radiculoneuropathy, plexopathy and ganglionitis.
- Perform differential diagnosis, justify and formulate a preliminary diagnosis of diseases of the peripheral nerve, roots, plexus and nodes.
- To be able to develop a plan of examination and analyze data of additional methods of examination of patients with lesions of the peripheral nervous system.
- To be able to make a plan for the treatment of patients with lesions of the peripheral nervous system.
- To be able to help patients with PNS.

Structural and logical scheme of lesson

DIFFERENTIAL DIAGNOSIS OF NEURITIS AND NEURALGIA		
Clinical elements	Neuralgia	Neuritis
Sensory	Hyperesthesia and pain with possible irradiation into the innervation zone	Hypesthesia and anesthesia of all types of sensitivity in the zone of innervation of the affected neural structure
Motor	Local cramps	Peripheral paresis of the muscles, innervated by the affected nerve
Autonomic	Signs of local autonomic hyperreactivity (hyperhidrosis, salivation, increased lacrimation, hyperemia, etc.)	Signs of local vegetative hypo- or areactivity (decreased turgor and marble skin tone, hair loss, local osteoporosis, etc.)

Polyneuropathies				
Causes				
Infectious	Toxic	Metabolic	Medication-induced	Hereditary
Pathogenesis				
Axonopathy		Myelinopathy		
Course				
Acute	Subacute		Chronic	
Key clinical syndromes				
Peripheral distal tetraparesis	Hypesthesia or anesthesia of various types of sensitivity in the hands and feet		Pain and vegetative-trophic disorders of the hands and feet	
Diagnostics				
Electromyography	Serum antibody titer to peripheral nerves' myelin		CSF diagnostics	
Differential diagnostics				
Other polyneuropathies	Raynaud's disease	Collagenoses	Liver disease	Blood diseases
Treatment				
Plasmapheresis, hemosorption	Human immunoglobulin, corticosteroids, B vitamins, lipoic acid, anticholinesterase agents, antiviral and desensitizing agents, detoxification, dehydration, metabolic shift correction		Physiotherapy, massage, reflexology	

VERTEBRO-NEUROLOGICAL DISEASES				
Causes				
Anomalies	Dystrophic lesions	Injuries	Neoplasms	Inflammatory and parasitic lesions
Body of vertebra, disk, articular processes, etc.	Osteochondrosis, ligamentosis, etc.	Bodies of vertebrae, discs, processes and arches, etc.	Primary and metastatic	Bechterev's disease, spondylitis, echinococcosis, etc.
Mechanisms of lesion				
Compression	Dysfixation	Dyshaemic	Inflammatory	Combined
Vertebral neurological syndromes				
Vertebral	Neural	Muscular	Neuro-vascular	
Classification of vertebro-neurological syndromes by localization				
Cervical level	Thoracic level	Lumbar leve		
1. Cervicalgia, cervicocranialgia, cervicobrachialgia 2. Radiculopathy 3. Syndrome of vertebral artery	1. Thoracalgia 2. Radiculopathy	1. Lumbago, lumbalgia, lumboishialgia 2. Radiculopathy		
Paraclinical methods for the diagnosis of vertebro-neurological diseases				
Spondylography	Radioscopy	CT	MRI	Myelography
Treatment of vertebro-neurological diseases				
Pharmacotherapy (see below)	Massage, exercise therapy, manual therapy, acupuncture, medical blockages	Physiotherapy - electrophoresis, diadynamic currents		
Pharmacotherapy of vertebro-neurological diseases				
Analgesics (non-narcotic and opioid) - analgin, baralgin, tramadol, morphine	Anti-inflammatory drugs (conventional non-steroidal and COX-2 inhibitors, corticosteroids) - diclofenac, meloxicam, celecoxib, diprospan			
muscle relaxants – tizanidine, baclofen, midocalm	Dehydrating - furosemide, magnesium sulfate			
Vasoactive drugs - nicotinic acid, pentoxifylline, euphiline	Chondroprotectors - arthrostop, teraflex, arthron, aflutop			
Metabolites - B group vitamins, enelbin, lipoic acid	Topical pharmacotherapy - Capsicam, Apisartron, Dip-Relief, Fastum Gel			

Control tests

1. What is the most often cause of brachial plexopathy?

*A) trauma;
B) infection;
C) angiopathy;
D) inherited neurodegeneration;
E) alcohol abuse.

2. Among those listed below which is most often observed in neuralgia?

A) anhidrosis;
B) palsy;
C) wasting;
*D) pain;
E) skin pallor.

3. Do we observe autonomic disorders and hyperpathia in an innervated area due to affection of the ulnar nerve?

A) yes;
*B) no;
C) depends on cause;
D) depends on neural damage extent;
E) depends on level of lesion.

4. What is the most prevalent cause of median nerve neuropathy?

A) ischemia due to vasculitis;
*B) compression in the carpal channel;
C) tuberculosis;
D) diabetes mellitus;
E) syphilis.

5. Intoxication of which metal is most often associated with the development of polyneuropathy?

*A) lead;
B) titanium;
C) uranium;
D) aluminum;
E) tungsten.

6. What is the difference between diphtheritic polyneuropathy and other forms of polyneuropathy?

A) rapid development of coma;
B) domination of cerebellar signs;
*C) starts from the affection of the cranial nerves;
D) presence of hypothalamic syndrome;
E) presence of thalamic syndrome.

7. What is the basic underlying mechanism of alcoholic polyneuropathy?

*A) thiamin deficiency;
B) toxic damage of nerves with alcohol;
C) alcohol-induced axonopathy;
D) constitutional failure of the peripheral neural conduction;
E) alcohol-induced apoptosis.

