

**Ministry of Health of Ukraine  
Danylo Halytsky Lviv National Medical University  
Department of Surgical Dentistry and Maxillofacial Surgery**

**METHODICAL GUIDE**  
(for the for the English-Medium students of 5<sup>th</sup> course of Dental faculty)

**from surgical dentistry**

**(individual profile course of choice: General Dentistry)**

**CC 3.1**

**Second level of higher education (Master's Degree)**

**Sphere of Knowledge 22 «Healthcare»**

**Specialty 221 «Dentistry»**

**Faculty, Year: Dentistry, V**

**Content module 1: Reconstructive and restorative surgery of the maxillo-facial area**  
Part two

Recommended by the by the profile methodical commission for dentistry

(Protocol No. \_\_ of \_\_\_\_\_20\_\_)

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## INTRODUCTION

### CURRICULUM Surgical Dentistry

According to Standard of Second level of higher education second (master's degree)

Sphere of Knowledge 22 «Healthcare»

Specialty 221 «Dentistry»

educational program of Master of Dentistry

**Educational program description (abstract).** The discipline involves the study of surgical dentistry in its main sections: "Propaedeutics of surgical dentistry", "Inflammatory diseases of the maxillo-facial area", "Oncology of the maxillo-facial area", "Traumatology of the maxillo-facial area", "Reconstructive and restorative surgery of the maxillo-facial area", with emphasis on pathology, clinics, diagnostics, emergency treatment and prevention of the main and most common diseases of maxillo-facial area (MFA).

Special attention is paid to the formation of students' skills of anamnesis collection, examination and differential diagnosis of maxillo-facial area (MFA) diseases with various clinical course and their complications, modern approaches to diagnostics, principles of treatment and prophylaxis on the basis of evidence-based medicine and urgent conditions are studied in practical surgical dentistry. Students participate in the diagnostic and treatment process of outpatient, inpatient patients under the guidance of assistants and associate professors of the department. There is also an introduction to the treatment-and-prophylactic measures that are most commonly used in surgical dental practice.

The study of the discipline "surgical dentistry" helps to form a holistic view of the structure and functioning of the organs of the maxillo-facial area; deepening of theoretical and practical preparation, acquisition of professional practical skills for independent medical activity.

Structure of the discipline	Number of credits, hours, including				Year of study/ semester	Test type
	Total	In class		Self-study		
		Lectures (hours)	Practical (hours)			
<b>Name of the discipline: Surgical Dentistry</b> <b>Number of content modules: 2</b>	<b><u>11</u> credits / <u>330</u> hours</b>	<b>0</b>	<b>192</b>	<b>138</b>	<b>V course (IX, X semesters)</b>	<b>Credit</b>
<b>by semesters</b>						
<b>content module 1</b>	<b>4 credits / 120 hours</b>	<b>0</b>	<b>60</b>	<b>60</b>	<b>IX semester</b>	<b>Credit</b>
<b>content module 2</b>	<b>7 credits / 210 hours</b>	<b>0</b>	<b>132</b>	<b>78</b>	<b>X semester</b>	<b>Credit</b>

**The subject of study of the discipline** are pathological processes of maxillo-facial area, related to the competence of surgical dentistry and maxillofacial surgery, features of their clinical course, the main diagnostic and therapeutic manipulations used in the practice of the dental surgeon.

**Interdisciplinary relations:** therapeutic dentistry, pediatric dentistry, orthopedic dentistry, normal anatomy, histology, normal physiology, pathological physiology, topographic anatomy and surgery, microbiology, biochemistry, pharmacology, internal diseases, endocrinology, endocrinology, endocrinology otolaryngology, ophthalmology, medicine of extreme conditions.

### **The purpose and objectives of the discipline**

**The purpose of teaching** the discipline (surgical dentistry) is to provide a comprehensive and highly-specialized training of a dentist, which involves mastering the theory and practice of all sections of surgical dentistry and basics of MFD, from organization of surgical department of dental clinic and maxillofacial hospital to the ability of providing urgent care in extreme conditions and qualified surgical dental and reconstructive-restoration assistance in MFD.

**The main tasks** of surgical dentistry are to educate a professional surgical dentist who is able to provide a thorough examination of the patient, diagnose the main symptoms and syndromes of MFA pathologies, to substantiate and formulate the preliminary diagnosis; to analyze the results of the examination and conduct differential diagnosis, to formulate a clinical diagnosis of major diseases, to identify the manifestations of somatic diseases in the oral cavity, to define the principles of integrated treatment in the clinic of surgical dentistry, to identify various clinical variants and complications of the most common diseases of the MFA, to be aware of the measures of primary and secondary prevention the most common surgical dental diseases.

### **Content module 1: Reconstructive and restorative surgery of the maxillo-facial area**

**Explain and interpret** the etiology, classification, clinical picture, differential diagnosis of defects and deformations of MFA, the principles of reconstructive surgery in MFA, methods of examination of patients with pathology of MFA, participation of related specialists in the examination.

**To analyze** indications and contraindications, features of application of the basic techniques of restorative-plastic interventions on MFA, features of the general and local anesthesia, sedation in practice of the surgeon-dentist.

**To develop** a plan and conduct an examination of a patient with MFA pathology, make a plan of additional reexamination methods and be able to interpret their results, a plan of comprehensive examination and treatment of patients with defects and deformations of MFA.

**To collect** the anamnesis and examination of the patient for the specified pathology of MFA, to fill in the corresponding medical documentation.

**To carry out** the collection of material for additional research methods (microbiological, cytological, histological); measures for the prevention of pathologies of the MFA.

**To prescribe** an individual scheme of premedication depending on the psycho-somatic condition of the patient, the nature and extent of surgery, drug therapy in the postoperative period, provide appropriate recommendations; prescribe conservative treatment of diseases and pathologies of the MFA.

**To demonstrate** techniques of preoperative preparation of the surgeon's hands according to modern methods, techniques of antiseptic treatment of the operating field, techniques of local plastic surgery.

### Thematic plan of practical (seminar) classes for IX / autumn / semester

№	Topic	Hours
1.	<b>Topic №1.</b> TMJ ankylosis: etiology, pathophysiology, classification, clinical signs, diagnostics, treatment, prevention. Arthroscopy: indications and contraindications, arthroscopic techniques. Mandible contracture: etiology, classification, clinical signs, differential diagnostics, treatment, prevention.	6
2.	<b>Topic №2.</b> Secondary facial soft tissues defects and deformities. The principles of plastic surgery planning. Local plastic surgery. Pedicle flap use. Free dermal transplantation. Soft tissue substitution by means of round Filatov's stem. Salivary gland fistulas surgical treatment.	6
3.	<b>Topic №3.</b> Lip and palate clefts: classification, clinical features, functional disorders. The surgical treatment principles.	6
4.	<b>Topic №4.</b> Jaw deformities: etiology, pathogenesis, classification, clinical signs, diagnostics. Orthognathic surgery: principles and techniques of mono- and bimaxillary surgery. Distraction osteogenesis methods.	6
5.	<b>Topic №5.</b> Fundamentals of the MFA bone grafting. Osteoplastic materials classification. The concept of autogenous, allogeneic, xenogeneic transplantation, the synthetic (alloplastic) bone substitution. General principles of MFA osteoplastic surgery. The principles of the maternal and donor places preparing for the transplantation.	6
6.	<b>Topic №6.</b> Total and subtotal maxillary and mandibular defects, clinical and radiological features. Principles of MFA reconstructive surgery by means of craniofacial titanium implants and bone autografts. The principles of rhynoplasty and otoplasty. Basics of ectoprosthesis. TMJ reconstruction.	6
7.	<b>Topic №7.</b> Preprosthetic surgery. Soft tissues procedures: dissection of the labial and lingual frenulums, scars, mucous hyperplasia and fibrous inflammatory hyperplastic lesions. Vestibuloplasty: the surgeries principles and techniques.	6
8.	<b>Topic №8.</b> Dental implantation. The history and the main development stages. The types of dental implants. The principles of one and two stage implantation. The concept of immediate and delayed loading. Complications of dental implantation.	6
9.	<b>Topic №9.</b> Endodontic treatment complications and their surgical treatment. Periodontal surgery: the main principles, bone grafting materials. Guided tissue regeneration.	6
10	<b>Topic №10.</b> The trigeminal and facial nerves diseases: clinical signs, diagnostics, treatment. Pain syndrome surgical treatment. TMJ pain dysfunction syndrome.  The practical skills algorithms performing: local plastic surgery methods, suturing techniques, alveolotomy conducting. Periodontal abscess incision.  <b>Summary lesson "MFA Reconstructive Surgery".</b>	6
<b>Total hours: 60</b>		

### Independent work schedule for IX /autumn/ semester

№	Topic	Hours	Type of
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			<b>Control</b>
1.	<b>Topic №1.</b> Surgical treatment of TMJ disorders, TMJ reconstruction	3	Current control on the practical classes
2.	<b>Topic №2.</b> TMJ pain dysfunction syndrome.	2	
3.	<b>Topic №3.</b> Mandible contracture surgical treatment.	3	
4.	<b>Topic №4.</b> Soft tissue defects substitution by local (connective tissue, mucosal) grafts. Technique of pedicle flap.	6	
5.	<b>Topic №5.</b> The employment of round Filatov's stem.	4	
6.	<b>Topic №6.</b> Free dermal transplantation.	4	
7.	<b>Topic №7.</b> Salivary glands fistulas surgical closure.	3	
8.	<b>Topic №8.</b> Tissues regeneration. Biological basics of the osteogenesis.	3	
9.	<b>Topic №9.</b> Bone grafting. Osseointegration. Autologous transplantation. Osteogenic materials.	5	
10.	<b>Topic №10.</b> Distraction and compression methods of osteogenesis.	4	
11.	<b>Topic №11.</b> Alveolar bone augmentation before the dental implantation. Methods and materials.	6	
12.	<b>Topic №12.</b> Biological basics of dental implantation. Surgical stages.	4	
13.	<b>Topic №13.</b> Periodontal Surgery. Guided tissues regeneration. Membrane techniques.	6	
14.	<b>Topic №14.</b> MFA neuritis and neuralgia Physical therapy methods of treatment.	3	
15.	<b>Topic №15.</b> MFA microsurgery.	4	
	<b>Total</b>	<b>60</b>	

«Approved»  
at the meeting of the Department  
of Surgical Dentistry and  
Maxillofacial Surgery  
Head of the Department  
Professor Ya. E. Vares

METHODICAL GUIDE FOR THE PRACTICAL LESSONS

Educational discipline	Surgical Dentistry and Maxillofacial Surgery
Topic of the lesson	<b>Topic №6.</b> Total and subtotal maxilla and mandible defects ,the clinical and radiological features. Principles of MFA reconstructive surgery by craniofacial titanium implants and bone autografts. The principles of rhinoplasty and otoplasty. Basics of ectoprosthesis. TMJ reconstruction.
Cours	V
Faculty	Dentistry

## THE PLAN OF THE PRACTICAL LESSON № 6

**1. Topic of the lesson:** «Total and subtotal maxilla and mandible defects ,the clinical and radiological features. Principles of MFA reconstructive surgery by craniofacial titanium implants and bone autografts. The principles of rhynoplasty and otoplasty. Basics of ectoprosthesis. TMJ reconstruction.»  
**Lesson duration 4 hours 30 min., including three breaks of 10 minutes.**

### 2. Learning objectives:

➤ *professional competence:*

1. Collection of medical information of the patient's condition
2. Evaluation of the results of the laboratory and instrumental research..
3. Establishment of the clinical diagnosis of dental disease.
4. Diagnosis of the emergency conditions.
5. Determining the nature and treatment principles of the dental diseases.
6. Determining the necessary mode of work and rest, the diet in the dental diseases treatment
7. Determination of the treatment tactics of dental patient with the somatic pathology.
8. Performing the medical and dental manipulations.
9. Treatment of the main dental diseases.
10. Assessment of the environment impact on the health of the population (individual, family, population).
11. Organization and carry out of dental monitoring of the persons subjected to the dispensary supervision.
12. Defining the tactics and providing the emergency medical care.
13. Maintaining medical records.
14. Processing of the state, social and medical information.

➤ *general competence:*

1. The ability to the abstract thinking, analysis and synthesis; the ability to learn and be trained today.
2. Knowledge and understanding of the subject area and understanding of the profession.
3. Ability to apply knowledge in practical situations.
4. Ability to communicate in the state language both verbally and in writing; Ability to communicate in a second language.
5. Skills to use the information and communication technologies.
6. Ability to search, process and analyze information from the various sources.
7. Ability to adapt and act in a new situation; ability to work autonomously.
8. Ability to identify, set and solve the problems.
9. Ability to choose a communication strategy.
10. Ability to work in a team.
11. Interpersonal skills.
12. Ability to act on the basis of ethical considerations (motives).
13. Safe skills.
14. Ability to evaluate and ensure the quality of the performed work.
15. Ability to act in a socially responsible and civic conscious manner.

### 3. Methods of training:

Preparatory stage - frontal oral interview.

The main stage - practical training, role-playing game.

The final stage – brain storm.

### 4. Interdisciplinary integration.

Disciplines	Student should know	Student should be able to
Previous:		
Anatomy	To know the anatomical and physiological features of the	Be able to explain the structure of the MFA organs and systems.



Physiology.	maxillofacial area: - structure of the maxilla and mandible; innervation and blood supply of the maxilla and mandible; - the structure of the head and neck lymphatic system ; - the structure of the head and neck muscles; - the structure of the head and neck.	Be able to explain the mechanical interaction of muscle groups
Topographic Anatomy and operative surgery.	To know the topography of the MFA organs.	Be able to explain the topography of the MFA organs. Be able to depict schematically the fracture lines of the mandible. Be able to depict schematically the fracture lines of the maxilla according Le For.
Biophysics.	To know the biomechanics of the dento-jaw system.	Be able to prognosis the mechanical loading, mastication loading when different treatment techniques were used treatment.
Disaster (emergency) medicine.	To know the medical care at each stage evacuation.	Be able to explain the basic principles of the emergency care in victims..
Radiology.	To know the most informative additional examination methods for the MFA fractures diagnosis.	Be able to describe the general radiological signs of the facial bones fractures.
Prosthetic dentistry.	To know the types of materials and applied structures for the orthopedic treatment in victims with fractures of the jaws .	To be able to describe different types of tires and explain the stages of their manufacture.
Pharmacology	To know the main groups of the pharmacological drugs that used for the treatment of the non-gunshot maxilla fractures.	To be able to characterize the mechanism of drugs action. Be able to assign and calculate the dose of the basic medical drugs that are prescribed.
<b>Intra-subject integration:</b>		
Topic 1 («The Surgical dentistry Propedeutic»): ... The oral cavity, jaws, face and neck examination methods.	To know the examination methods in patients with the MFA diseases.	Be able to conduct the subjective and objective examination in patient, to prescribe the additional examination methods, fill in the relevant medical documentation.
Topic 3 («The Surgical dentistry Propedeutic»): ... General Anesthesia.	To know the methods, indications of the General Anesthesia in dentistry.	Be able to identify indications to conduct surgery under the General anesthesia. .

Topic 4-9.« The Surgical dentistry Propedeutic»: ... The conductive anesthesia methods.	To know the types and techniques of the local anesthesia. .	Be able to conduct different conduct anesthesia on maxilla and mandible.
Topic 6,7«MFA traumatology». Non-gunshot fracture of the maxilla and mandible.	To know the classification, clinical signs of the maxilla and mandible fractures .	Be able to conduct the diagnose in the patient with face bone fractures.

## 5. Literature:

### 1. Educational

#### *The main*

1.1 Oral and Maxillofacial Surgery Edited by prof. V. Malanchuk, Vinnytsa, Nova Knyha Publisher, 2011. – part .2. - p. 147-198.

#### *The additional*

1.2 PETERSON'S PRINCIPLES OF ORAL AND MAXILLOFACIAL SURGERY, *Second Edition*, 2004, p. 783-803

### 2. Methodical

3.1 Methodical Guide for Practical Training in Surgical Dentistry for the S-th year Students of the Dentistry Faculty , edited by prof.Ya. Vares, 2014, 32 p.

## STRUCTURE OF PRACTICAL LESSON

### Preparation stage (30 min.)

- *Organizational part of the lesson:* presence check, evaluation of the uniform.
- *Informing about of the topic and the purpose of the lesson.*

*The lesson topic:* «Total and subtotal maxilla and mandible defects ,the clinical and radiological features. Principles of MFA reconstructive surgery by craniofacial titanium implants and bone autografts. The principles of rhynoplasty and otoplasty. Basics of ectoprostheses. TMJ reconstruction.»

*The aim of the lesson:* to study the basics of the MFA reconstructive surgery, the total and subtotal maxilla and mandible defects classification, their clinical and radiological features. To know the indications and contraindications for the craniofacial titanium implants and bone grafts using. Know the general rules of osteoplastic surgery and the principles for their preparing.

