

**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 one

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			Self-study	Year of study/ semester	Test type
	Total	In class				
		Lectures (hours)	Practical (hours)			
<b>Name of the discipline: Surgical Dentistry</b> <b>Number of content modules: 3</b>	<b>4,5 credits / 135 hours</b>	<b>10</b>	<b>70</b>	<b>55</b>	<b>IV course (VII, VIII semesters)</b>	<b>Credit Exam</b>
<b>by semesters</b>						
<b>content module 1</b>	<b>2,2 credits / 66 hours</b>	<b>8</b>	<b>34</b>	<b>24</b>	<b>VII semester</b>	<b>Credit</b>

content modules 2, 3	2,3 credits / 69 hours	2	36	31	VIII semester	Exam
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**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**

<b>№</b>	<b>Topic</b>	<b>Hours</b>
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
<b>Total: 8</b>		

**Practical lessons schedule for V /autumn/ semester**

<b>№</b>	<b>Topic</b>	<b>Hours</b>
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.	2

	Advantages and disadvantages.	
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
<b>Total hours: 34</b>		

**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
<b>Total hours: 24</b>			

**Ministry of Health of Ukraine**  
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“Approved”  
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	<b>Topic №1.</b> Statistics and classification of maxillofacial injuries. Initial management of the maxillofacial trauma patient's.
Course	4 <sup>th</sup>
Faculty	Dental

Lviv – 2019

**Actuality of the topic:** rhythm of modern life, technological progress, modernization of production cause the constant growth of traumatism, which requires the dentist to freely navigate the issues of diagnosis of trauma of the maxillofacial area of peacetime, perfect possession of methods of rendering first aid for traumatic injuries. Proper organization of surgical dental care promotes quality treatment of patients, provides conditions for preventive measures. In the practice of the dental surgeon, an important place is the examination of patients, which is the basis for establishing the correct diagnosis and prescribing effective treatment.

**Aim of the lesson:** to acquaint students with the organizational principles of assisting the victims with injuries to the maxillofacial area. To analyze the etiological factors that contribute to the occurrence of traumatic injuries. To study the methods of examination of a patient with trauma to the maxillofacial area. To propose a plan of examination of the patient with trauma 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.
10. Organization of medical evacuation activities.

➤ *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:		
<p style="text-align: center;">Normal anatomy</p> <p style="text-align: center;">Normal physiology</p>	<p style="text-align: center;">Know the anatomical and physiological features of the maxillofacial area:</p> <ul style="list-style-type: none"> <li>- structure of the upper and lower jaws;</li> <li>- innervation and vascularization of these sites;</li> <li>- structure of the lymphatic system of the head and neck;</li> <li>- structure of the muscles of the head and neck;</li> <li>- structure of the head and neck areas.</li> </ul>	<p>To be able to explain the structure of systems and organs of maxillo-facial area (MFA)</p>
General surgery	To know classification of blood vessels damage	To be able to provide temporary stop of the bleeding
Topographical anatomy	To know the topography of the organs of MFA	To be able to explain the topography of the organs of MFA
Internal diseases	To know the clinical picture of loss of consciousness, collapse, shock.	To be able to provide first aid in case of loss of consciousness, collapse, shock.
Radiation diagnostics	To know the methods of radiological examination used in dental practice	To be able to explain the principles on which these or other methods are based (X-ray, CT, MRI, ultrasound)
Pharmacology	To know the pharmacokinetics of drugs that are prescribed for traumatic injuries of the bones of the facial skeleton.	Be able to prescribe the scheme of medical treatment to the victim.
<b>Intradisciplinary integration:</b>		
Topic 1. (Content module 1 “Propedeutics of surgical dentistry”): ... Method of examination of the maxillofacial area and neck.	To know the method of examination of the patient with diseases of the maxillofacial area.	To be able to carry out subjective and objective examination of the patient, to appoint additional methods of research, to fill in appropriate medical documentation.

