

## **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: Surgical Dentistry)**

**CC 3.3**

**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 one

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 gland", "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>12 credits / 360 hours</b>	<b>0</b>	<b>215</b>	<b>145</b>	<b>V course (IX, X semesters)</b>	<b>Credit</b>
<b>by semesters</b>						
<b>content module 1</b>	<b>4,8 credits / 144 hours</b>	<b>0</b>	<b>83</b>	<b>24</b>	<b>IX semester</b>	<b>Credit</b>
<b>content module 2</b>	<b>7,2 credits / 216 hours</b>	<b>0</b>	<b>132</b>	<b>84</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> Modern principles of diagnostics of defects and deformations of the facial skeleton. Anthropometry, cephalometry. Methods of radiological examination, stereolithography. Navigative computer technologies in complex treatment of defects and deformities of the face.	6
5.	<b>Topic №5.</b> Jaw deformities: etiology, pathogenesis, classification, clinical signs, diagnostics. Orthognathic surgery: principles and techniques of mono- and bimaxillary surgery. Distraction osteogenesis methods.	6
6.	<b>Topic №6.</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
7.	<b>Topic №7.</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 ectoprostheses. TMJ reconstruction.	6
8.	<b>Topic №8.</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
9.	<b>Topic №9.</b> Preprosthetic surgery. Bone surgery: alveolotomy, removal of exostoses, vertical and horizontal augmentation of the alveolar process. Open and closed sinus lifting: indications, methods and modifications.	6
10.	<b>Topic №10.</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
11.	<b>Тема№11.</b> Platelet concentrates. Classification. Manufacturing techniques. The concept of growth factors and their regenerative potential. Possibilities of application of platelet concentrates and compositions based on them for regeneration of soft tissues of MFA and osteogenesis stimulation.	6
12.	<b>Topic №12.</b> Aesthetic surgery of MFA. Age-related changes in the face and neck soft tissues. Contour facelift. Methods of injection of botulinum toxin, fillers, platelet concentrates to correct age-related changes and eliminate aesthetic defects of the face.	5

13.	<b>Topic №13.</b> Endodontic treatment complications and their surgical treatment. Periodontal surgery: the main principles, bone grafting materials. Guided tissue regeneration.	6
14.	<b>Topic №14.</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, alveotomy conducting. Periodontal abscess incision. <b>Summary lesson "MFA Reconstructive Surgery".</b>	6
<b>Total hours: 83</b>		

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

№	Topic	Hours	Type of Control
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 № 1</b> TMJ Ankylosis: etiology, pathophysiology, classification, clinical signs, diagnosis, treatment, prevention. Arthroscopy: indications and contraindications, arthroscopic techniques. Mandible contracture: etiology, classification, clinical signs, differential diagnosis, treatment, prevention.
Cours	V
Faculty	Dentistry

## THE PLAN OF THE PRACTICAL LESSON № 1

**1. Topic of the lesson:** «TMJ Ankylosis: etiology, pathophysiology, classification, clinical signs, diagnosis, treatment, prevention. Arthroscopy: indications and contraindications, arthroscopic techniques. Mandible contracture: etiology, classification, clinical signs, differential diagnosis, treatment, prevention.»

**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. Planning and conducting the preventive measures of the dental diseases.
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 and carry out of dental monitoring of the persons subjected to the dispensary supervision.
11. Assessment of the environment impact on the health of the population (individual, family, population).
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 know	Student should be able to
Previous:		
Normal Anatomy	To know the anatomical and physiological structure of the	Be able to explain the pathological process



Topographical Anatomy	mandible, masticatory muscles, TMJ their vascularisation and innervations. To know the topography of the MFA cellular spaces.	localization in the maxillofacial area.
Pathological Anatomy	To know the pathomorphological changes in the tissues that occur in TMJ ankylosis and mandibular contractures.	Be able to explain the mechanism of the pathomorphological changes that occur in TMJ ankylosis and the mandible contractures.
Radiology	To know the TMJ X-Ray picture.	Be able to describe the radiological changes in the TMJ ankylosis and the mandible contractures.
Pharmacology	To know the pharmacological properties of the drugs used for the TMJ ankylosis and mandibular contractures treatment.	Be able to prescribe the drugs of the different pharmacological groups in the patient with the TMJ ankylosis and mandibular contractures.
Physical therapy	To know the Physical therapeutic methods and general principles of the mechanical therapy for the TMJ ankylosis and mandibular contractures treatment.	Be able to prescribe a course of the physical therapy procedures and mechanical therapy in the patients with TMJ ankylosis and mandibular contractures.
<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 Anaesthesia.	To know the methods, indications and contraindications of the General Anaesthesia in dentistry.	Be able to choose the correct anaesthesia method for the MFA surgery.
Topic 23 («The MFA inflammatory diseases»): TMJ arthritis and arthrosis: complications.	To know the complications of the TMJ arthritis and arthrosis.	Be able to conduct the prevention of the TMJ arthritis and arthrosis.
Topic 4 («MFA traumatology»): Non-gunshot injuries of the mandible ...	To know the clinical signs, diagnosis, treatment methods of the mandibular articular processes fractures.	Be able to conduct the prevention methods in patients with the mandibular articular processes fractures to prevent TMJ ankylosis and mandibular contractures.

## 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. 95-101.

### ***The additional***

1.2 PETERSON'S PRINCIPLES OF ORAL AND MAXILLOFACIAL SURGERY, *Second Edition*, 2004, p. 933-949

## **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:* «TMJ Ankylosis: etiology, pathophysiology, classification, clinical signs, diagnosis, treatment, prevention. Arthroscopy: indications and contraindications, arthroscopic techniques. Mandible contracture: etiology, classification, clinical signs, differential diagnosis, treatment, prevention».

*The aim of the lesson:* to teach to diagnose TMJ ankylosis and mandible contractures, to know their classification, clinical signs and a variety of modern diagnostic methods, be able to work out a plan of the surgical or therapeutic treatment.

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

Ankylosis is a bony or fibrous fusion of the TMJ articular surfaces which causes a stable, complete or partial restriction of the mouth opening , the disappearance of the joint space. Mandible contracture is a persistent limitation of it mobility caused by extra-articular factors, mainly due to pathological changes in the tissues surrounding the TMJ and functionally related to it. The dentist should be familiar with the various manifestations of the TMJ diseases in order to prevent and treat this pathology, as well as the possibilities of arthroscopy and arthroscopic surgery TMJ ankylosis.

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

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

1. The TMJ ankylosis classification.
2. The examination methods in patients with TMJ ankylosis.
3. The mandible contracture classification.
4. The modern methods of the mandible contracture treatment.

#### ***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 etiology of ankylosis is well studied. Thus, the scientific literature describes casuistic cases of congenital ankylosis. Most TMJ ankylosis is acquired due to various causes, including after injury (42%), after inflammation of the joint (40%), after systemic disease (nonspecific polyarthritis, rheumatoid arthritis, collagenosis, ossifying myositis, connective tissue dysfunction, disorders osteogenesis, etc.). The cause of its occurrence is not determined in about 5-10% of cases.

The pathogenesis of the disease indicates the loss of the anatomical structure and function of the TMJ tissues - there scar or bone fusion of the articular surfaces of the TMJ are developed, the loss of function of the growth zones of the mandible (in childhood), resulting not only restriction of the mouth opening but also deformation of the mandible, underdevelopment of a particular part or the lower jaw. Thus, after an intra-articular fracture there is a displacement of the fragments, the injuries of the

articular surfaces, and the healing processes of injuries cause loss of mobility in the joint. As a result of inflammation the scars are developed in the joint tissues. The systemic connective tissue diseases cause disorders of all elements of the joint, as well as bones, muscles, their innervation and blood circulation, disorders of the immune system, and so on.

The clinical features of TMJ ankylosis in children is quite clear: significant asymmetry of the face, unilateral or bilateral microgeny, the chin is shifted back (in case of bilateral microgenia) or sideways (in case of unilateral ankylosis), the breathing is difficult, at night the child snores or breathes due to sagging of the tongue and blockage of the upper respiratory tract (sleep apnea syndrome). The mouth opening and the mandible mobility are limited, nutrition is much more difficult. The mandible body and the branch are shortened, the bite is disturbed and mostly oblique, the teeth are clustered and fan-shaped, there is a clear manifestations of active teeth decay, significant periodontal problems.

There are secondary maxilla, nose, chin deformities with their displacement, the displacement of the mouth bottom organs and tissues towards the joint (with unilateral ankylosis) and backward. In the adults the face will be symmetrical, but mouth opening, speech and nutrition are impaired. Scars on the skin are possible after previous surgeries.

Echoosteometry - the bone density decrease or increase in the area of the mandible branch and body. Electromyography- the bioelectrical activity of the masticatory muscle is often reduced, and the temporomandibular muscle is increased. Thermography or rheography - there may be the signs of decreased blood flow in the area of the TMJ and jaw branch.

On radiographs, CT, MRI: the joint gap is completely absent or partially shortened, narrowed, deformed or interrupted on the affected side, not symmetrical with the gap on the healthy side of the jaw; the articular process may be deformed, "flattened"; the mandible branch and angle are hyperplastically altered, dilated; coronal process - elongated, extends above the zygomatic arch.

General changes in the blood and immunity systems may indicate the presence of low compensatory capacity of the patient's body, microbial allergy to streptococcus, staphylococcus, other pathogens, intoxication and more.

Differential diagnosis of the TMJ ankylosis is performed with the mandible contractures (fibrous and bony), the coronal process tumors (osteoma, sarcoma, etc.), the temporal bone tumors (osteoma, osteoma which covers the articular process), the joint systemic diseases, internal disorders of the TMJ (disc dislocations, etc.).

The TMJ ankylosis surgical treatment methods:

- the mandible branch osteotomy.
- osteotomy with dilution - the branch fragments stretching.
- the mandible branch osteoectomy.
- osteotomy-osteoectomy with interposition.
- osteotomy-osteoectomy.
- the articular process resection with one-step the branch and articular process plasty with various grafts.
- the TMJ and the branch restoration by the artificial implants made of metal, metal and plastic.

The mandible contracture are a persistent limitation of mandibular mobility caused by extra-articular factors, mainly due to pathological changes in the TMJ surrounding tissues and functionally related to it.

Etiology. The contractures occur due to the various negative factors and damages of the various tissues adjacent to the joint, and are observed after inflammatory processes, injuries, injections, tumors, systemic connective tissue diseases, neurogenic, mixed etiology.

The genetically determined type of wound healing and tendency to form hypertrophic or keloid scars, which is a prognostic negative factor have the great importance. On the contrary, with the formation of atrophic scars, the risk of contracture is much lower. Systemic connective tissue diseases that are accompanied by increased collagenogenesis (rheumatoid arthritis, lupus erythematosus, ossifying myositis, dermatomyositis, fungal mycosis, etc.) can play a large role in contracture development.

Classification. Contractures are classified on various signs. Thus, according to the type of affected tissues, there are: dermatogenic, mucogenic, fasciogenic, myogenic, osteogenic, combined. By type of pathological tissues that limit the mouth opening: scar (fibrous), bone, bone and scar. By stability over time: stable, unstable. By the patient's age, when they arose: in children, in adults (after the facial skull growth). In the presence of disorders in the joint: without ankylosis, with the presence of TMJ

ankylosis.

- Contractures after the inflammatory process
- Contractures after facial injury.
- Post-injection contractures ..
- Neurogenic contractures.
- Contractures in tumors.
- Fixation contractures.
- Arthrogenic contractures
- Contractures of mixed etiology.