#### *The motivation of educational activity.*

Cranial-maxillofacial defects are diseases that occur under the influence of numerous etiological factors, causing a wide range of disorders, significant changes in the functions of a number of organs and systems, closely interdependent and interacting with each other. Elimination of pathological changes leads to the elimination of a number of functional and aesthetic disorders and contributes to the full psychosocial rehabilitation of patients with anomalies and defects of the facial skull.

#### *Materials of the methodical providing of a preparatory stage of the classes:*

##### *The frontal interview questions :*

1. The MFA defects classification according to the etiology, pathogenesis, localization and the nature of dysfunction.
2. The examination of the patient's with the MFA acquired defects.
3. The principles of the MFA reconstructive surgery.
4. Types of the defects and deformations of the nose.
5. Types of the lip defects.
6. Replacement of the middle zone of the face tissue defects.

## 7. Plastic surgery of the postoperative defects and deformities of the upper lip, nose and palate.

### **Main stage: formation of professional skills and abilities (180 min)**

Professional training conducting .

#### ***Materials of methodical maintenance of the main stage of the classes:***

The bone defects - a state of deficiency of bone tissue due to partial or complete loss of its fragment, which leads to the anatomical changes, the functional, aesthetic and other disorders. They are acquired and occur as a result of the tumors, after trauma (gunshot, non-gunshot wounds), postoperative (eg: after the tooth extraction), after the inflammatory processes, and so on. The pathogenesis is obvious and leads to the bone loss by various mechanisms, or to the loss of both bone and adjacent soft tissues. Patients complain of impaired facial appearance, jaw and mouth function: eating, speaking, etc. The clinical signs of the jaw defects depends on it's location, it's size, cause, duration, etc. As a rule, the following signs of the maxilla defect are always observed: asymmetry of the face, possible visible absence of the soft tissues and bones; soft tissue depression - cheeks, upper lip; there may be a drooping of the eyeball, curvature of the eyelids closing lines and eye slits, oronasal or oroantral opening; the violation of the tightness of the oral cavity; dysfunction of the jaws of varying degrees, etc.

The mandible defects are a state of violation of its continuity, monolithicity and integrity. They are divided into gunshot, non-gunshot , among the latter are post-resection (postoperative); post-inflammatory; post-traumatic; post-burn; after the radiation therapy. The mandible defects can be noted as an independent pathological cases, or as an important component of the congenital syndrome. Classifications of mandible defects describe various important clinical features - the number of the jaw fragments, the presence of teeth fragments , unilateral or bilateral defects, and so on. The following mandible defects are conventionally distinguished by length: small (up to 2 cm), medium size (2-6 cm), subtotal (up to 10-12 cm), halfly (up to the half length of the jaw) and total. They can be: 1) while maintaining the continuity of the mandible (cavity, perforated, cystic and marginal); 2) with a violation of the continuity of the mandible (there are two or more fragments of the jaw). According to the condition of the soft tissues adjacent to the jaw: with the preservation or loss of mandible soft tissues.

By the localization: defects of the middle part of the mandible body, defects of the distal parts of the body, combined distal and middle defects, defects of the branch and angle, subtotal and total defects of the body, absence of branches and body parts, multiple defects. Additionally, segmental mandible defects (for example: chin, articular process of the jaw) are distinguished if they are important for the preservation of functions. The main types of gunshot mandible defects: 1) with unstable displacement of fragments; 2) with a stable displacement of fragments (with shortening of the jaw, scars); 3) improperly fused fractures with a defect of the jaw. Each of these defects can be in the anterior part of the jaw, distal part, in the area of the branch and angle, as well as doubled.

The patient examination: examine the bite, note the presence, number and stability of the teeth on the jaw fragments , the state of the immune system, teeth vitality, CT, MRI, CT-3D reconstruction of the affected area, make the stereolithographic models, individual fixators (plates, grids, screws) for the fastening of jaw fragments. In the clinical diagnosis of the defect it is important to indicate the following signs: the origin of the defect; the defect localization; the length (in cm); the presence of teeth on the fragments of the jaw; scarring of fragments of the jaw, on the tongue and soft tissues; the presence of a soft tissue defect, etc.

There are the following types of edges of the bone segment: in shape - sharp, sawtooth, etc., in bone density - sclerosed, resorbed, variable density, in thickness - thin or thick (this is important for planning of the fixation), but almost always after various pathological conditions they do not have a normal anatomical shape. Only after resection of the jaw due to tumors, the edges of the defect over time almost retain the shape given to them during the surgery.

The clinical features of the defects is quite diverse: mutilation and asymmetry of the face, scars on the skin, violation of the tightness of the oral cavity and the saliva outflow from it; abnormal position, defect and sagging of the soft tissues in the area of missing bones; disorders of mouth opening, facial expressions, speech, mastication, nutrition, displacement and osteoporosis of jaw fragments, occlusion disorders, chin displacement toward the jaw defect, jaw angle depression, pathological mobility of jaw fragments, possible absence of facial soft tissues, etc. Displacement of the focal points of the mouth floor muscles can cause the tongue to move backwards with possible

respiratory disturbances of varying severity, persistent hypoxia and even dislocation asphyxia, especially during sleeping.

Radiographically - the absence of jaw areas of different sizes, displacement of surviving fragments of the mandible. The bone fragments density is different, possible thinning of bone areas, their uneven contour, limiting defect edges of the fragments have rounded ends with a closing bone plate and so on.

Surgical treatment of the jaw defects involves removing the defect by restoring the anatomical integrity and function of the bone. Numerous surgical interventions have been developed for this purpose, in particular: transplantation of fragments of local bone on the feeding legs from the adjacent muscles; transplantation of fragments of distant bones (clavicle on the sternocleidomastoid muscle, crest of the scapula on the trapezius muscle); free transplantation of autografts (whole or split rib, iliac bone, etc.); use of canned bone allo- and other biological grafts; microvascular transplantation of autologous grafts or breft transplants (embryonic femur on the femoral artery); distraction elimination of mandibular defects (up to 17 cm long); use of metal implants, crystals and other materials of non-biological bone substitutes; the use of metal frames with different materials of bone components (part of the bone), together with inducers of osteogenesis; combined methods.

Types of the bone grafting at the time of its implementation: primary bone grafting - it is performed simultaneously with the resection of the jaw during the removal of tumors; primary delayed in the first 1-2 days after injury and the appearance of a bone defect, provided that antibiotics are taken and there is no obvious inflammation in the tissues; in the granulation wound in 10-30 days, after cleaning the wound from necrotic tissues and in the 2nd phase of the wound inflammation process; secondary bone grafting after 1 month. and more after complete wound healing and normalization of the condition, volume and quality of the soft tissues adjacent to the jaw defect. Variants of the bone graft contact with the edge of the jaw differ in area: transverse, planar, combined (partly transverse, partly planar): butt, overlay, on the inner (better) or outer side of the lower jaw. It is desirable that the contact between the graft and the bone was the greatest. Methods of graft and bone fixation are numerous. Various methods of osteosynthesis are used for this purpose - wire seam, Kirchner needles, metal plates, etc. The bone bed of the graft may be in conjunction with the oral cavity or without conjunction. In the first case, the bone bed is infected with oral fluid, which increases the risk of complications. After the operation for the operated area you need to provide favorable conditions, in particular to immobilize the jaw for a period of 1 to 3-6 months. To do this, use various devices for fixing and immobilizing the jaw in the correct position: Vankevich, Stepanov splints, Tigerstedt dental splints, etc. They are prepared before the surgery on models of the jaws. The "fate" of the bone graft depends on many factors and may be as follows: 1) complete engraftment and organotypic reconstruction of the graft; 2) partial engraftment and organotypic reconstruction of the graft; 3) complete resorption; 4) encapsulation of the graft without further restructuring; 5) pathological restructuring of the graft - hyperplasia, hypo- or hypergrowth of part or all of the graft; 6) rejection of all or part of the graft (with suppuration, resorption or sequestration). The best option is complete engraftment and rapid organotypic reconstruction of the entire graft. This occurs with the use of microvascular carries for 1.5-3 months.; whole carbone, transferred in a free way for 1-1.5 years; various allografts and implants even later up to 2-3 years or more.

Defects of the articular process are: the absence of the junction head of the mandible and the base of the articular process. These defects are difficult to treat. The choice of surgery method depends mainly on the size of the bone defect and the condition of the temporomandibular joint. Variants of the condition of the temporomandibular joint (SNICS) in defects of the articular process: the absence of the head of the jaw and the articular surface of the joint (1A), the absence of the head of the jaw and articular disc (2A), the absence of all joint tissues (3A - while maintaining mobility).

Thus, in condition 1A (no head of the jaw) can completely restore the TMJ by bone grafting with the articular end (1st option of joint restoration) or suturing of the capsule of the lower floor of the joint (2nd option), and only then restore the articular process of the jaw. which bone graft, preferably autologous. But the 2nd option of joint restoration is more expedient.

In the case of TMJ 2A, it is necessary to restore both floors of the TMJ and the articular disc, but local tissues can only restore the upper floor of the TMJ by suturing its capsule. Therefore, during reconstruction, it is necessary to either restore the lower floor of the joint with a graft containing a complete joint, or leave the restored TMJ one-story, as mobility in this one-story joint can be provided by the preserved upper part of the TMJ. However, in the latter case, the restored joint will not have an

articular disc.

Defects 0.5-2.5 cm in size. The most common cause is intra-articular multifragmental, fragmentary fractures of the articular process of the jaw, when during the attempt to reposition and fix the fragments from the mandibular access they are removed, resulting in a defect of this size. Then perform local bone grafting: round the sharp edges of the remnants of the articular process, form a new head of the jaw, suture the capsule of the temporomandibular joint and thus form the lower floor of the joint, perform planar osteotomy of the posterior edge of the jaw branch with preservation of the fixation surface. jaws, move a new fragment of the jaw up to the contact of the new head of the jaw with the joint capsule, fix the moved fragment of the branch in the new position by osteosynthesis and the wound is sutured. Katz surgery can also perform - osteotomy and lengthening of the posterior edge of the jaw branch.

If there is not enough local bone-plastic material in the plastic area or the jaw body is very thin, you can additionally use bone tissue from the jaw body and create the necessary bone stops-fixators for the moved fragment of the branch, bone graft, make a stock of bone for further stage surgery. In the absence of the ability to use the bone of the posterior and lower part of the jaw branch, its coronal process is used to create the articular process: a coronal process with a planar osteotomy of its lower parts and preservation of blood supply sources is isolated. the outer surface of the jaw branch, transfer the coronal process to the place of the joint, set the jaw in the correct position, perform osteosynthesis of fragments and suture the wound.

If it is impossible to perform the previous operation, the distraction method of forming the articular process is used. From the mandibular access from the remains of the jaw branch form its fragment in the shape of the articular process, impose a distraction apparatus and after 10-14 days begin to move the fragment to the desired position at a rate of 1 mm / day for 4 activations of the apparatus. After reaching the correct shape of the jaw and occlusion, the distraction is completed, waiting for the mineralization of bone regenerate and the device is removed (MB Shvirkov).

The use of artificial prostheses of the TMJ and the articular process of the jaw made of metal, plastic, artificial crystals is possible when you want to get the desired result faster and with less intervention. However, the perfection of these prostheses is far from desirable, so they are not used often.

Microvascular bone grafts are performed when the receiving bed has low, undesirable biological reparative properties, there is a deficiency of soft tissues, it is advisable to improve blood circulation in the area of intervention, increase the volume of soft tissues, and so on.

The use of artificial prostheses of the joint, branch or body of the jaw is also one of the possible methods of eliminating defects of this size.

Defects of the mandibular branch can be terminal (the defect is limited to one, only the central fragment of the jaw, there is no articular process) or included (limited to two bone fragments - the central fragment of the jaw and the articular process of the jaw). Given that the absence of the coronal process of the jaw branch is not essential for the function of the mandible, its absence is usually not a reason for its recovery. Elimination of these defects differs in methods and techniques of operation.

End defects of the jaw branch in adults:

- up to 3-4 cm in size is removed by local bone grafting - perform a planar osteotomy of the lower branches and the angle of the jaw, move the fragment of the branch up to restore the height of the jaw branch in the articular process and fix the fragment in a new position;

— end defects of a branch of 3-7 cm in size are also eliminated by the method of local bone grafting, but the remnants of the branch and the body of the jaw are used to eliminate them. From the mandibular access from the central bone fragment cut a graft of the desired size with the inclusion of the lower edge of the jaw, in the area of which perform a planar osteotomy, the graft on the leg of the muscle is moved to the branch of the jaw to the state of split cortical plates in the body of the jaw;

— distraction method involves the formation of a branch and articular process from the remnants of the angle of the jaw and the lower body of the jaw by combined (transverse and planar osteotomy), then impose a distraction device and move the jaw fragment to a new position. Diastasis between the donor zone and the displaced fragment of the jaw is formed by this method of bone regenerate, so the rate of movement of the fragment of the jaw is classic (MB Shvirkov);—

combined method "distraction-osteosynthesis". When forming a fragment of the jaw to create a branch of the jaw, the length of the zone of planar osteotomy is greater than the value of the desired movement of the fragment. Distraction of the jaw fragment is performed at a rate of up to 2.5-3 mm /

day, after its completion, the area of contact between the moved fragment and the jaw body is opened, the cortical plates of the fragments are compared and osteosynthesis is performed. After that, the fragments of the jaw grow together, as in a fracture;

— free or microvascular bone grafting is indicated when other methods cannot be performed due to local or general conditions. As free or microvascular bone autografts, costal cartilage grafts, whole or split ribs, transplants from the sternum, scapula, iliac bone, radial, tibial, metatarsal bones, etc. are used. It is also proposed to create a branch of the jaw and TMJ from the thigh of human embryos on the femoral artery, transferred by microsurgery. Defects of the jaw branch in adults up to 3-4 cm in size are eliminated mainly by local bone grafting, which uses: coronal process of the jaw branch, the lower edge of the jaw, metal frames in the shape of the lost part of the jaw branch, which after repositioning both jaw fragments fixed between them under the condition of the receiving bone bed, fill the skeleton with an autologous bone crest, bone marrow or spongy bone. Some bone substitutes are also used. In 2-6 months. after the operation, the formation of new functionally capable bone tissue between the two fragments of the jaw is expected.

Defects of the body, chin and mandibular branch are eliminated by many of these methods, which have some peculiarities of execution, due to the large size of the defects and other properties of the receiving bed of soft tissues. Used to eliminate defects in these parts of the jaw: up to 3-4 cm in size local bone graft from the jaw on the feeding legs of the muscles of the bottom of the mouth (Deacon's operation) or split along the clavicle on the sternoclavicular-mammary muscle, less often free bone plastics, plastics by boiled autograft (Khodorovich-Bernadsky-Drobtsyun method), distraction method; size over 4 cm (included or final defects up to half the size of the jaw) free and microvascular autoosseous plasticity, distraction method, less often make plastic preserved ortho- or heterotopic allografts and artificial, metal plates-implants, etc. Defects of branches, angle and lower jaw up to 10-12 cm in size to avoid free autologous bone grafts or microvascular grafts with patients' feet containing two bones (main phalanx 2-4 fingers, metatarsal bone), metatarsophalangeal joint at vessel end posterior artery of the foot and comitant (accompanying) vein. With mandibular access to the opening of the recipient artery (face, vein), the graft is bent at the joint to form the angle of the jaw, fix the required shape, which is passed through the Kirchner needle joint and involve this arthrod, after formulating the transplant involved.

Osteoplasty of the mandible by local tissues. Indications are defects of the jaw: body up to 2.5 cm, chin up to 5 cm. Create contact of fragments for bone regeneration with their preparation and compression, distraction begins 7-12 days after bone contact, maturation of regenerate 1-2 months. The rate of distillation of the regenerate 1 mm / day.

There are many classifications of defects of the upper jaw, the most commonly used is the classification which identifies the following clinical situations:

I. Partial defects: 1. Unilateral, bilateral. 2. Bilateral (anterior jaw; lateral; posterior; isolated defects of the palatine processes).

A. In the presence of teeth.

B. In the absence of teeth.

II. Complete unilateral defects:

1. Isolated defects of the upper jaw.

2. Defects combined with deformations of other departments: in the presence of a connection with a nasal cavity; without communication with the nasal cavity.

A. In the presence of teeth on a healthy upper jaw.

B. In the absence of teeth on a healthy upper jaw.

III. Bilateral defects:

1. Incomplete (in the presence of teeth; in the absence of teeth).

2. Complete (without soft tissue defect; with soft tissue defects).

A. In the presence of communication with the nasal cavity.

B. In the absence of communication with the nasal cavity.

Clinical manifestations of maxillary defects are diverse and due to the etiology of the defect, the size and location of areas of bone and soft tissue loss, the presence of the oral cavity with the nasal cavity, maxillary sinus, the number and location of surviving teeth, the general condition of the patient.

