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

METHODICAL GIDE

(for the teachers)

from surgical dentistry

Second level of higher education (Master's Degree)
Sphere of Knowledge 22 «Healthcare»
Specialty 221 «Dentistry»
Faculty, Year: Dentistry, IV

Content module 1: Traumatic injuries of maxillo-facial area

Part two

Lviv – 2019

Recommended by the by the profile methodical commission for dentistry

(Protocol No. __ of _____201_)

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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 MFA", "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 thyroid 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 thyroid; 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)			
Name of the discipline: Surgical Dentistry **Number of content modules: 3**	**4,5 credits / 135 hours**	**10**	**70**	**55**	**IV course (VII, VIII semesters)**	**Credit** **Exam**

by semesters						
content module *1*	**2,2 credits / 66 hours**	**8**	**34**	**24**	**VII semester**	**Credit**
content modules *2, 3*	**2,3 credits / 69 hours**	**2**	**36**	**31**	**VIII semester**	**Exam**

The subject of study of the discipline are traumatic injuries of the MFA and the oncological processes of the MFA, related to the competence of surgical dentistry and maxillofacial surgery, features of their clinical course, the main diagnostic and treatment manipulations used in the practice of 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.

1. The purpose and objectives of the discipline

1.1. **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.

1.2. **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: Traumatic injuries of maxillo-facial area

Explain and interpret the features of traumatic injuries of the thyroid gland, taking into account the aesthetic and functional significance of the face and the topographic proximity of vital organs, the principles of providing emergency assistance to patients with traumatic injuries, the role of specialists in related specialties in the comprehensive examination of the injured.

Analyze the radiographs of patients with traumatic injuries of the bones of the facial skeleton, to determine the indications for conservative or surgical treatment based on the evaluation of clinical and radiological criteria.

Make a plan and conduct a patient's examination with MFA injuries of peacetime, refer to an additional research (if needed) and be able to interpret their results to set primary diagnosis. To make a diagnostic and treatment plan for patients with combined injuries.

Collect anamnesis and examination results of the patient MFA injuries of peacetime, fill in the relevant medical documentation.

Carry out primary surgical debridement of soft tissue lesions of the thyroid, temporary (transport) immobilization in fractures of the upper and lower jaw, assist with emergency conditions.

Assign an individual scheme of medicament therapy for whole period of treatment, depending on the psycho-somatic state of the patient, the task and volume of surgical intervention. To make appropriate recommendations.

Demonstrate methods of antiseptic cleaning of wounds, technique of suturing during primary surgical debridement, ligature bonding of teeth, production and imposition of bent aluminum tires, their fixation for temporary or prolonged jaw immobilization.

Lecture schedule for V /autumn/ semester

№	Topic	Hours
1.	Frequency and classification of the maxillofacial civil trauma (injuries). Dental (teeth) dislocations and fractures, alveolar fractures, temporomandibular joint (TMJ) dislocations. Soft tissue injures. Clinical signs, diagnostics, treatment.	2
2.	Modern principles of the maxillofacial fractures management. Types of the bone fixation.	2
3.	Management of maxillofacial trauma in extremal situations. Principles of medical sorting of patients in military conditions. General characteristics, clinical features, diagnostics of gunshot injuries, burns, combined lesions of the maxillofacial area.	2
4	Tumors of maxillofacial area: classification, principles of diagnostics and treatment. Postoperative care.	2
Total: 8		

Practical lessons schedule for V /autumn/ semester

№	Topic	Hours
1.	Statistics and classification of maxillofacial injuries. Initial management of the maxillofacial trauma patient's.	2
2.	Soft tissue injuries: classification, clinical features, diagnostics, treatment.	2
3.	Surgical debridement of soft tissue wounds. Sequence of reparation. Suturing methods. Postoperative wound care.	2
4.	Teeth dislocations and fractures: classification, clinical signs, diagnostics, methods of stabilization, treatment.	2
5.	Mandibular dislocation: clinical features, diagnostics, treatment.	2
6.	Mandibular fractures: classification, clinical signs, treatment.	2
7.	Maxillary fractures: classification, clinical signs, treatment.	2
8.	Zygomatic complex and nasal fractures: classification, clinical signs, treatment.	2
9.	Temporary (transport) immobilization of the facial bones fractures: types, requirements.	2
10.	Prolonged (treatment) jaws splint immobilization. Wiring techniques, methods of intermaxillary fixation. Dental, dentogingival and gingival splints. Advantages and disadvantages.	2
11.	A notion about internal fixation. Osteosynthesis techniques. Indications, contraindications, surgical methods, complications. External hardware fixation of facial bone fragments.	2
12.	Types of bone regeneration, primary and secondary bone healing.	2
13.	Combined injures of maxillofacial area: clinical features, diagnostics, treatment.	2
14.	Early general and local complications of maxillofacial injures (bleeding, asphyxia, shock: clinical signs, diagnostics, treatment).	2
15.	Late complications of maxillofacial injures: clinical signs, diagnostics, treatment.	2
16.	Thermal (burns, frostbite), chemical (acids, alkalis, heavy metal salts), physical (electric current) facial injures.	2
17.	Algorithms of the practical skills implementation (primary wound debridement, temporary and prolonged jaws immobilization**.**	2
Total hours: 34		

Independent work schedule for V /autumn/ semester

№ #№	Topic	Hours	Type of control
1.	The modern diagnostic methods of maxillofacial injures.	3	Current control on the practical classes
2.	Surgical treatment of soft tissues injuries, types of sutures.	3	Current control on the practical classes
3.	Types of the jaws fractures healing. Methods of influence on osteoreparative processes.	3	Current control on the practical classes
4.	Clinical signs, peculiarities of treatment and prognosis of maxillofacial fractures in patients with concomitant diseases (HIV/AIDS, thyroid disease, drug users). Protocols of care.	3	Current control on the practical classes
5.	Osteosynthesis of the facial bones: techniques, biological principles of bone regeneration.	3	Current control on the practical classes
6.	Clinical signs, diagnostics, treatment of frontal-facial and craniofacial trauma.	3	Current control on the practical classes
7.	The modern diagnostic methods and complications of craniofacial injures.	3	Current control on the practical classes
8.	Distraction and compression treatment methods of maxillofacial fractures.	3	Current control on the practical classes
Total hours: 24			

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"Approwed"
on the meeting of the Department
of Surgical Dentistry
and Maxillofacial Surgery

Head of the Department:
professor Ya. E. Vares

METHODICAL GIUDE FOR PRACTICAL LESSONS

Educational discipline	SURGICAL DENTISTRY
Topic of the lesson	**Topic №9.** Temporary (transport) immobilization of the facial bones fractures: types, requirements.
Course	4th
Faculty	Dental

Lviv – 2019

Actuality of the topic: knowledge of the stage treatment of patients with injuries of the skeletal bones, possession of methods of temporary (transport) immobilization of fragments will allow the dentist to rationally organize and provide medical care to the maxillofacial injured both in peacetime and in conditions of extreme situations or hostilities.

Aim of the lesson: learn how to temporarily immobilize fragments of the bones of the facial skull. Analyze the volume and procedure of providing medical care to patients with traumatic injuries of the skeletal bones during the stages of medical evacuation.

Learning objectives:

- *Professional competence:*

1. Collection of medical information on the patient's condition.
2. Evaluation of the results of laboratory and instrumental research.
3. Establishment of a clinical diagnosis of dental disease.
4. Planning and conducting preventive measures for dental diseases.
5. Execution of medical and dental manipulations.
6. Organization and conducting of dental medical examination of persons subject to dispensary supervision.
7. Assessment of the environmental impact on the health of the population (individual, family, population).
8. Maintaining medical records.
9. Processing of state, social and medical information.

- *General competence:*

1. The ability to 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 in the use of information and communication technologies.
6. Ability to search, process and analyze information from various sources.
7. Ability to adapt and act in a new situation; ability to work autonomously.
8. Ability to identify, put and solve problems.
9. Ability to choose a communication strategy.
10. Ability to work in a team.
11. Interpersonal skills.
12. Ability to act on the basis of ethical considerations (motives).
13. Ability to act in a socially responsible and civic conscious manner.

Methods of training:

Preparatory stage - Frontal oral interview.
The main stage - practical training, role-playing game.
The final stage is brainstorming.

Interdisciplinary integration

Disciplines	Student should know	Student should be able to
Previous:		
Normal anatomy	Know the anatomical and physiological features of the maxillofacial area: - structure of the upper and lower	To be able to explain the structure of systems and organs of maxillo-facial area (MFA)

Normal physiology	jaws; - innervation and vascularization of these sites; - structure of the lymphatic system of the head and neck; - structure of the muscles of the head and neck; - structure of the head and neck areas.	
Topographical anatomy	To know the topography of the organs of MFA	To be able to explain the topography of the organs of MFA
Biophysics	To know the biomechanics of tooth-jaw system	Be able to predict the mechanical load, chewing load, using different treatments.
Disaster medicine	Know the amount of medical care provided at each stage of the evacuation.	Be able to explain the basic principles of emergency care for victims.
Radiation diagnostics.	To know the methods of radiological examination used in maxillofacial traumatology	To be able to explain the principles on which these or other methods are based (X-ray, CT, MRI, ultrasound)
Prosthetic dentistry	Know the types of materials and structures used for orthopedic treatment of victims with fractured jaws	Be able to characterize different types of tires and explain the stages of their manufacture.
Pharmacology	Know the pharmacological features of the drugs used for topical and general treatment of mandibular fractures.	Be able to prescribe drugs of different pharmacological groups
Intradisciplinary integration:		
Topic 1. (Module 1. “Propedeutics of surgical dentistry”): Methods for examination of the oral cavity, jaws, face and neck.	To know the methods for examination of the oral cavity, jaws, face and neck.	Be able to provide examination of the oral cavity, jaws, face and neck.
Topic 3. (Module 1. “Propedeutics of surgical dentistry”): General anesthesia	To know the types of general anesthesia	Be able to identify the indications for anesthesia surgery.
Topics 4-9. "Propedeutics of Surgical Dentistry": ... Conductor Methods for Immunization of Jaws and Adjacent Tissues.	Know the types and techniques of local anesthesia	Be able to perform different anesthesia techniques on the upper and lower jaws
Themes 6,7 "Traumatology of the MFA". Non-gunshoted fractures of the lower and upper jaws.	Know the classification, clinic for fractures of the lower and upper jaw	Be able to diagnose a patient with lesions of the facial skeleton.

Plan and organizational structure of practical lesson of the discipline

Duration of practical lesson is 2 academic hours – 1 hour 30 minutes including 10 minutes for a break.

№	The main stages of the lesson, their functions and content	Time period	Methods of eductation and control	Materials of methodical support	
1.	**Preparatory stage**	**20 min.**			
1.1	Organizational measures	5 min.			
1.2	Setting up of educational goals and motivation.	5 min.			
1.3	Control of the initial level of knowledge (standardized control methods).	10 min.	Individual theoretical evaluation. Solving typical tasks.Test control.Written interwiev.	Question for an individual oral and written evaluation. Typical situational tasks and tests.	Tables, phantoms, collapsible jaws, textbooks, manuals, reference books, atlas, methodical recommendations, video films
2.	**Main Stage**	**30 min.**			
	Formation of professional skills and abilities: 1. The technique of applying a different types of bandage. 2. To carry out temporary transport bandage. 3. Technique for ligature fixation of teeth and jaws by Limberg. 4. Technique for ligature fixation of teeth and jaws by Gotzko. 5. Technique for ligature fixation of teeth and jaws by Ivy. 6. To make a plan of complex treatment of the patient with certain injury of the		Formation of professional skills: Work with patients with pathology of maxillofacial area. Work out the results of additional methods of examination of patients with diseases of the maxillofacial area. Solving typical situational tasks. Oral and written evaluation on standardized list of issues.Work with phantoms, view thematic videos.	Patients with pathology of maxillofacial area. The history of the disease.Selection of results of additional survey methods. Situational tasks.Algorithms.Phantoms, surgical instruments.Thematic videos.	

	MFA			
3.	**Final stage**	**30 min.**		
3.1	Control and correction of the level of professional skills and abilities		Individual skills control.Control of skills by solving non-typical situational problems with illustrative material.	Phantoms, surgical instruments.The history of the disease.Selection of results of additional methods of examination of thematic patients.Unusual situational tasks.
3.2	Control and correction of the level of professional skills and abilities.		Final evaluation of the students	
3.3	Homework. Informing students about the topic of the next lesson.			Recommended literature

Methodology of organization of educational process in practical lesson.
STRUCTURE OF PRACTICAL LESSON
Preparation stage (20 min.)

To substantiate the significance of the subject for further study of the discipline and professional activity of the doctor in order to formulate motivation and purposeful educational activity. Get acquainted with students with specific goals and lesson plans.Conduct standardized control of the initial level of student training, discussion and student answers.

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

Topic of the lesson: «Temporary (transport) immobilization of the facial bones fractures: types, requirements.»

Aim of the lesson: learn how to temporarily immobilize fragments of the bones of the facial skull. Analyze the volume and procedure of providing medical care to patients with traumatic injuries of the skeletal bones during the stages of medical evacuation.

Motivation of educational activity.

Knowledge of the stage treatment of patients with injuries of the skeletal bones, possession of methods of temporary (transport) immobilization of fragments will allow the dentist to rationally organize and provide medical care to the maxillofacial injured both in peacetime and in conditions of extreme situations or hostilities.

Materials of methodical support of the preparatory stage of the lesson:

Questions to frontal survey:

1. Methods of temporary immobilization of fragments of the bones of the facial skeleton.
2. Basic principles of evacuation transport immobilization.
3. Types and methods of temporary immobilization at fractures of the jaws (circular bandage occipito-mental sling-like bandage, bandage by Pomerantseva-Yrbanska, Entin's sling-like bandage, maxillo-mandibular ligature wiring etc.).
4. Impressions and contraindications for ligature wiring of teeth and jaws.
5. Technique of ligature wiring of jaws (simple, by Ivy, Gotsko, etc.).
6. Methods of anesthesia during temporary evacuation transport immobilization.

7. Modern ways of teeth wsring.
8. Features of displacement of the fragments of the mandible depending on the location of the fracture.
9. Recognize the complications that may occur with damage to the bones of the facial skull.
10. Prevention of the complications of injuries in bones of the facial skeleton.

The main stage: the formation of professional skills (30 min)

Conducting professional training.

Materials of methodical support of the main stage of the lesson:

Temporary mandibulomaxillary fixation during reduction serves to address the posterior height of the facial skeleton by utilizing the height of the ramus of the mandible, since the posterior maxillary buttress is not directly opened. Arch bars are preferred for temporary fragment stabilization in emergency cases before definitive treatment. They are used as a tension band in combination with rigid internal fixation or for long-term fixation in conservative treatment. The method is also used for fixation of avulsed teeth and alveolar crest fractures.

Before placing the arch bars the occlusion must be checked. Determine if the patient has a normal occlusion or a preexisting malocclusion before taking the patient to the operating room. In the case of jaw malformations, such as a deep bite deformity, it may be impossible to use arch bars.

The prefabricated arch bar must be adjusted in shape and length according to the individual situation. The arch bar should not damage the gingiva. Firstly, the bar is adapted closely to the dental arch. It should be placed between the dental equator and the gingiva.

The hooks should be symmetrically positioned in the upper and lower jaw, because the symmetry is essential for right placing of the elastics. The bar should not extend past the most distal tooth or protrude into the gingiva.

Arch bar fixation is a time-tested and reliable technique that results in more stable fixation than Ivy loops alone. Arch bars come in a variety of styles. The two force ends of the wire are tightened in a pigtail fashion over the bar under continuous apical pressure. Arch bar ligatures should typically run from the first or second molars to the canines. Anterior teeth can be utilized, when necessary, but caution should be used because wires have been known to orthodon- tically move incisors labially or rotationally. A smaller wire is recommended if anterior tooth ligation is needed. Reduction of segments should be with elastic or box wire traction of arch bars into an acceptable occlusion before definitive tightening of circumdental wires, proximal to the fracture site. Arch bars should be affixed tightly without evidence of vertical or horizontal mobility. Tooth-bearing fractures (symphysis, body) should, as a general rule, be reduced prior to non-tooth-bearing fractures (angle, ramus). Arch bars also provide a stable point of fixation for luxated mobile teeth and dentoalveolar segment fractures.

Principles of applying the arch bar and intermaxillary fixation

1. Adapt the arch bar closely.
2. Use a cuspid wrap wire where indicated.
3. Avoid placing the wire across the intermaxillary stabilization lugs.
4. Use circumferential wires when single teeth stand alone, and intraosseous suspension or circum-mandibular wires in edentulous areas.
5. In the area of the fracture, reduction should be accomplished prior to stabilization of the arch bar on both sides of the fracture.
6. Tighten the wires with a continuous tension.
7. Direct the force apically when tightening the wires.
8. Tighten all wires in a clockwise direction.
9. At the end of tightening, turn only half a turn at a time.
10. Turn the end of the wire into the interproximal embrasure.

- *Algorithms for the formation of professional skills.*

1. The technique of applying a different types of bandage.
2. To carry out temporary transport bandage.
3. Technique for ligature fixation of teeth and jaws by Limberg.
4. Technique for ligature fixation of teeth and jaws by Gotzko.
5. Technique for ligature fixation of teeth and jaws by Ivy.
6. To make a plan of complex treatment of the patient with certain injury of the MFA

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

Individual tasks:

Task №1.

During the transport of a patient aged 32 years with a traumatic unilateral fracture of the body of the mandible to the department of maxillofacial surgery, the dental surgeon applied imaxillo-mandibular fixation by Ivy. For what time it is indicaated to hold Ivy's fixation:

A. For the entire duration of treatment
B. Up to 5-6 days
C. No value
D. Up to 8 days
E. Up to 2-3 days.

Task №2.

A 35-year-old driver was delivered to the maxillofacial hospital in an automobile accident. Consciousness did not lose. Objectively: the face is asymmetric due to edema of soft tissues of the cheek area to the right, where there is a torn wound in the size of 2x3 cm, the mouth is semi-open, the upper jaw is mobile and shifted to the bottom. Choose the best way to immobilize:

A. Solid-state splint with mustache
B. Weber's splint with extraoral wires
C. Elastic splint with a wire frame
D. Limberg's splint
E. Zbarazh's apparatus.

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

Patient G., 35 years old, was taken to the hospital's admission ward. Complaints of pain in the chin area. He was injured as a result of a fall during a seizure. According to the accompanying persons, he has been abusing alcohol for a long time. Objectively: the face is asymmetrical due to swelling in the mental region of the mandible on the right, the symptom of a "step" on palpation of the lower edge of the jaw, the bite is broken. What additional examination methods should be used to diagnose it? Which method of temporary immobilization should be chosen? What medication 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 self-employment.To work on phantoms the technique of examination and palpation of maxillofacial area, oral cavity under conditions of phantom class.
- Evaluation.

Conduct standardized final control using individual test tasks and questions (20 min.), Work check (5-10 min.). Evaluate the student's current activities during the classroom, taking into account

standardized final control, analyze the student's progress, announce the evaluation of each student's activity, and display it in the student attendance and student log book.An adult group at the same time makes assessments in the record of the record of success and attendance of classes by students, the teacher certifies them with his signature.

Brief informing the students about the topic of the next lesson and the methodical measures for preparing for it.

Basic knowledge level:

1. Anatomical and functional features of the lower and upper jaw.
2. Classification of fractures of the lower and upper jaw.
3. Diagnosis of fractures of the lower and upper jaw.
4. Clinic of fractures of the lower and upper jaw.
5. Methods of general and local anesthesia on the upper and lower jaws.

List of questions to be studied by the student:

1. Methods of immobilization of bone fragments of the facial skull
2. Methods of temporary immobilization
3. Basic principles of evacuation and transport evacuation
4. Types of temporary immobilization in case of the mandibular fractures (Circular bandage, individual mental-parietal bandage, elastic bandage of Pomerantseva-Urbanska, etc.).
5. Types of temporary immobilization cases of the maxilla fractures (Faltina bandage, Limberg bandage, sub mental Entin bandage, etc.).
6. The indications and contraindications to the ligature binding of teeth and jaws.
7. The technique of ligature binding of teeth and jaws (Ivy, Limberg, Hotsko techniques etc.).
8. Types of permanent immobilization of the facial skull fractures.
9. Splinting techniques using different kinds of splints (dental, dentalgingival etc.).
10. Hardware treatments of the upper and lower jaw fractures (Rudko, Zbarzh devices, etc.).

The list of practical skills to be learned by the student:

1. The technique of applying a different types of bandage.
2. To carry out temporary transport bandage.
3. Technique for ligature fixation of teeth and jaws by Limberg.
4. Technique for ligature fixation of teeth and jaws by Gotzko.
5. Technique for ligature fixation of teeth and jaws by Ivy.
6. To make a plan of complex treatment of the patient with certain injury of the MFA.

Situational tasks and questions on the topic of the lesson:

1. Methods of temporary immobilization at jaw fractures during evacuation stages:

A. Bone suture
B. Different splints
C. Standard bandages
D. Compression and distraction apparatus
E. Miniplates

2. Standard bandages for fractures of the jaws for transport immobilization:

A. Circular bandage
B. Hippocrates hat
C. Bandage by Pomerantseva-Urbanska
D. Compression and distraction apparatus
E. Circular parieto-mental bandage

3. Improvised bandages for jaw fractures for transport immobilization:

A. Zbarazh's apparatus
B. Hippocrates hat
C. Circular fronto-occipital bandage
D. Compression and distraction apparatus
E. Circular parieto-mental bandage

4. Improvised bandages for jaw fractures for transport immobilization:
A. Zbarazh's apparatus
B. Hippocrates hat
C. Sling-like bandage
D. Circular fronto-occipital bandage
E. Compression and distraction apparatus

5.Transportation immobilization is carried out for the term:
A. 3-5 days or until permanent immobilization is imposed
B. 7 days
C. 2 weeks
D. 6 weeks
E. 10 days

Literature:

Basic:
1. Oral and Maxillofacial Surgery: Textbook, Part 1, 2 / V. O. Malanchuk. – Vinnytsia: Nova Knyha Publishers, 2011. – 453p.
2. PETERSON'S PRINCIPLES OF ORAL AND MAXILLOFACIAL SURGERY Second Edition, 2004. - 1502 p.
3. Principles of Dental Local Anaesthesia and Teeth Removal / Ya. E. Vares, R. Z. Ogonovsky, Ch. R. Pohranychna – LNMU, 2007. – 63p.
4. Atlas of Human Anatomy / F. Netter – 2nd ed. – New Jersey: ICON Learning Systems. – 592 p.