The local examination is performed after the general. It involves the examination of the external facial contours, the degree of mouth opening, mobility of the mandible, the presence of the scars on the skin and on the mucous, and their direction and location, size , etc.

The additional examination methods are include

orthopantomography of the facial skull, radiography of the mandible, TMJ, facial bones, echoosteometry, electromyography of the masticatory muscles, immunogram, study of jaw models, study the occlusion in the articulator, study the TMJ function , thermography, CT , other methods (according to the indications).

The clinical features of the contracture depends on its type, time of onset, age of the patient, previous treatment, etc. Palpation can identify rough scar along the lines of stretching of tissues when opening the mouth. If the disease has developed in childhood or adolescence, it is possible to detect underdevelopment of the mandible body or branch, displacement of the chin into the healthy direction.

Contractures of different genesis may have their own special features. After inflammation - jaws contracture of various degrees, possible residual pain and swelling of soft tissues, thickening of the jaws, displacement (deviation) of the jaw. After the injury, there may be scars on the skin, facial deformity, displacement or defects of soft tissues and bone fragments, stretching of the scars when opening the mouth.

• *Algorithms for the formation of the professional skills and abilities*

1. To be able to make the examination in patient with TMJ ankylosis and mandible contracture:
  - a) to study the patient's complaint;
  - b) to study the diseases anamnesis;
  - c) to assess the general condition;
  - d) to conduct extra oral and intra oral examination.
2. To learn to make a differential diagnosis of mandible contracture with TMJ ankylosis, prescribing additional examination methods.
3. To determine the indications for surgical treatment of patients with TMJ ankylosis and mandibular contractures.
4. To learn to prescribe the physical therapeutic treatment methods of TMJ ankylosis and mandibular contracture , to prescribe mechanotherapy.

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

*Individual task:*

Task №1.

TMJ ankylosis is functionally manifested:

- A. Lack of movement in the joint
- B. The appearance of crepitation when moving in the joint
- C. Pain, which periodically appears and restriction of movement in the joint
- D. Stiffness of TMJ movements in the morning
- E. The appearance of a feeling of clicking when moving in the joint

Task №2.

The 44 tooth root was extracted using mandibular anesthesia . A day later, the patient visit the dentist again with complaints of severely limited, painful mouth opening. Body temperature 37.0°C, II degree

trismus, face is symmetric, proportional, the mouth mucous membrane pale pink. What is the possible complication ?

- A. Post-injection muscle contracture
- B. Post-injection hematoma of the pterygomandibular space.
- C. Abscess of the pterygomandibular space.
- D. Inflammatory infiltrate of the pterygomandibular space.
- E. Painful TMJ dysfunction .

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

The patient, 60 years old, has a limited and painful mouth opening, difficulty speaking and eating. During the year the condition worsens, was treated independently, suffers from chronic bronchitis and chronic purulent otitis. Restriction of mouth opening up to 1 cm, on the X-Ray - shadows of bone layers between the articular surfaces on the left. What additional screening methods should be prescribed to make a diagnosis? Which medical treatment should be prescribed? Is there are indications for surgical treatment? 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.*

Master the examination methods in patient's with TMJ ankylosis and mandibular contracture :

- a) to study the patient's complaints;
- b) to study the diseases anamnesis;
- c) to assess the general condition;
- d) to conduct the extra oral and intraoral examination.

To learn to make a differential diagnosis of mandibular contracture with TMJ ankylosis, to prescribe the additional examination methods. To determine indications for surgical treatment of TMJ ankylosis and mandibular contractures. To learn to prescribe methods of physical therapy treatment of TMJ ankylosis and mandibular contracture, to prescribe mechanotherapy.

- *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 №2.</b> Secondary facial soft tissues defects and deformities . The principles of plastic surgery planning. Local plasty. Pedicle flap plasty. Free skin transplantation . Round Filatov stem plasty. Salivary gland fistulas surgical treatment.
Cours	V
Faculty	Dentistry

## THE PLAN OF THE PRACTICAL LESSON № 2

**Topic №2.** Secondary facial soft tissues defects and deformities . The principles of plastic surgery planning. Local plasty. Pedicle flap plasty. Free skin transplantation . Round Filatov stem plasty. Salivary gland fistulas surgical treatment.

**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 laboratory and instrumental researches results..
3. Establishment of the clinical diagnosis of dental disease.
4. Planning and conducting the preventive measures of the dental diseases.
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 and carry out of dental monitoring of the persons subjected to the dispensary supervision.
11. Assessment of the environment impact on the health of the population (individual, family, population).
12. Maintains of the 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 know	Student should be able to
Previous:		
Normal Anatomy	To know the anatomy and physiology of the skin and subcutaneous tissues their blood	To be able to explain the anatomical structure of the MFA and oral cavity organs.

Histology	supplying and innervations. To know the topography of the MFA cellular spaces. To know the lymph outflow features and the skin functional properties.	To be able to explain the lymph outflow features and functional properties of the skin.
Topography Anatomy	To know the MFA topography	To be able to explain the MFA defect location, determine the lost tissues type and volume ..
Pharmacology	To know the pharmacological properties of the drugs used for the plastic surgery of the MFA defects .	To be able to prescribe the drugs of the different pharmacological groups in the patients with the MFA defects after the surgery.
<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 («The Surgical dentistry Propedeutic»): ... Asepsis and antyseptics.	To know the rules of asepsis and antiseptics during the MFA surgery.	Be able to perform the aseptics of the surgeon's hands and operating area during the MFA surgery.
Topic 3 («The Surgical dentistry Propedeutic»): Local and general anaesthesia.	To know the technics, the indications and contraindications to the general anesthesia in dentistry. To know the methods of the local anesthesia for the MFA surgery.	Be able to correctly choose the optimal anaesthesia method during the MFA plastic surgery. To be able to carry out local anesthesia during the MFA plastic surgery.
Topic 13 («MFA traumatology»): Thermal injures of the MFA... ..	To know the basic clinical manifestations and principles of diagnosis and treatment of thermal facial injuries.	Be able to provide the emergency care in the patients with the MFA thermal damages, to determine the area of affected tissues, to conduct the primary d-bridment of the thermal injures.

## 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. 130-147.

#### *The additional*

1.2 PETERSON'S PRINCIPLES OF ORAL AND MAXILLOFACIAL SURGERY, *Second Edition*, 2004, p. 769-819.

### 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 the topic and the purpose of the lesson.*

*The lesson topic:* “ Secondary facial soft tissues defects and deformities . The principles of plastic surgery planning. Local plasty. Pedicle flap plasty. Free skin transplantation . Round Filatov stem plasty. Salivary gland fistulas surgical treatment “.

*The aim of the lesson:* to learn to diagnose the MFA defects and deformations , which can be treated by the typical methods of plastic surgery, be able to plan local plastic surgery, to know the indications for the various types of surgical interventions..

To learn to eliminate acquired and postoperative defects and deformities of the lips, cheeks, nose, chin with the local tissues, the pedicle flap, by the free transplantation skin and mucous flaps; to develop the ability of analytical thinking during the choosing methods of free skin grafting in specific clinical cases; to learn the surgical treatment of the salivary fistulas. Learn to determine the indications and contraindications to the replacement of the MFA defects by the round Filatov's stem and the principles of it's formation, training, migration and the stem stratification on the recipient wound.

*The motivation of educational activity.*

The issues of reconstructive surgery for the congenital and acquired face defects and deformities are an urgent and complex problem of maxillofacial surgery, so dentists should be guided by the basic principles and techniques of the local plastic surgery planning, know the indications for the various surgery treatments.

The local plasty of the significant defects often lack local plasty materials - skin, subcutaneous fat, muscle. To achieve this goal, a free tissues transplantation, is used with their complete separation from the donor base (mother substrate). An urgent problem is the correct choice of the plasty method, taking into account the biological justification and anatomical and physiological features of the MFA. The revolutionary solution to this problem was proposed by VP Filatov (1916) - to transfer from the donor site to the defect place additional plastic material in the form of a round stem, consisting of skin and subcutaneous fat (Filatov's stem).

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

*The frontal interview questions :*

1. Indications and contraindications to local plastic surgery.
2. Local plasty methods, their classification.
3. The essence of the triangular flaps plasty (Z-plastic) by AA Limberg.
4. Salivary fistulas surgery.
5. Classification of the free skin and mucous transplantation.
6. The main stages of the Filatov's stem plasty.

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

#### ***Professional training conducting .***

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

There are many different classifications of the human body defects and deformities that require surgery or other interventions to improve their anatomical, physiological condition and aesthetic appearance.

By etiology:

1. Congenital (the lip and palate clefts):
  - primary and secondary - as a consequence, the deterioration of the primary defect (deformation).
2. Acquired (due to various factors) - after injury, thermal, chemical factors, infectious diseases, inflammatory diseases, radiation, aseptic inflammation, postoperative, age-related changes, etc.

By localization in the tissues the defect and deformations are:

- 1) skin and mucous ;
- 2) skin and subcutaneous fat, subcutaneous glands;
- 3) skin, subcutaneous fat, adjacent muscles;
- 4) other anatomical structures (salivary glands, nerves, etc.).

The indications for plastic and aesthetic surgery are conventionally divided into medical (anatomical, functional), social and individually conditioned. Medical cases include the clinical cases that are accompanied by significant changes in the anatomical structure and function of the human body, leading to a violation of the aesthetic appearance of the person, and the degree and ratio of these disorders may be different.

Social indications include situations when the shape and function of certain areas, such as the human face, are practically acceptable to the patient, but cause some social difficulties in society.

Contraindications to plastic aesthetic interventions are conventionally divided into absolute and relative (temporary), local and general.

The main local plasty methods include:

- 1) triangle flap plasty (Z-plastic);
- 2) rotation flap plasty ;
- 3) pedicle flap plasty;
- 4) transposition flap plasty.

The most common method of classifying flaps is based on the method of transfer. Advancement flaps are mobilized along a linear axis toward the defect . Rotation flaps pivot around a point at the base of the flap. Although most flaps are moved by a combination of rotation and advancement into the defect, the major mechanism of tissue transfer is used to classify a given flap. *Transposition flap* refers to one that is mobilized toward an adjacent defect over an incomplete bridge of skin. Examples of transposition flaps include rhombic flaps and bilobed flaps . Interposition flaps differ from transposition flaps in that the incomplete bridge of adjacent skin is also elevated and mobilized. An example of an interposition flap is a Z-plasty. Interpolated flaps are those flaps that are mobilized either over or beneath a complete bridge of intact skin via a pedicle. These flaps often require a secondary surgery for pedicle division.

The triangle flaps skin plasty. This method is also called Z-plastic, its mathematic substantiation was proposed by AA Limberg. The essence of the method: it is based on redistribution and partly on the stretching and contraction of tissues when cutting and moving two (or more) opposite triangular flaps of skin, which can have different shapes. The movement of the triangular flaps of skin exfoliated from the subcutaneous fascia is accompanied by an increase in tissue in the direction of the middle incision of the skin.

Rotated flap plasty according to Yu.K. Szymanowski. A rotation flap is a flap that is moved to the defect by the flap leg rotation, while the flap slides on the wound donor surface.

The pedicle flap plasty is a complex type of local plastic surgery. The complexity of reconstruction is not only in the surgical technique, but also in the preoperative planning and the choice of rational methods, so the surgeon must evaluate all possible plastic methods and take into account all available factors. It is also useful to have alternative plans in case of unforeseen circumstances that arose during the surgery.