8. Which among those listed below is used for the management of Guillain-Barre syndrome during the acute stage?

A) corticosteroids and cytostatics;
*B) plasmapheresis and immune globulin;
C) antibiotics and interferons;
D) aggressive detoxification and dehydration;
E) analeptic agents and sympathomimetic amines.

9. What is the basic difference between lumbago and lumbalgia?

*A) rate of acuteness;
B) pain location;
C) outcome;
D) rate of anesthesia;
E) rate of palsy.

10. In aseptic-inflammatory mechanism of spinal osteochondrosis what drugs are most relevant for pathogenetic treatment?

*A) diclofenac, ibuprofen, bethametasone;
B) vitamin B complex, nicotinic acid;
C) baclofen, tizanidine, diazepam;
D) diuretics, magnesium sulfate;
E) neuroleptics, benzodiazepines.

Clinical cases for self-control of knowledge

1. Patient, 42 years old, female, was admitted to the neurological department due to complaints of dumb pains, paresthesias, weakness in legs, especially in distal portions and difficulty during walking. This state started 3 weeks ago and has been slowly progressing. During the last year the woman noted thirst, intensive urination, during prophylactic visit to out-patient department increased level of blood glucose (11,2 mmol/l) was revealed. Patient didn't received regular treatment. Her vital parameters: BP – 125/85 mm Hg, PR – 79 beats/sec., RR – 14/sec. During neurological examination the following signs were revealed – decrease of muscular strength in her feet, absence of the tendon reflexes on distal portions of legs, a decrease in pain, thermal and proprioceptive sensation there, the same was found on hands. During Romberg's test some mild swaying is observed. What is your diagnosis? A) diabetic polineuropathy B) Guillain-Barre syndrome C) alcoholic polineuropathy D) chronic immune polyneuropathy E) mononeuropatia multiplex	A
2. Patient, 41 years old, male, consults neurologist due to complaints of low back pain, ache on posterior-lateral surface of the right thigh and shin, weakness of the right foot. Pain is increased during motion and sitting, decreases during lying supine. These symptoms have been observed during the last 10 years. The first time pain occurred was after the lifting of a heavy weight when something «cracked» in lumbar area – then patient was unable to assume the erect position. 2 days after treatment with pain-killers health condition was stabilized. Pain developed subsequently 3 times. 10 days before consultation the man almost slipped on the ice but was able to keep balance. After 20 minutes pain appeared again, became stronger closer to the evening, in 2 days started referring to right leg, in 1 day more weakness occurred. Somatic examination is unremarkabe. His vital parameters: BP – 130/86 mm Hg, PR – 78 beats/sec., RR – 13/sec. During neurological examination the following signs were revealed – limited mobility in lumbar area and right ankle. Muscular strength in right foot, especially in great toe, is decreased.	

Knee jerks are preserved and symmetric, right Achilles reflex is lost. Paravertebral points are tender during palpation. Positive Neri's and Lasegue's signs, hypesthesia of pain sensation at the lateral surface of right shin and dorsal surface of right foot, especially in area of IV-V toes. Urination is preserved. What is your diagnosis? A) lumbalgia B) schiatica C) radiculopathy D) myelopathy E) spinal stroke	C
3. Patient I., 18 years old, a student, was admitted to the neurological ward with complaints of food intake suppression, change of voice, numbness and weakness in the arms and legs, mainly in the distal parts, difficulty while walking. 3 weeks before hospitalization she was treated in the outpatient department by GP for angina (sore throat while swallowing, general weakness, headache, poor sleep, lost appetite, palpitations, temperature 38°C). On the 15th day from the onset of the disease suppression of food intake appeared, the voice became slurred, and after another 4 days - numbness and weakness in the hands and feet developed. On examination; temperature - 36.8°C, heart rate - 88 beats/min., arrhythmic, blood pressure 130/80 mm Hg. Pupils of equal magnitude, right eye slit slightly narrowed, pupil reaction to light is alive, weakened accommodation. Suppression of food intake, liquid food enters the nose, voice is hoarse, with a nasal vocality; the palate drops, the pharyngeal reflex is not elicited. The tongue moves along the midline. Active movements in all extremities are preserved in full volume with a slight decrease in muscle strength in the hands and feet. Tendon and periosteal reflexes on the hands and feet are not elicited. No pathological reflexes. There is a decrease in pain and temperature sensitivity in the distal extremities, the patient does not distinguish the direction of the toes motions, swaying when walking. What is your clinical diagnosis? A) diphtheroid polyneuropathy B) myasthenia gravis C) amyotrophic lateral sclerosis D) glossopharyngeal neuralgia E) brainstem stroke	A

Control questions for self-study on the topic of the lesson

1. Classification of diseases of the peripheral nervous system.
2. The concept of neuropathy, polyneuropathy, neuralgia, radiculopathy, plexopathy, ganglionitis.
3. Etiology, pathogenesis, clinic of neuropathies of the median, radiation, ulnar, femoral, tibial, common peroneal nerves – diagnostics, treatment.
4. Polyneuropathic syndrome, its manifestations. Etiology, pathogenesis, clinical signs of alcoholic, diabetic, post-diphtheroid polyneuropathy - diagnosis, treatment.
5. Guillain-Barre syndrome – etiology, diagnosis, treatment
6. Etiology, pathogenesis and clinical manifestations of vertebrogenic reflex and root syndromes of cervical, thoracic and lumbar-sacral levels.
7. Causes, clinical picture of brachial plexopathy.
8. Methods of diagnosis and treatment of diseases of the peripheral nervous system.

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