### 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 education and control	Materials of methodical support
<b>1.</b>	<b>Preparatory stage</b>	<b>20 min.</b>		
1.1	Organizational measures	5 min.		
1.2	Setting up of educational goals and	5 min.		

	motivation.				
1.3	Control of the initial level of knowledge (standardized control methods).	10 min.	Individual theoretical evaluation. Solving typical tasks. Test control. Written interview.	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.
<b>2.</b>	<b>Main Stage</b>	<b>30 min.</b>			
	<p>Formation of professional skills and abilities:</p> <ol style="list-style-type: none"> <li>1. To collect anamnesis and to conduct a review of the patient with the pathology of the maxillofacial area.</li> <li>2. Set up a patient survey plan.</li> <li>3. Make a plan for additional research methods.</li> <li>4. Complete the relevant medical documentation.</li> <li>5. To work out a method of examination and palpation of the maxillofacial area during the examination.</li> <li>6. To work out the method of examination and palpation of vestibulum of the oral cavity.</li> <li>7. To work out the method of examination and palpation of the oral cavity itself.</li> <li>8. To work out a survey method, percussion, determination of degree of mobility of teeth, depth of tooth-gingivalpockets.</li> <li>9. To work out the method of determining the degree of limitation of opening the mouth.</li> <li>10. Learn to fill the patient's dental formula.</li> <li>11. Learn to formalize the documentation for additional diagnostic methods.</li> </ol>		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.	
<b>3.</b>	<b>Final stage</b>	<b>30 min.</b>			
3.1	Control and correction of the level of professional skills and abilities		Individual skills control. Control of skills by solving non-typical	Phantoms, surgical instruments. The history of the disease. Selection of results of additional methods of examination of thematic patients. Unusual situational	

			situational problems with illustrative material.	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.	1 min.		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:** «Statistics and classification of maxillofacial injuries. Initial management of the maxillofacial trauma patient's.»

**Aim of the lesson:** to acquaint students with the organizational principles of assisting the victims with injuries to the maxillofacial area. To analyze the etiological factors that contribute to the occurrence of traumatic injuries. To study the methods of examination of a patient with trauma to the maxillofacial area. To propose a plan of examination of the patient with trauma to the maxillofacial area.

- *Motivation of educational activity.* rhythm of modern life, technological progress, modernization of production cause the constant growth of traumatism, which requires the dentist to freely navigate the issues of diagnosis of trauma of the maxillofacial area of peacetime, perfect possession of methods of rendering first aid for traumatic injuries. Proper organization of surgical dental care promotes quality treatment of patients, provides conditions for preventive measures. In the practice of the dental surgeon, an important place is the examination of patients, which is the basis for establishing the correct diagnosis and prescribing effective treatment.

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

*Questions to frontal survey:*

1. Principles of organization of dental care for the population of Ukraine.
2. Organization of work of the surgical department (office) of the dental polyclinic.
3. Features of organization and provision of specialized surgical dental care.
4. Sanitary and hygienic requirements for the surgical department (office) of the dental polyclinic.
5. Sanitary and hygienic requirements for the surgical department of the hospital.
6. Equipment, medical documentation of the surgery room (department).
7. Subjective examination of a surgical dental patient (complaints, medical history, life history).
8. Methods of examination of the general condition of a surgical dental patient.
9. Methods of extraoral examination of a surgical dental patient.
10. Methods of intraoral examination of a surgical dental patient. Oral examination tools.
11. Laboratory methods of examination.
12. Instrumental additional diagnostic methods.
13. Functional additional examination methods.

#### 14. Indications for hospitalization of surgical dental patients.

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

Conducting professional training.

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

CAUSES OF TRAUMA. Classification of injuries of the maxillofacial area.

Damage to facial tissues has been known to mankind since ancient times. They occur both in peacetime and in wartime. The face is the least protected part of the human body, because it houses the most important organs through which a person constantly perceives, communicates with the world, and therefore the person should be as open as possible to that communication.

Traditionally, etiologic injuries distinguish between domestic, industrial (industrial or agricultural), transport and sports. Recently, criminal trauma, which is important for evaluating social and social events in society, has been isolated. At present, there is a significant increase in road accidents, criminal and industrial injuries, an increase in the number of combined injuries, their severity, and hence disability and mortality. Domestic injuries (up to 90%) are predominant in face and jaw injuries, with the majority of victims receiving injuries in fights.

Mostly people in the young and working age range from 15 to 50 are suffering. Therefore, given the long duration of treatment, the significant number of negative effects of injuries to the maxillofacial area and their complications, the high complexity: the cost of treatment of such patients, the mortality rate, it becomes clear the importance of improving the treatment of the specified contingent of victims.