Salivary fistulas are pathological passages that connect the ducts of the salivary glands with the face or oral cavity and cause saliva to come out of the gland in an unnatural way.

Etiology. There are congenital or acquired. Acquired fistulas occur with injuries of the glands parenchyma and ducts, often due gunshot face injury, surgical trauma (as a complication), or as a result of chronic inflammatory processes in the salivary glands or in the tissues around them.

Classification of salivary fistulas. and salivary ducts; external (open with a point hole on the face skin in the area of the scar) and internal (open into the mouth); complete and incomplete; without inflammatory signs in the gland and with inflammatory signs in the gland.

Due to the rupture of the duct, a complete fistula is formed and the saliva excreted through it; if the wall of the duct is damaged, part of the saliva is excreted through the fistula, and a part - through the duct opening. The most common salivary fistulas are parotid, less often mandibular, salivary glands. Sublingual salivary fistulas usually do not bother the patients.

The salivary fistula's therapeutical treatment methods . The purpose of these methods is to achieve the death of the epithelial lining, the development of scars and as a result the salivary fistula

closure without surgery. They are reduced to the elimination of inflammation around the fistula and suppression of gland function, damage the epithelial lining of the fistula with chemicals with cauterizing action (chromic, hydrochloric and lactic acids, alcohol, iodoform, lapis crystals, alcoholic iodine solution), electrocoagulation, cryodestruction, mechanical deepithelialization, external pressure on the gland and fistula. In the case of significant scarring around the fistula, radiotherapy is prescribed in combination with electrocoagulation of the fistula to suppress salivary gland function.

These measures are amplified pharmacologically - to reduce the function of the salivary gland appoint 6-8 drops of 0.1% solution of atropine sulfate or belladonna tincture for 30 minutes to go, which causes a decrease in saliva secretion.

These measures are more effective in the treatment of incomplete fistulas.

Surgical interventions are divided into two groups: 1) the formation of a mechanical obstacle to the outflow of saliva; 2) creating conditions for the outflow of saliva into the oral cavity.

Surgical treatments are radical. These include: narrowing of the fistula by introducing paraffin and other non-absorbable solutions into the tissues near it; fistula suturing; curettage and suturing of a fistula; excision and suturing of the fistula; partial excision of the fistula and the imposition of a circular suture; fistula excision with the adjacent tissues and moving it into the mouth; various methods of creating a new outflow of saliva by breakthrough; removal of a functioning salivary gland; active suppression of the functional capacity of the gland by its denervation, etc.

The most commonly used are excision of the fistula within healthy tissues to the salivary gland and layer-by-layer suturing of the wound with removal of the formed defect by the local plasty surgery method, which involves additional incisions and mutual movement of the tissues structures.

Free tissue transplantation. Thin split skin flaps (according to Tirsch) consist of: the epidermis and papillary (upper part) layers of the dermis. Widely used to replace defects of the mucous membranes of the mouth, nose and orbit. In such cases, skin grafts are performed on hard inserts of stens or soft inserts of iodine gauze.

Medium and thick split skin flaps are used to replace mucous defects of the oral cavity, and nose, eyelids, scalped wounds, as well as to temporarily close large infected wounds or in the presence of granulating wounds (on the face, head and neck).). In the latter cases, a two-stage (delayed) skin graft is used. First, the wound is prepared for skin transplantation: antiseptic treatment of the wound surface, apply ointment dressings, dressings with hypertonic sodium chloride solution, and the excess granulation is sometimes cauterized with 25% silver nitrate solution (not desirable). After the wound is covered with fine granulations, begin to close it with a free skin graft. They are sutured to the epithelium of the wound edges or to the underlying tissues.

The entire thickness skin transplantation the most fully replaces the missing skin. The transplanted flap retains its normal color and mobility, the function of the sebaceous and sweat glands, as well as hair growth is restored on the flap. The full-layer skin flap is most sensitive to adverse conditions that may occur during its transplantation. Full-layer flaps have nice healing on the connective tissue, fascia, and muscle, and are less healing on loose tissue, periosteum, bone, and granulation tissue.

For the local soft tissue plasty with extensive defects and deformations, local plastic material is often lacking - skin, subcutaneous fat, muscles. That is why the urgent issue of plastic surgery is to provide the damage area with the required amount of plastic material with the necessary properties to reproduce the lost anatomical structures.

The revolutionary solution to this question was proposed in 1916 by V.P. Filatov - to transfer from the donor site to the desired location of additional plastic material, soft tissues in the form of a round stem, which consists of skin and subcutaneous fat. Later, this flap was called the round Filatov stem.

The essence of the method is to prepare the required volume of plastic material in a remote area from the plasty zone, transfer the material to the damage zone and use it for its intended purpose. The transfer of plastic material to the place of its use is carried out either immediately during the formation of the flap, or alternately (the method of "caterpillar step"), or with the help of a moving part of the body, often the hand.

As a donor place can be used or adjacent to the damage place, or remote from it. Surgical treatment involves a number of successive stages: the stem preparing, transferring it to the damage site, plasty of the defect or deformation.

Indications for the eliminate defects and deformations by the Filatov's stem to : non-penetrating

and penetrating defects of the face soft tissues, in particular total and subtotal defect of the cheeks; complete and isolated lip defects; isolated defects of the chin, bottom of the mouth and lower jaw; complete defects of the nose, ears; facial atrophy; subtotal and total defects of the tongue, palate, etc.

• *Algorithms for the formation of the professional skills and abilities*

1. Be able to make the examination in patient with MFA defects who needs a plastic surgery.
2. To practice on the phantoms the technique of the face skin defects replacing and subcutaneous tissue with local tissues .
3. To work out on phantoms the triangle flap technique (Z-plasty) to replacement the defects (in particular salivary fistulas) and MFA deformations.
4. Practice on the phantoms the pedicle flap technique to replace of the acquired defects and deformations of the lips, cheeks, nose, chin and postoperative deformations of the upper lip and palate.
5. To work on the phantom the technique of the free skin and mucous transplantation .
6. To practice on the phantom the technique of forming, training, migration and plasty of the defect by the round Filatov stem.
7. To make a plan of comprehensive treatment and patient's care in the postoperative period.

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

*Individual task:*

Task №1.

A 30-year-old man complains of the lower eyelid deformity after a facial burn, which was a year ago. Objectively: the burn scar cord localized vertically , its upper end is connected with the lower eyelid. Which plasty method of is indicate in this case?

- A. Triangle flaps Z-plasty
- B. Pedicle flap local plasty
- C. Plasty By the round Filatov stem
- D. Free skin plasty
- E. Scar excision, the wound suturing

Task №2.

What is the thickness of the thin split flap?

- A. 0,2-0,4 mm
- B. 0,8 mm
- C. 0,5 mm
- D. 1 mm
- E. 0,1 mm

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

The patient, 32 years old with a cheek gunshot wound, was indicate the surgery - the skin defect plasty by the local tissues. Which method of defect plasty should be chosen? What must be prescribe in the postoperative period? 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.*

Master the technique of conducting a clinical examination of a patient who needs MFA reconstructive surgery . To practice on phantoms the technique of replacing face skin and subcutaneous defects by the

local tissues. To work out on phantoms the triangle flap technique (Z-plasty) to replacement the defects (in particular salivary fistulas) and MFA deformations. Practice on the phantoms the pedicle flap technique to replace of the acquired defects and deformations of the lips, cheeks, nose, chin and postoperative deformations of the upper lip and palate. To work on the phantom the technique of the free skin and mucous transplantation . To practice on the phantom the technique of forming, training, migration and plasty of the defect by the round Filatov stem. To make a plan of comprehensive treatment and patient's care in the postoperative period.

*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 №3.</b> Lip and palate clefts: classification, clinical features, functional disorders. The surgical treatment principles.
Cours	V
Faculty	Dentistry

## THE PLAN OF THE PRACTICAL LESSON № 3

**1. Topic №3.** Lip and palate clefts: classification, clinical features, functional disorders. The surgical treatment principles.

**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 laboratory and instrumental researches results..
3. Establishment of the clinical diagnosis of dental disease.
4. Planning and conducting the preventive measures of the dental diseases.
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 and carry out of dental monitoring of the persons subjected to the dispensary supervision.
11. Assessment of the environment impact on the health of the population (individual, family, population).
12. Maintains of the 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 know	Student should be able to
Previous:		
Normal Anatomy	To know the MFA anatomy and topography including the upper lip, hard and soft palate, their	Be able to explain the face and oral cavity anatomy and topography- (upper lip, hard
Topography Anatomy	innervation and blood supply.	and soft palate), their

		innervation and blood supply.
Histology and embryology	To know the general patterns of the the maxillofacial area development of the human embryo	Be able to explain the timing of the human face and oral cavity formation in embryogenesis.
Pediatrics	Features of the subjective and objective examination of pediatric patients.	Be able to conduct subjective and objective examination of pediatric patients.
Pharmacology	To know the pharmacological properties of the drugs used in the patients with lip and palate cleft in postoperative period.	Be able to prescribe drugs of different pharmacological groups to patients with congenital malformations and lip and palate cleft in the postoperative period.
Pediatric Dentistry	To know the MFA examination in child.	Be able to conduct subjective and objective examination of MFA in pediatric patients..
Prosthetic Dentistry  Orthodontic	To know the methods of orthodontic and prosthetic treatments in children with lip and palate cleft.	Be able to take impressions from the dentition for the manufacture of postoperative protective palatine plates, additional palate, orthodontic appliances.
<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 («The Surgical dentistry Propedeutic»): ... Asepsis and antyseptics.	To know the rules of asepsis and antiseptics during the MFA surgery.	Be able to perform the aseptics of the surgeon's hands and operating area during the MFA surgery.
Topic 3 («The Surgical dentistry Propedeutic»): Local and general anaesthesia.	To know the technics, the indications and contraindications to the general anesthesia in dentistry. To know the methods of the local anesthesia for the MFA surgery.	Be able to correctly choose the optimal anaesthesia method during the MFA plastic surgery. To be able to carry out local anesthesia during the MFA plastic surgery.

## 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. 130-147.

#### *The additional*

1.2 PETERSON'S PRINCIPLES OF ORAL AND MAXILLOFACIAL SURGERY, *Second Edition*, 2004, p. 839-871.



## 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:* “ Secondary facial soft tissues defects and deformities . The principles of plastic surgery planning. Local plasty. Pedicle flap plasty. Free skin transplantation . Round Filatov stem plasty. Salivary gland fistulas surgical treatment “.

*The aim of the lesson:* learn to diagnose congenital malformations and lip and palate clefts, to determine the timing and indications for various types of plastic surgery, to know the basic principles of medical examination and rehabilitation of the patients.

*The motivation of educational activity.*

Congenital lip, alveolar process and palate clefts are observed with a total frequency of 1 in 500-700 newborns and their frequency is constantly increasing. There are serious anatomic and functional disturbances in cleft patients. Such disturbances Such changes necessitate the provision of qualified medical care, the use of modern methods of plastic surgical treatment, early medical and social rehabilitation, which allows a person to return to the full life.

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

*The frontal interview questions :*

1. Etiology of lip and palate clefts.
2. Classification of lip and palate clefts.
3. The surgery terms in lip and palate cleft patients.
4. The main plastic surgery methods in lip and palate cleft patients .