Examination of patients with upper jaw defects is typical, but the larger the defect, the more complete and thorough examination of the patient, especially the regenerative capacity of the tissues. It is necessary to perform CT, MRI, to create stereolithographic models of the jaws and its missing

fragment.

Treatment of the defects of the upper jaw is surgical. It depends on many factors, including the location and size of the defect, the condition of the surrounding soft tissues, the general condition of the patient, the condition of the teeth and bite, the condition of the maxillary sinus and nasal cavity, the activity of the maxillary muscles, tongue, the mucous membrane company, etc. The following surgical methods of treatment are used: 1) plastic surgery with local soft tissues (used for small defects of the jaw and oroantral, oronasal joints); 2) plastic removal of defects by transferred soft tissues (tongue flap, Filatov's stem, arterialized flaps, flaps on microvascular anastomoses); 3) bone graft together with soft tissues (local bone graft, free bone grafts, canned bone graft, etc.); 4) distraction elimination of defects of the upper jaw; 5) using the metal, artificial frames with a bone crest and artificial or natural materials. It is also possible to use combined methods to eliminate defects of the upper jaw.

Indications and techniques for removing defects of the upper jaw:

1. Defects of the alveolar process of the jaw after removal of the molars and the presence of the connection of the oral cavity with the maxillary sinus (rarely - with the nasal cavity) are eliminated by various methods, using soft tissues, bone, bone grafts, biologically active substances and others. Plastic removal of the defect by local soft tissues in one layer of soft tissues is indicated for short, small oroantral connections.

Such plastic operations using two soft tissue layers, which provide the creation of two epithelial protections of the bone regeneration zone in the area of the defect from the maxillary sinus and oral cavity, give a more reliable treatment result. Even more reliable are operations using two soft tissue flaps with placement between them of biological components and means to optimize bone regeneration, such as free or soft tissue leg of an autoosseous graft from the anterior surface (trepanation hole) of the maxillary sinus, other auto tissues, bone grafts, biologically active substances, etc. To increase the volume of tissue in the area of the defect (oro-antral junction) used: from the cheek fat lump Bisha, covered it with mucus-oxide flaps; free bone graft from the anterior surface of the maxillary sinus; the same graft on the leg from the periosteum and soft tissues; muco-oxidative-bone decortication from the outer surface of the alveolar process of the defect; canned biological tissues, including bone substitutes, etc.

2. Plasty of upper jaw defects by soft tissues (tongue flap, Filatov's stem, arterialized flaps, flaps on microvascular anastomoses) is shown mostly in difficult to eliminate and large defects of bone and soft tissues, the presence of a significant number of scar tissue after injury and numerous operations on the palate.

3. Bone grafting of the upper jaw can be performed with the loss of important for function or large in size areas. Such defects occur mainly after gunshot wounds, cancer surgery and the like. Several types of operations are used, in particular: local bone grafting, free bone graft plastic surgery, microvascular graft plastic surgery, other operations based on the above, etc.

4. Distraction of defects of the alveolar process of the upper jaw, distraction of the upper jaw by dental devices and methods today is possible only in the sagittal direction in the areas of the alveolar processes of the jaw at a distance of up to 8-10 mm. Given that defects of this size, located in the sagittal direction, can be eliminated by single-stage surgical methods, the distraction hardware methods for this purpose are now practically not used. Vertical distraction of the alveolar process of the upper jaw is indicated after its atrophy and the inability to perform prosthetics using dental implants or removable dentures. Perform a rectangular osteotomy of the alveolar process of the upper jaw. Check the complete separation of the fragment from the jaw, the jaw and the fragment impose a distraction apparatus and after 12-14 days begin the vertical distraction of the alveolar sprout with an average rate of 0.25-0.33 mm / day. The retention period lasts up to 1 month, the regenerate matures, the device is removed and a new bone is used for removable or non-removable prosthetics.

5. Metal or artificial frames, resorbable or non-resorbable special membranes that hold in the right place autologous bone chips, bone gravel, canned grafts, bone replacement artificial or natural materials are used for local reproduction and increase in bone volume before dentures, preferably for further insertion in this area of the jaw of dental implants. Orthopedic preparation of the patient for surgery and the subsequent treatment, rehabilitation provides production of model of jaws and the person in advance, preparation of an obturating resection prosthesis device. Such prosthetic devices include: removable prostheses with a thickened base; removable prostheses with an obturating area on the defect or area of the maxillary sinus; facial prostheses of the face with fixation on glasses or intraosseous implants.

Acquired soft tissue defects:

According to the etiology of the acquired defects are divided as follows:

1st group - those that arose after injury: after mechanical (domestic, industrial, sports, motor transport, natural disasters and emergencies); after gunshot wounds (bullet, shrapnel, etc.); after thermal and chemical lesions (burns, frostbite, alkalis, acids, alcohol); after electric shock; after surgery (often after removal of tumors);

2nd group - defects that occurred after various diseases: nonspecific (phlegmon, osteomyelitis, noma, boil, carbuncle) or specific (smallpox, anthrax, etc.) inflammation; with facial atrophy; in lipodystrophy, etc. ;

3rd group - after irradiation and the action of several causes.

In the event of defects may open the mouth, nose, paranasal sinuses, orbit, esophagus, trachea and other anatomical formations, so the nature of the defects are divided into: 1) permeable (through) into the anatomical cavities - with a defect of the supporting bone structures or without such a defect ; 2) impermeable (not through) - with a defect of integumentary tissues or without them, with a defect of bone structures or without such defects.

Topographic and anatomical defects can be limited (occupy one anatomical area) and extensive (occupy two or more anatomical areas), partial or total (complete absence of structure, organ), marginal or complete, true or false. There are also isolated defects that are not accompanied by deformation of adjacent tissues.

The extent of post-traumatic defects depends on the nature of the injury. Post-traumatic facial defects are extremely diverse. In contrast, the defects that form after cancer surgery are more similar, although their size and shape can also vary depending on the size of the tumor and the degree of its invasiveness.

The clinical features of the defects depends on the location, degree of damage (area and depth, type of lost tissue) and deformation of the tissues adjacent to the defect. Characteristics of through defects: their cause is often block removal of tumors, severe mechanical and gunshot wounds; loss of large areas of integument, facial bones and muscles; the edges of the postoperative defect have clear boundaries, but as a result of scarring there is a displacement and deformation of adjacent tissues and anatomical structures (inversion of the eyelids, displacement of the corner of the mouth and wings of the nose); the edges of the post-traumatic defect are blurred, the tissues adjacent to the defect are significantly deformed by scars; characteristic absence of large fragments of organs and damage to several anatomical areas; the skin around the defect is macerated due to constant salivation; functional disorders depend on the size and location of the defect (for example, a through defect of the cheek causes speech, chewing, facial expressions). Characteristics of non-penetrating defects: they can be caused by partial resection of the jaws, radiation therapy in early childhood, facial atrophy. They are characterized by different depth and area of tissue damage, often no connection with adjacent anatomical cavities, possible absence or lack of supporting bone structures and may develop asymmetry due to the shift of soft tissues towards the bone defect.

The causes of acquired secondary deformities of the face, as a rule, are the previous formation of a tissue defect, fractures of the facial bones with displacement of fragments.

Classification of scarring of the face:

According to the location and size of the scar:

1) isolated deformations (lips, mouth, cheeks, chin): partial; full;

2) combined deformations of one or both lips with damage to the cheeks, nose, upper neck.

The depth of scarring is deformed: the skin, skin and subcutaneous fat, the intermediate layers in combination with damage to the skin or mucous membranes, the entire thickness of the soft tissues of the face.

The clinical sign of scarring of the face depends on the type of injury, the location of the primary wound, the type of healing, the quality of treatment, the type of connective tissue of the victim, the regenerative properties of his body and so on. Thus, electric trauma always causes deep necrosis and, as a consequence, significant secondary deformation of tissues. Thermal burns lead to the formation of scars in the form of bands and membranes, as well as in the form of a scar mass, often developing hypertrophic and keloid scars. Localization of the wound in the oral area and around the nostrils leads to the formation of concentric scars, which narrow the mouth and nostrils, and the localization of the wound in the lower lip often leads to inversion of the lip, so due to the violation of the closure of the lips and the tightness of the oral cavity there is salivation with maceration of the adjacent skin. The



peculiarity of the development of scar deformities is that over time the primary clinical picture can change completely - both for the better and, mostly, for the worse, because the time of final development and maturation of scars on the face is up to 12-18 months.

Defects and deformities of the nose are a separate complex category. Because the nose has a rather complex anatomical structure and many important functions, a separate additional classification of its defects and deformations has been created, which takes into account the location of defects and deformations, as well as the volume of lost tissue. This classification allows surgeons to justify the choice of surgical treatment.

All defects and deformations of the nose are divided into three groups:

1st group - defects of nasal tissues:

- total (separation of the whole nose);
- subtotal (separation of bone and part of the cartilaginous department, or vice versa);
- one-sided;
- complete defects of the cartilaginous department (wings, tip, septa without respiratory dysfunction);
- partial defects of the cartilaginous department (wings, tip, septa without respiratory dysfunction);
- defects of the bone of the nose;
- combined defects;

2nd group - deformations associated with damage to the edges of the pear-shaped hole, ie the bony base of the outer nose:

- with the destruction of the entire nostril - the nose is flattened or retracted;
- at destruction of the top edge of a nasal opening - the back of a nose sinks, and cartilaginous department is pulled up;
- at destruction of the lower edge - the involved cartilaginous department;
- at unilateral destruction of a nasal opening - one side of a nose sinks;

Group 3 - combined defects of the outer nose, aperture and adjacent parts of the face.

Among the deformities of the nose are the curvature of the nose due to fractures of the bones and cartilage of the nose with a displacement that is incorrectly fused; malformations of the bones and cartilage of the nose after an injury suffered in childhood. Elimination of nasal defects with a predominant loss of soft tissues has been carried out for a long time. There are methods of local plastic surgery, among which the main ones are the "Indian method" and its modifications, and the "Italian method" and its modifications, when the tissues for the restoration of the nose are taken away from the place of plastic surgery - on the forearm.

At posttraumatic curvatures of a nose thickening and consolidation of bone structures, and also deformation of a lateral wall (curvature or concavity) is radiologically defined. Clinically - the formation of excess callus. The bony septum of the nose with curvatures, as a rule, remains not deformed. In 45% of cases, nasal curvature is accompanied by nasal breathing disorders, which, in turn, contributes to the development of anemia, oxygen starvation, catarrh of the upper respiratory tract. Such patients are usually operated on by otorhinolaryngologists. In the absence of defects and deformations of the skin, the curvature of the nose is treated surgically: a) fresh fractures of the nasal bones are removed by manual reposition, fixation can be provided by anterior nasal tamponade; b) obsolete fractures are removed by osteotomy, reposition and fixation of fragments of nasal bones. In practice, for convenience, use the following clinical classification of nasal defects: a) defects of the wings of the nose; b) the tip of the nose; c) the back of the nose; d) the whole nose. Defects of the skin of the nasal septum are considered separately. This classification is simple and convenient, but does not take into account the depth and extent of damage to the tissues of the nose and adjacent tissues, and so on. This simplifies the approach to the choice of surgical treatment and often leads to a negative cosmetic and functional result, contrary to the rules of modern plastic surgery, which requires surgeons to know not only aesthetic but also anatomical and functional features of the face. AI Nerobeev divides the defects of the tissues of the head and face into 3 main groups, which differently affect the general health of the patient, the external and functional condition of the tissues of the damaged area:

1st group - defects that require immediate closure for vital signs (defects of tissues covering the skull; exposure of the vascular bundle);

Group 2 - defects in which reconstructive surgery is required for functional and aesthetic indications, but can be delayed for some time (total and subtotal defects of the nose, lips, cheeks);

Group 3 - defects in which reconstructive surgery is not required and is the method of choice.

Simultaneous complete elimination of the defect has advantages and disadvantages. The advantages include: no need to form a wound surface in the area of the defect, no secondary scarring of adjacent tissues, the skin on the edges of the defect is not macerated constantly flowing from the mouth saliva, wound infection is not required, the decision to operate favorably affects the patient's psyche, it is easy agrees to it. Disadvantages of one-time operations: increase in duration of operation, additional blood loss, at electrocutting of tumors deep cellular damages on periphery of a wound that can negatively affect engraftment of rags are formed, at long operations the operating crew can get tired and need equivalent replacement.

Determining the timing of the operation. Traumatic defects are eliminated either immediately after the injury (up to 24 hours - primary plastic surgery) or after complete wound healing (preferably after 10-12 months, when the infiltration along the edge of the defect disappears and the scarring process ends).

After specific inflammatory processes and radiation therapy, the terms of plastic surgery should be removed and determined individually after consultation with relevant specialists. For example, in tuberculous lupus, the elimination of defects is possible after the stable elimination of the process, ie, after 6-8 months. At syphilitic defeats of fabrics of the person plastic is carried out after clinical treatment and at negative serological reactions.

After removal of a malignant tumor, primary plastic surgery can be performed only if the surgeon is confident in the radicality of the basic operation. In squamous cell carcinoma, the probability of recurrence is high, so reconstructive surgery is performed only after 1-1.5 years. All this time the patient should be under observation. After chemotherapy and radiation therapy, it should be borne in mind that due to the deterioration of the reparative potential and nutrition of adjacent tissues, it is impractical to use rags from areas adjacent to the defect. Flaps that have not been irradiated, have not been exposed to regional chemotherapy, and have their own vascular leg are more effective.

Indications for reconstructive surgery for facial defects are due to existing disorders of facial appearance and functional disorders, including disorders of the tightness of the oral cavity, eating, speaking, breathing. But for the patient it is important not only to restore lost functions, but also to reproduce the correct anatomical shape of the face, getting a good cosmetic result.

- *Algorithms for the formation of the professional abilities.*
  1. To be able to make the clinical examination in patient with maxilla, mandible and nose defects .
  2. Make a treatment plan in the patients with with maxilla, mandible and nose defects .
  3. Make a plan of a complex treatment and patient care in the postsurgical period.
  4. To practice on the phantom the technique of the bone autografting and the method of the graft fixation to the donor site.

- *Practical tasks (typical, atypical, unpredictable situations).*

*Individual task*

Task №1.

What is not related to the etiological factors of the maxilla defects?

- A. Malignant tumors.
- B. Osteomyelitis.
- C. Congenital nonunion of the palate.
- D. Gunshot wounds.
- E. All answers are correct.

Task №2.

Which clinical symptoms are not typical after the resection of the upper jaw?

- A. Depression of the cheek tissues.
- B. Omission of the eyeball.
- C. Dysfunction of swallowing, speech.
- D. Disorders of binocular vision.
- E. Functional rather than anatomical disorders predominate, mainly chewing.

*Tasks for the independent work and work in small groups (interactive teaching methods).*

In patient M. 39, after the excision removal of ameloblastoma, the integrity of the jaw was violated with the formation of a defect of the jaw branch and the body to the level of 44 tooth. Which treatment plan would you suggest? What methods of surgical treatment can be offered to the patient? Justify your choice.

**Final stage (30 min)**

Summing up of the lesson.

**Materials of methodological support of the final stage of the lesson:**

- *Brain storm.*

Students demonstrate an exhaustive description of the unusual clinical situation and offer to offer the most rational diagnostic methods. After recording all the proposed diagnostic methods during the discussion, students choose the most rational.

- *Tasks for the self-employment.*

Fill in the medical documentation, make a plan of the patient examination with the appropriate clinical situation and determine the indications for the osteoplastic surgery, make a plan of postoperative care of the patient

*Evaluation.*

«Approved»  
at the meeting of the Department  
of Surgical Dentistry and  
Maxillofacial Surgery  
Head of the Department  
Professor Ya. E. Vares

METHODICAL GUIDE FOR PRACTICAL LESSONS

Educational discipline	Surgical Dentistry and Maxillofacial Surgery
Topic of the lesson	<b>Topic № 7.</b> Preprsthetic surgery. Soft tissue surgeries: lip and tongue bridle plastic surgery, scar deformities, muscle strands and fibrous changes of the oral mucos removal surgery . Vestibuloplasty: principles and techniques of surgery using free mucous and skin grafts.
Course	V
Faculty	Dentistr

## THE PLAN OF THE PRACTICAL LESSON № 7

**1. Topic of the lesson:** «Preprosthetic surgery. Soft tissue surgeries: lip and tongue bridge plastic surgery, scar deformities, muscle strands and fibrous changes of the oral mucosa removal surgery . Vestibuloplasty: principles and techniques of surgery using free mucous and skin grafts.»