The average frequency of maxillofacial injuries is 0.3 cases per 1000 population, which tends to increase. In the maxillofacial departments of hospitals up to 30-40% are patients with facial injuries and their consequences.

Among non-gunshot mechanical damage of tissues of the maxillofacial region is isolated injuries: soft tissues, teeth and facial bones — mandible, maxilla, zygomatic bone, nasal bone. On average, soft tissue injuries of the face amount to 1.5–14 % of injuries, fractures of the mandible, 71-80 %, zygomatic bone — 12-15 %, nasal bone and 3-4 %, upper jaw and 2.5–3.5 %, and combined injuries is 4.5 to 5.6 %.

In addition to mechanical injuries of the maxillofacial area note thermal (burns and frostbite). Injuries to the face can be isolated, combined (single and multiple) and combined, leading or accompanying.

Classification of injuries of the maxillofacial region.

I. Mechanical damage to the upper, middle, lower and lateral areas of the face.

1. Localization:

A. soft tissue Injuries with damage to: a) language b) salivary glands C) major nerves; d) large vessels.

Would. Bone injuries: a) mandible; b) maxilla C) zygomatic bones d) nasal bone. d) two bones and more.

2. By the nature of the injury: a) through; b) blind; C) shear; d) penetrating into the cavity of the mouth, nose, maxillary sinus; d) not penetrable in the cavity of the mouth, nose, maxillary sinus; d) with defect of tissues without tissue defect; e) major — related; g) single — multiple; C) isolated — combined.

3. The clinical course of wound process: a) complicated b) uncomplicated.

4. Mechanism of damage:

A. Gunshot: a) a bullet; b) fragmentation, C) ball; g) arrow-like elements.

B. Non-fgunshot.

II. Combined damage.

III. Burns (including electrical injury).

IV. Frostbite.

Classifications of mechanical damage to tissues of maxillofacial area in peacetime:  
The nature of the damage

- A. Isolated
- B. Combined:
  - a) with traumatic brain injury;
  - b) with damage to soft tissues of other areas;
  - c) with damage to other skeletal bones
- C. Single
- D. Multiple

Isolated damage is the injury of one anatomic area. Combined damage is the trauma of two or more anatomical sites with one striking factor (mechanical, thermal). These include simultaneous wounds of the maxillofacial region and ENT organs, eye, skull and brain, and other parts of the human body (limbs, abdomen, chest).

A single isolated injury is the lesion of one anatomic area with one wound charge and multiple injury with several traumatic injuries.

Major damage causes the severity of the injury in several wounds. Collateral damage occurs simultaneously with the master, but does not determine the severity of the lesion compared to the main. They may vary depending on the quality of treatment, the course of the disease.

Combined damage is the damage of tissues under the influence of various factors of impact (mechanical, chemical, thermal, radiation, etc.).

Localization of damage

1. Fractures of the mandible.
2. Fractures of the upper jaw.
3. Fractures of the jawbone and arch.
4. Nose fractures.
5. Tooth injuries.
6. Multiple (simultaneous) injuries to the bones of the face.
7. Soft tissue injury.

### **Examination of patients with traumatic injuries of maxillofacial area**

Examination of a patient with surgical pathology of the maxillofacial area is a complex of studies that are conducted to identify the individual characteristics of the patient for the purpose of diagnosis, selection of rational treatment, monitoring the dynamics of the disease, determining the prognosis.

Algorithm of examination of maxillofacial patient:

- surveys (complaints, anamnesis, and life)
- face examination (examination, physical examination, bite study);
- examination of the oral cavity (examination, physical and instrumental examination). Instruments for examination of maxillofacial patient:
  - spatula - for removal of lips, cheeks or tongue, as well as during examination of the tongue, sublingual area, palatine tonsils, pharynx;
  - dental or anatomic forceps - to determine the degree of mobility of teeth and their percussion;
  - dental mirror - for examination of teeth, back of tongue, sublingual area, palate;
  - dental probe (angular or bayonet) - to determine the depth of the gum-pockets and defects of the crowns of the teeth;
  - a thin Bauman probe, blunted thin injection needles, plastic salivary catheters - to probe the ducts of the large salivary glands and fistula;

- button probe - for probing oroantral junctions, fistulas, deep soft tissue wounds, palate defects and jaw bones.