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

##### ***Professional training conducting .***

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

Lip and palate clefts are the most common congenital MFA defects. Up to 30% of patients have other malformations, about 60% of children - a combined defect lip and palate cleft. Clefts of the lip and palate has a polyetiological nature, which involves both genetic and teratogenic factors. They are maternal diseases (infection, vitamin and micronutrient deficiencies, gynecological pathology, diabetes); influence of the teratogenic poisons (drugs, hormones), radioactive radiation; physical activity of the mother in early pregnancy, heredity (from 10 to 15%). The critical period for the occurrence of of the upper lip clefts is the 5-6th week of pregnancy, the alveolar process clefts - 6-7 weeks, the palate - 10-12 weeks.

There are unilateral and bilateral clefts of the upper lip, which can be hidden, incomplete and complete. The latent lip cleft is clinically manifested by a retracted linear furrow on the skin and a depression on the red border (occurs due to nonunion of the circular muscle of the mouth). Incomplete (partial) - defect of the soft tissues of the upper lip does not reach the lower part of the nostril. Complete nonunion - there is a defect of the upper lip along the entire height, which captures the lower part of the nasal opening, and in some cases the anterior part of the bottom of the nasal passage. Bilateral lip clefts are symmetrical and asymmetrical. The cleft of the lip can be isolated (not accompanied by the presence of a bone defect of the upper jaw) and combined - with the simultaneous presence of a defect of the alveolar process, as well as hard and (or) soft palate.

The palate clefts also hidden, incomplete (not through the whole palate) and full (through the whole palate), as well as isolated and combined. Incomplete the palate cleft captures the soft palate or partially hard, but does not pass through the alveolar process.

Complete - the defect passes through the alveolar process, hard and soft palate..

The palate cleft can be median, unilateral and bilateral. Congenital lip and palate clefts, as well as accompanying deformities of the nose occur in various forms and variants.

The clinical signs of the congenital lip cleft has characteristic features and usually does not cause difficulties in diagnosis. In the presence of isolated hidden the lip cleft, the defect and deformation of the soft tissues is the smallest, even sometimes it is only the involvement of the skin in the projection of the column of the upper lip. Cleft is incomplete in the presence of the bottom of the nasal passage. In the case of complete defects of the upper lip, the clinical picture is aggravated.

Unilateral isolated cleft of the upper lip is manifested in the form of a defect of the upper lip on one side or another. In this case, the red border consists of two fragments, on the larger fragment it rises to  $1/3 - 1/2$  the height of the upper lip, and sometimes more. The column of the upper lip on the unfused side is also divided into two parts, the height of the column on the large fragment is always reduced, and on the small - almost normal. The wing of the nose from the cleft is flattened (the muscles of the upper lip on a small fragment are woven into the base of the wing of the nose, which leads to its fixation in the pathological position), the tip is also flattened and shifted to the healthy side, the bottom of the nasal passage is absent and replaces the defect.

If the lip cleft is combined with the cleft of the alveolar process, then a large fragment of the alveolar process moves forward and upward (as it inverted), the bridle (frenulum) of the upper lip is always short. The small fragment in this case is turned medially downwards and looks underdeveloped.

Bilateral clefts of the lip is the most severe defect of the maxillofacial area both in the clinical signs and in terms of medical care. The biomechanism of its development is significantly different from unilateral. In the presence of such a defect, the upper lip is divided into three fragments, the soft tissues on the lateral fragments are quite pronounced, the height of the columns is slightly reduced, the red border and the muscle layer are usually well expressed. The medial fragment is represented by the intermaxillary bone, the soft tissues of the prolabium (the central part of the upper lip is limited by columns), the red border and the nasal septum. From its position (presence of protrusion of the intermaxillary bone, its rotation, displacement to one side), the relationship with the lateral fragments and the severity of soft tissues on it depend on the timing and type of surgery and the need for orthodontic treatment. The soft tissues on the medial fragment are always small (both the red border and the skin of the upper lip), especially in height. The dorsum of the oral cavity is shallow. With this type of the cleft there is a significant deformation of the nose. The nasal septum is always very short, the medial pedicle of the wing cartilage are underdeveloped. Sometimes the nasal septum is attracted to the soft tissues of the lip, the tip of the nose is bifurcated, the wings are stretched and the nose looks like a lamb. The somatic condition of such children depends on the type and sizes of the cleft.

In the case of isolated cleft of the lips, the child can eat well, so it develops normally physically, gaining weight, which is very important, especially in the 1st year of life.

In the case of penetrating (unilateral and bilateral) cleft of the upper lip, combined with the palate cleft, the functions of sucking and breathing are disturbed. This leads to the development of various inflammatory processes of the upper respiratory tract, anemia and malnutrition. For example, 30% of such children have contraindications to surgical treatment of a general somatic nature. During a detailed examination, they are diagnosed with thymomegaly, otitis, chronic kidney disease and more. Only additional research methods can detect comorbidities, which is very important to prepare the child for surgery.

In the case of congenital cleft of the palate, the child's parents complain of a defect in the tissues of the palate and food penetration into the nose during feeding, which causes coughing and choking. At an older age, the child "hums", slurred speech.

In the case of medial isolated palate clefts during the examination of the oral cavity, the alveolar process is intact, the hard and soft palate consist of two fragments, the vomer bone is located in the middle. In the presence of latent (hidden) isolated cleft of the hard and soft palate is detected: on the hard - the area of tissue involvement in the middle, which is illuminated by a bluish color, and during palpation determines the absence of bone tissue in this area; on soft such involvement of fabrics is well

visible when the child pronounces "A" or a cry. Often isolated palate clefts are accompanied by defects in the development of the muscle-skeletal system and other systems. That is why such children need a thorough examination. In the presence of unilateral cleft, the alveolar process, hard and soft palate consist of two fragments, one of them larger, the other smaller; the vomer bone is always spliced with a larger one throughout or partially (1/3, 2/3 of the length). The oral cavity connects with the nasal cavity from the cleft side. Usually a small fragment is underdeveloped, shorter, turned inward, and a larger one turned outward. In the case of bilateral palate clefts, the alveolar process consists of three fragments - two lateral and medial. The medial is represented by the intermaxillary (incisal) bone, part of the alveolar process with incisors and a vomer bone lying between the lateral fragments in the middle. In other cases, the intermaxillary bone protrudes forward - this is the so-called protrusion, which can be congenital or acquired as a result of improper feeding of the child. Significant protrusion of the intermaxillary bone requires orthodontic preoperative treatment. Lateral fragments are represented by a alveolar process and horizontal plates of a palatine bone (in most cases are displaced inwards and backwards). The oral cavity connects with the nasal cavity. In the presence of all types of palate clefts, fragments of the soft palate are usually short, may be asymmetric. The middle part of the pharynx is wide. In older children, hypertrophied tonsils and adenoid growths on the posterior wall of the pharynx are detected. Natural breastfeeding of the newborn reduces mortality among babies, satisfies the sucking reflex, strengthens the muscular activity of the child. Deficiency of food in the 1st year of life can not be compensated in any subsequent periods. Therefore, providing quality food and choosing the right method of feeding are fundamental for the harmonious development of infants with nonunion of the palate, in which from the first days of life impaired sucking, swallowing, breathing, which complicates feeding and creates conditions for various inflammatory diseases of the respiratory system, digestive system, etc. In infants, sucking affects the secretory and motor functions of the digestive system, metabolism, harmonious growth of the jaws and facial skeleton in general. There are several artificial ways to feed babies with cleft palate: using a tube, spoon, pacifier and obturator. The first two contribute to the attenuation of one of the important reflexes of the baby - sucking, under the action of which the muscles of the maxillary tissues are strengthened, the lower jaw moves forward, thus leveling the physiological microgenicity. In the case of tube feeding, the mucous membrane of the pharynx, esophagus is injured, there is swelling, inflammation, and further possible formation of bedsores, strictures. Therefore, these methods of feeding in children with congenital malformations of the lips and palate should be excluded, unless there are other indications for them (for example, Pierre Robin syndrome).

Currently, surgeons do not have a single view on the timing and methods of surgery for congenital malformations of the upper lip and palate. This is due to the variety of anatomical-functional and clinical manifestations of nonunion. Plastic surgery for congenital cleft of the upper lip, alveolar process and palate is shown to all children who were born on time and the general condition of the body allows for surgery. Contraindications to surgery are a combination of malformations of vital organs (brain, heart, etc.), birth injuries, acquired diseases that prevent surgery and other disorders of physiological functions of the young child. Contraindications are generally relative. After special training, the correct choice of age, the surgery can be performed. The decisive surgical tactic for 90% of children with the complete and noncomplete (rarely - isolated) cleft of the lips and palate is as follows: up to 3 months the child uses an obturator or a special pacifier, which provides breastfeeding conditions close to natural; up to 3-5 months in case of incorrect ratio of cleft fragments of the palate, orthodontic treatment is performed; at the age of 3-6 months surgery on uncomplicated cleft of the upper lip; at 6-9 months surgery of the wide cleft of the upper lip (bilateral, possibly in two stages), sometimes combining cheylorinoplasty with veloplasty; at 6-12 months - veloplasty or gentle uranostaphyloplasty; at 9-18 months, isolated cleft of the palate is surgically treated in one stage in a gentle way; at 18-24 months after primary veloplasty - uranoplasty; at the age of 2-3 to 12-14 years surgery on the secondary deformities of the upper lip and nose, secondary and residual defects of the palate; at the age of 8-10 bone grafting of the alveolar process of the maxilla is performed; in 12-16 years - the final elimination of secondary deformities of the upper lip, nose, if necessary - the maxilla.

To restore the correct anatomical shape and function of the lip, the surgeon must: 1) eliminate the gap; 2) lengthen the upper lip; 3) correct the shape of the nose. Lip augmentation techniques used by dental surgeons can be divided into 3 groups depending on the shape of the incisions on the skin of the lips:

Group I - linear methods (Evdokimova, Limberg, Miro). The positive side of the linear method is the cosmetic of the scar line, which coincides with the line of the filter. However, the above methods do not allow to obtain sufficient elongation of the upper lip with wide complete nonunion.

Group II - techniques based on the transposition of the triangular skin flaps with different angles - Z-plastic (Tennyson, Obukhova). Due to these techniques it is possible to obtain the necessary elongation of the tissues of the lip, which depends on the size of the triangular flap to compare the tissues of the lip in the symmetrical shape of Cupid's bow. The disadvantage of these techniques is the need to cross the filter line in the transverse direction. The transverse direction of the postoperative scar reduces the cosmetic result of the surgery.

Group III - techniques that allow to lengthen the upper lip by transposition the quadrangular flaps (Hagerdon, Le Mesurier). These techniques are used for significant lip lengthening. However, the techniques are not anatomical enough. The quadrangular flap is immobile and is not used for plastic incomplete cleft, often allows you to close the slit defect in bilateral cleft of the upper lip at the same time. The final deformations of the cartilaginous base of the nose, which are formed in the postoperative period are typical and are congenital deformities of the nose, accompanying the lip cleft before surgery. When performing cheiloplasty in the early stages, it is impossible to perform a complete correction of the nasal cartilage at the same time, to correct the wrong position of the muscles of the perioris area and the nose. Simultaneous elimination taking into account the mechanism of occurrence, possibly at an older age.

The success of restorative treatment of upper lip and nose deformities is largely determined by compliance with the requirements for the postoperative period. They are aimed primarily at the prevention of trophic disorders of the operated tissues, inflammatory complications in the early postoperative period, as well as the correction of the scarring process, which lasts up to a year.