**Lesson duration 4 hours 30 min., including three breaks of 10 minutes.**

### 2. Learning objectives:

➤ *professional competence :*

1. Collection the medical information of the patient's condition
2. Evaluation of the laboratory and instrumental research results.
3. Establishment of the clinical diagnosis of dental disease.
4. Diagnosis of the emergency conditions.
5. Determining the nature and treatment principles of the dental diseases.
6. Determining the necessary mode of work and rest, the diet in the dental diseases treatment
7. Determination of the treatment tactics of dental patient with the somatic pathology.
8. Performing the medical and dental manipulations.
9. Treatment of the main dental diseases.
10. Organization of medical and evacuation measures..
11. Defining the tactics and providing the emergency medical care.
12. Maintaining medical records.
13. Processing of the state, social and medical information.

➤ *general competence:*

- 1. The ability to the abstract thinking, analysis and synthesis; the ability to learn and be trained today.
- 2. Knowledge and understanding of the subject area and understanding of the profession.
- 3. Ability to apply knowledge in practical situations.
- 4. Ability to communicate in the state language both verbally and in writing; Ability to communicate in a second language.
- 5. Skills to use the information and communication technologies.
- 6. Ability to search, process and analyze information from the various sources.
- 7. Ability to adapt and act in a new situation; ability to work autonomously.
- 8. Ability to identify, set and solve the problems.
- 9. Ability to choose a communication strategy.
- 10. Ability to work in a team.
- 11. Interpersonal skills.
- 12. Ability to act on the basis of ethical considerations (motives).
- 13. Safe skills.
- 14. Ability to evaluate and ensure the quality of the performed work.
- 15. Ability to act in a socially responsible and civic conscious manner.

### 3. Methods of training:

Preparatory stage - frontal oral interview.

The main stage - practical training, role-playing game.

The final stage – brain storm.

### 4. Interdisciplinary integration.

Disciplines	Student should to know	Student should be to able
Previous:		
Anatomy.	To know the anatomical and physiological features of the maxillofacial area: - structure of the maxilla and	Be able to explain the structure of the MFA organs and systems. Be able to explain the

Physiology.	mandible; innervation and blood supply of the maxilla and mandible; - the structure of the head and neck lymphatic system ; - the structure of the head and neck muscles; - the structure of the head and neck.	mechanical interaction of muscle groups .
Topographic Anatomy and operative surgery	To know the topography of the MFA organs.	Be able to explain the topography of the MFA organs. Be able to depict schematically the fracture lines of the mandible. Be able to depict schematically the fracture lines of the maxilla according Le For.
Biophysics.	To know the biomechanics of the dento-jaw system.	Be able to prognosis the mechanical loading, mastication loading when different treatment techniques were used treatment.
Disaster (emergency) medicine.	To know the medical care at each stage evacuation.	Be able to explain the basic principles of the emergency care in victims.
Radiology.	To know the most informative additional examination methods for the MFA fractures diagnosis.	Be able to describe the general radiological signs of the facial bones fractures .
Prosthetic Dentistry.	To know the types of materials and applied structures for the orthopedic treatment in victims with fractures of the jaws .	To be able to describe different types of tires and explain the stages of their manufacture.
Pharmacology	To know the main groups of the pharmacological drugs that used for the treatment of the non-gunshot maxilla fractures.	To be able to characterize the mechanism of drugs action. Be able to assign and calculate the dose of the basic medical drugs that are prescribed.
<b>Intra-subject integration:</b>		
Topic 1 («The Surgical dentistry Propedeutic»): ... The oral cavity, jaws, face and neck examination methods.	To know the examination methods in patients with the MFA diseases.	Be able to conduct the subjective and objective examination in patient, to prescribe the additional examination methods, fill in the relevant medical documentation.
Topic 3 («The Surgical dentistry Propedeutic»): ... General Anesthesia.	To know the methods, indications of the General Anesthesia in dentistry.	Be able to identify indications to conduct surgery under the General anesthesia
Topic 4-9.« The Surgical dentistry Propedeutic»: ... The conductive anesthesia	To know the types and techniques of the local anesthesia.	Be able to conduct different conduct anesthesia on maxilla and mandible.

methods.		
Topic 6,7«MFA traumatology». Non-gunshot fracture of the maxilla and mandible.	To know the classification, clinical signs of the maxilla and mandible fractures.	Be able to conduct the diagnose in the patient with face bone fractures.

## 5. Literature:

### 1. Educational

#### *The main*

1.1 Oral and Maxillofacial Surgery Edited by prof. V. Malanchuk, Vinnytsa, Nova Knyha Publisher, 2011. – part .2. - p. 277-283.

#### *The additional*

1.2 PETERSON'S PRINCIPLES OF ORAL AND MAXILLOFACIAL SURGERY, *Second Edition*, 2004, p. 783-803

### 2. Methodical

3.1 Methodical Guide for Practical Training in Surgical Dentistry for the S-th year Students of the Dentistry Faculty , edited by prof.Ya. Vares, 2014, 32 p.

## STRUCTURE OF PRACTICAL LESSON

### Preparation stage (30 min.)

- *Organizational part of the lesson:* presence check, evaluation of the uniform.
- *Informing about of the topic and the purpose of the lesson.*

*The lesson topic:* “Preprsthetic surgery. Soft tissue surgeries: lip and tongue bridle plastic surgery, scar deformities, muscle strands and fibrous changes of the oral mucos removal surgery . Vestibuloplasty: principles and techniques of surgery using free mucous and skin grafts”.

*The aim of the lesson:* to study the clinical situations that make it impossible or impossible to perform full-fledged dental prosthetics; general and local treatment measures for surgical preparation of the oral cavity and alveolar sprout for dental implantation and prosthetic treatment.

#### *The motivation of educational activity*

Despite the successful development of dentistry, various new methods of treatment of teeth and periodontal diseases, the number of patients who need dental prosthetics is not decreasing. The dentist should be familiar with the procederes of surgical preparation of the oral cavity and alveolar sprout, which are an important step before the prosthetic treatment and dental implantation.

#### *Materials of the methodical providing of a preparatory stage of the classes:*

##### *The frontal interview questions :*

1. Indications and contraindications for the surgical preparation of the oral cavity for prosthetics.
2. Indications for plastic surgery on the oalcavity soft tissues.
3. Methods of lengthening the lips, cheeks, tongue bridles, indications for surgery.
4. Indications for the plastic surgery of the oral cavity soft tissues.
5. Surgical techniques for deepening the vestibulom oris.
6. Indications for free skin plastic surgery, surgery methods .
7. Indications for free plasticity of the mucous membrane, the surgery methods.
8. Complications when performing interventions on the soft tissues of the oral cavity.

### Main stage: formation of professional skills and abilities (180 min)

***Materials of methodical maintenance of the main stage of the classes:***

The task of the preprosthetic surgery is to create a reliable support structure of bone and soft tissues for further optimal functioning of dentures.

Preparation of the patient for pre-prosthetic surgery of the oral cavity:

1. Referral from an orthopedist.
2. Psychological readiness of the patient to use prostheses, especially removable, as well as for surgery in this regard.
3. Conducting a joint examination with an orthopedic dentist and determining the absence of general contraindications to surgery.
4. Thorough examination of the oral cavity (assessment of changes in soft tissues and bone formations that prevent prosthetics).
5. Evaluation of the jaws models and X-ray examination.

There are following surgery methods :

- on the jaw bones ;
- on the soft tissues (oral mucosa, muscle bundles, periosteum);
- on the peripheral branches of the trigeminal nerve;
- raising the bottom of the maxillary sinus (sinus lift).

Reducing the unevenness of the oral cavity mucous and jaws periosteum .

Surgery technique :

- 1) Make elliptical convergent incisions that border the pathological area.
- 2) Mobilize the muco-periosteum flaps on the vestibular and oral sides to connect them without tension.
- 3) The wound is sutured with nodular or continuous sutures.

Reduction of retromolar tissues. In the retromolar area, excess tissue is usually associated with hypertrophy.

Technique of operation:

- 1) Make elliptical incisions.
- 2) Thin the tissues along the edges of the defect.
- 3) The wound is sutured with nodular or continuous sutures.

Removal of excess soft tissue in the distal palate. Excess tissue in the distal part of the palate causes its narrowing and creates difficulties in prosthetics.

Surgery technique :

- 1) Excess soft tissue is cut with a sharp thin scalpel on the tangential surface to the depth of the mucous and submucosal layers.
- 2) The edges of the wound are brought together, sutures are applied.
- 3) Put a protective plate on the wound surface.

Complications: shallow tissue excision is recommended, as damage to the anterior palatine artery, loops of the pterygoid venous plexus is possible.

Removal of excess soft tissue of the alveolar arch. Bone atrophy, the use of inadequately fixed dentures, creates an excess of soft tissue that is devoid of bone support. Tissue removal is performed with two parallel, converging at the ends, incisions to the periosteum along the alveolar arch, and the wound is sutured by the usual method.

Excision of excess inflammatory-altered tissue. Excess inflammatory-altered tissue is formed when using unreliable dentures, their inadequacy. The simplest method is electrocoagulation or laser excision with subsequent wound healing by secondary tension under a tampon. At the considerable sizes of an excess inflammatory site carry out usual excision to a periosteum with suturing of a wound by a nodal or continuous seam.

Surgery on the shortened bridle of the tongue. To lengthen the bridle of the tongue, make a median incision through the bridle, form two triangular flaps, which are mutually moved and fixed with a thin catgut or synthetic thread. During the surgery, it is necessary to remember the location of the sublingual papillae in order to prevent their injury.

With a significant shortening of the bridle of the tongue, it is more appropriate to perform the operation by horizontal dissection of the bridle.

Excision of the bridle of the lip (lip frenectomy), removal of scar muscle strands of the mouth.

With a shortened bridle of the upper / lower lip, it is difficult to fixate the dentures.



Excision of the bridle is performed by attaching the bridle of the lip to the alveolar arch with a wide base. The mucous membrane is sutured to the periosteum, preferably to the full depth of the gingival sulcus. The wound is sutured along its entire length together with the periosteum.

Plastic counter triangular flaps are used to lengthen the bridle of the lip.

Plastic dorsum of the oral cavity using grafts. Indications: insufficient depth of the dorsum of the oral cavity for adequate fixation of the denture; lack of mucous membrane on the upper lip; if plastic surgery with submucosal tissue can cause shortening of the lips.

Surgery technique :

1) An incision is made in the area of the oral cavity vestibulum, the mucous-periosteum flap is separated.

2) A free split skin graft is placed in the formed wound.

3) Tires or prefabricated prostheses are used to create the conditions for graft integration.

According to the available clinical variants of the structure of the mucous membrane, treatment includes a large number of possible surgical interventions to prepare the mucous membrane for prosthetic teeth: 1) excision of scar adhesions of the mucous membrane using triangular flaps of mucous membrane to close the defect; 2) deepening of the small orifice of the mouth is necessary before the manufacture of a removable plate prosthesis, clasp prosthesis, bridge in an aesthetically significant area. To conduct this, use a variety of surgical techniques. The most common of them are: transplantation of split Tirsch skin (1-stage technique): perform an incision of the mucous membrane to the bone in the transitional fold, exfoliate the tissue flap, form a stent new form of the transitional fold, lift the split skin graft, glue it, glue it the liner with the wound surface of the graft on the wound of the tissue bed and fix the liner with sutures for 12-14 days; split skin transplantation by 2-stage method: from two small vertical incisions stratify the tissues along the transition fold, make a tunnel in the takanin, enter it rolled into a tape on a rubber tube skin graft with the wound surface outwards and after 12-14 days the mucous membrane above the tube is cut, the tube is removed, made in this area shaping devices and prescribe massage; transplantation of the muco-oxidative flap from the alveolar ridge to the body of the jaw with fixation of the flap by sutures or a peloid prosthesis (according to Rumpel); 3) the mobility of the mucous-muscle flaps is more often performed from the lingual surface of the anterior mandible, when moving down the muscles of the bottom of the oral cavity with the mucous membrane; 4) removal of excess oral mucosa in local hyperplasia, fibromatosis of the alveolar process, hump of the upper jaw, fibropapillomas and papillomatosis, which may occur due to prolonged injury to the mucous membrane by the edges of removable dentures; 5) at a mobile mucous membrane on a crest of an alveolar shoot carry out various types of operations: movement of mucous down and its hemming in the lower pole of a wound (according to Kazanyan), movement down, on a bare bone and closing by an iodoform tampon (according to Wassmund), movement of a mucous membrane on the lower jaw down simultaneously from the lingual and labial sides (according to Rerman); 6) myoplasty of the muscles adjacent to the mandible involves moving to a new position m.mentalis, m.genioglossus, m.milohioideus, which allows you to significantly deepen the dorsum of the mouth and the level of tissues on the side of the tongue. After most plastic surgeries it is necessary to use forming plastic caps on the area of reconstruction of the mucous membrane, alveolar processes, the orifice of the oral cavity.

- *Algorithms for the formation of the professional abilities.*

1. Make a plan for pre-prosthetic preparation of the patient.
2. Make a plan of the comprehensive treatment and care of the patient after local plastic surgery.
3. Work out the technique of the frenuloplasty surgery on the phantom.
4. Work out the technique of the vestibuloplasty surgery on a phantom.

- *Practical tasks (typical, atypical, unpredictable situations).*

*Individual task*

Task №1.

Vestibuloplasty according to Clark is performed:

A. Under conditions of poor general condition of the patient.

B. Only under conditions of complete adentia.

- C. On the upper jaw.
- D. On the lower jaw.
- E. All answers are correct.

Task №2.

What are the different types of frenuloplasty according to Limberg?

- A. Z-shaped.
- B. Y-shaped, Z-shaped.
- C. Z-shaped, W-shaped.
- D. Open and closed.
- E. M-shaped.

*Tasks for the independent work and work in small groups (interactive teaching methods).*

A 50-year-old woman had extracted teeth because the generalized periodontitis 9 years ago. Uses removable dentures. There was a complete atrophy of the alveolar processes of the jaws. What is the reason of the jaws atrophy? Which methods of permanent fixed prosthetics can be offered in such clinical case? Justify your choice.

### **Final stage (30 min)**

Summing up of the lesson.

#### **Materials of methodological support of the final stage of the lesson:**

- *Brain storm.*

Students demonstrate an exhaustive description of the unusual clinical situation and offer to offer the most rational diagnostic methods. After recording all the proposed diagnostic methods during the discussion, students choose the most rational.

- *Tasks for the self-employment.*

Fill in the medical documentation, make a plan of the patient examination with the appropriate clinical situation and determine the indications for the osteoplastic surgery, make a plan of postoperative care of the patient

*Evaluation.*

Ministry of Health of Ukraine  
Danylo Halytsky Lviv National Medical University  
Department of Surgical Dentistry and Maxillofacial Surgery

«Approved»  
at the meeting of the Department  
of Surgical Dentistry and  
Maxillofacial Surgery  
Head of the Department  
Professor Ya. E. Vares

METHODICAL GUIDE FOR PRACTICAL LESSONS

Educational discipline	Surgical dentistry and Maxillofacial Surgery
Topic of the lesson	<b>Topic №8.</b> Dental implantation. History and main stages of implantology development. Types of dental implants, materials for their manufacture. Principles and methods of one- and two-stage implantation. The concept of immediate and delayed implants loading . Complications of dental implantation.
Course	V
Faculty	Dentistry

## THE PLAN OF THE PRACTICAL LESSON № 8

**1. Topic of the lesson:** “. Dental implantation. History and main stages of implantology development. Types of dental implants, materials for their manufacture. Principles and methods of one- and two-stage implantation. The concept of immediate and delayed implants loading . Complications of dental implantation “.

**Lesson duration 4 hours 30 min., including three breaks of 10 minutes.**

### 2. Learning objectives:

➤ *professional competence :*

1. Collection the medical information of the patient's condition
2. Evaluation of the laboratory and instrumental research results.
3. Establishment of the clinical diagnosis of dental disease.
4. Diagnosis of the emergency conditions.
5. Performing the medical and dental manipulations.
6. Organization and carrying out of dental medical examination of persons subject to dispensary supervision.
7. Organization of medical and evacuation measures..
8. Defining the tactics and providing the emergency medical care.
9. Maintaining medical records.
10. Processing of the state, social and medical information.

➤ *general competence:*

1. The ability to the abstract thinking, analysis and synthesis; the ability to learn and be trained today.
2. Knowledge and understanding of the subject area and understanding of the profession.
3. Ability to apply knowledge in practical situations.
4. Ability to communicate in the state language both verbally and in writing; Ability to communicate in a second language.
5. Skills to use the information and communication technologies.
6. Ability to search, process and analyze information from the various sources.
7. Ability to adapt and act in a new situation; ability to work autonomously.
8. Ability to identify, set and solve the problems.
9. Ability to choose a communication strategy.
10. Ability to work in a team.
11. Interpersonal skills.
12. Ability to act on the basis of ethical considerations (motives).
13. Ability to act in a socially responsible and civic conscious manner.