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1. The AIDS booklet. – Boston: WCB Mcgraw Hill, 1999. – 70 p.
2. Contemporary Oral and Maxillofacial Surgery / J. P. Sapp, L. R. Eversole, G. P. Wysocki – 2nd ed.- St. Louis: Mosby – 2004. – P. 88-90.
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4. Bauml, Philips R.W., Lund M.R. Texbook of Operative Dentistry. - 3-rd ed.- Philadelphia: Saunders, 1995.- 661p.
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Head of the Department:
professor Ya. E. Vares

METHODICAL GIUDE FOR PRACTICAL LESSONS

Educational discipline	SURGICAL DENTISTRY
Topic of the lesson	**Topic №10**. Prolonged (treatment) jaws splint immobilization. Wiring techniques, methods of intermaxillary fixation. Dental, dentogingival and gingival splints. Advantages and disadvantages.
Course	4th
Faculty	Dental

Lviv – 2019

Actuality of the topic: knowledge of the methods of permanent (therapeutic) immobilization of fragments with injuries to the jawbones will allow the dentist to rationally organize and provide qualified and specialized medical care to the victims, both in peacetime and in extreme situations or hostilities. Conservative-orthopedic techniques are used as an independent method of treatment of fractures of the jaws, as well as for osteosynthesis for immobilization of the mandible in the occlusion, with a number of bone-plastic and reconstructive operations. Fragment immobilization creates favorable conditions for reparative osteogenesis and reduces the risk of complications in the post-traumatic period.

Aim of the lesson: master the principles of permanent immobilization in fractures of the upper and lower jaws. Analyze the volume and procedure of providing medical care to patients with traumatic injuries of the skeletal bones during the stages of medical evacuation.

Learning objectives:

- *Professional competence:*

1. Collection of medical information on the patient's condition.
2. Evaluation of the results of laboratory and instrumental research.
3. Establishment of a clinical diagnosis of dental disease.
4. Planning and conducting preventive measures for dental diseases.
5. Execution of medical and dental manipulations.
6. Organization and conducting of dental medical examination of persons subject to dispensary supervision.
7. Assessment of the environmental impact on the health of the population (individual, family, population).
8. Maintaining medical records.
9. Processing of state, social and medical information.

- *General competence:*

1. The ability to 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 in the use of information and communication technologies.
6. Ability to search, process and analyze information from various sources.
7. Ability to adapt and act in a new situation; ability to work autonomously.
8. Ability to identify, put and solve problems.
9. Ability to choose a communication strategy.
10. Ability to work in a team.
11. Interpersonal skills.
12. Ability to act on the basis of ethical considerations (motives).
13. Ability to act in a socially responsible and civic conscious manner.

Methods of training:

Preparatory stage - Frontal oral interview.
The main stage - practical training, role-playing game.
The final stage is brainstorming.

Interdisciplinary integration

Disciplines	Student should know	Student should be able to
Previous:		
Normal anatomy Normal physiology	Know the anatomical and physiological features of the maxillofacial area: - structure of the upper and lower jaws; - innervation and vascularization of these sites; - structure of the lymphatic system of the head and neck; - structure of the muscles of the head and neck; - structure of the head and neck areas.	To be able to explain the structure of systems and organs of maxillo-facial area (MFA)
Topographical anatomy	To know the topography of the organs of MFA	To be able to explain the topography of the organs of MFA
Biophysics	Know the biomechanics of the jawbone system.	Be able to predict the mechanical load, chewing load, using different treatments.
Disaster medicine	Know the amount of medical care provided at each stage of the evacuation.	Be able to explain the basic principles of emergency care for victims.
Radiation diagnostics.	To know the methods of radiological examination used in maxillofacial traumatology	To be able to explain the principles on which these or other methods are based (X-ray, CT, MRI, ultrasound)
Prosthetic dentistry	Know the types of materials and structures used for orthopedic treatment of victims with fractured jaws	Be able to characterize different types of tires and explain the stages of their manufacture.
Pharmacology	Know the pharmacological features of the drugs used for topical and general treatment of mandibular fractures.	Be able to prescribe drugs of different pharmacological groups
Intradisciplinary integration:		
Topic 1. (Module 1. “Propedeutics of surgical dentistry”): Methods for examination of the oral cavity, jaws, face and neck.	To know the methods for examination of the oral cavity, jaws, face and neck.	Be able to provide examination of the oral cavity, jaws, face and neck.
Topic 3. (Module 1. “Propedeutics of surgical dentistry”): General anesthesia	To know the types of general anesthesia	Be able to identify the indications for anesthesia surgery.
Topic 4,9. (Module 1) Local anesthesia, it	To know the pharmacological features of local anesthetics,	To be able to explain the pharmacological features of

properties, side effects...	indications and contraindications to use.	local anesthetics.
Topic 6,7 "Traumatology of the MFA". Non-gunshoted fractures of the lower and upper jaws.	Know the classification, clinic for fractures of the lower and upper jaw	Be able to diagnose a patient with lesions of the facial skeleton.
Topic 9. "Traumatology of the MFA". Temporary (evacuation-transport) immobilization for damage to the bones of the facial skull: requirements, types.	Know the types and methods of temporary (transport) immobilization in fractures of the lower and upper jaw.	To be able to carry out different techniques of temporary immobilization of jaws to a patient with damage to the bones of the facial skeleton.

Plan and organizational structure of practical lesson of the discipline

Duration of practical lesson is 2 academic hours – 1 hour 30 minutes including 10 minutes for a break

№	The main stages of the lesson, their functions and content	Time period	Methods of eductation and control	Materials of methodical support	
1.	**Preparatory stage**	**20 min.**			
1.1	Organizational measures	5 min.			
1.2	Setting up of educational goals and motivation.	5 min.			
1.3	Control of the initial level of knowledge (standardized control methods).	10 min.	Individual theoretical evaluation. Solving typical tasks.Test control.Written interwiev.	Question for an individual oral and written evaluation. Typical situational tasks and tests.	Tables, phantoms, collapsible jaws, textbooks, manuals, reference books, atlas, methodical recommendations, video films
2.	**Main Stage**	**30 min.**			
	Formation of professional skills and abilities: 1. 1. To carry out immobilization with smooth wire tire on the phantom. 2. To carry out immobilization with tire with incined plane on the phantom. 3. To carry out immobilization with		Formation of professional skills: Work with patients with pathology of maxillofacial area. Work out the results of additional methods of examination of patients with diseases of the maxillofacial area. Solving typical situational tasks. Oral and written evaluation on standardized list of	Patients with pathology of maxillofacial area. The history of the disease.Selection of results of additional survey methods. Situational tasks.Algorithms.Phantoms, surgical instruments.Thematic videos.	

	tire with hooked loops on the phantom. 4. To carry out immobilization with wire tire on the phantom. 5. To carry out intermaxillary fixation with IMF screws on the phantom. 6. To make a plan of complex treatment of the patient with certain injury of the MFA.		issues.Work with phantoms, view thematic videos.	
3.	**Final stage**	**30 min.**		
3.1	Control and correction of the level of professional skills and abilities		Individual skills control.Control of skills by solving non-typical situational problems with illustrative material.	Phantoms, surgical instruments.The history of the disease.Selection of results of additional methods of examination of thematic patients.Unusual situational tasks.
3.2	Control and correction of the level of professional skills and abilities.		Final evaluation of the students	
3.3	Homework. Informing students about the topic of the next lesson.			Recommended literature

Methodology of organization of educational process in practical lesson.
STRUCTURE OF PRACTICAL LESSON
Preparation stage (20 min.)

To substantiate the significance of the subject for further study of the discipline and professional activity of the doctor in order to formulate motivation and purposeful educational activity. Get acquainted with students with specific goals and lesson plans.Conduct standardized control of the initial level of student training, discussion and student answers.

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

Topic of the lesson: «Prolonged (treatment) jaws splint immobilization. Wiring techniques, methods of intermaxillary fixation. Dental, dentogingival and gingival splints. Advantages and disadvantages.»

Aim of the lesson: master the principles of permanent immobilization in fractures of the upper and lower jaws. Analyze the volume and procedure of providing medical care to patients with traumatic injuries of the skeletal bones during the stages of medical evacuation.

Motivation of educational activity.

Knowledge of the methods of permanent (therapeutic) immobilization of fragments with injuries to the jawbones will allow the dentist to rationally organize and provide qualified and specialized medical care to the victims, both in peacetime and in extreme situations or hostilities. Conservative-orthopedic techniques are used as an independent method of treatment of fractures of the jaws, as well as for osteosynthesis for immobilization of the mandible in the occlusion, with a number of bone-plastic and reconstructive operations. Fragment immobilization creates favorable conditions for reparative osteogenesis and reduces the risk of complications in the post-traumatic period..

Materials of methodical support of the preparatory stage of the lesson:

Questions to frontal survey:

1. . Methods of permanent immobilization of the fractures of the bones of the facial skull.
2. Impressions and contraindications for ligature binding of teeth and jaws.
3. Nail studded tires and upcoming plasmas tires are their disadvantages.
4. Disadvantages and advantages of conservative methods of treatment of fractures.
5. Tactics of the doctor in the presence of teeth in the fracture lines
6. Smooth arch bar: the technique of making impressions, the technique of fabrication.
7. Indications to the use of dentoalveolar splints
8. Onteeth individual splints: their types and indications for use.
9. Possible complications. Causes of their occurrence.
10. Ways of prevention and treatment of complications.

The main stage: the formation of professional skills (30 min)

Conducting professional training.

Materials of methodical support of the main stage of the lesson:

Closed reduction technique using the patient's existing dentures is indicated when MMF with splints will offer adequate segment control and reduction. Circummandibular wires are used to fix the denture or splint with an arch bar to the maxilla. The dentures or splints should be modified by placement of arch bars (or sections thereof) along the labial flanges and interocclusal keys should be developed occlus- ally to serve as occlusal stops to prevent sliding displacement. Since the blood supply to the atrophic mandible is nearly entirely supplied by the periosteum, open reduction techniques on these fractures should only done if closed reduction techniques (or biphasic pins) are unsuccessful.

Accurate reproduction of the pre-existing occlusal state of the patient is the cardinal rule in treatment of mandible fractures. Mandible fractures can be treated with a variety of techniques (open reduction, closed reduction, pin fixation, etc.) and with a wide variety of materials (wires, alloy plates, resorbable plates, lag screws, splints, etc.). However, proper treatment should be guided by using the simplest method to achieve the most predictable favorable result. If the principle of using the simplest method to achieve optimal results is to be followed, the use of closed reduction for mandibular fractures should be widely used. Therefore, the indications for closed reduction may simply be stated as all cases in which an open reduction is either not indicated or is contraindicated. Several conditions deserve specific mention. Grossly comminuted fractures are, as a general rule, best treated by closed reduction, because using open reduction techniques would jeopardize the blood supply to the small bone fragments and lead to an increased likelihood of infection. This category also includes gunshot wounds, which are particularly prone to infection. Fractures in the severely atrophic edentulous mandible represent a difficult clinical situation. On the one hand, there is limited osteogenic potential; the majority of the blood supply comes from the periosteum, so an open reduction further disrupts the blood supply. On the other hand, a stable, nonmobile reduction and fixation of these fractures is difficult with closed reduction techniques.

Open reduction with limited dissection of the soft tissue and rigid fixation may be the preferred technique.

Indications for closed reduction

1. Minimally to moderately displaced simple or compound fractures
2. Most condyle fractures
3. Fractures in children
4. Severely comminuted fractures or fractures in which overlying blood supply has been compromised

Arch bar fixation is a time-tested and reliable technique that results in more stable fixation than Ivy loops alone. Arch bars come in a variety of styles. The two force ends of the wire are tightened in a pigtail fashion over the bar under continuous apical pressure. Arch bar ligatures should typically run from the first or second molars to the canines. Anterior teeth can be utilized, when necessary, but caution should be used because wires have been known to orthodon- tically move incisors labially or rotationally. A smaller wire is recommended if anterior tooth ligation is needed. Reduction of segments should be with elastic or box wire traction of arch bars into an acceptable occlusion before definitive tightening of circumdental wires, proximal to the fracture site. Arch bars should be affixed tightly without evidence of vertical or horizontal mobility. Tooth-bearing fractures (symphysis, body) should, as a general rule, be reduced prior to non-tooth-bearing fractures (angle, ramus). Arch bars also provide a stable point of fixation for luxated mobile teeth and dentoalveolar segment fractures. Following closed reduction of fractures, it may be determined that a previously nondisplaced fracture, for example, in the angle, is now significantly displaced and nonreducible. In such cases, the practitioner will need to weigh the indications for open reduction and at times change the initial treatment plan. Closed reduction techniques demand patient compliance with maxillomandibular elastic traction (immobilization) for 3-4 weeks prior to release. Thus, patients with behavioral difficulties or those at risk for significant aspiration (alcoholics, patients with Alzheimer's disease) may require more predictable, definitive treatment or overtreat ment to effect a more predictable outcome. Mobility at the fracture site has been shown to lead to malunion, nonunion, and osteomyelitis. Persistent trismus often results from prolonged maxillomandibular fixation; physical therapy is often useful to obtain a return to normal range of motion.

When IMF is used it may be applied with either elastics or wires. Elastics can be used for fracture reduction and for IMF; however, they apply a constant pressure, which can lead to muscle spasm and pain, particularly in the masseter muscle, and they are difficult to keep clean. Wires, on the other hand, are easier to keep clean and are passive. However, they do loosen over time and may need to be tightened or replaced over the period of fixation.

Two other techniques categorized as closed reduction methods for treating mandible fractures apply to situations in which a dentate mandible opposes an edentulous maxilla, or vice verse. In the first case, the patient's pre-existing denture can be modified with acrylic to fix an arch. This is then affixed to the maxilla by screw fixation at the pyriform rims, zygomatic buttresses, or palate. Pyriform rim wires or perialveolar wires can also be used. An arch bar is then affixed to the dentate mandible and a standard closed reduction is then performed using the maxillary denture as the occlusal basis for proper alignment followed by elastic traction fixation. Wires and /or screws are removed when the time treatment is completed. If a dentate maxilla opposes a fractured mandible with a limited number of teeth, a modification of the patient's mandibular partial denture or fabrication of an acceptable splint can be performed in a similar way. This can then be affixed to the mandible via circummandibular wires, with care being taken to avoid wire proximity to the fracture site. Care should also be taken to avoid injury to the mental nerve as it exits the mandible and to the submandibular duct and contents of the floor of the mouth. A standard closed reduction can then be created via elastic traction fixation.

- *Algorithms for the formation of professional skills.*

1. To carry out immobilization with smooth wire tire on the phantom.

2. To carry out immobilization with tire with incined plane on the phantom.
3. To carry out immobilization with tire with hooked loops on the phantom.
4. To carry out immobilization with wire tire on the phantom.
5. To carry out intermaxillary fixation with IMF screws on the phantom.
6. To make a plan of complex treatment of the patient with certain injury of the MFA.

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

Individual tasks:

Task №1.

A patient J., 29 years old, entered the hospital with a diagnosis: an open fracture of the mandible between 46, 47 teeth without displacement of the fragments. Objectively: the mouth does not open completely, dental arches are intact. Between 46, 47 teeth is a gap up to 3 mm. The symptom of an indirect load is painful. What method of immobilization indicated for this patient?

A. Onteeth smooth arch bar

B. Onteeth Tigerstedt's arch bars with hooks

C. Onteeth Tigerstedt's arch bar with sloping plane

D. Onteeth Tigerstedt's arch bar with roughened bend

E. Onteeth Vasiliev's arch bar.

Task №2.

A patient, 28 years old, applied 3 days after an injury with complaints of painful swelling in the area of the body of the mandible on the left. Palpation of the body of the mandible on the left is painful, there is movement of the fragments in area 45. When attempting to close the mouth, there is a closure of the molar antagonists to the left. In the central area and in the area of molars on the right, no tooth closure. On the X-ray in the lateral left projection, a fracture line was found in section 45. Diagnosis: fracture of the body of the mandible on the left in section 45. Which of the types of conservative treatment should be used?

A. Intarmaxillary teeth wiring

B. Double-hinged tires with hinged hinges

C. Pomerantseva-Urbanska's sling-like bandage

D. Port's splint

E. Smooth arch bar on mandible.

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

Patient V., 30 years old, was delivered to the ventilation unit. Complaints of pain in the lower jaw body on the right. He was injured as a result of hitting a ball while playing sports. According to the patient, he did not lose consciousness, there was no bleeding. At the trauma center, where the patient initially addressed, a circular bandage was applied to the parietal chin bandage. Objectively: the face is asymmetrical due to the swelling in the lower jaw body on the right, the symptom of "step" on palpation of the lower edge of the jaw, mouth opening sparingly, the bite is broken. In the radiograph of the skull and the radiographs of the mandible in lateral projections marked violation of the integrity of bone tissue in the body of the mandible on the right, without displacement of fragments; the fracture line passes through the hole of the intact 46 tooth. What additional examination methods should be used to diagnose it? Which method of permanent immobilization should be chosen? What medication should be prescribed to the patient? Justify your choice.

<u>Final stage</u> (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 self-employment.To work on phantoms the technique of examination and palpation of maxillofacial area, oral cavity under conditions of phantom class.
- Evaluation.

Conduct standardized final control using individual test tasks and questions (20 min.), Work check (5-10 min.). Evaluate the student's current activities during the classroom, taking into account standardized final control, analyze the student's progress, announce the evaluation of each student's activity, and display it in the student attendance and student log book.An adult group at the same time makes assessments in the record of the record of success and attendance of classes by students, the teacher certifies them with his signature.

Brief informing the students about the topic of the next lesson and the methodical measures for preparing for it.

Basic knowledge level:

1. Anatomical and functional features of the lower and upper jaw.
2. Classification of fractures of the lower and upper jaw.
3. Diagnosis of fractures of the lower and upper jaw.
4. Clinic of fractures of the lower and upper jaw.
5. Methods of general and local anesthesia on the upper and lower jaws.
6. Types of temporary transport immobilization in fractures of the upper and lower jaws.

List of questions to be studied by the student:

1. Methods of immobilization of bone fragments of the facial skull
2. The technique of ligature binding of teeth and jaws (Ivey, Limberg, Hotsko techniques etc.).
3. Types of permanent immobilization of the facial skull fractures.
4. Splinting techniques using different kinds of splints (dental, dentalgingival etc.).
5. Hardware treatments of the upper and lower jaw fractures (Rudko, Zbarzh devices, etc.).
6. Dental, dentogingival and gingival splints.
7. Advantages and disadvantages of permanent immobilization.

The list of practical skills to be learned by the student:

1. To carry out immobilization with smooth wire tire on the phantom.
2. To carry out immobilization with tire with incined plane on the phantom.
3. To carry out immobilization with tire with hooked loops on the phantom.
4. To carry out immobilization with wire tire on the phantom.
5. To carry out intermaxillary fixation with IMF screws on the phantom.
6. To make a plan of complex treatment of the patient with certain injury of the MFA.

Situational tasks and questions on the topic of the lesson:

1. What device is used for fractures when there is a sufficient number of teeth with high clinical crowns on the jaws of both jaws?
A. Wankevich’s splint
B. Shpreng's splint
C. Van-Til’s splint
D. Weber’s splint
E. Guning-Port’s splint

2. Orthopedic methods of permanent immobilization of the upper jaw fractures:
A. Angle’s arch
B. Osteosynthesis
C. Zbarazh’s apparatus
D. Sling-like bandage

E. Smooth arch bar

3. Surgical-orthopedic methods of permanent immobilization of fractures of the upper jaw:
A. Angle's arch
B. Osteosynthesis
C. Adams method
D. Bimaxillary arch bars with elastics
E. Smooth arch bar

4. To fixate the fragments of the lower jaw, the following devices are used:
A. Port's splint
B. Zbarazh's apparatus
C. Rudko's apparatus
D. Wankevich's sling
E. Limberg's sling

5. After the fixation of bimaxylary arch bars wit hhooks, the elastics should be changed:
A. Daily
B. Monthly
C. Every week
D. 3 times a month
E. 2 times a week

Literature:

Basic:

1. Oral and Maxillofacial Surgery: Textbook, Part 1, 2 / V. O. Malanchuk. – Vinnytsia: Nova Knyha Publishers, 2011. – 453p.
2. PETERSON'S PRINCIPLES OF ORAL AND MAXILLOFACIAL SURGERY Second Edition, 2004. - 1502 p.
3. Principles of Dental Local Anaesthesia and Teeth Removal / Ya. E. Vares, R. Z. Ogonovsky, Ch. R. Pohranychna – LNMU, 2007. – 63p.
4. Atlas of Human Anatomy / F. Netter – 2nd ed. – New Jersey: ICON Learning Systems. – 592 p.

Additional:

1. The AIDS booklet. – Boston: WCB Mcgraw Hill, 1999. – 70 p.
2. Contemporary Oral and Maxillofacial Surgery / J. P. Sapp, L. R. Eversole, G. P. Wysocki – 2nd ed.- St. Louis: Mosby – 2004. – P. 88-90.
3. Contemporary Oral and Maxillofacial Surgery / L. J. Peterson, E. Ellis, J. R. Hupp, M.R. Tucker – 3rd ed. – St. Louis: Mosby – Year Book, Inc. – 1998. – P. 69-82.
4. Bauml, Philips R.W., Lund M.R. Texbook of Operative Dentistry. - 3-rd ed.- Philadelphia: Saunders, 1995.- 661p.
5. Kharkov L. V. Pediatric oral and maxillofacial surgery : a textbook for students of higher medical educational institutions of the III-IV levels of accreditation / L. V. Kharkov, L. M. Yakovenko, N. V. Kiselyova ; ed. by L. V. Kharkov. - Kyiv : AUS Medicine Publishing, 2015. - 103 p.
6. Pohranychna, Ch. R. Maxillofacial oncology : guide of lectures on oral and maxillofacial surgery for the english-medium students of the 5th year education at dentistry faculty (autumn semester) : methodological guide / Ch. R. Pohranychna, R. Z. Ogonovsky. - Lviv, 2011.
7. Timofieiev O.O. Anesthesia in Oral and Maxillofacial Surgery / O.O. Timofieiev, I.I.

Fesenko. - Kyiv: OMF Publishing, 2016, 128 p.

Ministry of Health of Ukraine
Danylo Halytsky Lviv National Medical University

"Approwed"
on the meeting of the Department
of Surgical Dentistry
and Maxillofacial Surgery

Head of the Department:
professor Ya. E. Vares

METHODICAL GIUDE FOR PRACTICAL LESSONS

Educational discipline	SURGICAL DENTISTRY
Topic of the lesson	**Topic №11**. A notion about internal fixation. Osteosynthesis techniques. Indications, contraindications, surgical methods, complications. External hardware fixation of facial bone fragments.
Course	4th
Faculty	Dental

Lviv – 2019

Actuality of the topic: Dentist surgeons often have to deal with traumatic injuries. Timely and qualified assistance with facial skeletal injuries prevents severe complications and cosmetic defects. Therefore, the dentist surgeon should be able to choose the optimal method of treatment of fractures of the facial skeleton.