Uranoplasty methods. The classic surgery, which provides closure of the cleft, lengthening of the palate (retrotransposition), narrowing of the middle pharynx (mesopharyngoconstriction) is radical uranoplasty by the method of Limberg. It is still the basic methods that determines the development of modern surgical treatment of congenital malformations of the palate. The main stages of radical uranoplasty according to Limberg are as follows:

1. Renewing by incision the edges of the hard palate cleft .
2. The formation of mucous-periostal flaps on the hard palate.
3. Separating them from the posterior edge of the horizontal plates of the palatine bone.
4. Osteotomy of the posterior wall of the large palatine opening.
5. Incision through the pterygomandibular folds in the direction to the lingual surface of the mandible alveolar process and mesopharyngoconstriction.
6. Interlaminar osteotomy according to Limberg.
7. Releasing of the vessels and displacement of soft palate tissues to the posterior wall of the pharynx.
8. Renewing the edges of the soft palate cleft.
9. Crosslinking of the vello palatinus, soft palate, mucous-periostal flaps of the hard palate.
10. Tamponade with iodoform tampon the additional incisions.
11. Closing the created palate with an iodoform tampon and covered it by the plastic plate.

Analysis of the long-term results of radical uranoplasty according to Limberg revealed a number of imperfect moments of the surgery, which led to the deterioration of the achieved anatomical and functional results, impaired growth of the upper jaw. Through the efforts of many clinics, radical uranoplasty has been improved, and new surgical techniques have been proposed. Improves the consequences of the operation free bone grafting - the introduction of a bone or cartilage allograft. Free bone grafting of the hard palate prevents postoperative narrowing of the upper jaw.

The sequence and scope of actions of the dentist during the treatment of a patient with congenital malformations of the upper lip and palate:

1. Dispensary registration of the patient with filling in the relevant documentation and notification to the Ukrainian or interregional centers for treatment of children with congenital and acquired diseases of the maxillofacial area, depending on the place of residence of the child. Inform the child's parents about the stages, place and timing of treatment.

2. Solving the issue of feeding - a special nipple or making an obturator type removable plate on the edentulous upper jaw in the first days after the birth of a child with through non-union of the upper lip and palate.

3. Examination of the child by a pediatrician and related specialists to identify concomitant congenital and acquired diseases that may be a contraindication to surgery, and begin treatment in appropriate specialized hospitals.

4. Adjustment of preoperative orthodontic treatment methods.

5. Between the stages of surgical and orthodontic treatment for the treatment of diseases of the teeth, oral mucosa, correction of orthodontic appliances, classes with a speech therapist and psychologist.

6. Maintenance of consultative communication with the medical team of the center.

Treatment of children with congenital palate clefts is comprehensive and includes surgical, orthodontic, speech therapy and psychological rehabilitation. Depending on the type of the palate cleft, the somatic condition of the child is determined by the timing, sequence of a particular type of treatment, but at each stage they interact, have their own patterns.

• *Algorithms for the formation of the professional skills and abilities*

1. Master the method of clinical examination of patients with congenital malformations of the upper lip and palate.

2. Work out the basic techniques of cheiloplasty and uranoplasty on phantoms.

3. To make up a plan of preoperative preparation, comprehensive treatment and patients postoperative care.

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

*Individual task:*

Task №1.

The exogenous factors of the face clefts development are:

- A. Radiation
- B. Heredity
- C. Hypervitaminosis A
- D. Mother's age
- E. Bad habits of parents
- F.

Task №2.

A 3-year-old girl was admitted to the Department of Maxillofacial Surgery due to the congenital hard and soft palate cleft. In addition, she has polydactyly. Which specialists need to be involved in the rehabilitation of this child?

- A. Maxillofacial surgeon, pediatrician, otolaryngologist, speech therapist, orthodontist, psychologist, orthopedic surgeon
- B. Maxillofacial surgeon, pediatrician, speech therapist, orthodontist, orthopedic surgeon
- C. Maxillofacial surgeon, pediatrician, otolaryngologist, speech therapist, orthodontist
- D. Maxillofacial surgeon, pediatrician, otolaryngologist, speech therapist, psychologist
- E. Maxillofacial surgeon, orthodontist, psychologist, orthopedic surgeon

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

The boy was diagnosed with congenital partial isolated lip cleft. No general somatic diseases were detected in the child. What additional examination methods should be prescribed in the preoperative period? At what age is it best to perform cheiloplasty? What medical treatment should be prescribed 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.*

Master the method of clinical examination of patients with congenital malformations of the upper lip and palate. Work out the basic techniques of cheiloplasty and uranoplasty on phantoms. To make up a plan of preoperative preparation, comprehensive treatment and patients postoperative care.

- *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 № 4.</b> The modern principles of the facial bones defects and deformations diagnostic. Antropometry, cefalometry. The radiological diagnostic methods, stereolithography. The navigation computer technology in the complex treatment of facial defects and deformities.
Cours	V
Faculty	Dentistry

## THE PLAN OF THE PRACTICAL LESSON № 4

**1. Topic №4.** The modern principles of the facial bones defects and deformations diagnostic. Antropometry, cefalometry. The radiological diagnostic methods, stereolithography. The navigation computer technology in the complex treatment of facial defects and deformities.

**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 laboratory and instrumental researches results..
3. Establishment of the clinical diagnosis of dental disease.
4. Planning and conducting the preventive measures of the dental diseases.
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 and carry out of dental monitoring of the persons subjected to the dispensary supervision.
11. Assessment of the environment impact on the health of the population (individual, family, population).
12. Maintaines of the 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 work in a team.
10. Interpersonal skills.
11. Ability to act on the basis of ethical considerations (motives).
12. Ability to evaluate and ensure the quality of the performed work.
13. Ability to act in a socially responsible and civic conscious manner.

### 4. Interdisciplinary integration.

Disciplines	Student should know	Student should be able to
Previous:		
Normal Anatomy  Topography Anatomy	To know the anatomical structure of the maxilla and mandible. To know the MFA blood supply and innervation. To know the MFA muscle anatomy.	Be able to explain the anatomical structure of the upper and lower jaw. Be able to explain the MFA blood supply and innervation. Be able to explain the MFA muscle anatomy.
Histology and embryology	To know the general patterns of the human embryo development. Know the histological structure of	Be able to explain the general patterns of the human embryo development .



	the bone and cartilage tissue.	Be able to explain of the bone and cartilage tissue histological structure.
Pathomorphology Pathophysiology	To know the mechanism and stages of the bone regeneration.	Be able to explain the mechanism and stages of the bone regeneration.
Radiology	To know the facial bones X-Ray picture.	Be able to explain the facial bones X-Ray picture.
Orthodontics	To know the diagnosis and orthodontics treatment methods in patient with maxilla and mandible deformations.	Be able to take the impressions for the diagnostic models and orthodontic appliances.
<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.

## 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. 151-154.

#### *The additional*

1.2 PETERSON'S PRINCIPLES OF ORAL AND MAXILLOFACIAL SURGERY, *Second Edition*, 2004, p. 1087-1111

### 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 of the topic and the purpose of the lesson.*

*The lesson topic:* «The modern principles of the facial bones defects and deformations diagnostic. Antropometry, cefalometry. The radiological diagnostic methods, stereolithography. The navigation computer technology in the complex treatment of facial defects and deformities».

*The aim of the lesson:* to learn to diagnose the facial defects and deformations using modern additional research methods; learn to determine the indications for certain methods and interpret their results.

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

The face plays an important role in human life, it reflects the inner world of man, mood, emotions, functions of others. Face defects and deformations can disrupt the psychological state of man, his self-esteem, social adaptability, practicality, etc. Therefore, the importance of reconstructive,

aesthetic and plastic surgery in the treatment of such conditions is huge. A dentist of any specialization must know the peculiarities of such diseases and be able to diagnose them using modern research methods.

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

*The frontal interview questions:*

1. The classification of the additional examination methods in patients with the face deformities and defects.
2. Cephalometry. The essence of the method. Indications.
3. Computed tomography. The essence of the method. Indications.
4. Stereolithography. The essence of the method. Indications .
5. CAD / CAM (Computer-Aided Design/Computer-Aided Manufacture) technologies in the diagnosis and treatment of patients with the face defects and deformities .

***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 treatment of defects and deformities of the face bones, resulting from the injuries, severe infectious and inflammatory diseases, surgery, genetic defects and other causes, is problematic and in many cases ineffective. This is due to the complex topographic anatomy of the face, which has significant individual, ethnic and age differences, the variety of existing defects and deformities, the presence of the systemic and local morphological and functional disorders that are diagnosed in the vast majority of the patients. The desire to improve the quality of the life and the important role of the person in human socialization necessitates modern diagnostics, improving the effectiveness of reconstructive interventions and predictability of their results, reducing the number of the surgical stages and rehabilitation terms provided rational use of the available financial and material resources.

Anthropometry (from the Greek ἀνθρώπος anthropos, "man" and μέτρον metron, "measure") refers to the measurement of man.

Anthropometry involves the systematic measurement of the physical properties of the human body, primarily dimensional descriptors of body size and shape.

Cephalometry (measurement of craniofacial parameters), an ethnographic determination of the morphology of the skull, has been studied by anthropologists for many centuries.

In 1922, based on gnathostatics and photography, Simon introduced a new technique in which teeth and surrounding tissues were examined in relation to certain craniofacial structures. Racini and Carrera in 1926 received the first radiographs of the head in lateral projection, but this technique became standardized only in 1931 after the development of Broadbent cephalometry. This special form of radiography allowed the doctor to identify specific areas of disproportion of the craniofacial area and develop a detailed treatment plan. Thanks to the work of Brodie, Downs, Steiner, Tweed, Ricketts and other specialists, it became possible to analyze various disproportions of the lower and upper jaws, teeth and facial profile with the help of cephalometry.

The primary purpose of cephalometric analysis is the localization of occlusion abnormalities in relation to the bones of the facial skeleton and soft tissues of the face. The analysis is performed using standard cephalometric landmarks on radiographs of the head and face, which are built lines, angles and imaginary planes that allow you to perform linear and angular measurements. The obtained data are compared with the established norms, which allows to develop the most appropriate treatment plan.

The technique of the cephalometric radiographs performing was standardized in order to be able to compare the initial and subsequent images of the same patient to assess the growth and development of the maxillofacial area during the treatment.

The reliability of cephalometric analysis depends on the initial accurate identification and localization of the anatomical and anthropological points. These points are used for the further construction of lines, angles and imaginary planes. Although each analysis is performed in two dimensions, a three-dimensional image can be obtained by comparing lateral and frontal radiographs.

Measurements performed on the cephalometric radiographs allow:

1. Identify the types of the face and skull.
2. Evaluate the relationship between the bases of the upper and lower jaws.
3. Assess the relationship of the teeth.

4. Localize the anomaly and determine its nature (skeletal or dentoalveolar).
5. Examine the contours of soft tissues.
6. Assess the impact of various corrective measures on facial contours and bone structures.
7. Facilitate the choice of treatment.

Computed tomography (CT) is a method of layer-by-layer examination of the human organs using radiological diagnostics.

The introduction of the CT in practice is an epoch-making event in modern medicine. CT is a fundamentally new, non-invasive method of diagnosis that allows you to visualize the ratio of individual organs and tissues in normal and various pathological conditions, based on the principle of mathematical modeling of X-ray images with subsequent construction of horizontal sections of the human body on the display screen. The using of the CT expands the diagnostic possibilities.

Computed tomography is a layered study of the optical density of individual organs and tissues in the form of sections of parts of the human body on a monitor screen using computer mathematical modeling of X-ray images.