### 3. Methods of training:

Preparatory stage - frontal oral interview.

The main stage - practical training, role-playing game.

The final stage – brain storm.

### 4. Interdisciplinary integration.

Disciplines	Student should know	Student should to able
Previous:		
Anatomy	To know the anatomical structure of maxilla and mandible, nerve and blood supply of the maxilla and mandible.	Be able to explain the structure of maxilla and Mandible
Histology	To know the histological structure of the alveolar processes mucosa and bone.	Be able to explain the histological structure of the alveolar processes mucosa and bone.
Topographic Anatomy and operative surgery .	To know the topography of the MFA organs.	Be able to explain the topography of the MFA organs.
Radiology.	To know the peculiarities of radiological structures of maxilla and mandible.	To be able to use modern methods of X-ray examination. Be able to use modern methods of X-ray examination.
Pharmacology	To know the pharmacokinetics of drugs prescribed to patients with dental implantation in the postoperative.	Be able to prescribe a scheme of drug treatment to patients with dental implantation.
Prosthetic dentistry	To know the main stages of prosthetic treatment on dental implants.	Be able to explain the main stages of prosthetic treatments on dental implants.
<b>Intra-subject integration:</b>		
Topic 1 («The Surgical dentistry Propedeutic»): ... The oral cavity, jaws, face and neck examination methods.	Topic 1 («The Surgical dentistry Propedeutic»): ... The oral cavity, jaws, face and neck examination methods.	Topic 1 («The Surgical dentistry Propedeutic»): ... The oral cavity, jaws, face and neck examination methods.
Topic 4-9.« The Surgical dentistry Propedeutic»: ... The conductive anesthesia methods.	To know the types and techniques of the local anesthesia.	Be able to conduct different conduct anesthesia on maxilla and mandible.
Topic 9. «Reconstructive Surgery of MFA»: Preparing of alveolar crest for dental implantation.	To Know the methods of the alveolar crest preparing for dental implantation.	Have the techniques for preparing the alveolar crest for dental implantation.

### 5. Literature:

#### 1. Educational

*The main*

1.1 Oral and Maxillofacial Surgery Edited by prof. V. Malanchuk, Vinnytsa, Nova Knyha Publisher, 2011. – part .2. - p. 2712-236.

### ***The additional***

1.2 PETERSON'S PRINCIPLES OF ORAL AND MAXILLOFACIAL SURGERY, *Second Edition*, 2004, p. 189-235

## **2. Methodical**

3.1 Methodical Guide for Practical Training in Surgical Dentistry for the S-th year Students of the Dentistry Faculty , edited by prof.Ya. Vares, 2014, 32 p.

### **STRUCTURE OF PRACTICAL LESSON**

#### **Preparation stage (30 min.)**

- *Organizational part of the lesson:* presence check, evaluation of the uniform.
- *Informing about of the topic and the purpose of the lesson.*

*The lesson topic:* «Dental implantation. History and main stages of implantology development. Types of dental implants, materials for their manufacture. Principles and methods of one- and two-stage implantation. The concept of immediate and delayed implants loading . Complications of dental implantation.»

*The aim of the lesson:* to learn indications and contraindications for dental implantation, types of implants, features of patient's examination before dental implantation, complications during and after dental implantation , their treatment and prevention.

#### *The motivation of educational activity*

In recent years, implantology has emerged as a separate branch of dentistry, which is developing rapidly. The surgical stage plays an important role in both dental and maxillofacial implantation. The dentist must know the indications, contraindications to implantation, types of implants, the amount of examination before dental implantation, methods of implantation, complications after dental implantation and their treatment.

#### ***Materials of the methodical providing of a preparatory stage of the classes:***

##### *The frontal interview questions :*

1. Features of patient examination before dental implantation.
2. Indications and contraindications for dental implantation.
3. Types of implants.
4. The structure of implants:
  - a) by type of material;
  - b) by type of construction;
  - c) components of implants.
5. Support areas for dental implants.
6. Types of bone density by Misch.
7. Functional loads on implants .
8. Basic requirements for the design and materials of implants.
9. Types of dental implantation
10. Clinical stages of dental implantation.
11. Planning the the method of prosthetic treatment based on implants.
12. Methods of endoosal implantation and features of it's implementation on the maxilla and mandible.
13. The main criteria when designing implants.
14. The main criteria for assessing the condition of the endoosal implant in the bone.
15. Basics of medical tactics when using dental implants.

16. Complications during and after implantation and their treatment.
17. Expediency and inexpediency of using dental implants.

**Main stage: formation of professional skills and abilities (180 min)**

Professional training conducting .

***Materials of methodical maintenance of the main stage of the classes:***

Dental implantation is a branch of dentistry that solves the problems of restoring the anatomical shape and function of various parts of the dental system through the introduction of alloplastic materials into the tissue. With the help of various implants it is possible to restore the continuity of the jaws, TMJ, facial contours (maxillofacial implantology), or dental arches and individual teeth (odontoimplantology). An implant is a structure made of a material of non-biological origin, which is inserted into the tissues of a macroorganism for the purpose of prosthetics, or to create a support for fixing the prosthesis.

Indications for prosthetic treatment on dental implants:

- 1) the absence of the teeth in the dentition;
- 2) limited included defects of the frontal part of the dentition;
- 3) terminal unilateral, bilateral defects of the dentition in the absence of 3 or more teeth;
- 4) complete adentia and atrophy of the alveolar process of the jaws;
- 5) intolerance to dentures;
- 6) diseases of the digestive tract.

Contraindications for dental implantation:

- absolute: 1) tuberculosis, rheumatism, uncompensated diabetes mellitus; 2) blood diseases; 3) bone diseases; 4) diseases of the central and peripheral nervous system; 5) malignant tumors;
- relative: 1) periodontitis; 2) pathological bite; 3) unsatisfactory oral hygiene; 4) precancerous diseases; 5) precious metals in the oral cavity; 6) TMJ disease; 7) bruxism.

The patient's examination should be thorough, comprehensive and include the completion of a questionnaire, general and local examination.

Types of dental implants:

- 1) Insert implants
- 2) Endodontic-endosseous implants
- 3) Subperiosteal implants
- 4) Endosseous implants
- 5) Endoosal-subperiosteal implants
- 6) Submucosal implants.

Components of dental implants:

1. Intratissue, supporting part
2. Adjacent to the mucous membrane - suture
3. Intraoral - coronal or superstructure, abutment.

За видом конструкції імплантати можуть бути:

1. Цільними
2. Розбірними
3. З опорною головкою для фіксації знімного протеза або опорної балки.

A functional loading on the implants after their installation is apply at different times after surgery:

1. Immediately, in 3-5 hours after placement of the implant in the jaw.
2. After 1-4 weeks after surgery, after wound healing.
3. After 2-6 months after surgery, after the effect of implant osseointegration

Clinical stages of the prosthetic treatment based on dental implants:

1st stage - planning the type of dental prosthesis based on implants, which involves a team of specialists: dentist-therapist, dental surgeon or maxillofacial surgeon, orthopedist, hygienist, dental technician;

2nd stage - surgical - it involves pre-prosthetic (pre-implant) surgical preprosthetic treatment of soft tissues and bone structures of the jaws, implant placement (performed by a surgeon under the supervision of an orthopedist);

3rd stage - orthopedic - production of dentures (performed by an orthopedist, supervised by a surgeon, hygienist);

The 4th stage - hygienic - begins after the prosthesis installation and involves long-term management of the patient after prosthetics by a dental hygienist (under the supervision of a surgeon, orthopedist).

Methods of endosseous implants at the time of installation of the superstructure and on the basis of the connection of the bone wound with the oral cavity:

- 1) one-stage method - installation of a single implant with intraosseous and coronal part, with superstructure;
- 2) two-stage method (intraosseous part of the implant and its crown are connected by a screw): the first stage - installation of the intraosseous part of the implant, the second - installation of gum shaper, which in 10-14 days is replaced by the overbone structure connected with intraosseous part by screw, then take an impression and make dentures. This is done in 2-7 months after the first stage.

Immediate dental implantation is a technique according to which the implant is inserted into the socket immediately after tooth extraction (immediate implantation), after 10 days (early delayed implantation) or after 30 days (late delayed implantation). It takes 10-30 days to eliminate, for example, inflammatory phenomena in the area of the socket of extracted tooth.

The main criteria for assessing (osseointegration) of the endosseous implant in the bone:

- 1) implant mobility;
- 2) bone damage, degree and rate of bone atrophy;
- 3) the condition of the gums adjacent to the implant;
- 4) the depth of the pocket;
- 5) the effect of the implant on neighboring teeth;
- 6) efficiency of functioning;
- 7) external aesthetic appearance of the prosthesis and implant;
- 8) the presence of an infectious process around the implant;
- 9) the ratio (whether there is an invasion) of the implant to the mandibular canal, maxillary sinus, nasal cavity, soft tissues with loss of fertility;
- 10) the patient's reaction to the implant, etc.

Complications that may occur during implantation:

1. Intraoperative: bleeding (errors of operative technique, anesthesia, assessment of preoperative status, chronic inflammatory processes, poor preparation of the patient, etc.), overheating of the bone and the occurrence of its burns; tool fracture; fracture of cortical plates of bone; damage to the bottom of the maxillary sinus, the bottom of the nasal cavity, mandibular canal; damage or compression of the mandibular nerve; mismatch of soft tissue rags; mismatch between the size of the bone bed and the implant; implant rejection.:

2. Early: excessive infection of the bone bed and the development of the inflammatory process; maxillary abscesses and phlegmons; hematomas of the operated soft tissues and bones; paresthesias; implant rejection.

3. Late: progressive resorption of bone above standard (1 mm in the first year and then 0.1 mm annually); osteomyelitis due to bone overheating (over 47°C); penetration of the bottom of the maxillary sinus, nasal cavity, mandibular canal, adjacent teeth; perimucositis; perimplantitis; implant rejection

4. Exacerbation of chronic inflammatory processes: sinusitis, osteomyelitis of the alveolar process.

- *Algorithms for the formation of the professional abilities.*

1. To be able to examine a patient with partial and complete defects of the dentition, to make a plan of complex treatment with the use of dental implantation.
2. Be able to analyze orthopantomograms, CT to determine the width and height of the alveolar crest, the location of the mandibular canal and the bottom of the maxillary sinus to select the optimal length and diameter of the implant.
3. To work out the technique of surgical stages of implantation on phantoms.

- *Practical tasks (typical, atypical, unpredictable situations).*



*Individual task*

Task №1.

A 58-year-old patient underwent dental implantation surgery on the mandible by a two-stage method. How many months does it take to connect the parts of dental implants?

- A. 3-4
- B. 5-6
- C. 9-10
- D. 1-2
- E. 7-8

Task №2.

Which factors do not affect the osseointegration of the implant?

- A. Type of anesthesia
- B. Material and shape of the implant
- C. The degree of preparation of the bone bed
- D. Adherence to the rules of asepsis
- E. Time.

*Tasks for the independent work and work in small groups (interactive teaching methods).*

A 43-year-old patient consulted a dental surgeon for dental implantation in maxilla. When studying sections of the maxilla, it was found that the volume of bone to the bottom of the maxillary sinus is 5.7 mm, the thickness of the alveolar ridge 5.7 mm. Determine the most rational management of the patient.

**Final stage (30 min)**

Summing up of the lesson.

**Materials of methodological support of the final stage of the lesson:**

- *Brain storm.*

Students demonstrate an exhaustive description of the unusual clinical situation and offer to offer the most rational diagnostic methods. After recording all the proposed diagnostic methods during the discussion, students choose the most rational.

- *Tasks for the self-employment.*

Fill in the medical documentation, make a plan of the patient examination with the appropriate clinical situation and determine the indications for the osteoplastic surgery, make a plan of postoperative care of the patient

*Evaluation.*

«Approved»  
at the meeting of the Department  
of Surgical Dentistry and  
Maxillofacial Surgery  
Head of the Department  
Professor Ya. E. Vares

METHODICAL GUIDE FOR THE PRACTICAL LESSONS

Educational discipline	Surgical Dentistry and Maxillofacial Surgery
Topic of the lesson	<b>Topic № 9</b> Endodontic complications surgical treatment. Periodontal surgery: the main principles, bone grafting materials using. Directed tissues, regeneration.
Course	V
Faculty	Dentistry

## THE PLAN OF THE PRACTICAL LESSON № 9

**1. Topic of the lesson:** «Endodontic complications surgical treatment. Periodontal surgery: the main principles, bone grafting materials using. Directed tissue regeneration.».

**Lesson duration 4 hours 30 min., including three breaks of 10 minutes.**

### 2. Learning objectives:

➤ *professional competence:*

1. Collection of medical information of the patient's condition
2. Evaluation of the results of laboratory and instrumental research..
3. Establishment of the clinical diagnosis of dental disease.
4. Diagnosis of the emergency conditions.
5. Performing the medical and dental manipulations.
6. Organization and carry out of dental monitoring of the persons subjected to the dispensary supervision.
7. Organization of medical and evacuation measures.
8. Defining tactics and providing emergency medical care
9. Maintaining medical records.
10. Processing of the state, social and medical information.

➤ *general competence:*

1. The ability to the abstract thinking, analysis and synthesis; the ability to learn and be trained today.
2. Knowledge and understanding of the subject area and understanding of the profession.
3. Ability to apply knowledge in practical situations.
4. Ability to communicate in the state language both verbally and in writing; Ability to communicate in a second language.
5. Skills to use the information and communication technologies.
6. Ability to search, process and analyze information from the various sources.
7. Ability to adapt and act in a new situation; ability to work autonomously.
8. Ability to identify, set and solve the problems.
9. Ability to choose a communication strategy.
10. Ability to work in a team.
11. Interpersonal skills.
12. Ability to act on the basis of ethical considerations (motives).
13. Ability to act in a socially responsible and civic conscious manner.

### 3. Methods of training:

Preparatory stage - frontal oral interview.

The main stage - practical training, role-playing game.

The final stage – brain storm.

### 4. Interdisciplinary integration.

Disciplines	Student should know	Student should be able to
Previous:		
Anatomy	To know the anatomical and physiological features of the MFA:  - the structure of the maxilla and mandible;  - MFA innervations and blood;  - the structure of the head and	Be able to explain the structure of the MFA organs and systems.

Physiology	neck lymphatic system;  - the structure of the head and neck muscles;  - the structure of the head and neck organs.	
Topographical Anatomy	To know the topography of the MFA.	Be able to explain the topography of the MFA.
Pathomorphology  Pathophysiology	To know the mechanism of inflammation and it's morphological manifestation.	Be able to explain the mechanisms of the inflammatory process development, the phases of inflammation. Be able to describe the pathomorphological and clinical signs of inflammation.
Radiology	To know the additional examination methods in dentistry.	Be able to explain the principles on which different examination methods are based (X-Ray, CT, ultrasound, MRI).
Therapeutic dentistry	To know the ways of the pathogenic microorganisms spreading into the pulp cavity and periodontium.	Be able to conduct the teeth examination.
<b>Intra-subject integration:</b>		
Topic 1 («The Surgical dentistry Propedeutic»): ... The oral cavity, jaws, face and neck examination methods.	To know the examination methods in patients with the MFA diseases.	Be able to conduct the subjective and objective examination in patient, to prescribe the additional examination methods, fill in the relevant medical documentation.
Topic 2. («MFA inflammatory diseases»): periodontitis: the surgical treatment methods.	To know the clinical signs, diagnosis, surgical treatment methods of the chronic periodontitis.	Be able to determine the indications and contraindications to epy surgery of the chronic periodontitis.
Topic 9 («MFA traumatology»): <i>The types of bone regeneration, primary and secondary bone healing.</i> The optimization methods of the bone regeneration.	To know the stages of the bone regeneration and methods of the bone regeneration optimization.	Be able to choose the optimal material for the stimulation of the bone regeneration.

## 5. Literatura:

### 1. Educational The main:

5.1 Oral and Maxillofacial Surgery Edited by prof. V. Malanchuk, Vinnytsa, Nova Knyha Publisher, 2011. – part .2. - p. 198-212.

**The additional:**

5.2 PETERSON'S PRINCIPLES OF ORAL AND MAXILLOFACIAL SURGERY, *Second Edition*, 2004, p. 3-17, 277-295.

**2. Methodical:**

2.1 Methodical Guide for Practical Training in Surgical Dentistry for the S-th year Students of the Dentistry Faculty , edited by prof.Ya. Vares, 2014, 32 p.

**STRUCTURE OF PRACTICAL LESSON**

**Preparation stage (30 min.)**

- *Organizational part of the lesson:* presence check, evaluation of the uniform.
- *Informing about the topic and the purpose of the lesson.*  
*The lesson topic:* «Endodontic complications surgical. Periodontal surgery: themain principles, bone grafting materials using. Directed tissue regeneration.»