Aim of the lesson: Acquire indications for osteosynthesis of facial skull bones and use of hardware fixation methods. Know the stages and features of osteosynthesis surgery in the maxillofacial area.

Learning objectives:

- *Professional competence:*

1. Collection of medical information on the patient's condition.
2. Evaluation of the results of laboratory and instrumental research.
3. Establishment of a clinical diagnosis of dental disease.
4. Planning and conducting preventive measures for dental diseases.
5. Execution of medical and dental manipulations.
6. Organization and conducting of dental medical examination of persons subject to dispensary supervision.
7. Assessment of the environmental impact on the health of the population (individual, family, population).
8. Maintaining medical records.
9. Processing of state, social and medical information.

- *General competence:*

1. The ability to 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 in the use of information and communication technologies.
6. Ability to search, process and analyze information from various sources.
7. Ability to adapt and act in a new situation; ability to work autonomously.
8. Ability to identify, put and solve problems.
9. Ability to choose a communication strategy.
10. Ability to work in a team.
11. Interpersonal skills.
12. Ability to act on the basis of ethical considerations (motives).
13. Ability to act in a socially responsible and civic conscious manner.

Methods of training:

Preparatory stage - Frontal oral interview.
The main stage - practical training, role-playing game.
The final stage is brainstorming.

Interdisciplinary integration

Disciplines	Student should know	Student should be able to
Previous:		
Normal anatomy	Know the anatomical and physiological features of the maxillofacial area: - structure of the upper and lower	To be able to explain the structure of systems and organs of maxillo-facial area (MFA)

Normal physiology	jaws; - innervation and vascularization of these sites; - structure of the lymphatic system of the head and neck; - structure of the muscles of the head and neck; - structure of the head and neck areas.	
Topographical anatomy	To know the topography of the organs of MFA	To be able to explain the topography of the organs of MFA
Hystology	To know histological structure of soft and hard tissues of MFA	To be able to explain the stages of manufacturing of cytological, histological preparations
Mycrobiology	To know the species identification of microorganisms in the oral cavity	To be able to explain the stages of manufacturing of microbiological preparations and the essence of bacteriological examination
Radiation diagnostics.	To know the methods of radiological examination used in maxillofacial traumatology	To be able to explain the principles on which these or other methods are based (X-ray, CT, MRI, ultrasound)
Prosthetic dentistry	Know the types of materials and structures used for orthopedic treatment of victims with fractured jaws	Be able to characterize different types of tires and explain the stages of their manufacture.

Plan and organizational structure of practical lesson of the discipline

Duration of practical lesson is 2 academic hours – 1 hour 30 minutes including 10 minutes for a break

№	The main stages of the lesson, their functions and content	Time period	Methods of eductation and control	Materials of methodical support	
1.	**Preparatory stage**	**20 min.**			
1.1	Organizational measures	5 min.			
1.2	Setting up of educational goals and motivation.	5 min.			
1.3	Control of the initial level of knowledge (standardized control methods).	10 min.	Individual theoretical evaluation. Solving typical tasks.Test control.Written interwiev.	Question for an individual oral and written evaluation. Typical situational tasks and tests.	Tables, phantoms, collapsible jaws, textbooks, manuals, reference books, atlas, methodical

					ecommendation s, video films
2.	**Main Stage**	**30 min.**			
	Formation of professional skills and abilities: 1. To analyze the indications and contraindications to the use of osteosynthesis and hardware methods of treatment of jaw fractures. 2. Explain the principles of osteosynthesis in fractures of the jaws. 3. Classify surgical methods of treatment of fractures of the face. 4. To interpret the radiographs of patients with fractures of the facial bones. 5. To analyze the possible complications in the treatment of fractures of the face by surgical methods. 6. Develop a plan for the treatment of various types of facial bone fractures by surgical methods. 7. Preparation of the patient for osteosynthesis surgery. 8. Hardware operative methods of osteosynthesis. 9. Features of the postoperative period in traumatic patients. Possible complications.		Formation of professional skills: Work with patients with pathology of maxillofacial area. Work out the results of additional methods of examination of patients with diseases of the maxillofacial area. Solving typical situational tasks. Oral and written evaluation on standardized list of issues.Work with phantoms, view thematic videos.	Patients with pathology of maxillofacial area. The history of the disease.Selection of results of additional survey methods. Situational tasks.Algorithms.Phantoms, surgical instruments.Thematic videos.	
3.	**Final stage**	**30 min.**			

3.1	Control and correction of the level of professional skills and abilities		Individual skills control.Control of skills by solving non-typical situational problems with illustrative material.	Phantoms, surgical instruments.The history of the disease.Selection of results of additional methods of examination of thematic patients.Unusual situational tasks.
3.2	Control and correction of the level of professional skills and abilities.		Final evaluation of the students	
3.3	Homework. Informing students about the topic of the next lesson.			Recommended literature

Methodology of organization of educational process in practical lesson.
STRUCTURE OF PRACTICAL LESSON
Preparation stage (20 min.)

To substantiate the significance of the subject for further study of the discipline and professional activity of the doctor in order to formulate motivation and purposeful educational activity. Get acquainted with students with specific goals and lesson plans.Conduct standardized control of the initial level of student training, discussion and student answers.

• *Organizational part of the lesson: presence check, evaluation of the uniform.*

• *Informing about of the topic and the purpose of the lesson*

Topic of the lesson: «A notion about internal fixation. Osteosynthesis techniques. Indications, contraindications, surgical methods, complications. External hardware fixation of facial bone fragments.»

Aim of the lesson: Acquire indications for osteosynthesis of facial skull bones and use of hardware fixation methods. Know the stages and features of osteosynthesis surgery in the maxillofacial area.

Motivation of educational activity.

Dentist surgeons often have to deal with traumatic injuries. Timely and qualified assistance with facial skeletal injuries prevents severe complications and cosmetic defects. Therefore, the dentist surgeon should be able to choose the optimal method of treatment of fractures of the facial skeleton.

Materials of methodical support of the preparatory stage of the lesson:

Questions to frontal survey:

1. General characteristics, diagnosis of traumatic injuries of the face bones and jaws.
2. Classification of injuries of the tissues of the maxillofacial area.
3. Examination of the patients with facial bones fractures.
4. Radiological imaging of MFA bones fractures. 3-D imaging and modelling.
5. Regeneration of bone tissue, types. Methods of optimization of regeneration of bone tissue.
6. Indications and contraindications to open reduction of the fractures.
7. Types of fixating devices.
8. Miniplate technique. Types of plates and screws.
9. Reconstructive plates and screws. Indications to use.
10. Osteosynthesis of the mandible: indications, types, methods and biomechanical principles.
11. Osteosynthesis of the maxilla: indications, types, methods and biomechanical principles.
12. Osteosynthesis of the zygoma: indications, types, methods and biomechanical principles.
13. Complications after osteosynthesis. Their treatment and ways of prevention.

The main stage: the formation of professional skills (90 min)

Conducting professional training.

Materials of methodical support of the main stage of the lesson:

Excluded from these indications for special consideration are edentulous mandible fractures, mandible fractures in conjunction with panfacial fractures, and avulsive or pathological fractures. Open reduction techniques for treating mandible fractures are numerous, ranging from both intra- and extraoral approaches, with variations in materials such as wires, wire mesh, plates and screws, lag screws, eccentric dynamic compression plates, resorbable plates, and others. However, the basis for treatment by open reduction or closed reduction should be the same: reestablishment of an acceptable occlusal relationship for the patient in a predictable and safe fashion. In most cases requiring open reduction, a closed reduction is performed initially to approximate an occlusal relationship. A closed reduction serves to guide the practitioner in a functional as well as anatomical alignment of mandibular segments. With the occlusal relationship established, open reduction techniques then provide a means of rigidly or semirigidly immobilizing and maintaining bony segments in an acceptable position with or without compression. Bone edges approximated under compression are thought to undergo more rapid osseous healing.

Extraoral approaches to the mandible include the submandibular or Risdon approach, the retromandibular approach, the submental approach, the preauricular approach, and through existing lacerations. Each approach has its particular strengths and weaknesses. Intraoral access can be gained to most anatomical regions of the mandible via a vestibular incision in the mucosa or by a traditional Obwegesser approach to the ramus and low condylar neck-coronoid regions. Extraoral approaches lend themselves well to the use of bone screws and rigid plating systems of all types, allowing wide visualization and the ability to place bicortical screws safely.

Intraoral approaches are useful to access oblique fractures of the anterior mandible when lag screw fixation is desired and for placement of plates and screws (low condyle fractures) or border wires. Wire osteosynthesis is a time-honored method for the treatment of mandible fractures. However, with the advent of rigid fixation techniques many practitioners now have limited experience in the use of direct transosseous wiring. In the case of a dentate mandibular fracture opposing a limited maxillary dentition, dental models can be utilized to fabricate acrylic splints with arch bars to establish a stable occlusal relationship. Long-term intermaxillary fixation is required when wire osteosynthesis is used as a treatment option due to the wire's inability to limit multidimensional mobility at the fracture site during typical mandibular function. Wires can also be useful adjuncts to manipulate segments in conjunction with extraoral open reduction techniques.

Rigidfixation techniques (or semirigid techniques) differ from wire fixation techniques in several important ways. Rigid fixation techniques maintain stability across a fracture site with an increased surface area (of device) to bone interface compared to wires and these techniques generally do not require prolonged intermaxillary fixation. However, there is a wide variety of alternatives to consider within this particular technique category: plate material and thickness, screw size and thread pitch, mono- or bicortical crews, tension band plates, neutral zone plates, compression plates, lag screws, reconstruction plates, wire meshes, and resorbable plates. Lag screws generate substantial cross-fragment compression and load sharing. The concepts of tension band plates, neutral zone (static plates), and compression plates are well documented in the literature. Compression plates (thicker bicortical- fixed plates) compress bony segments when placed across a fracture via eccentrically placed holes. This compression is believed to promote enhanced bony healing with no intervening callus formation. Tension band plates (smaller monocortical-affixed plates) resist tensile forces along the superior aspect of the mandible. Arch bars have been described as effective tension bands. Neutral or static bone plates (bicortical-fixed) do not offer compression across fracture lines. Wire mesh does offer some three-dimensional stability depending again on size and material. These meshes generally are indicated in avulsed or severely comminuted fractures requiring bone grafting. Resorbable plates and screws, currently

under close scrutiny regarding biodegradation issues, still have considerable mechanical limitations over equivalent alloy plates and screws.

Open reduction and internal fixation of midfacial fractures are usually accomplished via an intraoral sublabial approach with gingivobuccal incisions placed unilaterally or bilaterally, depending on the extent of fractures requiring subperiosteal exposure and reduction. This approach can be combined with various other methods including a transconjunctival approach to the orbital floor and rim, depending on fracture extent. Other approaches used to give access to the inferior, lower medial, and lateral aspects of the orbital cavity are subciliary, subtarsal, and infraorbital approaches.

Le Fort III fractures will often require an additional coronal approach for adequate exposure and reduction of the fracture. The coronal or bitemporal incision is also used to approach the anterior cranial vault, the forehead, and the upper and middle regions of the facial skeleton.

In some cases the glabellar approach can be used to expose nasoethmoidal fracture. It is particularly advantageous in elderly patients who have developed horizontal glabellar furrows. Facial fractures are often associated with lacerations. These existing soft-tissue injuries can be used to access directly the facial bones for management of the fractures.

The maxilla should be stabilized to the next highest stable facial structure, which varies with Le Fort fracture level. At the Le Fort I level, fixation is placed along the vertical buttresses of the maxilla at the piriform and zygomatic buttresses. The reconstruction sequence to reestablish midfacial pillars and dimensions begins with establishing the most reliable reference structures. This can be occlusion, an outside-to-inside or an up-to-down procedure as a first step. At higher Le Fort levels it may be necessary to use fixation to the nasalbones, the orbital rims, or the zygomaticofrontal sutures. The importance of achieving accurate three-dimensional reduction of the fractures along with accurate alignment of the occlusion prior to applying internal fixation cannot be overemphasized. Accurate reduction and titanium miniplate fixation of the fractured nasomaxillary and zygomaticomaxillary buttresses are key elements in stabilizing Le Fort I and II fractures. This should be accomplished after associated fractures are addressed, especially in patients with Le Fort II and III fractures, and the patient is placed in maxillomandibular fixation for occlusal alignment. Perioperative prophylactic antibiotics are prescribed in patients with midfacial fractures.

The introduction and acceptance of low profile titanium miniplates (1.5- 2.0 mm screws) have improved the ability to stabilize the majorload-bearing midface buttresses. Even smaller microplates (1.0-1.3 mm screws) assist in stabilizing multiple comminuted segments in non-load-bearing regions after fixation of the major buttresses.

Complexity of fracture fixation is not only determined by fracture morphology, including the number of fracture lines, but also depends on the necessary approach, accessibility, visibility of the area of interest and the stability of the fracture reduction.

Every under- or overcontouring of the bony midface in primary fracture repair results very likely in unfavorable projection of the soft-tissue mask and this again results in an esthetic compromise. In addition, functional disorders may follow such as malocclusion or orbital dysfunction.

The number, size, and position of plates and screws might vary according to the biomechanical needs and individual fracture situation.

In cases of comminution with small fragments, surgical exposure may require these fragments be removed, resulting in a defect fracture. Immediate bone grafting has been advocated for the severely comminuted maxillary antrum. This treatment prevents prolapse of the facial soft tissue into the maxillary sinus and the facial deformation that results. Titanium mesh works well for this procedure. The use of plate fixation should be kept to the minimum required to achieve fracture stabilization. Multiple facial fractures should be treated as separate units.

- *Algorithms for the formation of professional skills.*

1. To master the method of osteosynthesis of jaw bones on phantoms: a) fix the jaw fragments with the help of a bone suture, b) fix the jaw fragments with the help of miniplates and screws, c) fix the fractures of the lower and upper jaws, jaw bone and arch.
2. To be able to use the operative operative methods of osteosynthesis of facial skeleton bones on models and phantoms; c) be able to choose the method of surgical treatment of articular fractures with displacement, d) evaluate the positive and negative sides when applying different methods.
3. Learn to fix the apparatus of V.F.Rudko on the models, a) justify the indications for the use of the apparatus of V.F.Rudko B) to know how to provide the patient with effective analgesia, to have access to the bone c) to be able to impose the apparatus Rudko's.

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

Individual tasks:

Task №1.

In a 24-year-old soldier injured by a shell splinter was diagnosed a fracture of mandible accompanied by an over 2 cm long bone defect in the chin area. What method of fixation of mandible fragments is indicated?

A. Miniplate osteosynthesis
B. **Extraoral apparatus osteosynthesis**
C. MMF ligatures
D. Bimaxillary arch bars
E. Gunning-Port's splint

Task №2.

A 75-year-old patient has been admitted to the dental department for the right-angle mandibular fracture with a displacement. Objectively: the face is asymmetric due to the post-traumatic swelling; palpation reveals the mobility of fragments and pain. The patient has a lifelong history of epilepsy. What is the best method of treatment?

A. Polyamide thread osteosynthesis
B. **Miniplate osteosynthesis**
C. Extraoral apparatus osteosynthesis
D. Immobilization with bimaxillary arch bars
E. Immobilization with Port splint.

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

A soldier injured in a projectile is diagnosed with a refractory fracture of the mandible with a bone defect in the chin area greater than 3 cm. What method of fixation of the mandibular fragments is shown? What additional examination methods should be used to diagnose it? What alternative examination methods can be used in this clinical setting? 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 self-employment.To work on phantoms the technique of examination and palpation of maxillofacial area, oral cavity under conditions of phantom class.
- Evaluation.

Conduct standardized final control using individual test tasks and questions (20 min.), Work check (5-10 min.). Evaluate the student's current activities during the classroom, taking into account

standardized final control, analyze the student's progress, announce the evaluation of each student's activity, and display it in the student attendance and student log book.An adult group at the same time makes assessments in the record of the record of success and attendance of classes by students, the teacher certifies them with his signature.

Brief informing the students about the topic of the next lesson and the methodical measures for preparing for it.

Basic knowledge level:

1. Anatomy of the bones of the facial skeleton.
2. Mechanism of displacement of fragments at fractures of facial skull bones.
3. Orthopedic methods of treatment of fractures of jaws.
4. Features of consolidation of fractures of the facial skeleton.

List of questions to be studied by the student:

1. Indications for osteosynthesis of facial bones.
2. Preparation of the patient for osteosynthesis.
3. Choice of the fragments fixation methods.
4. Peculiarities of osteosynthesis in the lower and upper jaw, zygomatic arch fractures.
5. Hardware operative methods of osteosynthesis.
6. Hardware treatments of the upper and lower jaw fractures (Rudko, Zbarzh devices, etc.).
7. Peculiarities of postoperative period in patients with trauma.
8. Possible complications and ways of prevention.
9. Compression ostheosynthesis

The list of practical skills to be learned by the student:

1. To analyze the indications and contraindications to the use of osteosynthesis and hardware methods of treatment of jaw fractures.
2. Explain the principles of osteosynthesis in fractures of the jaws.
3. Classify surgical methods of treatment of fractures of the face.
4. To interpret the radiographs of patients with fractures of the facial bones.
5. To analyze the possible complications in the treatment of fractures of the face by surgical methods.
6. Develop a plan for the treatment of various types of facial bone fractures by surgical methods.
7. Preparation of the patient for osteosynthesis surgery.
8. Hardware operative methods of osteosynthesis.
9. Features of the postoperative period in traumatic patients. Possible complications.

Situational tasks and questions on the topic of the lesson:

1. Under what type of anesthesia the osteosynthesis of mental area must be underwent?
   A. Intravenous narcosis
   B. Infiltration
   C. Mask narcosis
   D. **Local potential anesthesia**
   E. Endotracheal narcosis

2. What surgical approach is usually used for mandibular condyle osteosynthesis?
   A. Infrazygomatic
   B. Intraoral
   C. Retromandibular
   D. Suprazygomatic
   E. **Submandibular**

3. What method of the lower jaw osteosynthesis is the most perspective?
   A. Extraoral apparatus osteosynthesis
   B. Application of U-shaped metal devices
   C. **Miniplate osteosynthesis**
   D. Application of intrabone fixing screws
   E. Polyamide thread osteosynthesis

4. What are the indications for apparatus immobilization of the lower jaw fragments?
   A. Presence of a tooth in a line of fracture
   B. Mandibular fracture with parodontosis teeth
   C. Soft tissues interposition
   D. Complicated reposition due to the displacement of the fragments
   E. **Bone defect of the jaw**

5. A 42 years-old-patient was has got gunshot injury of the face. Fracture of the lower jaw with bone defect of mental area takes place. What method of immobilization is indicated?
   A. Monomaxillary splint
   B. **Extraoral apparatus osteosynthesis**
   C. Bimaxillary arch bars
   D. Miniplate osteosynthesis
   E. Wire fixation osteosynthesis

Literature:

Basic:

1. Oral and Maxillofacial Surgery: Textbook, Part 1, 2 / V. O. Malanchuk. – Vinnytsia: Nova Knyha Publishers, 2011. – 453p.
2. PETERSON'S PRINCIPLES OF ORAL AND MAXILLOFACIAL SURGERY Second Edition, 2004. - 1502 p.
3. Principles of Dental Local Anaesthesia and Teeth Removal / Ya. E. Vares, R. Z. Ogonovsky, Ch. R. Pohranychna – LNMU, 2007. – 63p.
4. Atlas of Human Anatomy / F. Netter – 2nd ed. – New Jersey: ICON Learning Systems. – 592 p.

Additional:

1. The AIDS booklet. – Boston: WCB Mcgraw Hill, 1999. – 70 p.
2. Contemporary Oral and Maxillofacial Surgery / J. P. Sapp, L. R. Eversole, G. P. Wysocki – 2nd ed.- St. Louis: Mosby – 2004. – P. 88-90.
3. Contemporary Oral and Maxillofacial Surgery / L. J. Peterson, E. Ellis, J. R. Hupp, M.R. Tucker – 3rd ed. – St. Louis: Mosby – Year Book, Inc. – 1998. – P. 69-82.
4. Bauml, Philips R.W., Lund M.R. Texbook of Operative Dentistry. - 3-rd ed.- Philadelphia: Saunders, 1995.- 661p.
5. Kharkov L. V. Pediatric oral and maxillofacial surgery : a textbook for students of higher medical educational institutions of the III-IV levels of accreditation / L. V. Kharkov, L. M. Yakovenko, N. V. Kiselyova ; ed. by L. V. Kharkov. - Kyiv : AUS Medicine Publishing, 2015. - 103 p.
6. Pohranychna, Ch. R. Maxillofacial oncology : guide of lectures on oral and maxillofacial surgery for the english-medium students of the 5th year education at dentistry faculty (autumn semester) : methodological guide / Ch. R. Pohranychna, R. Z. Ogonovsky. - Lviv, 2011.
7. Timofieiev O.O. Anesthesia in Oral and Maxillofacial Surgery / O.O. Timofieiev, I.I. Fesenko. - Kyiv: OMF Publishing, 2016, 128 p.

Ministry of Health of Ukraine
Danylo Halytsky Lviv National Medical University

"Approwed"
on the meeting of the Department
of Surgical Dentistry
and Maxillofacial Surgery

Head of the Department:
professor Ya. E. Vares

METHODICAL GIUDE FOR PRACTICAL LESSONS

Educational discipline	SURGICAL DENTISTRY
Topic of the lesson	**Topic №12**. ***Types of bone regeneration, primary and secondary bone healing***
Course	4th
Faculty	Dental

Lviv – 2019

Actuality of the topic: Despite of considerable constructive improvements of medical devices and development of the newest biologically-inert and biologically-active materials in traumatic injuries of the maxillofacial area, it is impossible to achieve the necessary clinical results without taking into account the state of bone tissue, its biological and physical and physical properties. The available volume and quality of the bone, the peculiarities of the spatial distribution peculiar to its various types (architectonics), determine the closest and distant prognosis of maxillofacial operations, the technical possibility of using one or another technique, features of rehabilitation of the patient in the postoperative period. When treating traumatic injuries of the facial skull, the dentist must understand at the histological level the processes of bone regeneration and repair, the stage of bone healing, and to know the general and local factors that optimize the course of reparative osteogenesis.

Aim of the lesson: to study the stages of bone healing, features of reparative regeneration of the bones of the face, be able to justify the choice of treatment and optimize the repair of damaged bone structures.