Computer three-dimensional stereoscopic (volume) tomography (3-D image) - construction using computer technology on a series of 2-dimensional computer tomograms 3-dimensional model by combining tomographic sections in the required sequence (spiral mode, 16 scans in 0.5 seconds (or 32 "slices" in 1 second) with a thickness of up to 0.5 mm). The image of the high definition of any site turns out and the most exact three-dimensional images of a body of the person or a separate body in various spatial planes are reproduced. It is possible to make a 3-dimensional stereolithographic plastic model of the bones of the facial skeleton.

Laser stereolithography is the most accurate among rapid prototyping technologies, which allows in the shortest possible time (from several hours to several days) to go from the design idea to the finished model of the part: a three-dimensional object designed on a computer is grown from a liquid composition. It is photopolymerized in successive thin (0.1-0.2 mm) layers, which are formed under the action of laser radiation on a moving platform immersed in a container with the composition.

In industry, laser stereolithography was at the first used by 3D Systems (SILA) in 1986. Now SLA-technology (SLA - stereolithography apparatus) is used to produce prototypes of the products in various industries. Stereolithographic models are made by combining into a single technological chain of the computer diagnostics automated design of a virtual model and laser stereolithography.

The stereolithographic models of the jaws are made of translucent photopolymerizable composite materials with sequential curing of individual thin layers combined into the one whole. During the staining of the pathological focus (tumors, nerves, vessels, etc.) color stereolithographic models are obtained with a contrasting color.

The stereolithography is the most modern method of the patient's examining, which allows to obtain a three-dimensional model of the facial skeleton bones, to determine the actual size of the pathological focus (tumor) located in the jaw, its exact location, the size of bone disorders and the relationship with adjacent bone structures. Thanks to this information, the doctor can carefully study the location and assess the complexity of the planned surgery. Color stereolithography allows you to see the formation inside the jaw bone, its relationship with blood vessels and nerves. When performing osteotomies with this method of the patient's examination, the doctor can carefully plan surgery, determine the area of the osteotomy, as well as choose the exact size of the titanium implant, which will be used to replace a bone defect, etc..

Stereolithography performed in case of the jaws deformities and defects helps to choose the appropriate surgery method in case of overdevelopment and underdevelopment of the jaws, as well as to select appropriate obturators to close the defects of the maxilla.

One of the promising areas is the use of computer modeling, CAD / CAM technology and computer navigation in the implementation of reconstructive and restorative interventions in the maxillofacial area. Computational modeling in maxillofacial surgery is based on the study of virtual three-dimensional models of bones and soft tissues, built on the data of spiral or conical computed tomography (CT) with high resolution. The modern software for the analysis of tomographic images allows you to visualize the internal anatomical structures, assess their size and relative position, to study in detail their morphological features and even some physiological characteristics. It is important to note that the obtained images (virtual models) have a very high degree of resolution and allow to differentiate tissues with minimal structural differences, to study both bone and soft tissue structures,

and are the basis for the introduction of modern computer-aided design systems (CAD / CAM). technology) in clinical practice.

The abbreviation CAD (Computer – Aided Design) is used to denote automated design systems using computer technology, including the creation of three-dimensional computer models of biological objects, reproduction of surgical interventions on a virtual model and prediction of their anatomical consequences, creation of models of implants, fixators, medical devices, determining their optimal shape and location.

CAM (Computer-Aided Manufacturing) refers to computer-aided manufacturing automation systems. SAM systems are used to make stereolithographic models of anatomical structures, implants and medical devices from different materials.

In maxillofacial surgery, the use of CAD / CAM technology until recently was associated mainly with the creation of stereolithographic models of facial skull bones, which were used for better visualization of existing defects, deformities, pathological processes, direct measurements and "cold surgery" on the model. planning of surgical interventions. The laser stereolithography techniques in medicine appeared in the late 80s of the twentieth century.

But now the possibilities of using CAD / CAM technology are not limited to the manufacture of diagnostic models. They are widely used for the manufacture of individual implants, clamps, surgical template guides and other medical devices with individualized parameters that directly determine the effectiveness of surgical interventions in maxillofacial surgery, orthopedics, neurosurgery and dental implants.

There are a numerous reports of successful use of the CAD / CAM technology in maxillofacial surgery, which indicates an increase in the accuracy of restoration of the anatomical shape of damaged bones while reducing intraoperative risks. At the same time, the assessment of the effectiveness of the method in severe defects and deformations of the facial skull, determining its potential shortcomings and limitations, requires further systematic research based on the accumulation and analysis of relevant clinical material.

Using the modern computer simulation methods and CAD / CAM technology allows not only to improve the quality of diagnosis and treatment of patients with defects and deformities of the facial skull, but also to increase the effectiveness of surgical treatment of patients by making individual implants and navigational surgical templates.

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

1. To master the examination method in the patients with deformities of the upper and lower jaw.
2. Make a plan of the additional examination methods, correctly interpret the results of the instrumental research methods.

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

*Individual task:*

Task №1.

The patient, 27 years old, has a deformity of the face middle area, occlusion disorders, difficult mastication. He underwent lip and palate cleft surgery, orthodontic treatment was not conducted. Which maxilla deformity was developed in the patient?

- A. Upper micrognathia
- B. Lower micrognathia
- C. Upper macrognathia
- D. Lower macrognathia
- E. Upper prognathism

Task №2.

The patient, 20 years old, underwent surgery for lower macrognathia. Indicate where osteotomy is most often performed in this pathology:

- A. In the area of the mandible angles
- B. In the area of the mandible ramus
- C. In the area of the mandible body
- D. In the area of the articular processes

E. In the mental area

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

The patient, 24 years old, complained of the mandible enlargement, protrusion of the chin forward. The examination revealed: protrusion of the chin forward, narrowing of the face, sagittal slit in the area of the front teeth. The middle third of the face pseudo-depression, smoothing of the nasolabial folds, violation of the sagittal relationship between the "keys of occlusion". What additional screening methods should be prescribed to make a diagnosis? Which related specialists should be involved in the patient's examination? 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.*

Master the examination methods in patient's with maxilla and mandible deformations.

To make a plan of the additional examination methods. correctly interpret the results of the instrumental research methods.

*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 №5.</b> Jaw deformities: etiology, pathogenesis, classification, clinical signs, diagnosis. Orthognathic surgery: principles and techniques of mono- and bimaxillary surgery. Distraction osteogenesis methods.
Cours	V
Faculty	Dentistry

## THE PLAN OF THE PRACTICAL LESSON № 5

**1. Topic of the lesson:** «Jaw deformities: etiology, pathogenesis, classification, clinical signs, diagnosis. Orthognathic surgery: principles and techniques of mono- and bimaxillary surgery. Distraction osteogenesis methods.»

**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. Planning and conducting the preventive measures of the dental diseases.
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 and carry out of dental monitoring of the persons subjected to the dispensary supervision.
11. Assessment of the environment impact on the health of the population (individual, family, population).
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 know	Student should be able to
Previous:		
Normal Anatomy	To know the anatomical structure of the maxilla and mandible. To know the MFA blood supply and	Be able to explain the anatomical structure of the upper and lower jaw.

Topography Anatomy	innervation. To know the MFA muscle anatomy.	Be able to explain the MFA blood supply and innervation. Be able to explain the MFA muscle anatomy.
Histology and embryology	To know the general patterns of the human embryo development. Know the histological structure of the bone and cartilage tissue.	Be able to explain the general patterns of the human embryo development . Be able to explain of the bone and cartilage tissue histological structure.
Pathomorphology Pathophysiology	To know the mechanism and stages of the bone regeneration.	Be able to explain the mechanism and stages of the bone regeneration.
Radiology	To know the facial bones X-Ray picture.	Be able to explain the facial bones X-Ray picture.
Pharmacology	To know the main characteristics of the pharmacological drugs which are prescribes in patients with the maxilla and mandible deformities in post surgical period .	Be able to prescribe the drugs of the different pharmacological groups in patients with the maxilla and mandible deformities in post surgical period .
Orthodontics	To know the diagnosis and orthodontics treatment methods in patient with maxilla and mandible deformations.	Be able to take the impressions for the diagnostic models and orthodontic appliances.
<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»): ... The general anaesthazing methods.	To know the conducting specifics , indications and contraindications to general anesthesia in dentistry.	Be able to choose the optimal anaesthezing method in patients with MFA reconstructive surgery.
Topic 1 («MFA traumatology»): ... The bone regeneration, types. Bone healing. The methods of the optimization of the bone regeneration.	To know the mechanisms and types of the bone regeneration the methods of the optimization of the osteogenesis processes.	Be able to explain the bone regeneration mechanisms and the ways of the osteogenesis optimization.

## 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. 149-151, p. 256-261.

#### The additional:



## 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 of the topic and the purpose of the lesson.*  
*The lesson topic:* «Jaw deformities: etiology, pathogenesis, classification, clinical signs, diagnosis. Orthognathic surgery: principles and techniques of mono- and bimaxillary surgery. Distraction osteogenesis methods..»

*The aim of the lesson:* to learn to make a plan of complex examination and treatment of patients with maxilla and mandible deformities, to carry out preventive measures aimed to prevent the occurrence of craniomaxillary deformities; to master the basic principles of compression, distraction and compression-distraction methods of the MFA deformities treatment, to know the indications and treatment possibilities of these methods, to study the basic methods of compression-distraction osteogenesis.

*The motivation of educational activity.*

The frequency of the MFA anomalies and deformities in the population is about 10%. MFA defects and deformations can be congenital and acquired as a result of gunshot and non-gunshot traumatic injuries, osteomyelitis, tumors etc. Reconstructive surgery on the jaws, due to the deformations and defects, are performed in specialized hospitals by maxillofacial surgeons. The dentist should to: timely detect the occlusion anomalies, deformities and defects of the jaws, referral the patients to the appropriate departments, as well as conduct patient's postoperative rehabilitation. This presupposes the presence of certain theoretical knowledge and practical skills in a dentist.

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

*The frontal interview questions :*

1. The cranio-facial-jaws deformities classification.
2. The features of the examination in the patients with facial bones deformities.
3. The special methods of the facial deformities diagnosis.
4. The complex treatment of the patients with the cranio-facial-jaws deformities .
5. The medical rehabilitation and monitoring the patients with the facial deformities.

***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 deformities of the facial and skullbones are classified on the basis of isolating various essential for the treatment of the etiological, pathophysiological, clinical and other signs. By the nature of changes: primary and cartilaginous. By localization: tooth-alveolar, gnathic, cranial. In the direction of the bones proportion changing : height, width, sagittal. By type of deviation: size and size- forms; position; their relationships.

The most often the following deformations are observed : 1) increase in the jaws size ; 2) reducing the jaws size ; 3) violation of the jaw shape ; 4) incorrect position of the jaw; 5) combined deformations of the jaws.

According to the WHO classification (1975), the following jaw anomalies are distinguished:

- I. Anomalies in the jaws size : macrognathia of the maxilla; macrognathia of the mandible; maxilla and mandible macrognathia; maxilla micrognathia ; micrognathia of the mandible; micrognathia of both jaws.

II. Anomalies of the jaws position : asymmetry of the jaw; mandibular prognathism; maxillary prognathism; mandibular retrognathia; maxillary retrognathia.

III. Open and deep bite.

This classification is not complete, so there are numerous attempts to create a more complete and classifiable clinical work. One of them is the classification of anomalies and deformations of the facial skull, jaws and teeth of H. Kalamkarov (1972), which was improved by V. Bezrukov (1981) and V. Gunko (1986).

I. Anomalies of tooth development.

1. Anomalies in the number of teeth: a) adentia (partial, complete); b) overcomplete teeth.

2. Anomalies of the position of the teeth (vestibular, oral, medial, distal, rotation of the teeth along the axis, high or low position of the teeth, transposition).