*The aim of the lesson:* to teach the students to diagnose complications of endodontic treatments, to know the clinical features, to make a plan of complex treatment of patients with endodontic complications, to master the principles of surgical treatment of patients with endodontic treatment complications. To study the main provisions of the periodontal reconstructive and plastic surgery. Master the basic techniques of surgical treatment of parodontitis. To teach students to make a plan of complex treatment of the patients with periodontal tissues pathology. Get acquainted with bone replacement materials.

*The motivation of educational activity.*

Endodontic treatment in the structure of dental care have the one of the leading places. In addition, on the background of current advances in endodontics in recent years, the number of complications has increased significantly.

Complications of the endodontic treatments are detected in the 53.6% of cases. The most common are perforation of the tooth cavity bottom or the root canal walls (37.7%), fragmentation of an endodontic instruments (19.9%), excessive expansion and rupture of the apical opening (34.2%), output the filling material through the apex ( 23,9%), pushing the filling material into the adjacent anatomical structures (39%), in particular, in the mandibular canal (23.2%) or mental opening (12.3%). At such complications the expressed painful and paresthetic syndromes are observed, destructive changes in surrounding tissues is developed - first of all, in a cancellous bone , and also such structures as the inferior alveolar nerve, a mental nerve are suffer considerably. Such conditions require immediate intervention, including surgery. The biological essence of the directed tissue regeneration is to use the different in potency and in time of implementation of the reparative capabilities of the tissue components of the tooth-muco-periosteum-bone complex of the jawsThe bone directed regeneration allows complete or significant restoration of the volume and morphological structure of the bone, regeneration of periodontium and cementum, new fixation of the ligament. Therefore, for practical dentistry it is important to develop and improve methods of endodontic complications treatment.

***Materials of the methodical providing of a preparatory stage of the classes:***

*The frontal interview questions :*

1. The clinical features of the endodontic treatment complications.
2. The indications and contraindications for the appropriate surgical treatment.
3. The principles of the granuloma ectomy in the tooth root apex and interradicular septum.
4. The techniques and stages of the root apex resection surgery.
5. The resection (amputation) of the tooth root.
6. The coronary-radicular separation.

7. The tooth hemisection.
8. The tooth replantation.
9. The directed bone regeneration.
10. The main tasks of the periodontal reconstructive and plastic surgery.
11. The indications and contraindications of the periodontal tissues surgical treatment.
12. The periodontal surgery planning.
13. The methods of periodontal reconstructive and plastic surgery:
  - surgery within the periodontal, gingival pocket;
  - flap surgery;
  - vestibular plasty.
14. Osteoplastic materials.

***Main stage: formation of professional skills and abilities (180 min)***

***Professional training conducting .***

***Materials of methodical maintenance of the main stage of the classes:***

Tooth-preserving surgical treatment methods of the chronic periodontitis are used after high-quality endodontic treatment and arresting of the additional infection in the periodontium from the root canal. The purpose of treatment is to preserve the tooth or part of it and ensure its continued functioning.

The root apex resection is indicated in case when the root canal is sealed to 2/3 of the root length, the presence or absence of the periapical bone changes and the functional value of tooth crown. The technique: after the anesthesia the incision is made and exfoliation the mucous periosteum flap. The frontal cortical bone is removed by the bone drill, the apex of the causative tooth is open and cutting 1/3 of the root from the apex, visually controlling the presence of a filling material in the root canal, after the wound is sutured. The wound healing lasts 7-8 days. The surgery is performed mainly in the area of teeth and roots available for surgery. The complications - suppuration of the wound, preservation of the bone defect, displacement of the tooth under the functional load in the direction of the bone defect (for single-rooted teeth)

The root amputation is indicated in the case of incomplete filling (up to 1/2-1/3 of the root length) of one of the roots of a multi-rooted tooth. Usually is performed on the upper molars, removing the medial buccal root. The anesthesia, the surgery technique, the postoperative period and the medical support - similar to the surgery of the root apex resection. The difference is that cut off up to 3/4 of the length of one of the roots of a multi-rooted tooth. The condition of the surgery is the need to preserve the mucous membrane in the area of the resected root to prevent postoperative recession of the gums. Complications - recession of the gums in the area of the surgery, insufficient (sometimes) tooth stability under the functional load.

The crown-radicular (coronar-radicular) separation is indicated when the bottom of the pulp cavity is perforated and periodontitis has occurred in the area of the interradicular septum of the bifurcated molar of the mandible, and there are no signs of periapical tissues changes. To preserve such a tooth, it is necessary to allow the outflow of exudate from the interradicular septum and eliminate the inflammatory process. The technique: after the anesthesia, by the separation disk the cross section of the "causal" tooth from its occlusion surface to the inter-root septum is conducted, the one half of the tooth crown and root is separated, from the other. The distance between the tooth parts should be up to 1-1,5 mm. Thus, the upper parts of the interradicular septum become accessible for the removal of pathologically altered tissues and a constant outflow from the area of inflammation and its healing. As a result of the surgery, the patient has two single-rooted teeth instead of a double-rooted tooth, which can later be used for prosthetics.

The tooth hemisection is indicated in the presence of apical periodontitis in the area of only one of the two roots of the lower molars, the impossibility of quality endodontic treatment of the root canal, the need to preserve the maximum possible number of teeth. The technique: after the anesthesia the crown-radicular separation is conducted. Then the affected part of the tooth is extracted. The socket of the extracted root heals typically under the blood clot. After the surgery, the patient has a functionally capable half of the tooth.

The main tasks of the periodontal reconstructive and plastic surgery:

1. Enlargement of the keratinized attached area of the gums. This helps to stop the soft tissues recession and the bone resorption, for example, as a result of the teeth orthodontic movement or other reasons, helps to improve hygiene in the teeth area, dental implants and dental bridges areas.
2. Elimination of gum declines.
3. Increased the volume of the alveolar spine in the adentia area. Typically, such surgery are performed for the permanent prosthesis or prosthetics based on the dental implants to optimize the aesthetic and functional result.
4. Removal of the shortened bridle of the lips, cheeks - it allows to move correctly soft tissues, to use the dentures and the orthodontic devices.
5. Prevention of defects of the the alveolar process crest after the tooth extraction. Preservation the shape of the alveolar ridge in the area of the extracted teeth is a positive condition for the dental implantation.
6. Prolongation of the tooth crown clinical length improves the aesthetic appearance of the dentition.
7. Exposure of the impacted teeth allows their subsequent orthodontic moving into the dentition.
8. Restoration of the lost gingival papilla helps to improve the aesthetic appearance of the dentition.
9. Elimination of the excessive gums growth (hyperplasia, hypertrophy) and periodontal pockets - eliminates the pathologically changed tissues and improves the aesthetics of teeth, smile.

All surgical methods of the inflammatory and dystrophic periodontal diseases treatment are divided into the 3 main groups:

I. Surgery within the periodontal and gingival pockets: open and closed curettage, vacuum curettage, cryocurettage, gingivotomy, gingivectomy, gingivoplasty, etc..

II. Flap plasty surgery - methods to eliminate recessions, including apically or laterally displaced flap, a flap of two interdental papillae; freely transplanted connective tissue graft.

III. Formation of the oral cavity vestibulum- frenuloplasty, vestibuloplasty by the local tissues plasty, free grafts, etc.

Curettage - scraping of the gingival pocket in order to remove subgingival calculus, granulations, softened cementum and epithelium germinated into the gingival pocket, pocket contents (microorganisms, tissue breakdown products and bacterial activity). Indications: pathological gingival pockets up to 4 mm deep, no bone pockets and the presence of dense gums. During the intervention it is necessary to create a clean wound surface, then the blood clot of the wound is organized and the connective tissue grows into the newly formed root cementum. The operation is completed by the applying a hardening protective bandage for 1-2 days. It is forbidden to probe the pocket for three or four weeks and it is recommended not to eat solid food, to use a soft brush for teeth brushing. Curettage is contraindicated: for deep gingival and bony pockets, III-IV degree teeth mobility, acute inflammatory processes, scarring and thinning gums.

Gingivotomy is a linear dissection of the periodontal pocket mucose in order to open a periodontal abscess or for the open curettage of the periodontal pocket under visual control. Indications are deep and poorly visible gingival and bony periodontal pockets in the area of one or more teeth, single recurrent abscesses. For this purpose, incisions of different shapes are used: vertical along the tooth axis, displaced distally, through the interdental papilla, crescent, T-shaped, etc. After opening the pocket, it is rinsed with antiseptic solutions, thorough curettage is performed, then the wound is treated again with antiseptic solutions, a biologically active suspension of proteolysis enzyme inhibitors is injected, glued with medical glue, covered with a film or medical bandage for 2-3 days. At the abscesses opening the sutures are not imposed, biologically active suspensions (from enzymes, inhibitors and other substances) are entered into a cavity.

Gingivectomy is the excision of the periodontal pocket to its full depth (at the level of the alveolar edge) simultaneously with the pathologically altered gingival margin and the contents of the pocket. There are simple and radical gingivectomy. Simple is performed at a depth of periodontal pockets of more than 4-5 mm and horizontal, uniform resorption of the alveolar edge, with hypertrophic gingivitis, increased granulation, increased desquamation of the epithelium, without scarring after curettage. The surgery scope is limited to 2-3 lateral and 4-6 front teeth. After preoperative preparation (anesthesia, antiseptic rinsing) specify the limits of gingivitis, determine the depth of the incision (corresponds to the pockets depth). The incision line is marked with an aqueous solution of methylene blue or iodine-containing solution. The surgery consists of the following stages:

- 1) excision of the gingival margin from the lingual (palatine) and vestibular sides parallel to the gingival margin, taking into account the uneven depth of the pockets;
- 2) removal of subgingival tartar;
- 3) open curettage of granulations and pathologically altered bone of the alveolar process;
- 4) stop bleeding;
- 5) introduction of the osteoplastic materials into the surgical wound;
- 6) deposit and application of medicines.

The disadvantages of the surgery are the exposure of the teeth cervical part, interdental spaces; excision of all gingival papillae in the surgery area forms a cosmetic defect, the hyperesthesia of the bare roots from temperature, chemical and tactile stimuli often develops after the surgery.

Radical gingivectomy combines simple gingivectomy and leveling of the alveolar edge to change vertical bone resorption into horizontal.

Flap surgery is performed to eliminate periodontal pockets and to correct defects of the alveolar process of the jaws alveolar part. Indications for the flap surgery are periodontitis of moderate and severe degree and a depth of periodontal pockets more than 5 mm, destruction of the bone by no more than 1/2 the length of the tooth root, thinned and fibrous gums. At flap operations after a gingivotomy exfoliate and form a mucous-periosteum flap from lingual (palatal) and vestibular sides. There are complete and split periodontal flaps. The complete flap includes epithelium, connective tissue, periosteum, split - consists of epithelium and connective tissue. In some cases, the prepared flap is placed into the place, in others - moved at the end of the surgery to a new site.

Radical flap surgery (by the Cheshinsky - Otman - Neumann method) is indicated in the presence of deep periodontal bone pockets with a vertical type of bone resorption, the teeth mobility of the III degree, with thinned gums. As with simple gingivectomy, after irrigation of the oral cavity with antiseptic solutions, anesthesia, treatment of the gingival margin with iodine-containing solution make two vertical incisions to the bone, limiting the surgery area, from the gingival margin to the transitional fold (incisions should not pass along the top of the papillae. Then bluntly separate the mucous-periosteum flap from the vestibular and lingual (palatal) sides. The vestibular flap is taken on hooks, the lingual (palatine) is separated to a depth not more than 0.5 cm. Then remove the tartar, the altered gums edge, granulations, perform the curettage, smooth the alveolar process bone, polish the cementum of the root. The surgery area is rinsed with antiseptic solutions, arrest bleeding, mobilize the muco-periosteum flap, then put the flap into the place, apply sutures in each interdental space and vertical incisions. The operation simultaneously includes an area of not more than 6 teeth. Healing is the primary, the sutures are removed on the 6-7th day after the surgery. The disadvantages of the surgery are: the exposure of the teeth cervical part, hyperesthesia, reducing the height of the alveolar edge, the exposure of the interdental spaces.

Frenulotomy - dissection of the bridle - is used to prolongate the lip and tongue bridles.

Surgery: after the usual preparation, the bridle is cut to the required depth with a cutting tool at the base of the bridle.

Frenulectomy - the excision of the tongue or lip bridle, is indicated in cases with a short bridle. The lip bridle is excised with two semi-oval vertical incisions, a compact osteotomy is performed between the central incisors, the mucous membrane around the incision is mobilized, the wound edges are connect together and sutured tightly.

In cases of the small oral cavity vestibulum and a short bridle at once the bridle excision and vestibulum deepening are conducted. After the anesthesia with two converging semi-oval incisions to the periosteum in the area of the bridle attachment the muco-periosteum flap is separate towards the apex of the root to the required depth (8-10 mm), the edge is sutured to the base of the newly formed vestibulum. 1-2 suture are applied to the lip mucous. Then the muscles of the lower lip are cut off from the periosteum and together with the mucous membrane are moved and sutured to the periosteum. An iodoform bandage is applied to the wound, the wound heals secondary, epithelialization occurs in 10-14 days.

Directed tissue regeneration using the membranes

Indications: treatment of the deep narrow two- or three-walled bone pockets, the 2nd degree naked furcations of the first molars on the buccal side, the gums recession (in this case, thick and wide keratinized gums are desirable). Worse results are in the cases of the through defects of furcation of the 3rd degree and at molars of an upper jaw with distal and buccal defects of furcation of the 2nd degree.



Before the surgery, the patient is instructed, and periodontal conservative treatment is prescribed to create favorable hygienic conditions and eliminate inflammatory phenomena.

The technique: intrasulcular incision is performed with preservation of the papillae, and vertical lateral incisions - at a distance of 4-6 mm from the tooth of the operation area. The mucous-periosteum flap is separate from the bone, the epithelium and granulation tissue are cut from it's inner surface, and subgingival scaling with root polishing is performed. Then the membrane of the desired shape is chosen and fit to the tooth and the adjacent bone. Then the membrane is fixed in the correct position. Tight adaptation of the membrane to the tooth ensures its retention over the periodontal defect, and the muco-periosteum flap should overlap the membrane by 2-3 mm. After the surgery using the membrane, it is necessary to refrain from the applying a periodontal protective bandage, because under its pressure, the membrane can sink into the defect. To maintain the desired shape after the introduction of the osteogenic materials into the bone defect using metal mesh with screw fixation. It is advisable to cover the mucous sutures with protective films such as "Diplen-Denta", etc., which have anti-inflammatory properties. Before removing the mesh or resorbing the membrane (the first four weeks) it is necessary to avoid brushing the teeth in the surgery area and rinse the mouth with 0.2% chlorhexidine solution 1-2 times a day. After 4-6 weeks, the non-resorbable membrane is carefully removed through an intrasulcular incision so as not to injure the restored tissue. After removing the connective epithelium from the inside of the flap, it is adapted and sutured. Because it is very important to completely close the regenerated sensitive tissue, a slit-like incision in the bone periosteum can be make , and then move the flap.

- *Algorithms for the formation of the professional abilities.*
  1. To be able to make the examination and make a treatment plan in patient with the endodontic treatment complications.
  2. Master the technique of the root apex resection .
  3. Master the technique of coronary-radicular separation, tooth hemisection , the tooth root amputation, tooth replantation.
  4. Master the technique of the surgical periodontal instruments using.
  5. Master the techniques of periodontal reconstructive surgery.
  6. To master the technique of the flap surgery method according to Cieszynski-Widmann-Neumann.
  7. Master the technique of the directed tissue regeneration by membranes.

*Practical tasks (typical, atypical, unpredictable situations).*

*Individual task*

Task №1.

A 43-year-old patient apply the dentist with complaints of pain in 36 tooth. X-ray examination revealed the remnant of an endodontic instrument in the distal root. In the area of the root apex there is bone resorption up to 5 mm with limited contours. Which treatment method should be indicate ?

- A. Tooth hemisection.
- B. Conservative treatment.
- C. Tooth replantation.
- D. Root amputation.
- E. Root apex resection.

Task №2.

A 40-year-old patient complains of the gums bleeding from the mechanical stimuli, tooth mobility. From the anamnesis: 12 years suffering from chronic gastroduodenitis. Objectively: the gums of both jaws are hyperemic, swollen. Sub- and supragingival dental deposits are noted. Depth of periodontal pockets is 4-5 mm. 43, 42, 41, 31, 32, 33 teeth are mobile (I-II degree). On the X-Ray: atrophy of the intersocket septa up to 1/2 the length of the root. Choose a surgical treatment method :

- A. Flap surgery.
- B. Close curratage.
- C. Gingivectomy.

- D. Gingivotomy.
- E. Osteoplasty.