Learning objectives:

- *Professional competence:*

1. Collection of medical information on the patient's condition.
2. Evaluation of the results of laboratory and instrumental research.
3. Establishment of a clinical diagnosis of dental disease.
4. Planning and conducting preventive measures for dental diseases.
5. Execution of medical and dental manipulations.
6. Organization and conducting of dental medical examination of persons subject to dispensary supervision.
7. Assessment of the environmental impact on the health of the population (individual, family, population).
8. Maintaining medical records.
9. Processing of state, social and medical information.

- *General competence:*

1. The ability to 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 in the use of information and communication technologies.
6. Ability to search, process and analyze information from various sources.
7. Ability to adapt and act in a new situation; ability to work autonomously.
8. Ability to identify, put and solve problems.
9. Ability to choose a communication strategy.
10. Ability to work in a team.
11. Interpersonal skills.
12. Ability to act on the basis of ethical considerations (motives).
13. Ability to act in a socially responsible and civic conscious manner.

Methods of training:

Preparatory stage - Frontal oral interview.
The main stage - practical training, role-playing game.
The final stage is brainstorming.

Interdisciplinary integration

Disciplines	Student should know	Student should be able to
Previous:		
Normal anatomy Normal physiology	Know the anatomical and physiological features of the maxillofacial area: - structure of the upper and lower jaws; - innervation and vascularization of these sites; - structure of the lymphatic system of the head and neck; - structure of the muscles of the head and neck; - structure of the head and neck areas.	To be able to explain the structure of systems and organs of maxillo-facial area (MFA)
Topographical anatomy	To know the topography of the organs of MFA	To be able to explain the topography of the organs of MFA
Hystology	To know histological structure of soft and hard tissues of MFA	To be able to explain the stages of manufacturing of cytological, histological preparations
Imunology	To know methods of regulation of processes of bone tissue regeneration	Be able to explain the processes of bone regeneration
Radiation diagnostics.	To know the methods of radiological examination used in maxillofacial traumatology	To be able to explain the principles on which these or other methods are based (X-ray, CT, MRI, ultrasound)
Pharmacology	Know the pharmacological features of the drugs used for topical and general treatment of mandibular fractures.	Be able to prescribe drugs of different pharmacological groups
Intradisciplinary integration		
Topic 1. (Module 1. “Propedeutics of surgical dentistry”): Methods for examination of the oral cavity, jaws, face and neck.	To know the methods for examination of the oral cavity, jaws, face and neck.	Be able to provide examination of the oral cavity, jaws, face and neck.
Topic 1. («Traumatology of MFA»): … Methods of examination of patients with trauma of the MFA.	To know the method of examination of patients with trauma of MFA	Be able to carry out examination of patients with trauma of MFA
Topic 10. ("Traumatology of the MFA"): Permanent (therapeutic) immobilization of the jaws with tooth, tooth,	To know the principles of permanent repositioning and fixing of fragments.	Be able to carry out permanent immobilization with damage to the bones of the facial skull using orthopedic methods.

gum, gums with injuries of the bones of the facial skull.		
Topic 11. ("Traumatology of the MFA"): Osteosynthesis of the bones of the facial skeleton: indications for operations, methods of conduction, possible complications …	To know the principles of fastening of fragments of braids.	Be able to perform osteosynthesis of jaw bones on phantoms, including fixation of the jaw fragments with the help of a bone suture, fixation of the jaw fragments with the help of miniplates and screws. to use hardware operative methods of osteosynthesis of facial skeleton bones.

Plan and organizational structure of practical lesson of the discipline

Duration of practical lesson is 2 academic hours – 1 hour 30 minutes including 10 minutes for a break

№	The main stages of the lesson, their functions and content	Time period	Methods of eductation and control	Materials of methodical support	
1.	**Preparatory stage**	**20 min.**			
1.1	Organizational measures	5 min.			
1.2	Setting up of educational goals and motivation.	5 min.			
1.3	Control of the initial level of knowledge (standardized control methods).	10 min.	Individual theoretical evaluation. Solving typical tasks.Test control.Written interwiev.	Question for an individual oral and written evaluation. Typical situational tasks and tests.	Tables, phantoms, collapsible jaws, textbooks, manuals, reference books, atlas, methodical recommendations, video films
2.	**Main Stage**	**30 min.**			
	Formation of professional skills and abilities: 1.Method of examination of the patient with trauma of the tissues of the maxillofacial area (to collect anamnesis; to conduct external and intraoral examination of the MFA and to assess		Formation of professional skills: Work with patients with pathology of maxillofacial area. Work out the results of additional methods of examination of patients with diseases of the maxillofacial area. Solving typical situational tasks. Oral and written evaluation	Patients with pathology of maxillofacial area. The history of the disease.Selection of results of additional survey methods. Situational tasks.Algorithms.Phantoms, surgical instruments.Thematic videos.	

	the volumeof tissue damage). 2. Perform repositioning of the bone fractures. 3. Be able to assign additional examination methods for MFA injury and interpret the results (X-ray examination of the facial skull in two or more projections, 3D cone-beam CT, MRI).. 5. Be able to determine the indications to optimization of osteogenesis. 6. Be able to choose methods of optimization of osteogenesis. 7. To make a plan of complex treatment of the patient with non-union.		on standardized list of issues.Work with phantoms, view thematic videos.	
3.	**Final stage**	**30 min.**		
3.1	Control and correction of the level of professional skills and abilities		Individual skills control.Control of skills by solving non-typical situational problems with illustrative material.	Phantoms, surgical instruments.The history of the disease.Selection of results of additional methods of examination of thematic patients.Unusual situational tasks.
3.2	Control and correction of the level of professional skills and abilities.		Final evaluation of the students	
3.3	Homework. Informing students about the topic of the next lesson.			Recommended literature

Methodology of organization of educational process in practical lesson.

STRUCTURE OF PRACTICAL LESSON

<u>Preparation stage</u> (20 min.)

To substantiate the significance of the subject for further study of the discipline and professional activity of the doctor in order to formulate motivation and purposeful educational

activity. Get acquainted with students with specific goals and lesson plans.Conduct standardized control of the initial level of student training, discussion and student answers.

• *Organizational part of the lesson: presence check, evaluation of the uniform.*

- • *Informing about of the topic and the purpose of the lesson.*

Topic of the lesson: «Types of bone regeneration, primary and secondary bone healing».

Aim of the lesson: to study the stages of bone healing, features of reparative regeneration of the bones of the face, be able to justify the choice of treatment and optimize the repair of damaged bone structures.

- *Motivation of educational activity.*

Despite of considerable constructive improvements of medical devices and development of the newest biologically-inert and biologically-active materials in traumatic injuries of the maxillofacial area, it is impossible to achieve the necessary clinical results without taking into account the state of bone tissue, its biological and physical and physical properties. The available volume and quality of the bone, the peculiarities of the spatial distribution peculiar to its various types (architectonics), determine the closest and distant prognosis of maxillofacial operations, the technical possibility of using one or another technique, features of rehabilitation of the patient in the postoperative period. When treating traumatic injuries of the facial skull, the dentist must understand at the histological level the processes of bone regeneration and repair, the stage of bone healing, and to know the general and local factors that optimize the course of reparative osteogenesis.

Materials of methodical support of the preparatory stage of the lesson:

Questions to frontal survey:

1. Regeneration of the bone tissue, types.
2. Peculiarities of physiological bone regeneration.
3. Peculiarities of reparative bone regeneration.
4. Stages of the bone healing.
5. Methods of optimization of regeneration of the bone tissue.
6. Factors which have positive influence on regeneration of the bone tissue.
7. Factors which have negative influence on regeneration of the bone tissue.
8. Complications. Their treatment and ways of prevention.

The main stage: the formation of professional skills (30 min)

Conducting professional training.

Materials of methodical support of the main stage of the lesson:

Bone has 3 basic types of constrictors:

Osteogenesis, the synthesis of new bone by the cells of the graft or cells of host origin, is primary. Graft bone cells usually survive initial transplantation if properly handled and have been shown to synthesize a new bone. The cancellous bone, with its surface area, has a greater potential for forming a new bone than does the cortical bone.

Osteinduction is a second way in which a bone graft may function as a source of osteogenesis, osteoinduction is the recruitment of mesenchymal stem cells that differentiate into osteoblasts from the surrounding bed. The recruitment and differentiation of these cells are modulated by low-molecular-weight peptides such as the glycoprotein, bone morphogenetic protein. Bone morphogenetic protein is a hydrophobic, nonspecies-specific protein extracted from the diaphysis of the cortical bone, dentin, and various bone-forming tumors.

Osteoconduction is a term referring to the three-dimensional process of growth of capillaries, perivascular tissue, and osteoprogenitor cells of the host into the graft. The graft functions as a trellis or scaffold for the ingrowths of a new host bone.

Phases of fracture healing:

Phase of inflammation. In this phase, also sometimes called the immediate reaction or the phase haematoma formation, bleeding occurring from the damaged bone ends adjacent soft tissue forms a haematoma between the bone fragments. This haematoma is essential for fracture healing to occur. The fibrin of the clot serves as a scaffold for fibrocellular invasion.

Phase of osteogenic repair tissue. The next phase consists of organization of the fracture haematoma. The haematoma becomes invaded by fibrovascular tissue replacing the clot laying down collagen fibres and matrix which later becomes mineralized to from the woven bone of provisional or primary callus.

In some cases, cartilage may form in the periphery of the callus.

There are two theories: osteoprogenitors cells and osteogenic induction.

Osteoprogenitors cells — repair tissue arises specialized cells with predetermined commitment to bone formation. Osteoprogenitor cells occur in close association with bone surface (cambial layer of periosteum) or with bone marrow.

Osteogenic induction — repair is due to activity of previously uncommitted fibroblasts (mesenchymal stem cells) which could develop the power of osteogenesis given the appropriate environmental stimulation by the phenomenon of osteogenic induction. There cells do not arise from the bone itself but from the adjacent surrounding soft tissue. Indeed, soft tissues play a key role in the healing of fractures. The fibroblasts in the soft tissue cannot be distinguished morphologically from osteoprogenitor cells of bone.

Phase of remodeling — once the fracture is bridged by bony callus of osteoid the newly formed bone must adapt to its new function. Remodeling occurs just as the process of replacement and repair goes on continuously in normal uninjured bone.

There is the modeling process occurring in the cortical bone which is quite different from that occurring in the cancellous bone. In remodeling the normal Haversian system of osteons is developed from the initial less organized woven bone tissue. Remodeling is governed by Wolffs Law of Functional Adaptation of bone. The trabeculae realign themselves along directions of principal stress or strain to best protect them from bending. The end result is maximum structural support for minimum osseous structure.

In the cancellous bone, the cells are never very far away from the blood vessels. The whole process of bone apposition takes place on the surface of the trabeculae by the phenomenon of “Creeping Substitution”.

In compact bone, the presence of more deeply placed cells require the presence of Haversian systems which must be replaced. Remodelling occurs in a more orderly sequence. First, the osteoclasts ream out a tunnel in the dead bone down which a blood vessel follows, bringing osteblasts which lay down the lamellar bone of a new osteon — osteoblastic “cutter head”.

- *Algorithms for the formation of professional skills.*

1. Method of examination of the patient with trauma of the tissues of the maxillofacial area (to collect anamnesis; to conduct external and intraoral examination of the MFA and to assess the volumeof tissue damage).
2. Perform repositioning of the bone fractures.
3. Be able to assign additional examination methods for MFA injury and interpret the results (X-ray examination of the facial skull in two or more projections, 3D cone-beam CT, MRI)..
5. Be able to determine the indications to optimization of osteogenesis.
6. Be able to choose methods of optimization of osteogenesis.
7. To make a plan of complex treatment of the patient with non-union.

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

Individual tasks:

Task №1.

A 45-years-old patient after the successfully treated bilateral mandibular fracture was discharged from the hospital. In the recommendations physician noted that the patient should avoid overload on

the teeth-jaw system, and avoid traumatic sports for some time. How long stage of reparative remodeling asts?

A. 12-14 months after trauma
B. 21 day
C. 3-6 months after trauma

D. 1 -2 months after the end of treatment

E. 6-12 months after trauma

Task №2.

In maxillofacial trauma item delivered four victims injured while working in the mine. Patients are in consciousness, contact. After examination mandibular fractures and wounds of the lower parts of face were revealed. Which from the following manipulations should be performed at this stage of treatment?

A. Rinsing of the wound, careful hemostasis
B. Surgical treatment of bone wound (with fixation of jaw fragments) and soft tissue injuries
C. Complete anesthesia, removal of foreign bodies, non-viable tissue clots

D. Conducting antitetanic vaccination following indications, administration of medical treatment

E. All the above listed

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

Patient B. 19 years old was injured in the mandible 2 weeks ago. Immediately after the injury, he was taken to the maxillofacial ward by emergency medical care. After the examination, the following diagnosis was made: bilateral fracture of the mandible in the area of the corners. An open focal osteosynthesis with bone plates was made. What is the stage of bone healing in the patient at present? What drugs can be used to optimize reparative osteogenesis? 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 self-employment.To work on phantoms the technique of examination and palpation of maxillofacial area, oral cavity under conditions of phantom class.
- Evaluation.

Conduct standardized final control using individual test tasks and questions (20 min.), Work check (5-10 min.). Evaluate the student's current activities during the classroom, taking into account standardized final control, analyze the student's progress, announce the evaluation of each student's activity, and display it in the student attendance and student log book.An adult group at the same time makes assessments in the record of the record of success and attendance of classes by students, the teacher certifies them with his signature.

Brief informing the students about the topic of the next lesson and the methodical measures for preparing for it.

Basic knowledge level:

1. Micro- and macrostructure of bone tissue.
2. Features of embryonic development of bone tissue.
3. Features of the reaction of bone tissue to physiological load.
4. Applied value of biological properties of bone tissue.
5. Current methods for the study of damage to the thyroid.

6. Methods of treatment of injuries of facial skull bones.
7. Definition of "repair" and "regeneration".
8. Osteotropic materials for optimization of bone tissue regeneration.

List of questions to be studied by the student:

1. Mesenchymal osteogenesis.
2. Cartilage osteogenesis.
3. Factors that influence osteogenesis and regeneration.
4. Types of bone tissue regeneration.
5. Requirements for the reposition of fragments.
6. Phases of reparative osteogenesis.
7. Causes of impaired reparative regeneration.
8. Methods of optimization of reparative regeneration.
9. Modern methods of research of bone regeneration.
10. Types of fusion of bone fragments at fractures.
11. Conditions for improving the course of osteogenesis.
12. Physiotherapeutic methods of treatment at various stages of reparative osteogenesis.
13. Medicaments used to optimize the course of reparative osteogenesis.

The list of practical skills to be learned by the student:

1. Method of examination of the patient with trauma of the tissues of the maxillofacial area (to collect anamnesis; to conduct external and intraoral examination of the MFA and to assess the volumeof tissue damage).
2. Perform repositioning of the bone fractures.
3. Be able to assign additional examination methods for MFA injury and interpret the results (X-ray examination of the facial skull in two or more projections, 3D cone-beam CT, MRI)..
5. Be able to determine the indications to optimization of osteogenesis.
6. Be able to choose methods of optimization of osteogenesis.
7. To make a plan of complex treatment of the patient with non-union.

Situational tasks and questions on the topic of the lesson:

1. What stage of the bone wound healing lasts till 12-17 day after trauma and is characterized by such processes: formation of granulation tissue, formation and differentiation of collagen tissues structures (collagen matrix formation)?

A. **Stage of remodeling**
B. Stage of the bone wound purification
C. Stage of damage
D. Stage of reparative remodeling
E. Stage of primary osseous regenerate formation

2. A 40 years old patient was delivered in Trauma Hospital with fractures of the mandible and radial bone. Trauma happened in the street: beaten by unknown for robbery. The patient was assigned radiography. What are the typical radiological signs of bone fractures?

A. **Presence of the fracture line**
B. Osteoporosis
C. Osteosclerosis
D. Osteolisis
E. Osteodestruction

3. A 30 years old policeman was delivered in Trauma Hospital with a gunshot wound to the face, which received during the arrest of the offender. What pathogenic factors impede wound

healing by the secondary intention?

A. Complicated form of the wound channel, high degree of microbial contamination
B. High kinetic energy of the tissues
C. Widely affected area, including the area of molecular vibrations
D. **All above listed factors**
E. A large amount of necrotic tissues and foreign bodies

4. Physiological regeneration:
   A. Occurs when damage
   B. Happens in elder age
   C. No correct answer
   D. **Occurs during the whole life of an organism**
   E. Do not occur without any damage

5. Patient 60 years old. Diagnosis: traumatic mandibular angular fracture on the right. From the anamnesis we know that the patient has thyroid problems and is continuously treated by endocrinologist. In a patient a slowed consolidation of bone fragments is expected. What factor mostly influence on the bone regeneration in this case?
   A. Nervous factor
   B. **Hormonal factor**
   C. Genetic factor
   D. Epigenetic factor
   E. E**.** External factor

Literature:

Basic:

1. Oral and Maxillofacial Surgery: Textbook, Part 1, 2 / V. O. Malanchuk. – Vinnytsia: Nova Knyha Publishers, 2011. – 453p.
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Ministry of Health of Ukraine
Danylo Halytsky Lviv National Medical University

"Approwed"
on the meeting of the Department
of Surgical Dentistry
and Maxillofacial Surgery

Head of the Department:
professor Ya. E. Vares

METHODICAL GIUDE FOR PRACTICAL LESSONS

Educational discipline	SURGICAL DENTISTRY
Topic of the lesson	**Topic №13**. ***Combined injures of maxillofacial area: clinical features, diagnostics, treatment***
Course	4th
Faculty	Dental

Lviv – 2019

Actuality of the topic: set of pathological and adaptive processes caused by severe trauma is manifested by a complex symptom complex, called traumatic disease. These processes accompany any trauma, including the maxillofacial area, which leads to impaired anatomical integrity of tissues and is accompanied by impaired function, local and general reaction of the organism. This is a phase pathological process that gradually develops with severe injuries, which are based on disorders of homeostasis, general and local adaptation processes, and clinical manifestations depend on the nature, number and localization. Therefore, professionals in the dental profile should have the basic principles of diagnosis and treatment of traumatic disease, combined injuries.

Aim of the lesson: to study clinical manifestations and to be able to diagnose the combined injuries of the maxillofacial area, periods of traumatic illness; to provide medical care at the pre-hospital stage, to get acquainted with the principles of complex therapy of traumatic disease. Improve theoretical knowledge and practical skills to provide emergency medical care to victims of various traumatic injuries, accompanied by impaired vital functions of the body, life threatening and in need of emergency medical measures.

Learning objectives:

- *Professional competence:*

1. Collection of medical information on the patient's condition.
2. Evaluation of the results of laboratory and instrumental research.
3. Establishment of a clinical diagnosis of dental disease.
4. Planning and conducting preventive measures for dental diseases.
5. Execution of medical and dental manipulations.
6. Organization and conducting of dental medical examination of persons subject to dispensary supervision.
7. Assessment of the environmental impact on the health of the population (individual, family, population).
8. Maintaining medical records.
9. Processing of state, social and medical information.

- *General competence:*

1. The ability to 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 in the use of information and communication technologies.
6. Ability to search, process and analyze information from various sources.
7. Ability to adapt and act in a new situation; ability to work autonomously.
8. Ability to identify, put and solve problems.
9. Ability to choose a communication strategy.
10. Ability to work in a team.
11. Interpersonal skills.
12. Ability to act on the basis of ethical considerations (motives).
13. Ability to act in a socially responsible and civic conscious manner.

Methods of training:

Preparatory stage - Frontal oral interview.
The main stage - practical training, role-playing game.

The final stage is brainstorming.

Interdisciplinary integration

Disciplines	Student should know	Student should be able to
Previous:		
Disaster medicine	Know the amount of medical care provided at each stage of the evacuation.	Be able to explain the basic principles of emergency care for victims.
Topographical anatomy	To know the topography of the organs of MFA	To be able to explain the topography of the organs of MFA
General Surgery	Know the principles of first aid.	Demonstrate bundling skills, bonding. Resuscitation
Pharmacology	Know the pharmacological features of the drugs used for topical and general treatment of mandibular fractures.	Be able to prescribe drugs of different pharmacological groups
Intradisciplinary integration:		
Topic 1. (Module 1. "Propedeutics of surgical dentistry"): Methods for examination of the oral cavity, jaws, face and neck.	To know the methods for examination of the oral cavity, jaws, face and neck.	Be able to provide examination of the oral cavity, jaws, face and neck.
Topic 2. («Traumatology of MFA»): Traumatic injuries to soft tissues of the MFA	Know the features of soft facial tissue wounds.	Be able to diagnose the depth and severity of the wound. To be able to carry out a PSC of a wound.
Topic 3. («Traumatology of MFA»): Methods of surgical treatment of soft tissue wounds with regard to aesthetics of the face, types of sutures …		
Topic 6. («Traumatology of MFA»): Mandibula fractures…	To know the features of traumatic injuries of the bones of the MFA.	To be able to carry out a PSC of a wound. Be able to diagnose the depth and severity of the wound.
Topic 7. («Traumatology of MFA»): Maxilarry fractures…		
Topic 8. («Traumatology of MFA»): Injuries of the		

jaws and nasal bones …		

Plan and organizational structure of practical lesson of the discipline

Duration of practical lesson is 2 academic hours – 1 hour 30 minutes including 10 minutes for a break

№	The main stages of the lesson, their functions and content	Time period	Methods of eductation and control	Materials of methodical support	
1.	**Preparatory stage**	**20 min.**			
1.1	Organizational measures	5 min.			
1.2	Setting up of educational goals and motivation.	5 min.			
1.3	Control of the initial level of knowledge (standardized control methods).	10 min.	Individual theoretical evaluation. Solving typical tasks.Test control.Written interwiev.	Question for an individual oral and written evaluation. Typical situational tasks and tests.	Tables, phantoms, collapsible jaws, textbooks, manuals, reference books, atlas, methodical recommendations, video films
2.	**Main Stage**	**30 min.**			
	Formation of professional skills and abilities: 1 To master the technique of examination of the patient with combined lesions of the thyroid, traumatic disease: (to assess the general condition of the patient; to conduct the examination of the thyroid; 2. Master the skills of assistance organization during the stages of medical evacuation. 3. Master the		Formation of professional skills: Work with patients with pathology of maxillofacial area. Work out the results of additional methods of examination of patients with diseases of the maxillofacial area. Solving typical situational tasks. Oral and written evaluation on standardized list of issues.Work with phantoms, view thematic videos.	Patients with pathology of maxillofacial area. The history of the disease.Selection of results of additional survey methods. Situational tasks.Algorithms.Phantoms, surgical instruments.Thematic videos.	

	principles and skills of first aid in case of combined injuries and traumatic shock. 4. Master the principles of providing comprehensive medical care for combined injuries and traumatic shock.			
3.	**Final stage**	**30 min.**		
3.1	Control and correction of the level of professional skills and abilities		Individual skills control.Control of skills by solving non-typical situational problems with illustrative material.	Phantoms, surgical instruments.The history of the disease.Selection of results of additional methods of examination of thematic patients.Unusual situational tasks.
3.2	Control and correction of the level of professional skills and abilities.		Final evaluation of the students	
3.3	Homework. Informing students about the topic of the next lesson.			Recommended literature

Methodology of organization of educational process in practical lesson.