3. Anomalies in the size and shape of teeth.

4. Anomalies of teething (premature, late, retention).

5. Anomalies in the structure of the teeth.

II. Deformities of the jaws.

1. Macrognathia (maxilla, mandible, symmetrical, asymmetrical, different parts or the whole jaw).

2. Micrognathia (maxilla, mandible, symmetrical, asymmetrical, different parts or the whole jaw).

3. Prognathism (maxilla, mandible, functional, morphological).

4. Retrognathia (maxilla, mandible, functional, morphological).

III. Combined jaws deformations (symmetrical, asymmetrical).

1. Upper micro- and retrognathia, lower macro- and prognathia.

2. Upper macro- and prognathism, lower micro- and retrognathia.

3. Upper and lower micrognathia.

4. Upper and lower macrognathia.

IV. Combined anomalies of the teeth and deformities of the jaws.

V. Combined anomalies and deformities of the facial and cerebral skull and dental-maxillary system.

1. Symmetrical:

a) maxillofacial dysostoses (Tricher-Collins-Francescetti syndrome);

b) craniostenosis (Apert's syndrome, Cruzon's syndrome);

c) hypertelorism of the I-III degree.

2. Asymmetric:

a) hemifacial microsomia of I-III degree (Goldenhar's syndrome);

b) hypertelorism of the I-III degree.

According to the WHO classification (1975), the following jaw anomalies are distinguished:

I. Anomalies in the size of the jaws: macrognathia of the upper jaw; macrognathia of the lower jaw; macrognathia of both jaws; micrognathia of the upper jaw; micrognathia of the lower jaw; micrognathia of both jaws.

II. Anomalies of the position of the jaws: asymmetry of the jaw; mandibular prognathism; maxillary prognathism; mandibular retrognathia; maxillary retrognathia.

III. Open and deep bite.

Classification of the maxilla deformities WHO (1975):

1. Macro- and micrognathia .

2. Asymmetry of the jaw: maxillary prognathism; maxillary retrognathia. This classification does not describe all available clinical cases, as their actual number is much higher.

Among the deformities of the upper jaw, micrognathia (retrognathia), micrognathia with narrowing of the dentition, prognathia (macrognathia), open occlusion, etc. are more often observed.

The patients with jaw anomalies, deformities examination requires the addition special research methods

to the general clinical methods :

1. Teleradiography of the skull in lateral and direct projections with its interpretation, determination of angular and linear dimensions.

2. Orthopantomography of the facial skull bones, review X-Ray of the lower jaw.

3. X-Ray of the middle area of the face in axial or semi-axial projection, paranasal sinuses, chest, neck, skeleton (if necessary).
4. Determining the area of the bottom and the volume of the oral cavity, the size of the tongue.
5. CT, MRI of the area of deformation or defect, CT-3D or MPI-3D computer simulation of the facial and cerebral skull.
6. Creation of stereolithographic facial skull models, photographs and gips models of the face.
7. Study of the jaws models according to Pon (premolar and molar indices) and in the occluder.
8. Study of the functional state of the affected area and the patient's body as a whole (electromyography of the masticatory muscles, rheography, thermography, echoosteometry and other methods).
9. Planning the future surgery and its effect (based on photographs, radiographs, models of the jaws and face, computer simulations, etc.).

General principles of craniofacial surgery. Cranial access is the main method in the general system of correction of craniofacial deformation. It is used for dissection, resection, displacement, fixation and reconstruction of the orbit, ethmoidal and interstitial space, cranial vault, facial structures, upper jaw together or separately.

Craniofacial surgery gives the main priority to bone structures, because they determine the proportions (face, head), ratio and function of organs - eyeball, eyelids, nose, lips and even the tongue. Most cranial and facial bone dissections should be planned according to the retention capabilities of the tissues, as well as devices to ensure stability and control of the postoperative position of the fragments for the period of their fusion. Even small orbital and cranial deformities need to be operated on through intracranial access, as it provides a better view of the orbit and lower structures, and is safer. If intracranial access is not necessary, coronal access should be used for tissue reconstruction below the orbital foramen.

Displacement "in the block" of large segments of the face is better for stabilization and fusion than small fragments. This displacement is more efficient and more economical than contour bone grafting.

Autogenous bone grafts are widely used to replace bone defects and diastases that occur after osteotomies and movements. Foreign materials are not used in primary deformity surgery. Despite the priority of bone structures, the correction of soft tissue defects is necessary at the same time as bone reconstruction.

Surgery methods to eliminate craniofacial deformities (combined deformations of the facial and cerebral skull) are planned, extremely complex and lengthy. They require careful general and local examination of the patient and treatment planning with the participation of many specialists. For consultation, invite according to the testimony of related specialists - resuscitators, anesthesiologists, neurosurgeons, neurologists.

The immediate postoperative and final results of plastic surgery depend on the type of surgery, the patient's age, the condition of local tissues, and so on.

It is advisable to take into account the following biological and social options for assessing the plastic, reconstructive surgery: the local result of the intervention area; its compliance with the general body structure and appearance of the patient; psychological result; social outcome of treatment.

The local results of the surgery may differ at different times after it's implementation and be, in particular, as follows:

- 1) complete restoration of the shape and function of facial structures in the surgery area ;
- 2) partial restoration of the shape and function of facial structures;
- 3) restoration of either form or function (full, partial);
- 4) deterioration of the initial result ;
- 5) lack of a positive result, failure of treatment;
- 6) deterioration of the initial status of the intervention site and the general condition of the patient.

It should be borne in mind that obtaining a positive medical result of the surgery does not automatically mean obtaining the same psychological and social result, and there is no direct relationship between them.

For example, a complete medical result of plastic surgery may not result in the normalization of the patient's psychological state and improvement of his social status. Conversely, a partial medical result may lead to psychological and social rehabilitation of the operated.

The results of the treatment can be stable or unstable, depending on the quality of the surgery, the postoperative period, subsequent scarring of tissues, secondary tissue changes, the general condition of the body and so on..

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

1. Master the method of the patient's with the jaws deformities examination .
2. Make a plan of the additional examination methods, correctly interpret the results of the instrumental research methods.
3. To make a plan for comprehensive treatment of patients with the maxilla and mandible deformities.
4. To determine the indications for the compression and distraction treatment methods in patients with the MFA deformities.

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

*Individual task:*

Task №1.

The patient, 20 years old, underwent surgery for lower macrognathia. Indicate where is the osteotomy most often performed in this case:

- A. In the area of the mandible angles and body
- B. In the area of the mandible branch
- C. In the body part of the mandible
- D. In the area of articular processes
- E. In the mental area

Task №2.

The patient underwent osteotomy because the micrognathia with the introduction the grafts behind the maxilla tuber . Why are these grafts introduced?

- A. To exclude the displacement of the jaw to the original position
- B. For rigid fixation
- C. To move the jaw forward
- D. To increase the volume of the middle third of the face
- E. To stimulate osteogenesis

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

A 17-year-old patient complains of a protruding chin, difficulty biting, and depressing of the upper lip. As a child he underwent surgery - uranoplasty. Objectively: the upper lip is depressed, the chin of the normally developed mandible is protruded. separate frontal teeth are in the medial occlusion. The rest of the teeth in the correct ratio. What additional screening methods should be prescribed to make a diagnosis? Which surgical treatment is indicated ? Which method of temporary immobilization should be chosen in the postoperative period? 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.*

Master the examination methods in patient's with maxilla and mandible deformations. To make a plan of the additional examination methods, correctly interpret the results of the

instrumental research methods. Make a plan of the comprehensive treatment of patients with maxilla and mandible deformities . Determine the indications for the use of compression and distraction treatment method in the patient's with the jaws defects or deformities.

*Evaluation.*

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«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> Fundamentals of the MFA bone grafting. Osteoplastic materials classification. The concept of autogenous, allogeneic, xenogeneic transplantation, the synthetic (alloplastic) bone substitutes using. MFA osteoplastic surgery general principles. The principles of the maternal and donor places preparing for the transplantation.
Cours	V
Faculty	Dentistry

## THE PLAN OF THE PRACTICAL LESSON № 6

**1. Topic of the lesson:** «Fundamentals of the MFA bone grafting. Osteoplastic materials classification. The concept of autogenous, allogeneic, xenogeneic transplantation, the synthetic (alloplastic) bone substitutes using. MFA osteoplastic surgery general principles. The principles of the maternal and donor places preparing for the transplantation.»

**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. Planning and conducting the preventive measures of the dental diseases.
6. Determining the nature and treatment principles of the dental diseases.
7. Determining the necessary mode of work and rest, the diet in the dental diseases treatment
8. Determination of the treatment tactics of dental patient with the somatic pathology.
9. Performing the medical and dental manipulations.
10. Treatment of the main dental diseases.
11. Defining the tactics and providing the emergency medical care.
12. Organization and carry out of dental monitoring of the persons subjected to the dispensary supervision.
13. Assessment of the environment impact on the health of the population (individual, family, population).
14. Maintaining medical records.
15. 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.

<b>Disciplines</b>	<b>Student should know</b>	<b>Student should be able to</b>
<b>Previous:</b>		
Anatomy  Physiology.	To know the anatomical and physiological features of the 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 structure of the MFA organs and systems .  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 materials and appliances for the prosthetic treatment of the jaw fractures in the victims.	Be able to characterized the different types of the over dental splints and be able to 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,	To know the examination methods in patients with the MFA diseases.	Be able to conduct the subjective and objective examination in patient, to



face and neck examination methods.		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:* «Fundamentals of the MFA bone grafting. Osteoplastic materials classification. The concept of autogenous, allogeneic, xenogeneic transplantation, the synthetic (alloplastic) bone substitutes using. MFA osteoplastic surgery general principles. The principles of the maternal and donor places preparing for the transplantation.»

*The aim of the lesson:* to study the basics of the bone and plastic surgery, classification of bone and plastic materials. To learn the indications and contraindications of the autogenic, allogeneic, xenogenic transplantation and synthetic bone substitutes. To learn the general principles of the osteoplastic surgery.

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

The mechanisms of the damaged or lost bone tissue repairing are important issues in surgical dentistry and maxillofacial surgery. According to the statistics, diseases that are accompanied by destructive changes in the bone (radicular cysts, benign tumors of bone tissue) occupy one of the dominant places among the MFA diseases.

Parallel with the use of updated methods of surgical technique, both before and now the problem of choosing the bone and plastic material is relevant, because it is known that osteoplasty opens up great opportunities for complete rehabilitation of the patients.

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

*The frontal interview questions :*

1. Definition the "regeneration". Classification of the tissue regeneration.
2. The main features of the jaws that affect the processes of the bone regeneration.
3. The modern research methods of the bone regeneration .
4. Varieties of the osteogenesis.
5. The types of the osteoinductive, osteoconductive and osteoneutral materials.
6. Definition the "graft", "implant", "combined graft".
7. The biological principles and methods of bone and cartilage tissue transplantation.
8. The types of the artificial materials used to replace bone tissue.

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

***Professional training conducting .***

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

Regeneration is the process of restoring the lost or damaged parts, and, accordingly, the lost functions of damaged tissues and organs. For the survival of the organism it is more important to restore and preserve functions than the external form. Therefore, regeneration can be: 1) physiological (permanent, lasting a lifetime); 2) reparative (after damage of the tissues and organs); 3) pathological (if gives false results, slow or excessive).