In most cases, the above examination algorithm is sufficient for a full diagnosis of the condition, but if necessary, depending on the features of the disease and the general somatic status of the patient, additional methods of examination may be performed:

- laboratory diagnostic methods (blood, urine, wounds, saliva, etc.);

- Diagnostic methods (radiological examination, CT scan, etc.).

-Functional methods of diagnostics (thermometry, electroodontodiagnosis, functional chewing tests).

Laboratory research.

Morphological study

- cytological (imprint, scraping, flushing, punctate);

- histological (biopsy)

-excision, incisional, puncture, trepanation, curettage, accidental.

Microbiological research

- Identification of the pathogen in aerobic and anaerobic nutrient media (bacteriogram);

- microscopic examination (Gram staining);

- determination of sensitivity of microflora to antibiotics (antibiotic chart).

Serological examination

- complement binding reaction: Wasserman, Colmer (with syphilis), Bordeaux-Zhang (with actinomycosis), Paul-Bunnell (with infectious mononucleosis);

- response to HIV infection.

Immunobiological study

- study of the immune status (immunogram); General clinical analyzes

- general blood test (hemogram);

- general study of urine;

- blood group and rhesus factor;

- blood glucose;-

platelet count, bleeding duration, blood clotting time;

- coagulogram.

Biochemical blood test

- assessment of the functional state of the liver: bilirubin (direct, indirect, total), activity of hepatic transaminases (ALT, AST);

- assessment of the functional state of the kidneys: creatinine, uric acid, blood urea;

- presence of disturbances of water-electrolyte exchange: Na<sup>+</sup>, K<sup>+</sup>, chlorides;

- assessment of blood plasma protein content and protein fraction ratios;

- indicators of calcium-phosphorus metabolism: the level of calcium and phosphorus in the serum and the activity of alkaline phosphatase, parathormone.

Radiological methods of diagnostics.

Intraoral radiography

- contact (teeth, bottom of mouth);

- occlusal (teeth, hard palate).

Oral radiography

- examination of bones of the facial skeleton;

- the bones of the nose and paranasal sinuses;

- temporomandibular joints (laying by Schiller, Mayer, Pordes (in Parma modification));

- the maxilla and arches (in axial and semi-axial projections);

- mandible in lateral projection (laying by Cieszynski, Genish).

Tomography - obtaining a picture of a layer of the studied structure of a certain anatomical formation at a certain depth.

Orthopantomography (panoramic radiography) is a method of radiological examination that allows to obtain images of the volumetric curved surfaces of both jaws on a flat x-ray film. Gives

the opportunity to get a single-image of the entire dentoalveolar system as a single functional complex.

Electro-radiography - obtaining x-ray image on plain paper with the use of charged selenium film, which is shown with the help of dry graphite powder in a special apparatus.

Contrast radiography - salivary glands (sialography), maxillary sinuses (sinusography), cystic cavities (cystography), fistulas (fistulography) with 30% solution of iodipol, 40% solution of iodipine, lipodiol, etiodol.

Angiography of the vascular system with cardiotrastom, verographin, urotrast. Lymphography (indirect, direct) with lymphotrust. Computed tomography is a layer-by-layer study of the optical density of individual organs and tissues in the form of sections of parts of the human body on a monitor screen using computer-aided mathematical modeling of x-rays.

Computer Three-Dimensional Stereoscopic (Volume) Tomography (3 D-Image) - Construction using computer technology of a series of 2-dimensional computer tomographs of a 3-dimensional model by combining tomographic sections in the required sequence (spiral mode, 16 scans in 0.5 seconds (or 32 "sections" in 1 second) up to 0.5 mm thick. High-definition images of any area are obtained and the most accurate three-dimensional images of the human or individual body are reproduced in different spatial planes. It is possible to manufacture a 3-dimensional stereolithographic plastic model of the bones of the facial skeleton.

Stereolithography - allows to determine the actual size of the pathological lesion (tumor) in the jaw, its exact location, the size of the bone defect and the relationship with the surrounding structures. Colored stereolithographic models are obtained by contrasting substance when staining the lesion (tumors, nerves, blood vessels, etc.).