STRUCTURE OF PRACTICAL LESSON

<u>Preparation stage</u> (20 min.)

To substantiate the significance of the subject for further study of the discipline and professional activity of the doctor in order to formulate motivation and purposeful educational activity. Get acquainted with students with specific goals and lesson plans.Conduct standardized control of the initial level of student training, discussion and student answers.

• *Organizational part of the lesson: presence check, evaluation of the uniform.*

• *Informing about of the topic and the purpose of the lesson.*

Topic of the lesson: «Combined injures of maxillofacial area: clinical features, diagnostics, treatment».

Aim of the lesson: to study clinical manifestations and to be able to diagnose the combined injuries of the maxillofacial area, periods of traumatic illness; to provide medical care at the pre-hospital stage, to get acquainted with the principles of complex therapy of traumatic disease. Improve theoretical knowledge and practical skills to provide emergency medical care to victims of various traumatic injuries, accompanied by impaired vital functions of the body, life threatening and in need of emergency medical measures

Motivation of educational activity.

Set of pathological and adaptive processes caused by severe trauma is manifested by a complex symptom complex, called traumatic disease. These processes accompany any trauma, including the

maxillofacial area, which leads to impaired anatomical integrity of tissues and is accompanied by impaired function, local and general reaction of the organism. This is a phase pathological process that gradually develops with severe injuries, which are based on disorders of homeostasis, general and local adaptation processes, and clinical manifestations depend on the nature, number and localization. Therefore, professionals in the dental profile should have the basic principles of diagnosis and treatment of traumatic disease, combined injuries.

Materials of methodical support of the preparatory stage of the lesson:

Questions to frontal survey:

1. Clinic of traumatic shock
2. Treatment of traumatic disease
3. Diagnostic criteria for the severity of traumatic shock
4. Definition of the concept - traumatic disease, etiology
5. Stages of traumatic disease
6. Pathogenesis of traumatic disease
7. Combined injuries of the maxillofacial area
8. Definition of the concept - traumatic shock, stages
9. Clinic of traumatic disease
10. Features of providing emergency care to victims with a combined injury of the maxillofacial area
11. Features of treatment of victims with a combined injury of the maxillofacial area.

The list of practical skills to be learned by the student:

1 To master the technique of examination of the patient with combined lesions of the thyroid, traumatic disease: (to assess the general condition of the patient; to conduct the examination of the thyroid;
2. Master the skills of assistance organization during the stages of medical evacuation.
3. Master the principles and skills of first aid in case of combined injuries and traumatic shock.
4. Master the principles of providing comprehensive medical care for combined injuries and traumatic shock.

The main stage: the formation of professional skills (30 min)

Conducting professional training.

Materials of methodical support of the main stage of the lesson:

An isolated trauma is a single defeat of one anatomical site.

Multiple injuries are a few injuries to one or more shells within an anatomical site.

Combined injury is a trauma where one factor affects several organs or anatomical parts of the body. The combined damage to the jaw-pulp area is tissue damage and craniocerebral injury, or simultaneous damage to other body bones. Combined trauma is a consequence of the influence of two or more striking factors with a different mechanism of action on the tissue. For example, simultaneous mechanical, radial, thermal, chemical and other damage.

The lesions caused by two or more damaging factors are combined. Combined radiation injuries — are:

- A combination of injuries (gunshot, nongunshot or bum) with radiation disease.
- A combination of injuries (wounds) with the presence of radioactive substances.

Radiation disease is caused by external irradiation by gamma particles and hard X-rays or receipt of a source of alpha- and beta- radiation into the body through a wound, respiratory tract or digestive tract. Radiation burns are caused by beta particles and soft X-rays. Radiation disease complicates wound healing, and mechanical injury aggravates the course of radiation disease (syndrome of

mutual aggravation). Depending on the absorbed dose of radiation several degrees of radiation disease severity are defined. If the dose of radiation is less than 1 Gy than radiation, disease is not caused.

Scheme of the surgical treatment for combined wounds:

1. Analgesia
2. Dissection and excision of the edges and bottom of the wound (according to the indications)
3. Wound inspection should be careful.
4. Removal of foreign bodies.
5. Removal of free bone fragments and debris of soft tissues.
6. Levelling of sharp edges of traumatized bone.
7. Removal of tooth from the line of the fracture.
8. Debridement should be simultaneous, completed by a suturing.

Polytrauma - is a simultaneous defeat of two or more anatomical sites, in which there is a violation of vital functions of the body. That is, a polytrauma is a hard combined trauma, accompanied by a traumatic shock, shocked combined trauma.

Syndrome of mutual encumbrance. Simultaneous defeat of several anatomical parts of the body leads to the development of a special pathological condition associated with the emergence of severe and threatening trauma - a syndrome of mutual encumbrance. This syndrome significantly increases the overall severity of injury - each of the local lesions individually may not pose a direct threat to the life of the wounded, but in aggregate, they often lead to the inevitability of the death of the victim.

Traumatic disease is a life of a damaged organism from the moment of trauma to its recovery or death. The term traumatic disease is generalizable, similar to the terms afterreanimation, burn, vibration, cesonic, radiation, contusive disease, etc. - all this is a group of "post-aggressive illnesses" of a person.

Clinical symptoms and the course of a traumatic disease depend on the localization, the nature and severity of the damage. It is characterized by: the presence of a wound or damage to soft tissues or bones caused by trauma of local and general pathological adaptation processes, a decrease in the efficiency of the victim.

Traumatic shock is a serious condition caused by trauma, which is accompanied by significant violations of the functions of vital organs, primarily blood circulation and respiration. Characterized by two phases of the run: erectile (tension, active reaction of the organism to the injury) and torpid (depletion of the main functions of life support).

Hemorrhagic shock - similar to the clinical picture of traumatic shock. Occurs with severe blood loss in the event of an injury (external bleeding) or with internal bleeding.

Hypovolemic shock develops at significant losses in the body of blood plasma and other liquids (diarrhea, exhausting vomiting, large burning surfaces), when the volume of circulating blood decreases directly. Depending on the amount of blood lost, there are processes of compensation for blood loss.

The clinical forms of a traumatic disease may vary, depending on a number of factors. By degree of severity, distinguish between mild, moderate, severe forms. By the nature of the course: complicated, uncomplicated. By the end result of a traumatic disease: a favorable result or unfavorable. The latter depends on the nature, severity, localization of the trauma, the reactivity of the organism (the body's ability to react in a certain way to the etiological factor), the body's resistance (the body's ability to resist pathological effects), the quality of the treatment of the victim, etc.

- *Algorithms for the formation of professional skills.*

1 To master the technique of examination of the patient with combined lesions of the thyroid, traumatic disease: (to assess the general condition of the patient; to conduct the examination of the thyroid;

2. Master the skills of assistance organization during the stages of medical evacuation.
3. Master the principles and skills of first aid in case of combined injuries and traumatic shock.
4. Master the principles of providing comprehensive medical care for combined injuries and traumatic shock.

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

Individual tasks:

Task #1.
A patient N., 42 years old, was taken to the maxillofacial department due to the injury received during an accident. During the examination, the "symptom of the glasses" is determined. When does this symptom occur when an isolated fracture of the bones of the skull base?
A. Arises directly after injury and does not go beyond the circular muscle of the eye
B. Arises no earlier than 12 hours after injury and is widespread
C. Occurs directly after injury and is widespread
D. It occurs not earlier than 24-48 hours after injury and is widespread
E. It occurs not earlier than 12 hours after injury and does not go beyond the circular muscle of the eye

Task #2.
What period after receiving a serious injury is "golden" for the first medical care, is crucial for determining the future course of a traumatic disease?
A. The first day after injury
B. First 12 hours after injury
C. The whole period of traumatic shock
D. The whole period of unsustainable adaptation
E. First hour after injury

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

A 37-year-old man with a trauma was delivered to a midwifery center. Objectively: the condition is extremely difficult. The patient is slowed down, pale, pulse 120 beats per minute, blood pressure 85/55 mm Hg, frequent breathing, 24 minutes, superficial; malocclusion; the middle area of the face is flattened. The bite is open. Moving of the alveolar process of the upper jaw determines the mobility of the middle area of the face. Palpation is determined by the symptom of a "step" on the lower ocular margin, the alveolar ridge on both sides. Formulate and justify: a) a possible diagnosis; b) the amount of pre-hospital care; c) additional research methods; d) a comprehensive treatment plan.

<u>Final stage</u> (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 self-employment.To work on phantoms the technique of examination and palpation of maxillofacial area, oral cavity under conditions of phantom class.
- Evaluation.

Conduct standardized final control using individual test tasks and questions (20 min.), Work check (5-10 min.). Evaluate the student's current activities during the classroom, taking into account standardized final control, analyze the student's progress, announce the evaluation of each student's

activity, and display it in the student attendance and student log book.An adult group at the same time makes assessments in the record of the record of success and attendance of classes by students, the teacher certifies them with his signature.

Brief informing the students about the topic of the next lesson and the methodical measures for preparing for it.

Basic knowledge level:

1. Topographic and anatomical structure of the head and neck, their blood supply and innervation.
2. Examination of the dental patient.
3. Additional methods of examination of patients with trauma of soft tissues and bones of MFA.
4. Organization of medical care of the maxillofacial wounds.
5. Principles of primary surgical treatment of wounds.
6. Methods of temporary and permanent immobilization for MFA injuries.
7. Modern pharmaceutical anti-shock drugs.

List of questions to be studied by the student:

1. Determination of combined injury.
2. Determination of chemical warfare agents.
3. Determination of radioactive substance.
4. Classification of combined injuries.
5. Pathogenesis of combined injuries.
6. Variants of the clinical course of combined injuries of the maxillofacial area.
7. Primary surgical treatment the maxillofacial area.
8. Prevention of complications in patients with combined injuries the maxillofacial area.
9. The concept of radiation disease.
10. Features of the clinical course of radiation disease, depending on the severity.
11. Pre-hospital and hospital care for patients with traumatic shock.
12. Prevention of traumatic shock.
13. Comprehensive effect of trauma on the body.
14. Prevention of complications in combined lesions of MFA and traumatic disease.

The list of practical skills to be learned by the student:

1 To master the technique of examination of the patient with combined lesions of the thyroid, traumatic disease: (to assess the general condition of the patient; to conduct the examination of the thyroid;
2. Master the skills of assistance organization during the stages of medical evacuation.
3. Master the principles and skills of first aid in case of combined injuries and traumatic shock.
4. Master the principles of providing comprehensive medical care for combined injuries and traumatic shock.

Situational tasks and questions on the topic of the lesson:

1. The cause of traumatic disease:

A. Firearm or household injury

B. Effect of ionizing radiation
C. Effect of high temperature
D. Interaction of a mechanical agent with body tissues
E. Low temperature action

2. For the acute period of traumatic disease is characterized by:

A. Eosinophilia

B. Eozinopenia
C. The level of eosinophils does not change
D. Leukopenia
E. Leukocytosis

3. Anemia in patients with severe forms of traumatic disease:
A. Is present through 5-7 days after injury, due to the inclusion of mechanisms for long-term adaptation
B. Saves at least 3-4 weeks after injury
C. disappears 1-2 days after injury
D. Not characteristic
E. Disappears 14 days after injury

4.The Allgower's shock index is the ratio:
A. Systolic pressure to diastolic
B. Diastolic pressure to systolic
C. Frequencies of pulse to the frequency of breathing
D. Frequency of breathing to pulse rate
E. Pulse rate to systolic pressure

5. The concept of "centralization of metabolism" is typical for the acute period of traumatic disease associated with:
A. Violation of metabolism in vital nessessary organs (VNO)
B. Improvement of metabolism in VNO
C. Redistribution of glucose in favor of VNO
D. Accumulation of glucose in VNO
E. Decrease of glucose level in VNO

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Basic:

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"Approwed"
on the meeting of the Department
of Surgical Dentistry
and Maxillofacial Surgery

Head of the Department:
professor Ya. E. Vares

METHODICAL GIUDE FOR PRACTICAL LESSONS

Educational discipline	SURGICAL DENTISTRY
Topic of the lesson	**Topic №14**. ***Early general and local complications of maxillofacial injures (bleeding, asphyxia, shock: clinical signs, diagnostics, treatment).***
Course	4th
Faculty	Dental

Lviv – 2019

Actuality of the topic: Diagnosis and treatment of lesions of the maxillofacial area must be carried out taking into account its anatomical and physiological features. It is an extensive network of vessels and nerves, the presence of teeth and salivary glands, the complex structure of cellular spaces, the closeness of the brain, organs of vision, ENT-organs. These features create conditions for the development of threatening complications of injuries to the maxillofacial area, which are shock, asphyxia, bleeding. Therefore, every dentist should be able to timely diagnose the possibility of such complications, be able to provide effective emergency medical care for them.

Aim of the lesson: to analyze the causes of early general and local complications of MFA injury, the dependence of their likelihood of occurrence on various factors (localization and complexity of trauma, comorbidities, untimely and / or inadequate care, etc.); to study clinical manifestations and to be able to diagnose complications of damage to the maxillofacial area; to acquire practical skills in providing urgent medical care to the victims in the early complications of traumas, which are accompanied by impaired vital functions of the organism, endanger life and need urgent medical measures; to consider the principles of prevention of complications of traumatic injuries of the maxillofacial area.

Learning objectives:

- *Professional competence:*

1. Collection of medical information on the patient's condition.
2. Evaluation of the results of laboratory and instrumental research.
3. Establishment of a clinical diagnosis of dental disease.
4. Planning and conducting preventive measures for dental diseases.
5. Execution of medical and dental manipulations.
6. Organization and conducting of dental medical examination of persons subject to dispensary supervision.
7. Assessment of the environmental impact on the health of the population (individual, family, population).
8. Maintaining medical records.
9. Processing of state, social and medical information.

- *General competence:*

1. The ability to 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 in the use of information and communication technologies.
6. Ability to search, process and analyze information from various sources.
7. Ability to adapt and act in a new situation; ability to work autonomously.
8. Ability to identify, put and solve problems.
9. Ability to choose a communication strategy.
10. Ability to work in a team.
11. Interpersonal skills.
12. Ability to act on the basis of ethical considerations (motives).
13. Ability to act in a socially responsible and civic conscious manner.

Methods of training:

Preparatory stage - Frontal oral interview.
The main stage - practical training, role-playing game.
The final stage is brainstorming.

Interdisciplinary integration

Disciplines	Student should know	Student should be able to
Previous:		
Disaster medicine	Know the amount of medical care provided at each stage of the evacuation.	Be able to explain the basic principles of emergency care for victims.
Topographical anatomy	To know the topography of the organs of MFA	To be able to explain the topography of the organs of MFA
General surgery	Know: a) causes and types of bleeding; b) methods of stopping bleeding; c) measures for the prevention of asphyxia; c) measures of anti-shock therapy.	Be able to provide first aid for bleeding, asphyxia, shock. Demonstrate bundling skills, bonding.
Pharmacology	Know the pharmacological features of the drugs used for topical and general treatment of mandibular fractures.	Be able to prescribe drugs of different pharmacological groups
Intradisciplinary integration:		
Topic 1. (Module 1. "Propedeutics of surgical dentistry"): Methods for examination of the oral cavity, jaws, face and neck.	To know the methods for examination of the oral cavity, jaws, face and neck.	Be able to provide examination of the oral cavity, jaws, face and neck.
Topic 2. («Traumatology of MFA»): Traumatic injuries of soft tissues of the MFA …	Know the features of soft facial tissue wounds.	Be able to diagnose the depth and severity of the wound. To be able to carry out a PSC of a wound.
Topic 3. («Traumatology of MFA»): Methods of surgical treatment of soft tissue wounds with regard to aesthetics of the face, types of sutures …		
Topic 6. («Traumatology of MFA»): Mandibula fractures…	To know the features of traumatic injuries of the bones of the MFA.	To be able to carry out a PSC of a wound. Be able to diagnose the depth and severity of the wound.
Topic 7. («Traumatology		

of MFA»): Maxilarry fractures…		
Topic 8. («Traumatology of MFA»): Injuries of the jaws and nasal bones …		

Plan and organizational structure of practical lesson of the discipline

Duration of practical lesson is 2 academic hours – 1 hour 30 minutes including 10 minutes for a break

№	The main stages of the lesson, their functions and content	Time period	Methods of eductation and control	Materials of methodical support	
1.	**Preparatory stage**	**20 min.**			
1.1	Organizational measures	5 min.			
1.2	Setting up of educational goals and motivation.	5 min.			
1.3	Control of the initial level of knowledge (standardized control methods).	10 min.	Individual theoretical evaluation. Solving typical tasks.Test control.Written interwiev.	Question for an individual oral and written evaluation. Typical situational tasks and tests.	Tables, phantoms, collapsible jaws, textbooks, manuals, reference books, atlas, methodical recommendations, video films
2.	**Main Stage**	**30 min.**			
	Formation of professional skills and abilities: 1 To master the technique of examination of the patient with combined lesions of the thyroid, traumatic disease: (to assess the general condition of the patient; to conduct the examination of the thyroid;		Formation of professional skills: Work with patients with pathology of maxillofacial area. Work out the results of additional methods of examination of patients with diseases of the maxillofacial area. Solving typical situational tasks. Oral and written evaluation on standardized list of issues.Work with	Patients with pathology of maxillofacial area. The history of the disease.Selection of results of additional survey methods. Situational tasks.Algorithms.Phantoms, surgical instruments.Thematic videos.	

	2. Master the skills of assistance organization during the stages of medical evacuation. 3. Master the principles and skills of first aid in case of combined injuries and traumatic shock. 4. Master the principles of providing comprehensive medical care for combined injuries and traumatic shock.		phantoms, view thematic videos.	
3.	**Final stage**	**30 min.**		
3.1	Control and correction of the level of professional skills and abilities		Individual skills control.Control of skills by solving non-typical situational problems with illustrative material.	Phantoms, surgical instruments.The history of the disease.Selection of results of additional methods of examination of thematic patients.Unusual situational tasks.
3.2	Control and correction of the level of professional skills and abilities.		Final evaluation of the students	
3.3	Homework. Informing students about the topic of the next lesson.			Recommended literature

Methodology of organization of educational process in practical lesson.

STRUCTURE OF PRACTICAL LESSON

<u>Preparation stage</u> (20 min.)

To substantiate the significance of the subject for further study of the discipline and professional activity of the doctor in order to formulate motivation and purposeful educational activity. Get acquainted with students with specific goals and lesson plans.Conduct standardized control of the initial level of student training, discussion and student answers.

• *Organizational part of the lesson: presence check, evaluation of the uniform.*

• *Informing about of the topic and the purpose of the lesson.*

Topic of the lesson: «Early general and local complications of maxillofacial injures (bleeding, asphyxia, shock: clinical signs, diagnostics, treatment)*».*

Aim of the lesson: to study clinical manifestations and to be able to diagnose the occurrence of complications in injuries of the maxillofacial area; to provide medical care at the pre-hospital stage, to get acquainted with the principles of complex therapy. Improve theoretical knowledge and practical skills to provide emergency medical care to victims of various complications of MFA

injuries, which are accompanied by impaired vital functions of the organism, are life-threatening and require urgent medical measures

- *Motivation of educational activity.*

Diagnosis and treatment of lesions of the maxillofacial area must be carried out taking into account its anatomical and physiological features. It is an extensive network of vessels and nerves, the presence of teeth and salivary glands, the complex structure of cellular spaces, the closeness of the brain, organs of vision, ENT-organs. These features create conditions for the development of threatening complications of injuries to the maxillofacial area, which are shock, asphyxia, bleeding. Therefore, every dentist should be able to timely diagnose the possibility of such complications, be able to provide effective emergency medical care for them.

Materials of methodical support of the preparatory stage of the lesson:

Questions to frontal survey:

1. Early general and local complications of MFA injuries.
2. Bleeding. Clinical signs, diagnostics, treatment.
3. Degrees of the blood loss. Methods of diagnostic.
4. Blood substitution solutions. Their characteristics and indications to use.
5. Methods of temporary and permanent hemostasis.
6. Asphyxia. Types. Clinical signs, diagnostics, treatment.
7. Tracheotomy and conicotomy. Indications. Techiques.
8. Shock. Types. Clinical signs, diagnostics, treatment.
9. Bleeding caused by tissue damage: classification, treatment.
10. Neck injuries: clinical features and treatment.
11. Foreign bodies of the maxillofacial area: etiology, clinical flow, ways to remove.

The list of practical skills to be learned by the student:

1 To master the technique of examination of the patient with combined lesions of the thyroid, traumatic disease: (to assess the general condition of the patient; to conduct the examination of the thyroid;

2. Master the skills of assistance organization during the stages of medical evacuation.

3. Master the principles and skills of first aid in case of combined injuries and traumatic shock.

4. Master the principles of providing comprehensive medical care for combined injuries and traumatic shock.

The main stage: the formation of professional skills (30 min)

Conducting professional training.

Materials of methodical support of the main stage of the lesson:

In the maxillofacial area in somatic healthy individuals, external or internal bleeding after injury is possible from blood vessels of different caliber, from soft tissues, from bone or from both of these tissues. The most dangerous are injuries of the carotid artery and its large branches. The greater the diameter of the vessel and the arterial pressure in it, the more and more the wounded loses blood and the more dangerous bleeding.

The treatment of bleeding involves, first of all, providing the victim with the right position - face down or sideways to prevent the blood from flowing in the upper respiratory tract, its temporary or permanent cessation, and then - the elimination of local wound tissue and normalization of the general status of the wounded.

By temporary methods of contraction of bleeding from soft tissues include finger arrest, tamponade of the wound (possibly with hemostatic means of local action) and the imposition of a compression bandage, tamponade of the nasal cavity, an overlay of the tourniquet on the affected half of the neck, an overlay on the vessel of the clamp in the wound, or Pressure (general carotic) artery clamp through the skin.

The permanent methods of cessation of bleeding include ligation and flashing of the artery in the wound, coagulation of the artery and adjacent tissues with high temperature (electrocoagulation, laser coagulation) or active chemical substance (acid), firming of tissues and ligation of the artery through the skin, the artery through the open method, the intravascular (endovascular) embolization of the artery by one or more artificial clots that (for a long time) are not absorbed.