*Tasks for the independent work and work in small groups (interactive teaching methods).*

A 50-year-old patient complains of difficulty mastication, tooth mobility, bad breath, bleeding gums. Objectively: the gums are hyperemic with a cyanotic tinge with excessive enlargement of the gums, gingival pockets 4-5 mm deep. On the X-Ray: horizontal, uniform resorption of the alveolar ridge edge by 1/3 of the root length. Make a diagnosis and make a treatment plan.

#### **Final stage (30 min)**

Summing up of the lesson.

#### **Materials of methodological support of the final stage of the lesson:**

- *Brain storm.*  
Students demonstrate an exhaustive description of the unusual clinical situation and offer to offer the most rational diagnostic methods. After recording all the proposed diagnostic methods during the discussion, students choose the most rational.
  
- *Tasks for the self-employment.*  
Develop on the models and phantoms an examination and palpation method of the maxillofacial area and oral cavity in the phantom class.

*Evaluation.*

«Approved»  
 at the meeting of the Department  
 of Surgical Dentistry and  
 Maxillofacial Surgery  
 Head of the Department  
 Professor Ya. E. Vares

METHODICAL GUIDE FOR PRACTICAL LESSONS

Educational discipline	Surgical dentistry and Maxillofacial Surgery
Topic of the lesson	1
Course	<p><b>Topic №10.</b> Diseases and injuries of the trigeminal and facial nerves. Clinical signs, diagnosis, treatment. Pain syndromes surgical treatment : neuralgia, MFA neuritis. TMJ pain dysfunction syndrome.</p> <p>Algorithms for performing the practical skills: local plastic surgery , suturing techniques, alveolotomy, opening of periodontal abscess. Final lesson from the "MFa reconstructive surgery".</p>
Faculty	V
	Dentistry

## THE PLAN OF THE PRACTICAL LESSON № 10

**1. Topic of the lesson.** Diseases and injuries of the trigeminal and facial nerves. Clinical signs, diagnosis, treatment. Pain syndromes  
surgical treatment : neuralgia, MFA neuritis. TMJ pain dysfunction syndrome.  
Algorithms for performing the practical skills: local plastic surgery , suturing techniques, alveolotomy, opening of periodontal abscess.  
Final lesson from the "MFa reconstructive surgery ".

**Lesson duration 4 hours 30 min., including three breaks of 10 minutes.**

### 2. Learning objectives:

➤ *professional competence :*

1. Collection the medical information of the patient's condition
2. Evaluation of the laboratory and instrumental research results.
3. Establishment of the clinical diagnosis of dental disease.
4. Diagnosis of the emergency conditions.
5. Performing the medical and dental manipulations.
6. Organization and carrying out of dental medical examination of persons subject to dispensary supervision.
7. Organization of medical and evacuation measures..
8. Defining the tactics and providing the emergency medical care.
9. Maintaining medical records.
10. Processing of the state, social and medical information.

➤ *general competence:*

1. The ability to the abstract thinking, analysis and synthesis; the ability to learn and be trained today.
2. Knowledge and understanding of the subject area and understanding of the profession.
3. Ability to apply knowledge in practical situations.
4. Ability to communicate in the state language both verbally and in writing; Ability to communicate in a second language.
5. Skills to use the information and communication technologies.
6. Ability to search, process and analyze information from the various sources.
7. Ability to adapt and act in a new situation; ability to work autonomously.
8. Ability to identify, set and solve the problems.
9. Ability to choose a communication strategy.
10. Ability to work in a team.
11. Interpersonal skills.

12. Ability to act on the basis of ethical considerations (motives).

13. Ability to act in a socially responsible and civic conscious manner.

### 3. Methods of training:

Preparatory stage - frontal oral interview.

The main stage - practical training, role-playing game.

The final stage – brain storm

### 4. Interdisciplinary integration

Disciplines	Student should know	Student should to able
<b>Previous:</b>		
Anatomy	To know the anatomical structure of maxilla and mandible, the trigeminal and facial nerve nerve, the TMJ structure.	Be able to explain the structure of maxilla and mandible the trigeminal and facial nerve nerve, the TMJ.
Histology	To know the nerve system histological structure.	Be able to explain the nerve system hystological structure.
Topographic Anatomy and operative surgery	To know the topography of the trigeminal and facial nerves and TMJ.	To be able to explain the topography of the of the trigeminal and facial nerves and TMJ.
Physiology	To know the physiology of nerve system, mastication, pain physiological mechanisms.	To be able to explain the the physiology of nerve system, mastication, pain physiological mechanisms.
Neurology	To know the sensitive, motoric and autonomic innervation of the MFA, neurological diseases of the MFA.	Be able to explain the sensitive, motoric and autonomic innervation of the MFA, neurological diseases of the MFA.
Pharmacology	To know the mechanism of drugs used to treat MFA neuralgia, neuritis and TMJ painful dysfunction.	Be able to explain the mechanism of drugs action in case of MFA neuralgia, neuritis and TMJ painful dysfunction.
Orthodontic. Prosthetic Dentistry	To know the orthodontic and orthopedic aspects of TMJ pain dysfunction	Be able to explain the mechanisms of TMJ pain dysfunction in occlusal disorders and irrational orthopedic treatment.
<b>Intra-subject integration:</b>		
Topic 1 («The Surgical dentistry Propedeutic»): ... The oral cavity, jaws, face and neck examination methods..	To know the examination methods in patients with the MFA diseases.	Be able to conduct the subjective and objective examination in patient, to prescribe the additional examination methods, fill in the relevant medical documentation.
Topic 3. "Propaedeutics of surgical dentistry": Pain, its components, the leading pathways of pain.	To know the components and pathways of pain.	Be able to explain the components and pathways of pain.

Topic 17. «MFA inflammatory diseases»: TMJ arthritis and arthrosis .	To know the main clinical features of the TMJ arthritis, arthrosis and pain dysfunction.	Be able to conduct the differential diagnosis of arthritis, osteoarthritis and TMJ pain dysfunction.
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## 5. Literature:

### 1. Educational

#### *The main*

1.1 Oral and Maxillofacial Surgery Edited by prof. V. Malanchuk, Vinnytsa, Nova Knyha Publisher, 2011. – part .2. - p. 236-241.

#### *The additional*

1.2 PETERSON'S PRINCIPLES OF ORAL AND MAXILLOFACIAL SURGERY, *Second Edition*, 2004, p. 1015-1033

### 2. Methodical

3.1 Methodical Guide for Practical Training in Surgical Dentistry for the S-th year Students of the Dentistry Faculty , edited by prof.Ya. Vares, 2014, 32 p.

## STRUCTURE OF PRACTICAL LESSON

### Preparation stage (30 min.)

- *Organizational part of the lesson:* presence check, evaluation of the uniform.
- *Informing about of the topic and the purpose of the lesson.*

*The lesson topic:* “Diseases and injuries of the trigeminal and facial nerves. Clinical signs, diagnosis, treatment. Pain syndromes

surgical treatment : neuralgia, MFA neuritis. TMJ pain dysfunction syndrome.

Algorithms for performing the practical skills: local plastic surgery , suturing techniques, alveolotomy, opening of periodontal abscess.

Final lesson from the "MFA reconstructive surgery ".

*The aim of the lesson:* to study the etiology, pathogenesis, to master the main clinical symptoms and principles of diagnosis of trigeminal neuralgia and neuritis, painful dysfunction of the TMJ. To teach students to make a plan of patient's complex treatment .

#### *The motivation of educational activity*

Pain syndromes perceive stress reactions that disrupt normal life, which causes, causes psycho-emotional disorders, deterioration of quality of life. According to the WHO, the prevalence of trigeminal neuralgia in European countries averages 4.3 per 100 thousand population. At the age of 60, even more is counted - from 5 to 20 new cases of this action per 100 thousand population are reviewed annually. About 10% of the world's population is affected by greater TMJ dysfunction.

#### *Materials of the methodical providing of a preparatory stage of the classes:*

##### *The frontal interview questions :*

1. Causes of trigeminal neuralgia and neuritis, TMJ painful dysfunction. Factors contributing to the development of diseases.
2. Modern classifications of facial pain, trigeminal neuralgia.
3. Clinical symptoms of neuralgia and neuritis of the trigeminal nerve, painful dysfunction of the TMJ.
4. Diagnosis of neuralgia and neuritis of the trigeminal nerve, painful dysfunction of the TMJ.

5. Modern medical, physiotherapeutic and surgical methods of the neuralgia and neuritis of the trigeminal nerve treatment, treatment of the Tmj painful dysfunction .

**Main stage: formation of professional skills and abilities (180 min)**

Professional training conducting .

***Materials of methodical maintenance of the main stage of the classes:***

Classification of facial pain

1. Facial pain in neuralgia and neuritis of the sensitive nerves
2. Facial pain in ganglionitis
3. Stomalgia
4. Facial pains of arthrogenic and vertebrogenic origin
5. Facial pain of vascular origin
6. Reflection of facial pain
7. Neuro-psychogenic facial pain
8. Pain syndrome in dental diseases, oto-, rhino-, ophthalmogenic pain.

*Neuralgia* is a symptom complex that manifests itself in attacks of intense pain, localized in the area of innervation of one or more branches of the trigeminal nerve.

All types of trigeminal neuralgia are divided into 2 main groups:

- trigeminal neuralgia of central genesis (classical) (with a predominance of the central component),
- trigeminal neuralgia of peripheral origin (with a predominance of peripheral component).

Trigeminal neuralgia of central genesis

Etiology: vascular diseases (hypertension), rheumatism, traumatic brain injury, infectious diseases, lesions of the central nervous system (arachnoiditis, encephalitis), acute cerebrovascular disorders, menopause, chronic bacterial (tonsillitis) and viral (influenza, SARS) , poisoning by various poisons (lead, copper, arsenic), endogenous intoxications, endocrine diseases, etc. People aged 40-60 are more likely to get sick.Клініка.

The disease is characterized by the appearance of sharp, cutting, paroxysmal facial pain. Patients compare them with the "passage of electric current". Pain paroxysms last from a few seconds to several minutes. The frequency of attacks varies. Pain can occur spontaneously, but more often appear when the muscles of the face (talking, eating, washing, shaving, etc.). patients freeze in a certain position, are afraid to move (hold their breath or breathe heavily, squeeze the painful area or rub it with their fingers, some perform chewing movements.). Pains occupy a certain area of the face, which is innervated by a branch of the trigeminal nerve (often II or III branch, rarely I). Pain is accompanied by autonomic manifestations - facial flushing, tearing, rhinorrhea, hypersalivation (rarely dry mouth). There are hyperkinesias of the facial muscles - twitching of the muscles of the chin, eyes or other muscles. The attack of pain stops suddenly.

Trigeminal neuralgia of peripheral origin

Arise as a result of influence of pathological process on various sites of peripheral department of a trigeminal nerve. The etiological factors that can cause trigeminal neuralgia of peripheral origin include the following diseases: pulpitis; periodontitis; chronic periostitis; osteomyelitis; sinusitis; galvanism of the oral cavity; tumors and tumor-like formations of soft tissues and bones of the facial skeleton; prostheses that injure the oral mucosa or violate the height of the bite; filling material, which is removed outside the during apical therapy; at ossification of the mandibular canal (passes the mandibular nerve) or the infraorbital foramen (the infraorbital nerve emerges); herpes simplex or shingles (caused by a neurotropic virus), etc.

It is currently believed that a factor that can support the course of neuralgia is the presence of unremoved foci of chronic infection in the nasal cavity (chronic rhinitis, polyps, etc.), oropharynx (chronic tonsillitis, etc.) and oral cavity (cariou teeth, recurrent mucosal diseases or gums, tartar, decayed teeth, etc.). Clinically, the disease is characterized by the presence of paroxysmal pain along the corresponding branches of the trigeminal nerve. Pain paroxysms in trigeminal neuralgia of peripheral and central genesis do not differ from each other (see the description of the previously listed symptoms). The pain spreads along the II and III branches of the trigeminal nerve.

Vegetative symptoms (lacrimation, rhinorrhea, hypersalivation, etc.) in peripheral neuralgia are not so pronounced. Trigger areas are less common (47%), less common in Bali. There is no vegetative aura.

### **Treatment of neuralgia**

The patient needs a comprehensive examination: physician, neurologist, neurosurgeon, endocrinologist. It is necessary to find out the cause of neuralgia.

For treatment use:

- Anticonvulsants: finlepsin (carbamazepine, tegretol), pregabalin (lyrics)
- Antidepressants and tranquilizers
- Neurotrophic drugs (neurovitan, nootropil)
- Desensitizing drugs (fencarol, tavegil, suprastin) in combination with nicotinic acid
- Vitamin therapy (group B)
- Biogenic stimulants (plasmol, aloe, FIBS)
- Physiotherapeutic methods

### **Surgical treatment methods:**

- Blockades with anesthetics (novocaine and alcohol-novocaine blockades)
- neurotomy
- neurectomy
- neuroexeresis.
- for the treatment of peripheral forms of trigeminal neuralgia, decompression operations are used with the release of peripheral branches from the bone canals.
- Percutaneous stereotactic destruction of the trigeminal node.
- Hypothermic and chemical rhizotomies

Neuritis - a lesion of the nerve, characterized by changes in the interstitium, myelin sheath and axial cylinders. At neuralgias changes only in its covers are observed. Manifested by symptoms of irritation and (or) loss of function in the area of appropriate innervation. Nerve damage is caused by various etiological factors: bacterial and viral infections, endogenous and exogenous intoxications, injuries, vascular and metabolic disorders, allergic factors, cooling, beriberi, etc.

The pathogenesis of neuritis is complex and due to toxic, metabolic and vascular changes in the nerve, as well as violation of the anatomical integrity of the nerve fiber.

The peculiarity of the clinical manifestation of trigeminal neuritis is that the disease is manifested by pain, impaired sensitivity in the area of innervation (hypoesthesia, paresthesia, etc.), as well as motor disorders (with mandibular nerve neuritis).

There is both neuritis of three branches of the trigeminal nerve, and neuritis of its individual branches. Clinically, trigeminal neuritis is manifested by involuntary, constant, aching pain in the area of innervation of its branches (jaws, teeth, gums), numbness (there may be paresthesia) of the upper, lower lip and chin, as well as in the teeth and gums. Clinical symptoms can be expressed both in a mild form (does not bother the patient), and in a severe form (causes considerable concern). The examination reveals the loss of all types of sensitivity in the area of innervation of the trigeminal nerve.

Neuritis of the inferior alveolar nerve most often occurs as a result of trauma (difficult tooth extraction, after anesthesia, fracture of the jaw, etc.), during osteomyelitis, after removal of a large amount of filling material behind the tooth root (premolar or molar), tumor-like and tumor processes which are localized in the body of the mandible, etc. Patients complain of aching pain (which can sometimes be mild), numbness in the lower teeth and the corresponding half of the lower lip and chin. The pain can be constant, and in some cases even increase or decrease. There is a feeling of discomfort in the chin. In the acute stage (inflammation) there may be paresis of the masticatory muscles and trismus - a tonic contraction of the masticatory muscles, manifested by compression of the jaws. The examination reveals the loss of all types of surface sensitivity on the mucous membrane of the alveolar process on the vestibular side (except for a small area from the second premolar to the second molar), on the mucous membrane and skin of the lower lip and chin skin. Percussion of teeth is painful. Determining the electrical excitability of the pulp of the teeth on the corresponding half of the mandible, it can be established that it is reduced or absent. Not all groups of teeth respond equally to the current, so there may be damage to a certain area of the nerve in the mandibular canal. Electric



irritation can cause aching and sometimes prolonged pain in the teeth. Neuritis of the inferior ventricular nerve can be combined with neuritis of the lingual and buccal nerves.

Neuritis of the upper dental plexus occurs after storage of teeth, with excessive removal of the teeth of the filling mass, with inflammatory processes in the upper jaw (osteomyelitis, sinusitis), after surgery and others. There is a slight pain and numbness in the upper teeth (or in a certain group of teeth), as well as a disorder of all other superficial sensitivities of the mucous membrane of the alveolar process on the vestibular side and the adjacent area. The electrical excitability of the pulp in the corresponding teeth is reduced or absent. For neuritis of the upper alveolar nerves is characterized by a long course (for several months). The electrical excitability of the dental pulp may not be restored. The latter applies only if the nerves that extend from the maxillary plexus are damaged.

#### **Facial nerve neuritis.**

The facial nerve contains fibers of various functional purposes (motor, sensory, autonomic). In this regard, its damage entails a number of different symptoms. Neuritis is characterized by changes in the interstitium, myelin sheath and axial cylinders. Manifested by symptoms of irritation and (or) loss of function in the relevant area of innervation. The etiology of facial nerve neuritis is different. Neuritis can be observed without violating the integrity of the nerve (in inflammatory processes, tumors, pseudotuberculosis, Melkersson-Rosenthal syndrome, etc.) and in its traumatic injuries (surgery, trauma, etc.). facial nerve. As a result, there are movement disorders in the form of paresis and paralysis of facial muscles.