#### **Other methods of radiation diagnostics**

Contact thermography - obtaining color thermograms based on the ability of liquid cholesterol crystals to change their color depending on the skin temperature (infrared radiation) above the test area.

Remote infrared thermography (telemetry) - capture at a distance by special optical systems of infrared rays emitted by the human body and converting them into electrical signals in the form of an image on the screen electron beam tube thermograph.

Magnetic resonance imaging (MRI) - the study of organs and tissues using a constant magnetic field and short-term activation of an alternating electromagnetic field for the polarization of hydrogen atoms with subsequent mathematical modeling using a computer, which allows to obtain a layer-by-layer image of an organ or tissue on the monitor to characterize.

Ultrasonography (ultrasound) is a visualization of the deep structures of the body by recording the reflection of high-frequency pulses of ultrasonic waves directed into the tissue and calculating the time between generation and return of the pulse delivered on the screen of the ultrasonic diagnostic apparatus in the form of different image densities.

Doppler imaging is a study of changes in blood flow velocity in blood vessels.

Echoostometry - determination of bone density when passing ultrasonic waves using an osteometer.

Maxillofacial endoscopy:

- sinusoscopy of maxillary sinuses;
- arthroscopy of the temporomandibular joints;
- sialoscopy of the large salivary glands;
- diagnostic endoscopy of intraosseous hollow formations.

Functional methods of research

Electroodontometry - Measurement of the minimum amperage to which the pulp of the tooth or periodontal tissue responds with the help of an electroodontometer. Rheography is a method of investigation of blood supply to organs and tissues based on the recording of changes in blood flow resistance when high frequency current passes through tissues by means of a rheograph.

Polarography - the method is based on the reaction of electrochemical oxygen recovery at the polarographic electrode during electrolysis.

Electromyography - determination of the functional state of chewing and mimic muscles using an electromyograph.

Final clinical diagnosis is determined on the basis of the preliminary diagnosis, made after the subjective and objective examination of the patient, the results of additional methods of examination, the differential diagnosis. The information obtained during the examination of the patient and the complex of diagnostic and treatment-and-prophylactic measures are reflected in the Medical map of the dental patient (form № 043 / o). The records should be clear, concise, using standard medical terminology and fully reflect the objective clinical picture of the disease. The diagnosis should use the international classification of diseases. In the future it is necessary to indicate the dynamics of the disease.

The medical record of the dental patient is used not only as a source of medical or statistical information, but also as legal documentation and can appear in the resolution of conflict situations between the patient and the doctor.

#### ORGANIZATION AND PRINCIPLES OF VICTIM ASSISTANCE

The results of treatment of damage to tissues of maxillofacial area is largely dependent on the timely delivery of appropriate medical care, so to provide her needs as quickly as possible, to the extent possible. In peacetime, victims with injuries of the maxillofacial region provide first-aid, first medical, qualified and specialized help.

Aid can be provided by medical clinics, offices, medical and obstetric points or medical assistants — a person impose on the wound aseptic dressings, and at fractures of the jaws — circular or prasadb bandages, which keep the jaw from excessive movement during transport.

First medical aid in time of peace is provided in outpatient clinics, emergency departments and outpatient clinics and hospitals. It provides for the control of a condition imposed bandages, assignment (if necessary) painkillers, anti-inflammatory, symptomatic medicines, anti-tetanus serum, nasuno the imposition of transport immobilization of the jaws, etc.

Qualified medical care is provided by surgeons, by dental surgeons in the surgical and the emergency department clinics of district and city hospitals — conduct primary surgical treatment of wounds, splinting of the jaws, prescribed medication, etc.

Specialized medical care is provided in the maxillofacial departments of large cities and regional hospitals. They carry out the full range of diagnostic and treatment measures aimed at the full recovery and rehabilitation of the victims.

In all health care facilities where the victim may be traumatized, medical assistance should be provided to the maximum extent necessary, necessary and complete, appropriate to the particular condition of the patient at the moment, which is a condition for obtaining a positive result of treatment.

General direction of development of assistance to the injured in the maxillofacial area in peacetime and in wartime, in all extreme conditions - to reduce the time from injury to the moment of providing qualified or specialized medical care.