Postoperative hemorrhage occurs if arterioles and veins are not ligated when lacerations are repaired, if inadequate bone reduction allows continued oozing of blood. Lacerations should be reexplored so that hemorrhage can be controlled. Hematomas should be drained. Oozing of blood from bone requires re-reduction or the use of bonewax. Hemorrhage from a major arteiy requires emergency tamponade; if the source cannot be identified, then arteriography and embolization are indicated. Aneurysms and pseudoaneurysms are complications of maxillofacial trauma but rarely occur as the result of isolated maxillary fractures. They can also result in postoperative bleeding and are indications for angiography and embolization. Because of the proximity of the maxillato the orbits, complications associated with vision can occur.

Immediate postoperative blindness can be a complication of the reduction of high Le Fort fractures (Le Fort III or fractures involving the orbits) and occurs because of increased intraorbital hemorrhage or pressure, a retinal artery spasm, retrobulbar hemorrhage, or the impingement of bone fragments on the optic nerve. An undiagnosed or inadequately treated orbital floor fracture (alone or in combination with a zygomatic omponent) can lead to enophthalmos and diplopia. The most obvious postoperative complication sare misplaced bone segments or fixation devices. These complications are readily identified by clinical examination (e.g., alocclusion) or postoperative radiographic examinations.

Asphyxia is an acute or subacute pathological condition due to hypoxia and hypercapnia, which manifests itself as a serious disorder of the nervous system, respiration and circulation.

Dislocation asphyxia arises as a result of displacement of the tongue in the oropharynx and overlapping of the upper respiratory tract. The cause of such asphyxiation may be dizziness in the position lying on the back, bilateral mental fractures of the lower jaw with the displacement of the chips, wounds of the soft tissues of the bottom of the oral cavity with the transection of the muscles, which hold the sublingual bone and tongue in the correct position. Treatment of dislocation asphyxia involves the removal of the tongue forward by various methods: the overlap on the tongue of the holder and pushing it forward with the tool or fingers; Fitting the tongue with a ligature and fixing the last to the skin of the neck; puncture the tongue outward with a spike with its emphasis in the corners of the mouth; withdrawal of the lower jaw forward by pushing hands at the angles of the jaw.

Obturational asphyxia arises after getting into the oropharynx, on the vocal cords of any foreign object, blood clots, vomit (or napkins, tampon, imprint, removed tooth). To restore the patency of the upper respiratory tract, remove blood clots, other foreign objects, or carry tracheotomy.

Stenotic asphyxia is a consequence of swelling, hematomas of soft tissues, air fever of the tissues of the neck or mediastinum, which compress the upper respiratory tract. To eliminate this asphyxia, prescribe an anti-edematous treatment, including hormones, or carry out tracheotomy.

Valvular asphyxia is manifested in the free exhalation of air and difficult inhalation. It is due to the fact that the flap of soft tissues can move freely and shifts in the oropharynx, overlapping it during inhalation and opening the passage for air during exhalation. Treatment of asphyxiation is the laying of a soft tissue bundle or cutting it off.

Aspirational asphyxia causes aspiration of blood, saliva, vomit masses. Elimination of this asphyxiation is ensured by the cessation of bleeding, the exhaustion of the liquids from the trachea and bronchs.

- *Algorithms for the formation of professional skills.*

1. To master the technique of examination of the patient with combined lesions of the thyroid, traumatic disease: (to assess the general condition of the patient; to conduct the examination of the thyroid;
2. Master the skills of assistance organization during the stages of medical evacuation.
3. Master the principles and skills of first aid in case of combined injuries and traumatic shock.
4. Master the principles of providing comprehensive medical care for combined injuries and traumatic shock.

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

Individual tasks:

Task №1.
Missile wound of maxillofacial area resulted in tear of the front region of the mandible. Up to 500ml blood loss was observed. Skin was cold, moist, and cyanotic pale, with dramatically slowed blood flow, obnubilation, dyspnoea, and oliguria. Blood pressure - 80/60 mmHg, heart rate - 140 beats per minute, poor content. What complication occurred in this case?

A. Septic shock
B. Erectile phase of traumatic shock
C. **Torpid phase of traumatic shock**
D. Hypovolemic shock
E. Anaphylactic shock

Task №2.
As a result of a gunshot wound a patient got an avulsion of mental mandibular region. There was observed minor bleeding and asphyxia, which occurred with the change in the head position. What method should be used to prevent asphyxia?

A. Primary surgical management of wounds, application of tracheostomy
B. Conicotomy
C. **Fixation of tongue, transportation in face-down position**
D. Application of tracheostomy
E. Transportation in face-down position

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

Patient has bilateral mental mandibular fracture with back displacement of the central fragment, complicated breathing, respiratory failure increases. What is the cause of complicated breathing? What kind of transport immobilization should be applied? What complication is characteristic of a fracture of this localization?

<u>Final stage</u> (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 self-employment.To work on phantoms the technique of examination and palpation of maxillofacial area, oral cavity under conditions of phantom class.
- Evaluation.

Conduct standardized final control using individual test tasks and questions (20 min.), Work check (5-10 min.). Evaluate the student's current activities during the classroom, taking into account standardized final control, analyze the student's progress, announce the evaluation of each student's activity, and display it in the student attendance and student log book.An adult group at the same time makes assessments in the record of the record of success and attendance of classes by students, the teacher certifies them with his signature.

Brief informing the students about the topic of the next lesson and the methodical measures for preparing for it.

Basic knowledge level:

1. Topographic and anatomical structure of the head and neck, their blood supply and innervation.
2. Examination of the dental patient.
3. Additional methods of examination of patients with trauma of soft tissues and bones of thyroid.
4. Organization of medical care of the maxillofacial wounds.
5. Principles of primary surgical treatment of wounds.
6. Methods of temporary and permanent immobilization for thyroid injuries.
7. Modern pharmaceutical anti-shock drugs.

List of questions to be studied by the student:

1. Classification of the injuries complications of the maxillofacial area.
2. Asphyxia: types, prevention.
3. Traumatic shock: treatment and prevention.
4. Types of bleeding, how to stop.
5. Prolonged tissue compression syndrome faces.
6. Periods of prolonged compression syndrome.
7. Degrees prolonged compression syndrome.
8. Medical care in long-term syndrome compression

The list of practical skills to be learned by the student:

1. To master the technique of examination of the patient with combined lesions of the thyroid, traumatic disease: (to assess the general condition of the patient; to conduct the examination of the thyroid;
2. Master the skills of assistance organization during the stages of medical evacuation.
3. Master the principles and skills of first aid in case of combined injuries and traumatic shock.
4. Master the principles of providing comprehensive medical care for combined injuries and traumatic shock.

Situational tasks and questions on the topic of the lesson:

1. The wounded had significant soft tissue swelling of the face spreading to the neck and the floor of the mouth. There was a threat of sthenotic asphyxia. What aid should be given to the patient?
   A. Fixation of the tongue
   B. Symptomatic drug therapy
   C. **Tracheotomy**
   D. Mechanical ventilation
   E. Introduction of lobeline

2. The victim was injured in a road accident that resulted in a closed head injury and bilateral fracture of the mandible between 34, 35 and 44, 45 teeth. He lost his consciousness. Minor

bleeding was observed in the area of fracture. What type of asphyxia may occur in this case?
A. Dislocation
B. Obstructive
C. Valvular
D. Sthenotic
E. Aspiration

3. Injury of maxillofacial area resulted in 1500 ml blood loss. Skin is pale, blood pressure - 90/60 mmHg, heart rate - 100 beats per minute. What is the degree of the victim's blood loss?
A. **Medium**
B. Severe
C. No correct answer
D. Critical
E. Mild

4. The soldier got multiple injuries of the upper and lower jaw with fragments from grenade explosion. Up to 300ml blood loss was observed. The military man is excited, screaming, skin is cold, moist, cyanotic pale, oliguria is marked, and tachypnoe. Blood pressure - 90/80 mm Hg, heart rate - 120 beats per minute. What complication occurred in the military man?
A. Septic shock
B. Torpid phase of traumatic shock
C. Erectile phase of traumatic shock
D. Hypovolemic shock
E. Anaphylactic shock

5. As a result of shell explosion a soldier got a perforating cheek wound. In the area of the wound exit hole there is a gaping wound with torn edges, no maxillary premolars. Pulsating bleeding from cheek wound is observed. Which blood vessels can be damaged?
A. Infraorbital artery
B. Facial artery
C. **Facial vein**
D. Superficial temporal artery
E. Mental artery

Literature:

Basic:

1. Oral and Maxillofacial Surgery: Textbook, Part 1, 2 / V. O. Malanchuk. – Vinnytsia: Nova Knyha Publishers, 2011. – 453p.
2. PETERSON'S PRINCIPLES OF ORAL AND MAXILLOFACIAL SURGERY Second Edition, 2004. - 1502 p.
3. Principles of Dental Local Anaesthesia and Teeth Removal / Ya. E. Vares, R. Z. Ogonovsky, Ch. R. Pohranychna – LNMU, 2007. – 63p.
4. Atlas of Human Anatomy / F. Netter – 2nd ed. – New Jersey: ICON Learning Systems. – 592 p.

Additional:

1. The AIDS booklet. – Boston: WCB Mcgraw Hill, 1999. – 70 p.
2. Contemporary Oral and Maxillofacial Surgery / J. P. Sapp, L. R. Eversole, G. P. Wysocki – 2nd ed.- St. Louis: Mosby – 2004. – P. 88-90.
3. Contemporary Oral and Maxillofacial Surgery / L. J. Peterson, E. Ellis, J. R. Hupp, M.R. Tucker – 3rd ed. – St. Louis: Mosby – Year Book, Inc. – 1998. – P. 69-82.
4. Bauml, Philips R.W., Lund M.R. Texbook of Operative Dentistry. - 3-rd ed.- Philadelphia:

Saunders, 1995.- 661p.
5. Kharkov L. V. Pediatric oral and maxillofacial surgery : a textbook for students of higher medical educational institutions of the III-IV levels of accreditation / L. V. Kharkov, L. M. Yakovenko, N. V. Kiselyova ; ed. by L. V. Kharkov. - Kyiv : AUS Medicine Publishing, 2015. - 103 p.
6. Pohranychna, Ch. R. Maxillofacial oncology : guide of lectures on oral and maxillofacial surgery for the english-medium students of the 5th year education at dentistry faculty (autumn semester) : methodological guide / Ch. R. Pohranychna, R. Z. Ogonovsky. - Lviv, 2011.
7. Timofieiev O.O. Anesthesia in Oral and Maxillofacial Surgery / O.O. Timofieiev, I.I. Fesenko. - Kyiv: OMF Publishing, 2016, 128 p.

Ministry of Health of Ukraine
Danylo Halytsky Lviv National Medical University

"Approwed"
on the meeting of the Department
of Surgical Dentistry
and Maxillofacial Surgery

Head of the Department:
professor Ya. E. Vares

METHODICAL GIUDE FOR PRACTICAL LESSONS

Educational discipline	SURGICAL DENTISTRY
Topic of the lesson	**Topic №15**. ***Late complications of maxillofacial injures: clinical signs, diagnostics, treatment.***
Course	4th
Faculty	Dental

Lviv – 2019

Actuality of the topic: Given the anatomical and physiological features of the maxillofacial area, a number of late complications and consequences for the life of the patient may occur with its traumatic injuries. Therefore, the dentist-surgeon should be able to provide timely assessment of the patient's condition, medical care, determine the sequence of treatment and prevention of complications.

Aim of the lesson: to analyze the causes of late complications and consequences of MFA injury. Dependence of their development on such factors as: complexity of trauma, concomitant diseases, untimely and inadequate rendering of help, etc. To consider the principles of prevention and treatment of late complications and consequences of damage to the maxillofacial area.

Learning objectives:

- *Professional competence:*

1. Collection of medical information on the patient's condition.
2. Evaluation of the results of laboratory and instrumental research.
3. Establishment of a clinical diagnosis of dental disease.
4. Planning and conducting preventive measures for dental diseases.
5. Execution of medical and dental manipulations.
6. Organization and conducting of dental medical examination of persons subject to dispensary supervision.
7. Assessment of the environmental impact on the health of the population (individual, family, population).
8. Maintaining medical records.
9. Processing of state, social and medical information.

- *General competence:*

1. The ability to 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 in the use of information and communication technologies.
6. Ability to search, process and analyze information from various sources.
7. Ability to adapt and act in a new situation; ability to work autonomously.
8. Ability to identify, put and solve problems.
9. Ability to choose a communication strategy.
10. Ability to work in a team.
11. Interpersonal skills.
12. Ability to act on the basis of ethical considerations (motives).
13. Ability to act in a socially responsible and civic conscious manner.

Methods of training:

Preparatory stage - Frontal oral interview.
The main stage - practical training, role-playing game.
The final stage is brainstorming.

Interdisciplinary integration

Disciplines	Student should know	Student should be able to
Previous:		
Normal anatomy	Know the anatomical and	To be able to explain the

Normal physiology	physiological features of the maxillofacial area: - structure of the upper and lower jaws; - innervation and vascularization of these sites; - structure of the lymphatic system of the head and neck; - structure of the muscles of the head and neck; - structure of the head and neck areas.	structure of systems and organs of maxillo-facial area (MFA)
Hystology	To know histological structure of soft and hard tissues of MFA	To be able to explain the stages of manufacturing of cytological, histological preparations
Pharmacology	Know the pharmacological features of the drugs used for topical and general treatment of mandibular fractures.	Be able to prescribe drugs of different pharmacological groups
Radiation diagnostics.	To know the methods of radiological examination used in maxillofacial traumatology	To be able to explain the principles on which these or other methods are based (X-ray, CT, MRI, ultrasound)
Intradisciplinary integration:		
Topic 1. (Module 1. “Propedeutics of surgical dentistry”): Methods for examination of the oral cavity, jaws, face and neck.	To know the methods for examination of the oral cavity, jaws, face and neck.	Be able to provide examination of the oral cavity, jaws, face and neck.
Topic 12. («Traumatology of MFA»): ... Methods of optimization of bone tissue regeneration.	Know the endogenous and exogenous factors that affect the slowdown in consolidation.	Be able to prescribe drug treatment aimed at improving reparative osteogenesis.
Topic 10, 11 Methods of permanent immobilization. Osteosynthesis.	Know the methods of permanent immobilization of the jaws.	Be able to evaluate the quality of repositioning and fixing fragments.

Plan and organizational structure of practical lesson of the discipline

Duration of practical lesson is 2 academic hours – 1 hour 30 minutes including 10 minutes for a break

№	The main stages of the lesson, their functions and content	Time period	Methods of eductation and control	Materials of methodical support
1.	**Preparatory stage**	**20 min.**		

1.1	Organizational measures	5 min.			
1.2	Setting up of educational goals and motivation.	5 min.			
1.3	Control of the initial level of knowledge (standardized control methods).	10 min.	Individual theoretical evaluation. Solving typical tasks.Test control.Written interwiev.	Question for an individual oral and written evaluation. Typical situational tasks and tests.	Tables, phantoms, collapsible jaws, textbooks, manuals, reference books, atlas, methodical recommendations, video films
2.	**Main Stage**	**30 min.**			
	Formation of professional skills and abilities: 1. To stop secondary bleeding from soft tissues of the MFA. 2. To prepare ligature bonding of teeth. 3. The technique of applying a slit-like bandage. 4. Be able to determine clinical and radiological features of delayed fracture onsolidation. 5. Be able to determine clinical and radiological features of non-union. 6. Be able to determine clinical and radiological features of posttraumatic sinusitis. 7. To make a plan of complex treatment of the patient with delayed fracture healing. 8. Method of		Formation of professional skills: Work with patients with pathology of maxillofacial area. Work out the results of additional methods of examination of patients with diseases of the maxillofacial area. Solving typical situational tasks. Oral and written evaluation on standardized list of issues.Work with phantoms, view thematic videos.	Patients with pathology of maxillofacial area. The history of the disease.Selection of results of additional survey methods. Situational tasks.Algorithms.Phantoms, surgical instruments.Thematic videos.	

	examination of the patient with trauma of the tissues of the maxillofacial area			
3.	**Final stage**	**30 min.**		
3.1	Control and correction of the level of professional skills and abilities		Individual skills control.Control of skills by solving non-typical situational problems with illustrative material.	Phantoms, surgical instruments.The history of the disease.Selection of results of additional methods of examination of thematic patients.Unusual situational tasks.
3.2	Control and correction of the level of professional skills and abilities.		Final evaluation of the students	
3.3	Homework. Informing students about the topic of the next lesson.			Recommended literature

Methodology of organization of educational process in practical lesson.

STRUCTURE OF PRACTICAL LESSON

Preparation stage (20 min.)

To substantiate the significance of the subject for further study of the discipline and professional activity of the doctor in order to formulate motivation and purposeful educational activity. Get acquainted with students with specific goals and lesson plans.Conduct standardized control of the initial level of student training, discussion and student answers.

• *Organizational part of the lesson: presence check, evaluation of the uniform.*

• *Informing about of the topic and the purpose of the lesson*

Topic of the lesson: «Late complications of MFA injuries: clinical signs, diagnosis, treatment.»

Aim of the lesson: to analyze the causes of late complications and consequences of MFA injury. Dependence of their development on such factors as: complexity of trauma, concomitant diseases, untimely and inadequate rendering of help, etc. To consider the principles of prevention and treatment of late complications and consequences of damage to the maxillofacial area.

- *Motivation of educational activity.*

Given the anatomical and physiological features of the maxillofacial area, a number of late complications and consequences for the life of the patient may occur with its traumatic injuries. Therefore, the dentist-surgeon should be able to provide timely assessment of the patient's condition, medical care, determine the sequence of treatment and prevention of complications.

Materials of methodical support of the preparatory stage of the lesson:

Questions to frontal survey:

1. Late complications and consequences of injuries of the maxillofacial area.
2. Diagnosis of late complications and consequences of injuries of the maxillofacial area.
3. Treatment of late complications and consequences of injuries of maxillofacial area.
4. Posttraumatic osteomyelitis of the jaw. Clinic, diagnostics, treatment.
5. Radiographic picture of post-traumatic osteomyelitis of the jaws.
6. Salivary fistulas. Classification. Diagnosis.
7. Treatment of salivary fistulas.
8. Classification of contractures. Diagnosis.
9. Definition of contracture. Treatment.

The main stage: the formation of professional skills (30 min)

Conducting professional training.

Materials of methodical support of the main stage of the lesson:

A list of late complications

1. Infraorbital nerve paresthesia
2. Enophthalmos
3. Infection
4. Exposed hardware
5. Deviated septum
6. Nasal obstruction
7. Altered vision
8. Nonunion
9. Malunion or malocclusion
10. Epiphora
11. Foreign body reactions
12. Scarring
13. Sinusitis

Some of it may not be readily apparent until weeks or months after injury, but the potential for their occurrence should be in mind during evaluation and treatment of the patient. Perioperative and postoperative airway obstructions are unusual in cases of maxillary fracture alone. However, these conditions may occur in association with extubation while the patient is obtunded,with a septal hematoma or nasal packing, and with excessively edematous soft tissues that do not allow breathing through the nasal airways. Patients with intermaxillary fixation and complete dentition may have difficulty breathing during this time. Reintubation, opening nasopharyngeal airways, or merely removing the intermaxillary fixation may be effective. Uncorrected nasal septal fractures can lead to postoperative airway obstruction that remains afterall soft tissue swelling has resolved.

Acute sinusitis can result from prolonged nasotracheal intubation. Acute or chronic sinusitis may also occur in the ethmoid, sphenoid, frontal, and maxillary sinuses because fractures may obliterate or obstruct the sinus ducts or ostia.

Other complications related to rigid internal fixation include palpability, infection, extrusion or exposure, translocation, stress shielding, cortical osteopenia, and nonunion. Nonunion of the fractured segments can occur as the result of inadequate blood supply, inaccurate position, movement of segments, infection, or nutritional deficiencies. Infections may be caused by contaminated soft tissue lacerations or foreign bodies, hematomas, or odontogenic infections from previously diseased or fractured teeth. Infection round bone plates and screws can occur years after their placement. Malunion of maxillary fractures can obstruct the nasolacrimal ducts. This obstruction causes epiphora and may lead to episodes of dacryocystitis. Bone segments from fractured or improperly reduced maxillary fractures can also impinge on the infraorbital nerve, causing numbness of the distribution of the second division of the trigeminal nerve. Although the reduction and fixation of maxillary fractures may at times seem straightforward, the proximity of complicated anatomic structures and the consequences of inaccurate repair make it incumbent on the surgeon to follow sound surgical principles in the management of these fractures.

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

1. To stop secondary bleeding from soft tissues of the MFA.
2. To prepare ligature bonding of teeth.
3. The technique of applying a slit-like bandage.
4. Be able to determine clinical and radiological features of delayed fracture onsolidation.
5. Be able to determine clinical and radiological features of non-union.

6. Be able to determine clinical and radiological features of posttraumatic sinusitis.
7. To make a plan of complex treatment of the patient with delayed fracture healing.
8. Method of examination of the patient with trauma of the tissues of the maxillofacial area.

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

Individual tasks:
Task №1.
A patient, 22 years old, complains about a limited, but painless opening of the mouth that arose in childhood after falling from the swing, difficulty in eating, significant asymmetry of the face. At examination: the face is asymmetric due to the flattening of the left half, the tiredness of tissues of the left buccal area is present. Chin displaced to the right. Definitely barely noticeable movements of the lower jaw when opening the mouth. The bite is deep. The front teeth are inclined vestibularly. Determine the provisional diagnosis.
A. Arthrosis of the temporomandibular joint
B. Ankylosis of the left TMJ
C. Ankylosis of the right TMJ
D. Conventional dislocation of the left temporomandibular joint
E. Syndrome I-II gill arches

Task № 2.
At examination of the patient there is a dense, weakly painful infiltration in the area of the jaw angle. The skin is bluish and not folded. Opening of the mouth is 1.5-2cm. In the retro-molar area is fistula with purulent discharge. During bimanual palpation of the lower jaw is the mobility of fragments in the angle of the lower jaw. In the history of trauma of the mandible about 1 month ago. Make a diagnosis.
A. Posttraumatic osteomyelitis
B. Actinomycosis
S. Purulent hematoma of chewing area
D. Lower jaw fracture
E. The fracture of the lower jaw complicated by a hematoma.

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

Patient B., 48 years old, went to the inpatient unit with a diagnosis of chronic post-traumatic osteomyelitis of the mandible on the left. Suggest the best way to treat this disease. What additional examination methods should be used to confirm the diagnosis? What alternative examination methods can be used in this clinical setting? Justify your choice.