#### **Treatment of neuropathies**

- First you need to eliminate the cause (eliminate pinching),
  - Drug therapy: NSAIDs (mesulid, indomethacin), analgesics, neuroleptics, sedatives, nootropic drugs (nootropil, piracetam, glutamic acid), vitamins (B1, B2, C, D), aloe, galacerin, ATP, progenin, inhibitors ).
  - Effective neuromidine.
- Physiotherapeutic treatment.

#### **TMJ pain dysfunction.**

J. Costen (1934) described the symptom complex observed in toothless patients and persons with reduced occlusion:

- dull pain in the TMJ;
- headache, dizziness;
- pain in the cervical spine, occiput and behind the ear, which intensifies by the end of the day;
- clicking in the TMJ while walking;
- hearing loss, tinnitus;
- burning sensation in the throat and nose.

Later, this symptom complex was called "Kosten's syndrome". To the described manifestations were later added others: paresthesia, xerostomia, glossodynia, a feeling of pressure in the ears, soreness of the auricle, and so on.

The clinical manifestations of TMJ pain dysfunction are similar to those of arthritis and osteoarthritis. Patients complain of dull aching headache and TMJ pain, soreness and tenderness on palpation of the parotid area and external auditory canal, opening and closing of the mouth. The pain radiates to the temporal or infraorbital area, sometimes to the back of the head and spine. Clicking and crepitation in the TMJ, the presence of painful and spasmodic areas in the masticatory muscles. Palpation of the TMJ is painless. Usually the amplitude of movements of the lower jaw increases.

It has been shown that clicking in the TMJ is a consequence of anterior meniscal displacement (R. H. Tallents et al., 1985; P. L. Westesson et al., 1985). When opening the mouth, the articular head comes into contact with the posterior edge of the meniscus and jumps to the central position of its concave zone, as a result of which a clicking sound is heard. When moving backwards, the condyle jumps over the posterior edge of the meniscus again, causing a joint sound. It is noted that in the clinical course of the disease, a clicking sound during mouth opening develops later than during closing.

Characteristic of the TMJ painful dysfunction is the deviation of the lower jaw to the side during the opening of the mouth, the so-called S-shaped movements. VM Banukh (1986) proposes to distinguish

two clinical forms of the disease: latent and active. The latter form is characterized by pain and acoustic symptoms (noise, crack, click).

Treatment of the TMJ painful dysfunction is complex.

First of all, take measures to normalize the occlusion of the teeth. OI Mirza (1993) recommends the use of selective grinding of teeth to remove certain areas of the occlusal surface of the teeth that prevent multiple contacts of the teeth. When carrying out this method of occlusal correction, the basics of biomechanics of the masticatory apparatus are taken into account. To avoid excessive grinding of the teeth, it is advisable to first make a grinding plan, then grind the teeth on the model and decide whether it is possible to eliminate sepercontacts by grinding or other methods of occlusal correction are needed. The nature of occlusal contacts is checked with wax occludograms and carbon paper.

- *Algorithms for the formation of the professional abilities.*

1. To master the examination methods in patient with facial pain syndromes, trigeminal neuritis .
2. Learn to identify the characteristic clinical symptoms of the trigeminal neuralgia and neuritis , painful dysfunction of the TMJ.
3. Learn to differentiate neuralgia and neuritis of the trigeminal nerve .
4. To make the plan of complex treatment of patients with a neuralgia and a neuritis of a trigeminal nerve.
5. Explain and be able to perform alveolotomy surgery.
6. Explain and be able to perform an autopsy of a periodontal abscess.
7. Explain and be able to perform various techniques of suturing.
8. Explain and be able to perform various localplastic techniques.

- *Practical tasks (typical, atypical, unpredictable situations).*

*Individual task*

Task №1.

A 42-year-old patient apply the dentist with complaints of intense cutting paroxysmal pain with a feeling of electric shock in the upper lip on the right. Pain attacks occur spontaneously and last 3-5 minutes. Number of attacks - 2-3 times a day. The patient cannot determine the causes of the disease. Examination of the oral cavity revealed no pathological changes. Sanitized. The control orthopantomography revealed an overcomplete impacted 13 tooth. What is the most likely diagnosis?

- A. Peripheral neuralgia of the second branch of the trigeminal nerve
- B. Pterygopalatine ganglionitis
- C. Neuritis of the second branch of the trigeminal nerve
- D. Neuralgia of the second branch of the trigeminal nerve of central origin
- E. Pulpitis of the tooth on the upper right jaw

Task №2.

A 42-year-old patient complains of the pain in the right half of the head, restriction of lower jaw movements, clicking, periodic spasm of the masticatory muscles. Objective: the face is symmetrical, the opening of the mouth is limited. On palpation in the right TMJ, crepitation and crunch are noted during movements of the lower jaw. Examination of the oral cavity revealed a defect in the dentition on the right of class II according to Kennedy. What is the most likely diagnosis?

- A. Pain dysfunction of the right TMJ
- B. Acute arthritis of the right TMJ
- C. Sclerosing osteoarthritis of the right TMJ
- D. Contracture of the right TMJ
- E. Ossifying myositis

*Tasks for the independent work and work in small groups (interactive teaching methods).*

Patient M., 48 years old, was diagnosed with the trigeminal nerve second branch neuralgia of the peripheral origin. Make a treatment plan.

**Final stage (30 min)**

Summing up of the lesson.

**Materials of methodological support of the final stage of the lesson:**

- *Brain storm.*

Students demonstrate an exhaustive description of the unusual clinical situation and offer to offer the most rational diagnostic methods. After recording all the proposed diagnostic methods during the discussion, students choose the most rational.

- *Tasks for the self-employment*

Fill in the medical documentation, make a plan of the patient examination with the appropriate clinical situation , make a plan of postoperative care of the patient

*Evaluation.*

### Current control

Control measures in the study of the discipline "Surgical Dentistry" include current control, final control - semester test credit.

At the start of a new course an initial test is conducted in order to check students' knowledge in disciplines making up the course. The initial test is conducted during first class using the tasks corresponding to the syllabus of previous discipline. Test results are analyzed during department (inter-department) meetings and sessions of methodological committees with participation of academic staff who teach the discipline. Initial test results are used for development of student individual assistance means and academic process correction.

Current control is carried out at each practical lesson in accordance with the specific objectives of each topic. Current control is carried out on the basis of a comprehensive assessment of student activities, including control of the input level of knowledge, the quality of practical work, the level of theoretical training, independent work according to the thematic plan and the results of initial control of knowledge.

**Current evaluation** is conducted on the basis of comprehensive evaluation of student's activities, including assessment of initial level of knowledge, quality of practical work done, level of theoretical training and final level of knowledge. Forms of routine assessment – tests tasks, situational problems, recitation, structured written task and practical skills assessment under conditions approximating real. Forms of assessment of current learning activities are standardized and meet the standards of answers.

*Evaluation of current educational activities.* During the evaluation of the mastering of each topic for the current educational activity of the student, marks are set on a 4-point scale (national). This takes into account all types of work provided by the curriculum of discipline. The student must receive a mark from each topic for further conversion of marks into points on a multi-point (200-point) scale.

Evaluation of current student performance is carried out at each practical lesson and is recorded in the journal of academic performance.

Students' knowledge is evaluated from both theoretical and practical training according to the criteria given in the table.

Code of the result of education	Code of the type of the lesson	Method of verifying of learning outcomes	Enrollment criteria
<p><i>Kn1, Kn2, Skl1, Skl2, Com1, Com2, Aut1, Aut2, Aut3</i></p> <p><i>PRE1, PRE 2, PRE 3, PRE 4, PRE 5, PRE 6, PRE 7, PRE 8, PRE 9, PRE 11, PRE 12, PRE 14, PRE 15, PRE 16, PRE 17, PRE 18, PRE 21, PRE 22, PRE 23</i></p>	<p><i>IX semester: P1-P14 SIW1- SIW 15</i></p> <p><i>X semester: P1-P22 SIW1- SIW 14</i></p>	<p>package of test tasks,</p> <p>open questions,</p> <p>situational tasks,</p> <p>practical skills</p>	<p>- <b>"excellent"</b> – a student has perfectly mastered the theoretical material, demonstrates profound and comprehensive knowledge of a relevant topic or discipline as well as the main ideas of scientific sources and recommended literature; thinks logically and gives a logically built answer; freely uses theoretical knowledge gained during analysis of practical material; expresses attitude towards various problems; demonstrates a high level of practical skills;</p> <p>- <b>"good"</b> – a student has mastered theoretical material well, is aware of the main theoretical principles discussed in scientific sources and recommended literature and is capable of substantiating them; has practical</p>

			<p>skills and expresses opinion on this or that issue yet may be inaccurate and erroneous when presenting theoretical material or analyzing the practical material;</p> <p>- <b>"satisfactory"</b> – a student has generally mastered theoretical material on the topic or discipline, is aware of the scientific sources and recommended literature, yet is uncertain when answering and additional questions cause him/her to give an unclear answer or no answer at all; when answering practical questions a student demonstrate inaccuracies, is not capable of evaluating facts and phenomena and linking them to future activities;</p> <p>- <b>"unsatisfactory"</b> – a student has not mastered the material of the topic (discipline); has no knowledge of scientific facts and definition; is hardly aware of the scientific sources and recommended literature; he/she lacks academic thinking, practical skills have not been formed.</p> <p><b>The evaluation criteria by type of control are given below</b></p>
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**Criteria for evaluating the test task**

**"Excellent"** - the student solved 95-100% of the proposed set of test tasks;

**"Good"** - the student solved 80-94% of the proposed set of test tasks;

**"Satisfactory"** - the student solved 60.5-79% of the proposed set of test tasks;

**"Unsatisfactory"** - the student solved less than 60.5% of the proposed set of test tasks.

**Criteria for evaluating the package of open questions**

The task includes 5 open questions on the topic of practical lesson. The cost of each question is 1 point, or 20%. The results of the answers are summarized and rated on a five-point scale: 5 "excellent" - 4.5-5 points; 4 "good" - 3.5-4 points; 3 "satisfactory" - 3 points; 2 "unsatisfactory" - 2 or less points.

Each of the questions is evaluated according to the following criteria:

1 point - the student perfectly mastered the theoretical material of the topic of the lesson; independently, competently and consistently with exhaustive completeness answered questions;

demonstrates deep and comprehensive knowledge, logically builds the answer, expresses his attitude to certain problems; is able to establish causal relationships, logically and reasonably draw conclusions; unmistakably answers questions using materials submitted for independent work.

0.75 points - the student has mastered the theoretical material of the topic of the lesson, teaches it; reveals the main content of educational material, gives incomplete definitions, allows minor violations in the sequence of presentation of material and inaccuracies in the use of scientific terms, vaguely formulates conclusions, expresses its views on certain issues, but assumes certain errors in the logic of theoretical content.

0.5 points - the student has mainly mastered the theoretical material of the lesson, fragmentarily reveals the content of educational material, shows the initial idea of the subject of study, when reproducing the basic educational material makes significant mistakes, gives simple examples, unconvincing answers, confuses concepts.

0 points - the student has not mastered the educational material of the topic, does not know definitions, concepts; gives the wrong answer to the questions.

#### **Criteria for assessing the situational tasks**

**"Excellent"** - the student has deeply mastered the theoretical material of the lesson, is able to connect theory with practice, which allows him to solve situational tasks of increased complexity.

**"Good"** - the student has firmly mastered the theoretical material of the topic of the lesson, correctly applies theoretical knowledge in solving situational problems of medium difficulty.

**"Satisfactory"** - the student has mastered only the basic material without details, solves only the easiest tasks, assumes inaccuracies, chooses insufficiently clear wording, violates the sequence in the presentation of the answer.

**"Unsatisfactory"** - the student does not know much of the theoretical material of the topic of the lesson, makes significant mistakes, does not solve the situational task.

#### **Criteria for evaluation of the practical skills**

**"Excellent"** - the student has full practical skills, is able to connect theory with practice.

**"Good"** - the student partially has a practical skill, correctly applies the theoretical provisions in solving practical problems.

**"Satisfactory"** - the student has only a mandatory minimum of practical tasks, familiar with the technique of performing.

**"Unsatisfactory"** - the student does not have practical skills.

When using different methods of verifying learning outcomes, their scores are summed to the arithmetic mean.

#### **Evaluation of the students' independent work**

The material for independent work of students, which is foreseen in the topic of practical lessons at the same time as classroom work, is evaluated during the current control of the topic of the relevant lesson. Evaluation of topics that are submitted for independent work and are not included in the topics of practical lessons, are controlled during the final control.

In the process of control measures the teacher evaluates:

- the level of assimilation by the student of the educational material submitted for independent processing;
- ability to use theoretical knowledge in performing practical tasks;
- validity and logic of presentation of independently studied material;

- completeness of disclosure of the research topic;
- registration of materials according to the requirements.

Marks on the performance or non-performance of various types of independent work of students are placed in the teacher's Journal of attendance and performance the of students.

***Possible forms of independent work of students, forms of control and reporting***

<b>Types and forms of independent work of students</b>	<b>Forms of conduction, control and reporting</b>
<i>1. Preparation for current practical lessons</i>	
1.1. Study of required and additional literature, texts of the lectures etc.	1.1. Active participation in various types of practical lessons and lectures
1.2. Performing of hometasks	1.2. Checking the correctness of the tasks
1.3. Preparation for practical lessons	1.3. Active participation in practical lessons
1.4. Preparation for control works and to another forms of current control	1.4. Writing of control worl etc.
<i>2. Research-analytic work</i>	
2.1. Search (selection) and review of literature sources on a given issue	2.1. Consideration of prepared materials during practical lessons
2.2. Writing of the referate on a given issue	2.2. Discussion (defense) of the materials of the referate during practical lessons or checking of the work by the teacher
2.3. Analytical review of a scientific publication	2.3. Discussion of the results of the work done during practical lessons
2.4. Analysis of a specific clinical situation	2.4. Examination of patients, acquaintance with results of examination, filling in of the documentation
2.5. Workshop on the educational discipline using software	2.5. Checking the correctness of performing of the tasks
<i>3. Scientific work</i>	
3.1. Participation in scientific student conferences and seminars	3.1. Approbation of research results at scientific student conferences and seminars
3.2. Preparation of scientific publications	3.2. Discussion with the teacher of the prepared materials, submission to the press the results of scientific researches
3.3. Execution of tasks within the research projects of the department (faculty)	3.3. Use of research results in the SRW report, preparation of work for the competition of student research papers

**Final control**

Final control - semester test credit - is a form of final control, which consists in assessing the student's mastery of educational material solely on the basis of the results of his performance of certain types of work on practical lessons. It is conducted in accordance with the curriculum within the timeframe set by the schedule of the educational process and in the amount of educational material determined by the curriculum of the discipline.

Semester test credit of the discipline is conducted after the end of its study, before the examination session.

To the final control are admitted the students who have attended all practical lessons foreseen by the curriculum in the discipline and scored at least the minimum number of points for the current evaluation. For students who have missed 3 or more practical lessons, these lessons can be repassed with the permission of the dean's office to eliminate academic debt by a certain deadline within the semester.

Final controls are held by lecturers who had practical classes in the academic group. Students are admitted to the semester final control if they perform all types of assignments foreseen by syllabus and curriculum.

Evaluation of the student's work during semester must be recorded (in academic journal,

grade report sheet, student credit book). Tests and individual assignments performed by students during the term are kept at the department for a year.		
General system of evaluation	Participation in the work during the semester - 100% on a 200-point scale	
Scales of evaluation	traditional 4-point scale, multi-point (200-point) scale, ECTS rating scale	
Conditions of admission to the final control	The student attended all practical lessons, met the requirements of the curriculum and received at least 120 points for current evaluation.	
Type of the final control	Method of performing of final control	Enrollment criteria
Semester test credit	Assessment of the discipline is based solely on the results of current educational activities and is expressed on a two-point national scale: "credited" or "not credited". All topics submitted for current control must be included. Marks from the 4-point scale are converted into points on a multi-point (200-point) scale in accordance with the Regulation "Criteria, rules and procedures for evaluating the results of students' learning activities."	<p><i>Maximum number of points</i> is 200 points.</p> <p><i>Minimum number of points</i> is 120 points.</p> <p>To be enrolled, a student must receive at least 60% of the maximum amount of points of the discipline (120 points) for the current educational activity. Points of the discipline are ranked on the ECTS scale.</p>
<p><b>Calculation of the number of points</b> is conducted on the basis of grades under traditional grade scale received by the student during the term by determining arithmetic average (AA) rounded off to the nearest hundred. The resulting value is then converted into points according to the multipoint grade scale using the following procedure:</p> $x = \frac{AA \times 200}{5}$		