By the type of restored structures: 1) organ- or tissue-specific (structure and function of organ or tissue restored); 2) organ-, tissue-nonspecific (the structure of the organ or tissue is not restored, function is not restored or partially restored, then instead of lost tissue there is a scar or connective tissue).

By completeness of the regeneration: complete (complete) or incomplete (incomplete).

According to the volume of the regeneration of the transplanted bone graft or the bone replacement of biological or synthetic material: 1) complete organotypic reconstruction of the graft (function restored); 2) partial organotypic reconstruction of the graft and its partial resorption (partial restoration of function); 3) complete resorption of the graft without the appearance of new bone; 4) suppuration of the wound and graft rejection; 5) pathological restructuring of the graft (restructuring is functionally incapable).

The hallmark of reconstruction of the jaws is the grafting of bone into sites of loss or need. Bone, unlike most other tissues of the body, heals not by formation of scar tissue but by regeneration of bone. Advances in the understanding of bone physiology, immunologic concepts, and technology have made successful reconstruction of the jaws possible and somewhat predictable. The success of jaw reconstruction today is several times what it was only three decades ago. Bone reconstruction on a physiologic level is accomplished

by combinations of three processes: osteogenesis, osteoconduction, and osteoinduction.

Osteogenesis is the formation of new bone from osteocompetent cells.

Osteoconduction is the formation of new bone along a scaffold from the host's osteocompetent cells.

Osteoinduction is the formation of new bone from the differentiation and stimulation of mesenchymal cells by the bone-inductive proteins.

The understanding of the basic biologic processes in bone has blossomed over the past thirty years. Key discoveries in the bioactive molecules began with the findings of Urist and Strates relating to the bone morphogenetic proteins (BMPs).

Axhausen initially described the repair of bone and divided it into two phases.

The first phase consists of cellular proliferation and production of osteoid in a disorganized fashion. The second phase is characterized by resorption of the osteoid and replacement by more organized lamellar bone. During the first phase of bone regeneration the transplanted cells within the graft proliferate and form new osteoid over the course of a few weeks. The amount of bone regeneration is dependent on the amount of bone cells that survive the transplantation procedure. These

cells' survival is integrally related to the nourishment from the recipient bed. For the first 3 to 5 days diffusion by plasmatic circulation is the source of nutrients; by day 5, capillary ingrowth from the surrounding soft tissue and bone edges penetrate the graft. Free grafts of bone can be either cancellous, cortical, or corticocancellous blocks. Within a graft, cancellous bone revascularizes sooner than corticocancellous or cortical block grafts. Endosteal osteoblasts proliferate and form osteoid on the surface of cancellous bone trabeculae. Those cells within the trabeculae may die as a result of their encasement in mineralized matrix and impaired diffusion through it. Osteocytes within their lacunae appear to survive if they are less than 0.3 mm from the surface. In cortical grafts, revascularization is much slower because the process follows preexisting haversian systems from the periphery into the interior. A histologic difference in cortical grafts is the initiation of osteoclastic rather than osteoblastic activity. The osteoclasts will enlarge the haversian systems peripherally, then centrally. The haversian systems of a cortical graft will undergo significant resorption before osteoblastic activity will fill in the resorbed areas. The process of osteoclastic resorption followed by osteoblastic deposition is termed "creeping substitution." New bone may be deposited throughout the graft, leaving areas of necrotic bone covered by viable bone. The necrotic bone areas may persist indefinitely. The osteoid from the transplanted cells and from the endosteum fuse in a process called consolidation.

A second phase of bone growth follows the initial consolidation and begins at about 2 weeks. Fibroblasts and other mesenchymal cells differentiate into osteoclasts and begin a resorption of the osteoid. This differentiation of cells is accomplished by BMPs found in the transplanted bone. New bone is laid down in a more orderly fashion. The two-phase theory of bone healing applies to all types of autogenous grafts. In summary: (1) cancellous grafts are revascularized more rapidly than cortical grafts, (2) cancellous bone incorporates by an appositional phase followed by a resorptive phase but cortical grafts incorporate by a resorptive phase followed by an appositional phase, and (3) cancellous grafts tend to repair completely whereas cortical grafts remain a mixture of necrotic and viable bone. Bone grafts improve in their mechanical properties over time. Cancellous bone grafts tend to be strengthened over time with the addition of new bone. As the necrotic cores are replaced, the strength of the bone returns to normal. Cortical grafts have a different time course and actually undergo a weakening of the bone during the osteoclastic phase. Cortical grafts have been shown to be 40 to 50% weaker than normal bone from 6 weeks to 6 months following transplantation, a period in which the porosity of the graft increases approximately 15%. After 1 to 2 years the mechanical strength becomes equal to normal bone.

The methods of bone regeneration research:

- X-ray diagnostics (radiography, radiography and osteodensitometry, one-photon and two-photon absorptiometry);
- laboratory diagnostics;
- bone biopsy (histomorphometry).

The first signs of bone regeneration are determined radiologically in the period from 1 to 3 months. However, even after that, the restructuring of bone regeneration continues.

Laboratory diagnosis includes mineral metabolism studies, hormonal testing and determination of the biochemical markers of bone metabolism.

Biochemical markers of bone metabolism have the most complete information about the processes of bone remodeling. These are markers of bone resorption and markers of bone formation.

The advantage of biochemical research methods is the non-invasiveness of the conducting, availability, especially the parameters determined in the urine, as urine is one of the most convenient research objects. The markers of bone resorption are highly specific, they respond more quickly to changes in bone remodeling and appear in the studied fluids, providing information about the activity of the process.

The determination of the biochemical markers of bone metabolism allows to assess the condition of bone, to establish the rate of metabolic processes in bone tissue and the rate of spontaneous bone loss, to monitor treatment, early evaluation of therapy (3 months after treatment), to predict the risk of complications. with the risk of bone loss.

Bone formation markers are products of the active osteoblasts isolated during different stages of development. They reflect various aspects of osteoblast function and bone formation. All markers of bone formation are measured in serum or plasma.

Currently, three biochemical markers of bone formation are performed by osteoblasts:

- bone alkaline phosphatase ;

- osteocalcin );
- carboxy and aminothermal propeptides of procollagen type I.

Bone grafts are transplanted by various methods: 1) freely without preserving blood circulation in the form of a whole fragment or in a crushed state (so the autologous and canned grafts are transplant); 2) on the blood supply flaps of the soft tissues; 3) on the blood supply pedicles with the artery inclusion; 4) on microvascular anastomoses.

For transplantation, autologous bone grafts are taken from various skeletal bones - iliac, tibia, mandible (symphysis, angle and branch of the jaw), maxilla tuber, bone adjacent to the site of the surgery, body and lower edge of the chin, scal bones.

Bone grafts may have living osteogenic cells (own or donor) with different required functional properties, or not have living osteogenic cells (canned grafts), and differently affect the reparative properties of bone in the recipient area.

To date, all existing materials are divided, depending on the origin, into several groups - autogenous, allogeneic, xenogeneic, alloplastic (synthetic, artificially synthesized bone substitutes) and composite. Materials belonging to these groups have both positive properties and disadvantages, due to which the basic requirements for them were formulated. Therefore, the materials must be characterized by: a) osteogenicity - the ability of the material to cause bone growth due to osteogenic cells. b) osteoinduction - the ability to stimulate the growth of bone tissue as a result of the influence of the material on the differentiation of mesenchymal stem cells (blood proteins, growth factors, bioactive components that promote bone growth). c) osteoconduction - the ability of the material to play the role of a passive matrix for the growth of new bone, followed by resorption of the material.

The autogenous graft was at first used in 1820 by Walter. By the structure, autografts can be cortical, spongy and cortical-spongy. With the use of spongy bone grafts, rapid and more complete revascularization occurs because they contain more polypotent cells that can differentiate, proliferate, and participate in osteogenesis, and in cortical grafts these processes occur more slowly.

It is recommended to use this method with caution in children because of the possible risk of damage the growth zones.

The method of the allogeneic replacement of bone defects (the donor is another person) was first used in 1880 by Macewen. As a rule, use cadaveric bone tissue. It is known that the allogeneic graft is an osteoconductive material, although it has osteoinductive properties, the potential of which depends on the method of processing the allocyst (lyophilization, formalization, freezing). After the demineralization, the bone tissue becomes elastic, which facilitates easy filling of the defect and makes it possible to achieve close contact between the bone of the defect and the material, which is the key to the effectiveness of bone grafting.

The next group of materials - xenogenic - include grafts of animal origin. This type of bone grafting was at first used in 1668 by Mekeeren, but the active use of this method was noted in the second half of the 19th century. Now, the most commonly used bone tissue of pigs, cows, which undergoes special treatment - deproteinization, resulting in the elimination of the antigenic effect of the material in the recipient, as it is known that one of the most problematic aspects in the use of xenografts is immunological incompatibility - rejection of the material. This situation has forced scientists to look for new methods of purification in the production of the materials. Due to this, xenogeneic grafts are divided by the manufacture method: - materials based on the using of high temperatures ("OsteoGraf / N"); - materials based on the using of the low temperatures ("Bio-Oss", Giestlich, Switzerland) - materials based on enzymatic technologies (enzyme purification and long-term leaching) - "Bio-Gene", "Osteoplast" (Bioteck, Italy). The main peculiarity of the materials of this group is that they have a pronounced osteoconductive effect.

- *Algorithms for the formation of the professional abilities.*
  1. To be able to make the examination in patient with MFA defects and deformities.
  2. Make a treatment plan in the patients with MFA defects and deformities.
  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

Patient K., 47, is scheduled the surgery to restore the mandible with a bone graft taken from a donor.

How is named this type of transplantation?

- Allotransplantation
- Explantation
- Isotransplantation
- Xenotransplantation
- Autotransplantation

Task №2.

In patient M. 39, after the ameloblastoma excision , the integrity of the mandible was violated with the formation of a defect of the jaw branch and the body to the level of 44 teeth. Whic plastic method should be used?

- Rib autoplasty
- Hip autoplasty
- Rib alloplasty
- Lyophilized graft plasty
- Formilized graft plasty

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

A 50-year-old woman had extracted teeth because of the generalized periodontitis 9 years ago. Uses removable dentures. The complete atrophy of the alveolar processes is present. What caused atrophy of the jaws? What permanent fixed prosthetic methods 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 partient 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 №7.</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 ectoprostheses. TMJ reconstruction.
Cours	V
Faculty	Dentistry

## THE PLAN OF THE PRACTICAL LESSON № 7

**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 ectoprosthesis. TMJ reconstruction.»

*The aim of the lesson:* to study the basics of the MFA reconstructive surgery, the total and subtotal maxillaand 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 dropping 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.*
  5. To be able to make the clinical examination in patient with maxilla, mandible and nose defects .
  6. Make a treatment plan in the patients with with maxilla, mandible and nose defects .
  7. Make a plan of a complex treatment and patient care in the postsurgical period.
  8. 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.*

## Evaluation of the discipline

### 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</p>

			<p>literature and is capable of substantiating them; has practical 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

<p>syllabus and curriculum.</p> <p>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.</p>		
General system of evaluation	<p>Participation in the work during the semester - 100%</p> <p>on a 200-point scale</p>	
Scales of evaluation	<p>traditional 4-point scale, multi-point (200-point) scale, ECTS rating scale</p>	
Conditions of admission to the final control	<p>The student attended all practical lessons, met the requirements of the curriculum and received at least 120 points for current evaluation.</p>	
Type of the final control	Method of performing of final control	Enrollment criteria
Semester test credit	<p>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>	<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> $x = \frac{AA \times 200}{5}$		