<u>Final stage</u> (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 self-employment.To work on phantoms the technique of examination and palpation of maxillofacial area, oral cavity under conditions of phantom class.
- Evaluation.

Conduct standardized final control using individual test tasks and questions (20 min.), Work check (5-10 min.). Evaluate the student's current activities during the classroom, taking into account standardized final control, analyze the student's progress, announce the evaluation of each student's

activity, and display it in the student attendance and student log book.An adult group at the same time makes assessments in the record of the record of success and attendance of classes by students, the teacher certifies them with his signature.

Brief informing the students about the topic of the next lesson and the methodical measures for preparing for it.

Basic knowledge level:

1. Anatomic structure of the thyroid.
2. Impairment of reparative regeneration.
3. Methods of stop bleeding.

List of questions to be studied by the student:

1. Clinic, diagnosis and treatment of post-traumatic osteomyelitis.
2. Clinic, diagnosis and treatment of post-traumatic maxillary sinusitis.
3. Clinic, diagnosis and treatment of post-traumatic mandibular contracture.
4. Clinic, diagnosis and treatment of delayed fragment consolidation.
5. Clinic, diagnosis and treatment of the non-union of the fracture.
6. Clinic, diagnosis and treatment of a false joint.
7. Clinic, diagnosis and treatment of post-traumatic jaw deformity.

The list of practical skills to be learned by the student:

1. To stop secondary bleeding from soft tissues of the MFA.
2. To prepare ligature bonding of teeth.
3. The technique of applying a slit-like bandage.
4. Be able to determine clinical and radiological features of delayed fracture onsolidation.
5. Be able to determine clinical and radiological features of non-union.
6. Be able to determine clinical and radiological features of posttraumatic sinusitis.
7. To make a plan of complex treatment of the patient with delayed fracture healing.
8. Method of examination of the patient with trauma of the tissues of the maxillofacial area.

Situational tasks and questions on the topic of the lesson:

1. In a patient of 30 years diagnosed posttraumatic osteomyelitis of the mandible in the area of the body to the right. The injury occurred 1.5 months ago. On the X-ray, the line of perelomous and the shadow of the formed bone sequestration in the fracture line is determined. On the skin there is a fistula with purulent discharge. Identify treatment tactics.

A. Excision of fistulae, sequestrectomy
B. Physiotherapy
C. Sequestrectomy
D. Scratching the fist
E. Cortical dermatitis, antibacterial therapy

2. On the medical point of the regiment was provided the victim with a gunshot wound of the right parotid-masseteric area. During the survey, it was revealed that the patient does not close the right eye, right corner of the mouth is lowered. This symptomatology is caused by injury of:

A. Facial nerve
B. Mimic muscles
C. Parenchyma of the circulatory salivary gland
D. Capsules of the circulatory salivary gland
E. Outlet duct of the circulatory salivary gland

3. During hemotransfusion, the patient experienced nausea, tremor, pain in the lumbar, behind the sternum. When viewed, the skin is hyperemic, later it becomes pale, hyperhidrosis, hardness is heavy, Ps - 110 / min., AT - 70/40 mm.rt.st. Black urine. What complication did the patient have?
A. Haemotransfuzion shock
B. Acute renal failure
C. Pulmonary artery thromboembolism
D. Anaphylactic shock
E. Hypotonic crisis

4. Patient V., 37 years old, was hospitalized in the maxillofacial department for chronic post-traumatic osteomyelitis of the mandible in the area of 48, 47, 46 teeth. Duration of disease – about 2 months. Objectively: When winding the fist, the bare rough area of the bone is determined, shifted when pressed. On the Rtg-gram of the mandible - a hearth of destruction, in the center of which is a sequester of 1.0x1.5 cm, completely separated from healthy bone tissue. Choose a treatment method for a patient:
A. Sequestrectomy, bone plastic
B. Emotional therapy
S. Surgery of the oral cavity
D. Sequestration removal 47
E. Antibiotic therapy

5. A patient 58 years ago, received a blow to the chin area. Complains with a click in the TMJ when you eating. Periodically, with a wider opening of the mouth, the lower jaw is in a position where it is impossible to close the mouth. By pressing the fingers on the ankle sprouts of the lower jaw, the latter becomes easily in place. What diagnosis can be expected?
A. The usual dislocation of the lower jaw
B. Acute dislocation of the mandible
C. Lower jaw fracture
D. Front dislocation
E. Rear dislocation

Literature:
Basic:

1. Oral and Maxillofacial Surgery: Textbook, Part 1, 2 / V. O. Malanchuk. – Vinnytsia: Nova Knyha Publishers, 2011. – 453p.
2. PETERSON'S PRINCIPLES OF ORAL AND MAXILLOFACIAL SURGERY Second Edition, 2004. - 1502 p.
3. Principles of Dental Local Anaesthesia and Teeth Removal / Ya. E. Vares, R. Z. Ogonovsky, Ch. R. Pohranychna – LNMU, 2007. – 63p.
4. Atlas of Human Anatomy / F. Netter – 2nd ed. – New Jersey: ICON Learning Systems. – 592 p.

Additional:

1. The AIDS booklet. – Boston: WCB Mcgraw Hill, 1999. – 70 p.
2. Contemporary Oral and Maxillofacial Surgery / J. P. Sapp, L. R. Eversole, G. P. Wysocki – 2nd ed.- St. Louis: Mosby – 2004. – P. 88-90.
3. Contemporary Oral and Maxillofacial Surgery / L. J. Peterson, E. Ellis, J. R. Hupp, M.R. Tucker – 3rd ed. – St. Louis: Mosby – Year Book, Inc. – 1998. – P. 69-82.
4. Bauml, Philips R.W., Lund M.R. Texbook of Operative Dentistry. - 3-rd ed.- Philadelphia: Saunders, 1995.- 661p.
5. Kharkov L. V. Pediatric oral and maxillofacial surgery : a textbook for students of higher

medical educational institutions of the III-IV levels of accreditation / L. V. Kharkov, L. M. Yakovenko, N. V. Kiselyova ; ed. by L. V. Kharkov. - Kyiv : AUS Medicine Publishing, 2015. - 103 p.
6. Pohranychna, Ch. R. Maxillofacial oncology : guide of lectures on oral and maxillofacial surgery for the english-medium students of the 5th year education at dentistry faculty (autumn semester) : methodological guide / Ch. R. Pohranychna, R. Z. Ogonovsky. - Lviv, 2011.
7. Timofieiev O.O. Anesthesia in Oral and Maxillofacial Surgery / O.O. Timofieiev, I.I. Fesenko. - Kyiv: OMF Publishing, 2016, 128 p.

Ministry of Health of Ukraine
Danylo Halytsky Lviv National Medical University

"Approwed"
on the meeting of the Department
of Surgical Dentistry
and Maxillofacial Surgery

Head of the Department:
professor Ya. E. Vares

METHODICAL GIUDE FOR PRACTICAL LESSONS

Educational discipline	SURGICAL DENTISTRY
Topic of the lesson	**Topic №16.** Thermal (burns, frostbite), chemical (acids, alkalis, heavy metal salts), physical (electric current) face injures .
Course	4th
Faculty	Dental

Lviv – 2019

Actuality of the topic: Burn (Latin - combustion) - damage to the skin or mucous membranes, often with underlying tissues, due to the effects of high temperature (thermal burn), chemical (acids, alkalis, salts of heavy metals), physical (electrical current) factors. According to WHO, burns rank third among other injuries, and in some countries, second, second only to transport injuries. Burns account for 16% of the structure of soft tissue damage, including thermal burns - 92.4% of cases, chemical - 6.4%. Frostbite (lat. - congelation) - damage to tissues, parts of the body under the influence of low temperature. In regions with average climates, facial frostbite accounts for up to 1% of all frostbite and in outpatient clinics up to 50% of local cold injuries.
Electric shocks occur in 1-2.5% of cases of all types of injuries. The topographic and anatomic location of the MFA, the proximity of the location of the vital organs cause the difficulty of the general condition of the patients and the frequent development of complications. Therefore, the urgency of the problem of thermal, chemical, physical injuries of the face is determined by the high frequency of their occurrence in everyday life, at work, during hostilities, the severity of the disease, the complexity and duration of treatment.

Aim of the lesson: to learn the basic clinical manifestations and principles of diagnostics and treatment of thermal, chemical, physical injuries of the face. To acquaint the students with the protocols of rendering medical aid at the stages of medical evacuation in case of the mentioned injuries and to teach to make a plan of complex treatment of patients.

Learning objectives:

- *Professional competence:*
  1. Collection of medical information on the patient's condition.
  2. Evaluation of the results of laboratory and instrumental research.
  3. Establishment of a clinical diagnosis of dental disease.
  4. Planning and conducting preventive measures for dental diseases.
  5. Execution of medical and dental manipulations.
  6. Organization and conducting of dental medical examination of persons subject to dispensary supervision.
  7. Assessment of the environmental impact on the health of the population (individual, family, population).
  8. Maintaining medical records.
  9. Processing of state, social and medical information.
- *General competence:*
  1. The ability to 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 in the use of information and communication technologies.
  6. Ability to search, process and analyze information from various sources.
  7. Ability to adapt and act in a new situation; ability to work autonomously.
  8. Ability to identify, put and solve problems.
  9. Ability to choose a communication strategy.
  10. Ability to work in a team.
  11. Interpersonal skills.
  12. Ability to act on the basis of ethical considerations (motives).
  13. Ability to act in a socially responsible and civic conscious manner.

Methods of training:

Preparatory stage - Frontal oral interview.

The main stage - practical training, role-playing game.
The final stage is brainstorming.

Interdisciplinary integration

Disciplines	Student should know	Student should be able to
Previous:		
Normal anatomy Normal physiology	Know the anatomical and physiological features of the maxillofacial area: - structure of the upper and lower jaws; - innervation and vascularization of these sites; - structure of the lymphatic system of the head and neck; - structure of the muscles of the head and neck; - structure of the head and neck areas.	To be able to explain the structure of systems and organs of maxillo-facial area (MFA)
Topographical anatomy	To know the topography of the organs of MFA	To be able to explain the topography of the organs of MFA
Hystology	To know histological structure of soft and hard tissues of MFA	To be able to explain the stages of manufacturing of cytological, histological preparations
Pathologic anatomy Pathologic physiology	To know the appearance and flow of the pathological processes in the tissues and organd of MFA	To be able to explain the appearance and flow of the pathological processes in the tissues and organd of MFA
Internal diseases.	Know the basic clinical symptoms, principles of diagnosis and treatment of somatic diseases	Be able to explain the main clinical symptoms, principles of diagnosis and treatment of somatic diseases
General surgery.	Know the rules and ways of managing patients with thermal lesions.	Be able to determine the area of the burn surface and the degree of frostbite.
Intradisciplinary integration		
Topic 1. (Module 1. “Propedeutics of surgical dentistry”): Methods for examination of the oral cavity, jaws, face and neck.	To know the methods for examination of the oral cavity, jaws, face and neck.	Be able to provide examination of the oral cavity, jaws, face and neck.
Topic 3. (Module 1. “Propedeutics of surgical dentistry”): General anesthesia	To know the types of general anesthesia	Be able to identify the indications for anesthesia surgery.
Topic 1. («Traumatology of MFA»): … Methods of	To know the method of examination of patients with trauma of MFA. To	Be able to provide examination of patients with trauma of

examination of patients with trauma of the MFA. Organizational principles of assistance to victims in case of injury to the MFA.	know the types and methods of providing medical assistance to victims in case of injuries of the MFA.	MFA. To know the types and methods of providing medical assistance to victims in case of injuries of the MFA.

Plan and organizational structure of practical lesson of the discipline

Duration of practical lesson is 2 academic hours – 1 hour 30 minutes including 10 minutes for a break

№	The main stages of the lesson, their functions and content	Time period	Methods of eductation and control	Materials of methodical support	
1.	**Preparatory stage**	**20 min.**			
1.1	Organizational measures	5 min.			
1.2	Setting up of educational goals and motivation.	5 min.			
1.3	Control of the initial level of knowledge (standardized control methods).	10 min.	Individual theoretical evaluation. Solving typical tasks.Test control.Written interwiev.	Question for an individual oral and written evaluation. Typical situational tasks and tests.	Tables, phantoms, collapsible jaws, textbooks, manuals, reference books, atlas, methodical recommendations, video films
2.	**Main Stage**	**30 min.**			
	Formation of professional skills and abilities: 1. Work out the method of determining the area and extent of the burn surface. 2. To develop a method of rendering medical assistance in case of burns resulting from the action of high temperatures. 3. To work out the method of rendering medical help in frostbite. 4. To work out a method of rendering		Formation of professional skills: Work with patients with pathology of maxillofacial area. Work out the results of additional methods of examination of patients with diseases of the maxillofacial area. Solving typical situational tasks. Oral and written evaluation on standardized list of issues.Work with phantoms, view thematic videos.	Patients with pathology of maxillofacial area. The history of the disease.Selection of results of additional survey methods. Situational tasks.Algorithms.Phantoms, surgical instruments.Thematic videos.	

	medical help with chemical (acids, alkalis, salts of heavy metals) of the face. To choose the means of neutralization of corrosive chemicals. 5. To work out a method of rendering medical help in case of physical (electric current) injuries of the face. 6. To learn ways of transport immobilization of victims and rules of transportation.			
3.	**Final stage**	**30 min.**		
3.1	Control and correction of the level of professional skills and abilities		Individual skills control.Control of skills by solving non-typical situational problems with illustrative material.	Phantoms, surgical instruments.The history of the disease.Selection of results of additional methods of examination of thematic patients.Unusual situational tasks.
3.2	Control and correction of the level of professional skills and abilities.		Final evaluation of the students	
3.3	Homework. Informing students about the topic of the next lesson.			Recommended literature

Methodology of organization of educational process in practical lesson.

STRUCTURE OF PRACTICAL LESSON

Preparation stage (20 min.)

To substantiate the significance of the subject for further study of the discipline and professional activity of the doctor in order to formulate motivation and purposeful educational activity. Get acquainted with students with specific goals and lesson plans.Conduct standardized control of the initial level of student training, discussion and student answers.

• *Organizational part of the lesson: presence check, evaluation of the uniform.*

• *Informing about of the topic and the purpose of the lesson.*

Topic of the lesson: «Thermal (burns, frostbite), chemical (acids, alkalis, heavy metal salts), physical (electric current) face injures».

Aim of the lesson: to learn the basic clinical manifestations and principles of diagnostics and treatment of thermal, chemical, physical injuries of the face. To acquaint the students with the protocols of rendering medical aid at the stages of medical evacuation in case of the mentioned injuries and to teach to make a plan of complex treatment of patients.

Motivation of educational activity.

Burn (Latin - combustion) - damage to the skin or mucous membranes, often with underlying tissues, due to the effects of high temperature (thermal burn), chemical (acids, alkalis, salts of heavy metals), physical (electrical current) factors. According to WHO, burns rank third among other injuries, and in some countries, second, second only to transport injuries. Burns account for 16% of the structure of soft tissue damage, including thermal burns - 92.4% of cases, chemical - 6.4%. Frostbite (lat. - congelation) - damage to tissues, parts of the body under the influence of low temperature. In regions with average climates, facial frostbite accounts for up to 1% of all frostbite and in outpatient clinics up to 50% of local cold injuries.

Electric shocks occur in 1-2.5% of cases of all types of injuries. The topographic and anatomic location of the thyroid, the proximity of the location of the vital organs cause the difficulty of the general condition of the patients and the frequent development of complications. Therefore, the urgency of the problem of thermal, chemical, physical injuries of the face is determined by the high frequency of their occurrence in everyday life, at work, during hostilities, the severity of the disease, the complexity and duration of treatment.

Materials of methodical support of the preparatory stage of the lesson:

Questions to frontal survey:

1. Frostbite of the face: classification,
2. Clinical manifestations, diagnosis, treatment of the frostbite of the face.
3. Thermal trauma of the face: classification.
4. Peculiarities of the clinical signs and treatment of the thermal trauma of the face.
5. Burn disease: clinical features, diagnosis, principles of treatment.
6. Plastic surgery of the thermal damage of the face.
7. Radiation disease: clinical manifestations, peculiarities of treatment.
8. The syndrome of mutual aggravation.
9. Chemical burns of the face: classification.
10. Peculiarities of the clinical signs and treatment of the chemical burns of the face.
11. First aid in case of chemical burns of the face.
12. Complications of the thermal, chemical and physical face injures. Ways of their treatment and prevention.

The main stage: the formation of professional skills (30 min) (90 хв)

Conducting professional training.

Materials of methodical support of the main stage of the lesson:

Bums are a living organism tissue damage resulting from topical heat, chemicals, electric current or ionizing radiation. Commonly the first target lesion of bums is the skin surface.

Bums are classified as simple hyperemia (first degree bum), vesicant (second degree bum), destmctive of skin and underlying tissues (third degree bum). There is also a fourth degree of bum in national classification which manifests by destruction of deep tissues.

First degree bums (superficial bums) affect only the epidermis, causing redness and discomfort. First degree bums are rarely serious and heal by themselves within some days. First degree bums can occur as a result of exposure to the sun (sunburn) or exposure to hot liquids.

Second degree bums (partial thickness burns) affect both the epidermis and portions of the dermis. These types of bums cause blistering. These bums require longer periods of time to heal and may result in permanent scarring. They may sometimes require skin grafting if they extend deep into the dermis. Second degree bums can result from exposure to hot or scalding fluids or from flash and flame injuries.

Third degree bums (full thickness bums) affect all layers of the skin. These bums are severe and always require skin grafting as they result in the destmction of skin cells. These bums may result from prolonged exposure to flame, chemicals, electricity, scalding liquids or steam.

Fourth degree bums (full thickness bums) affect all layers of the skin and also stmctures below the skin, such as tendons, bone, ligaments and muscles. These bums are not painful, owing to destmction of nerve endings. They may occur from prolonged exposure to flame or electrical injury. These burns always require surgery or grafting to close the wounds. Fourth degree burns often result in permanent disability and may require lengthy rehabilitation. Fourth degree bums can be life-threatening and may require amputation due to the severe nature of fourth degree bum injuries.

Classification of Burn Injuries

Minor Burns

1. Less than 15 % body surface area (less than 10% in children)
2. Less than 3 % full-thickness
3. Not involving the head, feet, hands, or perineum

Moderate Burns

1. Bum area of 15-25% body surface area (10-15% in children)
2. Full-thickness burns involving 3-10% body surface area
3. Superficial partial-thickness bums of the head, hands, feet, or perineum
4. Suspected child abuse
5. Concomitant trauma
6. Significant pre-existing disease
7. Extreme age

Major Burns

1. Bum surface involvement of more than 25% body surface area (15% in children)
2. Full-thickness burns of more than 10% body surface area
3. Deep burns of the head, hands, feet, and perineum
4. Inhalation injury
5. Chemical burns
6. Electrical burns

Periods of bum disease

1. bum shock period (1-3 days)
2. period of acute bum toxemia (8-12 days)
3. septicetoxemia period (from 2-3 weeks to 2-3 months)
4. period recovery or wound exhaustion

In general, unless gross destruction of skin and soft tissues is obvious, a delay in the excision of acute facial burns until day 10 allows better determination of tissue that will not heal within a 3 week period. Subsequent excision of deep partial- and full-thickness bums must be carefully planned and performed in a precise manner following strict principles:

1. Respect for esthetic units
2. Sacrifice of less injured tissue to preserve aesthetic units
3. Minimization of blood loss
4. Delayed coverage with autografts to minimize postoperative hematomas
5. Early intervention of rehabilitation services.

Regardless of the dressing used on a superficial bum, it has to serve all the following purposes:

1. Superficial bums need to be aggressively debrided prior to the application of the definitive dressing. In many circumstances it is best done under sedation or general anesthesia in patients with large superficial bums.
2. The dressing has to provide a natural protection against infection. If subsequently infected, superficial bums may convert to full-thickness skin loss requiring formal excision and skin autografting, which leads to a worse cosmetic and functional outcome.
3. The dressing has to provide comfort to patients and, ideally, should provide good analgesia.
4. The dressing should permit patients' full range of motion and early rehabilitation.

5. The dressing should be easy to care by patients and relatives.
6. The dressing should permit early discharge of patients and subsequent control in the outpatient department.

Scarring can be minimized with the use of full-thickness grafts that have a complete layer of epidermis and dermis. Most of the techniques described above with partial-thickness skin grafts provide for epidermal coverage, but do not address the loss of dermis, leading to significant scarring. An extrapolation of the finding of decreased scarring with full-thickness grafts has led to the search for a dermal replacement to be used with partial-thickness skin grafts. Two products are currently available that hold this promise: Integra and AlloDerm. These two products have different properties and are thus used differently. These products are currently being widely used in many centers based on the hope that they will improve outcomes. These improvements, however, have not yet been firmly established. Their use is also associated with significant increases in cost

Frostbite is preventable with effects including avoiding temperatures below –15°C, covering the body properly, and avoiding situations that increase heat loss such as exhaustion, intoxication, and starvation.

First degree frostbite is superficial, surface skin damage that is usually not permanent. Early on, the primary symptom is loss of feeling in the skin. In the numb areas, the skin is numb, and possibly swollen, with a reddened border. In the weeks after injury, the skin's surface may slough off.

In second degree frostbite, the skin develops clear blisters early on, and the skin's surface hardens. In the weeks after injury, this hardened, blistered skin dries, blackens, and peels. At this stage, lasting cold sensitivity and numbness can develop.

In third degree frostbite, the layers of tissue below the skin freeze. Symptoms include blood blisters and "blue-grey discoloration of the skin. In the weeks after injury, pain persists and a blackened crust (eschar) develops. There can be longterm ulceration and damage to growth plates.

In fourth degree frostbite, structures below the skins are involved like muscles, tendon, and bone. Early symptoms include a colorless appearance of the skin, a hard texture, and painless rewarming. Later, the skin becomes black and mummified. The amount of permanent damage can take one month or more to determine. Autoamputation can occur after two months

Treatment by rewarming, though necessary, also causes damage to tissues. Non-freezing cold injury causes inflammation of tissues without the formation of ice crystals. Treatment consists of rewarming, when refreezing is not a concern. Increasing the core temperature to above 35°C is of critical importance as hypothermia is life-threatening. Aspirin and ibuprofen may prevent damaging inflammation. Wound care, antibiotics, tetanus toxoid, and pain management are often needed. Surgical debridement or amputation are sometimes necessary for severe frostbite, however these should be delayed for several weeks until the extent of the permanent damage is known.

- *Algorithms for the formation of professional skills.*

1. Work out the method of determining the area and extent of the burn surface.
2. To develop a method of rendering medical assistance in case of burns resulting from the action of high temperatures.
3. To work out the method of rendering medical help in frostbite.
4. To work out a method of rendering medical help with chemical (acids, alkalis, salts of heavy metals) of the face. To choose the means of neutralization of corrosive chemicals.
5. To work out a method of rendering medical help in case of physical (electric current) injuries of the face.
6. To learn ways of transport immobilization of victims and rules of transportation.

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

Individual tasks:

Task №1.

Patient K. aged 26 is diagnosed with second degree bums of the right cheek. What is responsible for

the regeneration of skin in this bum?

A. edge epithelialization and scar contracture
B. epithelial appendages of skin, edge epithelialization and scar contracture
C. no correct answers
D. secondary tension
E. epithelialization of the surviving epidermal layers

Task №2.
A patient aged 40 with facial bums as a result of gasoline ignition was brought to the emergency station. Clinically: hyperemia of skin on cheeks, nose and frontal region with large tight blisters filled with clear substance. Specify the degree of thermal injury.

A. IV degree
B. III-B degree
C. III-A degree
D. **II degree**
E. I degree

Tasks for independent work and work in small groups (interactive teaching methods).
Patient B. received thermal burns with boiling of the face, neck, anterior surface of the trunk. Hyperemia, edema, blisters with yellowish clear fluid on the skin. The patient is restless, screaming in pain. Determine the degree of burn, area of burn surface, period of burn disease. What are your first aid actions? 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 self-employment.To work on phantoms the technique of examination and palpation of maxillofacial area, oral cavity under conditions of phantom class.
- Evaluation.

Conduct standardized final control using individual test tasks and questions (20 min.), Work check (5-10 min.). Evaluate the student's current activities during the classroom, taking into account standardized final control, analyze the student's progress, announce the evaluation of each student's activity, and display it in the student attendance and student log book.An adult group at the same time makes assessments in the record of the record of success and attendance of classes by students, the teacher certifies them with his signature.

Brief informing the students about the topic of the next lesson and the methodical measures for preparing for it.

Basic knowledge level:
1. Injuries due to high temperatures.
2. Low-temperature injuries.
3. Injuries due to chemical (acid, alkali, heavy metal salts) substances.
4. Injuries due to physical (electric current) damage.

List of questions to be studied by the student:
1. Classification of thermal damage.
2. Features of thermal damage in the maxillofacial area.
3. Clinical picture of burns, methods for determining the area of damaged tissue.

4. Treatment of thermal injuries in MFA; prevention of complications.
5. General principles and types of restorative surgery in MFA.
6. Burn disease symptoms, diagnosis, principles of stepwise assist.
7. Complicatioms of the facial burns

The list of practical skills to be learned by the student:

1. Work out the method of determining the area and extent of the burn surface.
2. To develop a method of rendering medical assistance in case of burns resulting from the action of high temperatures.
3. To work out the method of rendering medical help in frostbite.
4. To work out a method of rendering medical help with chemical (acids, alkalis, salts of heavy metals) of the face. To choose the means of neutralization of corrosive chemicals.
5. To work out a method of rendering medical help in case of physical (electric current) injuries of the face.
6. To learn ways of transport immobilization of victims and rules of transportation..

Situational tasks and questions on the topic of the lesson:

1. Name the second period of bum disease:
   A. convalescence
   B. **bum toxaemia**
   C. no correct answer
   D. bum shock
   E. bum septic toxaemia

2. The victim with deep burns of face and body with the affected area of more than 10% developed a bum shock. What department should a patient be admitted to?
   A. Traumatology department
   B. Bum unit
   C. Surgical department
   D. **Resuscitation department at the bum center**
   E. Department of maxillofacial surgery

3. A military man aged 22 with bums of upper body, face and head was admitted to the bum unit at the hospital. What kind of aid should be given at this stage of the evacuation?
   A. injection of rabies vaccine, surgical treatment of bums
   B. opening of blisters and application of gauze bandage
   C. **treatment of bum disease, autoplasty**
   D. detoxification therapy, prescription of anticoagulants
   E. prescription of analgesics, antihistamines and cardiovascular drugs

4. An adult with thermal bums of the head and neck was admitted to the hospital. Indicate the percentage of the affected body area in this case.
   A. 19
   B. 2
   C. **9**
   D. 7
   E. 11

5. A patient aged 27 was admitted to a clinic complaining of the presence of blisters on the face. From the medical history we know that 25 hours ago he participated in firefighting and injured his face. Among his childhood diseases he indicates childhood infections, colds. On examination:

presence of thin-walled blisters containing yellowish substance on the nose and lips. What is a provisional diagnosis?

A. Thermal bum of face of the 3-A degree
B. Thermal bum of face of the 2-3 degree
C. Thermal burn of face of the 1 degree
D. Thermal burn of face of the 3-4 degree
E. Thermal burn of face of the 1 -2 degree

Literature:

Basic:

1. Oral and Maxillofacial Surgery: Textbook, Part 1, 2 / V. O. Malanchuk. – Vinnytsia: Nova Knyha Publishers, 2011. – 453p.
2. PETERSON'S PRINCIPLES OF ORAL AND MAXILLOFACIAL SURGERY Second Edition, 2004. - 1502 p.
3. Principles of Dental Local Anaesthesia and Teeth Removal / Ya. E. Vares, R. Z. Ogonovsky, Ch. R. Pohranychna – LNMU, 2007. – 63p.
4. Atlas of Human Anatomy / F. Netter – 2nd ed. – New Jersey: ICON Learning Systems. – 592 p.

Additional:

1. The AIDS booklet. – Boston: WCB Mcgraw Hill, 1999. – 70 p.
2. Contemporary Oral and Maxillofacial Surgery / J. P. Sapp, L. R. Eversole, G. P. Wysocki – 2nd ed.- St. Louis: Mosby – 2004. – P. 88-90.
3. Contemporary Oral and Maxillofacial Surgery / L. J. Peterson, E. Ellis, J. R. Hupp, M.R. Tucker – 3rd ed. – St. Louis: Mosby – Year Book, Inc. – 1998. – P. 69-82.
4. Bauml, Philips R.W., Lund M.R. Texbook of Operative Dentistry. - 3-rd ed.- Philadelphia: Saunders, 1995.- 661p.
5. Kharkov L. V. Pediatric oral and maxillofacial surgery : a textbook for students of higher medical educational institutions of the III-IV levels of accreditation / L. V. Kharkov, L. M. Yakovenko, N. V. Kiselyova ; ed. by L. V. Kharkov. - Kyiv : AUS Medicine Publishing, 2015. - 103 p.
6. Pohranychna, Ch. R. Maxillofacial oncology : guide of lectures on oral and maxillofacial surgery for the english-medium students of the 5th year education at dentistry faculty (autumn semester) : methodological guide / Ch. R. Pohranychna, R. Z. Ogonovsky. - Lviv, 2011.
7. Timofieiev O.O. Anesthesia in Oral and Maxillofacial Surgery / O.O. Timofieiev, I.I. Fesenko. - Kyiv: OMF Publishing, 2016, 128 p.

Assesment criteria of the discipline

Assessment procedures are an important element of feedback in educational process. They determine whether the level of knowledge and skills obtained by the students is in line with the requirements of regulatory acts pertaining to higher education.

Forms of assessment and grading system correspond to discipline syllabus requirements and the Regulation on Educational Process Organization at Danylo Halytskyi Lviv National Medical University approved by the Scientific Council of Danylo Halytskyi Lviv National Medical University on February 18, 2015, protocol No. 1-BP.

Forms of assessment include routine assessment, final assessment – end-of-term credit (autumn term), end-of-term exam (spring term).

Routine assessment is conducted during practical classes and is aimed at checking students' level of preparation for doing specific tasks.

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.

Routine assessment 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.

Assessment of student current progress is made during each practical class according to a 4-point scale and is recorded in academic performance journal.

Student knowledge is assessed both from theoretical and practical perspective under the following criteria:

- **"excellent"** – 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;
- **"good"** – a student has mastered theoretical material well, is aware of the main theoretical principles discussed in scientific sources and recommended literature and is capable of substantiating them; has practical skills and expresses opinion on this or that issue yet may be inaccurate and erroneous when presenting theoretical material or analyzing the practical material;
- **"satisfactory"** – 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;

- **"unsatisfactory"** – 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.

Independent student work assessment

Material for independent student work foreseen in the topic of practical class together with classroom work is evaluated during routine assessment of the topic in relevant class. Evaluation of topics planned for independent work and not included into topics for classroom work is made during final assessment.

Final assessment – end-of-term credit or exam which is conducted with the purpose of assessing the results of studying according to the national scale and ECTS scale.

Admitted to final assessment are students who attended all classes foreseen by the syllabus of discipline and who received above the minimum number of points during routine assessment. Students who skipped classes may be allowed to work off missed classes with the permission of dean's office before an established time within the term.

End-of-term credit – a final assessment form consisting of evaluating student's knowledge of educational material solely on the basis of grades received for performance of various tasks during practical classes.

End-of-term credits take place before exam session. Credits are held by lecturers who had practical classes in the academic group or delivered lectures in said discipline.

Students are admitted to end-of-semester assessment if they perform all types of assignments foreseen by syllabus and curriculum.

Assessment of student 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.

The following grade scales are used in educational process at the University: multipoint (200-point) scale, traditional 4-point scale and ECTS rating scale. The results are converted from one scale into another according to the following rules.

During routine assessment of student knowledge of every topic grades are given according to 4-point (traditional) scale. All types of assignments foreseen by the syllabus are taken into account during assessment. A student can receive a grade for every topic. Forms of routine assessment must include assessment of theoretical and practical training. Grades given according to a traditional grade scale are converted into points.

Maximum number of points a student can get during routine assessment of knowledge in discipline makes up **200 points**.

Minimum number of points a student must get during routine assessment of knowledge in discipline makes up **120 points.**

Calculation of the number of points 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. Figure received is then converted into points under multipoint grade scale using the following procedure:

$$x = \frac{AA \times 200}{5}$$

A conversion chart for 200-point scale is presented for convenience purposes:

Recalculation of average current grade into multipoint scale for disciplines for which a credit (graded credit) is foreseen

4-point scale	200-point scale
5	200
4.97	199
4.95	198
4.92	197
4.9	196
4.87	195
4.85	194
4.82	193
4.8	192
4.77	191
4.75	190
4.72	189
4.7	188
4.67	187
4.65	186
4.62	185
4.6	184
4.57	183
4.52	181
4.5	180
4.47	179

4-point scale	200-point scale
4.45	178
4.42	177
4.4	176
4.37	175
4.35	174
4.32	173
4.3	172
4.27	171
4.24	170
4.22	169
4.19	168
4.17	167
4.14	166
4.12	165
4.09	164
4.07	163
4.04	162
4.02	161
3.99	160
3.97	159
3.94	158

4-point scale	200-point scale
3.92	157
3.89	156
3.87	155
3.84	154
3.82	153
3.79	152
3.77	151
3.74	150
3.72	149
3.7	148
3.67	147
3.65	146
3.62	145
3.57	143
3.55	142
3.52	141
3.5	140
3.47	139
3.45	138
3.42	137
3.4	136

4-point	200-point
3.37	135
3.35	134
3.32	133
3.3	132
3.27	131
3.25	130
3.22	129
3.2	128
3.17	127
3.15	126
3.12	125
3.1	124
3.07	123
3.02	121
3	120
Less than 3	Not enough

Grades in disciplines which have a **credit** as a final assessment form are solely based on results of current academic progress and are expressed in grades of two-point national scale: “pass” or “not pass”. In order to get a “pass” a student must receive at least 60% for current academic progress from the maximum number of points in discipline (120 points). Grades in disciplines are ranked according to ECTS scale (Fig. 4) under above described procedure.

An **F** grade (unsatisfactory with a compulsory repeat course) for a credit or graded credit is given to students who attended all classes in discipline but did not get the minimum number of points for current academic progress. Such students are not assessed for the credit and are not admitted to exam session.

During final assessment of spring term – end-of-term exam:

Maximum number of points a student can get for current academic progress during term to be allowed to take an exam is 120 points.

Minimum number of points a student must get for current academic progress during term to be allowed to take an exam is 72 points. ***Calculation of the number of points*** 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. Figure received is then converted into points under multipoint grade scale using the following procedure:

$$x = \frac{AA \times 120}{5}$$

A conversion chart for 200-point scale is presented for convenience purposes:

Fig. 2

Recalculation of average current grade into multipoint scale for disciplines in which an exam is foreseen

4-point scale	200-point scale	4-point scale	200-point scale	4-point scale	200-point scale	4-point scale	200-point scale
5	120	4.45	107	3.91	94	3.37	81
4.95	119	4.41	106	3.87	93	3.33	80
4.91	118	4.37	105	3.83	92	3.29	79
4.87	117	4.33	104	3.79	91	3.25	78
4.83	116	4.29	103	3.74	90	3.2	77
4.79	115	4.25	102	3.7	89	3.16	76
4.75	114	4.2	101	3.66	88	3.12	75
4.7	113	4.16	100	3.62	87	3.08	74
4.66	112	4.12	99	3.58	86	3.04	73
4.62	111	4.08	98	3.54	85	3	72
4.58	110	4.04	97	3.49	84	Less than 3	Not enough
4.54	109	3.99	96	3.45	83		
4.5	108	3.95	95	3.41	82		

Grades in discipline for students who successfully completed the course are converted into traditional 4-point scale according to absolute criteria provided below:

Fig. 3

Grade in discipline	Grade under 4-point scale
From 170 to 200 points	5
From 140 to 169 points	4
From 139 points up to the minimum number of points to be received by a student	3
Below the minimum number of points to be received by a student	2

ECTS grade is not converted into traditional scale since ECTS scale and four-point scale are independent.

Objectivity of assessment is checked by means of statistical methods (correlation ratio between ECTS grade and grade under national scale).

Grades of students with the same academic major are ranked with consideration for points received in discipline in the following way:

Fig. 4

ECTS grade	Statistical index
A	Top 10 % students
B	The next 25 % students
C	The next 30 % students
D	The next 25 % students
E	The last 10 % students

Ranking with assignment of grades „A", „B", „C", „D", „E" is conducted for students of the same year with the same academic major who successfully completed the course. Students who received FX, F grade ("2") are not included into the list of students who are ranked. Students who received an FX grade upon retake automatically receive „E" grade.

An FX grade (unsatisfactory with possibility of retake) is given to students who got minimum points for current academic progress, were allowed to pass the exam but failed it. This category of students has the right to retake the exam within additional time for elimination of academic failure established by the schedule of educational process.

An F grade (unsatisfactory with compulsory repeat course) is given to students who attended all classes in discipline but got minimum points for current academic progress and were not allowed to take the exam. A student receiving an F grade is obliged to retake the course.

Exam retake is allowed no more than twice – the first retake exam is passed in the presence of examinator appointed by the head of department, the second retake exam is passed in the presence of a board set up by the dean of faculty. Students who failed to appear to the exam without

a valid reason shall be deemed as those who have received an unsatisfactory mark.

Student's refusal to fulfill examination task is classified as an unsatisfactory mark.

Students are supposed to fulfill their examination tasks independently. The use of forbidden additional materials and communication means or prompts results in student being expelled from the exam with grade "0".

Upon termination of exam the examinator collects written answers from each student together with exam cards and student credit books. Assessment results are recorded in grade report sheets.

A positive grade is recorded in student's credit book. The examinator announces exam results and gives out credit books with indication of points and grade according to national scale no later than two days after the scheduled date of exam.

A student who does not agree with the grade may file a written appeal with the head of department on the day of grade announcement indicating specific reasons for disagreeing with the grade.

Head of department together with examinator and other experts, if necessary, consider an appeal within 3 days and orally inform the student of the results.

Checked exam papers are kept for three months and then destroyed.

Procedure for end-of-term exam

End-of-term exam consists of the following stages:

I – written answer to:

a) format A test tasks. A student answers a set of tests. Each set contains 40 format A test tasks from the following fields of Surgical Dentistry: "Propaedeutics", "Inflammatory diseases", "Traumatology during peaceful times and emergencies, military maxillofacial surgery. Gunshot wounds to maxillofacial area», "Oncology". Each test task has only one correct answer.

b) set of questions. A student receives a set of 4 questions the answer to which is to be given in a written form.

Test tasks and advancement questions include all syllabus material from units covered, have professional (specialty) orientation and require the students not to reproduce the information on various topics and units of academic discipline but to demonstrate its integrated application.

Time allotted for performance of written task makes up 100 minutes.

II – checking of tasks by lecturer.

III – results announcement (conducted by examinator no later than two days after the scheduled exam with indication of points and grade according to national scale).

IV – formalization of documents.

Assessment criteria

No.	Number of points for correct answer
I. Test tasks (supplement No.1). 40 tests	**40 points** **(1 point – 1 test)**
II. Description of anesthesia methods **(two questions):**	**2 × 10 points:**
1. *injection site (anatomical landmarks)*	2 points
2. *direction and depth of needle movement*	2 points
3. *anesthetic dose*	1 point
4. *target point; nerves that are blocked*	2 points
5. *anesthesia zone*	3 points
III. Description of tooth extraction procedure **(two questions):**	**2 × 10 points:**
1. *position of patient and doctor*	2 points
2. *choice of local anesthesia method*	2 points
3. *choice of necessary instruments*	2 points
4. *extraction stages*	2 points
5. *typical local complications*	2 points

Maximum number of points a student can get when passing the exam is 80.

Minimum number of points when taking the exam – at least 50.

Grade in discipline for which an exam is foreseen is calculated as a sum of points for current academic progress (at least 72) and points received during exam (at least 50).

Grade in discipline for students who successfully completed the programme are converted into traditional 4-point scale according to absolute criteria provided in chart below:

Points in discipline	Grade under 4-point scale
From 170 to 200 points	5
From 140 to 169 points	4
From 139 points to minimum number of points to be received by a student	3
Below minimum number of points to be received by a student	2

Regulation of the exam of Surgical Dentistry

Control measures are a necessary element of feedback in the study process. They determine the compliance of the students acquired knowledge and skills requirements of normative documents on higher education.

Monitoring forms and evaluation system implemented in accordance with the discipline program and regulations on the organization of educational process in Lviv Danylo Halytsky National Medical University, 2/18/2015 protocol №1-BP.

Control measures for the Oral Surgery study in the 8 semester include ongoing monitoring and final control - semester exam.

The semester exam allowed students which attended all the provided curriculum of courses for classroom training sessions and took on the current success of marks, not less than minimum - 72 points.

Dates, time of the Dental surgery examination and the number of groups that make up the exam in one day, determined exam schedule drawn up by the educational department of the university.

Semester exam in the Oral surgery consists of the following stages:

Stage I - check the presence of students admitted to the assembly semester exam by test-examination information; familiarize students with members of the examination committee and support staff during an examination (assistant, senior assistant), duration of writing the exam, exam form filling rules replies term announcement of exam results.

Stage II - a written response to the format of the tests A. The student receives a test paper containing a package of tests (80 tests format A from the following sections of the Dental Surgery "Oral Surgery Propedeutic", "MFA Inflammatory diseases", "Civil and Military trauma of MFA","MFA Oncology").

In each variant all the tests are identical, arranged in different sequences of the correct answer and have five dystraktors. In each task using terms, names, designations are well known for the students.

Each test task has only one correct answer. Duration of written student work is 90 minutes.

The performance of the exam tasks must be extremely independent. With the use of illegal sources, additional communication facilities or hints, the student is not allowed to further exam and received a rating of "0" points.

After the answer form filling, the examiner receives written responses, exam tasks and academic records of each student.

Stage III – the exam tasks cheked by the examination committee.

Stage IV – paperwork and results announcement (provided the examiner not later, than two days after an examination by the Schedule for the above stated points and evaluation on a national scale).

The evaluation of a student's work results during the semester should be documented (included in the academic journal, test-examination information, academic records of student).

Examination works are stored during three months then they are utilized.

Evaluation criteria of the exam of Surgical Dentistry

The monitoring forms and evaluation system implemented to comply with the discipline program and regulations on the organization of educational process in Lviv Danylo Halytsky National Medical University, the Scientific Council of Lviv Danylo Halytsky National Medical University 2/18/2015 protocol №1-Academic Counsil.

Control measures for the dental surgery study in 8 semester include ongoing monitoring and final control - semester exam.

The criteria of the student's examination task evaluation - one test task correctly solved estimated 1 point.

The maximum points number that a student can collect during the exam is 80.

The minimum points number during the exam are not less 50.

Assessment of discipline, culminating exam is defined as the sum of scores for current educational activity (at least 72) and points on the exam (at least 50).

Scores of discipline for students who successfully completed the program, converted into traditional 4-point scale by absolute criteria listed in the table below:

Points of Discipline	**Scores by 4-points scale**
From 170 to 200 points	5
From 140 to 169 points	4
From 139 points to the minimum number of the points that a student must collect	3
Less than the minimum number of the points that a student must collect	2

Assessment ECTS in traditional scale is not converted because the scale of ECTS and four-point scale are independent.

The objectivity evaluation of the students educational activities is tested by the statistical methods (correlation coefficient between the assessment and evaluation of ECTS national scale).

The scores of the students are enrolled in one specialty, taking into account the number of points gained in the discipline ranked on a scale ECTS as follows:

ECTS estimate	Statistical Index
A	The 10 % top students
B	Next 25 % students
C	Next 30 % students
D	Next 25 % students
E	The last 10 % students

Ranking of assigning ratings of "A", "B", "C", "D", "E" is held for the students of this course, studying at one specialty and successfully completed the study subjects. Students who have

received assessment FX, F («2») is not made to the list of students who ranked. Students from assessment after retaking FX are automatically mark "E".

FX Evaluation (unsatisfactory with the possibility of re-passing) assigned to students who score a minimum number of points for current educational activity and admitted to the exam, but did not pass it. This category of students has the right to re-passing the exam in extra term for the elimination of academic debt, defined the schedule of the educational process.

Grade F (unsatisfactory with obligatory repeated course) assigned to the students who attended the lecture sessions on all subjects, but did not reach the minimum number of points for current educational activity and not allowed to take the exam. In the case of F evaluation the student is obliged re-pass the subject.

Re-exam are allowed no more than two times - the first time by the examiner appointed by the head of the department, the second – be the committee that created be the dean of the faculty.

The students who missed the exam without grounded reason, have received unsatisfactory evaluation.

Disclaimer from the performing of the Examination task is certified as unsatisfactory answer.

In case of disagreement with the assessment the student can submit the appeal in writing form to the Head of the department at the day of the announcement estimates, stating the specific reasons for disagreement with the assessment

The Head of the department together with the examiners, involving, if necessary, other professionals considering the appeal during the three days and orally notify the student of the outcome of the proceedings.