#### • Algorithms for the formation of professional skills.

1. To work out the technique of examination and palpation of the maxillofacial area during the extraoral examination.
2. To work out the method of examination and palpation of vestibulum of the oral cavity.
3. To work out the method of examination and palpation of the oral cavity.
4. To work out the procedure of examination, percussion, determination of the degree of mobility of teeth, bone fragments.
5. To palpate the maxillofacial area in a patient with suspected fracture of the upper jaw.
6. To conduct an indirect load test in a patient with suspected fracture of the mandible.

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

Individual tasks:

Task # 1.



Which of the following can be attributed to isolated injury?

- A. Facial and neck burns.
- B. Upper and lower jaw fracture.
- C. Lower jaw fracture.
- D. Cut wounds of the cheeks and mandibular area.
- E. Fracture of the nasal bones and concussion.

Task # 2.

Which of the following injuries is a combined injury?

- A. A cut wound to the cheek.
- B. A stabbed wound of the chin.
- C. Fracture of the nasal bones and concussion.
- D. Fracture of the upper and lower jaw.
- E. Lower jaw fracture and thermal facial burn.

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

The patient complained of pain and chewing disorders due to a blow to the right angle of the mandible obtained during the fight, headache, nausea. A preliminary diagnosis was made: fracture of the mandible. What additional examination methods are needed to clarify the diagnosis? Justify your answer.

### **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. Subjective examination of patients.
2. Objective (general and local) survey.
3. Basic methods of examination (review, palpation, percussion, auscultation).

### **List of questions to be studied by the student:**

1. Principles of the organization of dental care to the population of Ukraine.
2. Organization of the operation of the surgical department (cabinet) of the dental clinic.
3. Features of the organization and provision of special surgical dental care.
4. Sanitary-hygienic requirements to the surgical department (cabinet) of the dental clinic and inpatient department.
5. Equipment, medical documentation of the surgical office (department).
6. Subjective examination of a surgical dentist (complaints, history of the disease, history of life).
7. Method of examination of the general condition of a surgical dentist.
8. Method of local examination (extraoral and intraoperative) of a surgical dentist.

9. Additional methods of examination (electrodontometry, radiography, morphological, microbiological, functional research).

10. Indications for hospitalization of dental surgical patients.

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

1. To work out the technique of examination and palpation of the maxillofacial area during the extraoral examination.

2. To work out a procedure for examination and palpation of the vestibulum of the oral cavity.

3. To work out a method of examination and palpation of the oral cavity itself.

4. To work out the methodology of examination, percussion, determination of the degree of mobility of teeth, depth of gingival pockets.

5. To work out a method for determining the degree of restriction of mouth opening.

6. To learn how to fill a patient's dental formula.

7. To learn how to formalize the documentation for additional diagnostic methods.

**Situational tasks and questions on the topic of the lesson:**

1. Specify of which parts consists the clinical examination of the patient.

A. Patient complaints and history of life.

B. Examination of the oral cavity and additional examination methods.

C. Examination of the general condition of the patient and radiography of the teeth.

D. Extra- and intra-oral examinations.

E. Subjective and objective examination.

2. Which of the following can be attributed to isolated injury?

A. Facial and neck burns.

B. Upper and lower jaw fracture.

C. Lower jaw fracture.

D. Cut wounds of the cheeks and mandibular area.

E. Fracture of the nasal bones and concussion.

3. Which of the following injuries is a combined injury?

A. A cut wound of the cheek.

B. A stabbed wound of chin.

C. Fracture of the nasal bones and concussion.

D. Fracture of the upper and lower jaw.

E. Lower jaw fracture and thermal facial burn.

4. Which of the following is caused by a non-physical traumatic factor?

A. Thermal burns.

B. Barotrauma.

C. Soft tissue wound.

D. Radiation burns.

E. Acid burns.

5. To what section of the patient's examination are the general and local examination?

A. Prior to subjective examination.

B. Before the medical history.

C. To the anamnesis of disease and life.

D. Before an objective examination.

E. To the objective and subjective examination.

## 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 – 2<sup>nd</sup> ed. – New Jersey: ICON Learning Systems. – 592 p.

### Additional:

1. The AIDS booklet. – Boston: WCB McGraw Hill, 1999. – 70 p.
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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. Textbook 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**

“Approved”  
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	<b>Topic №2.</b> Soft tissue injuries: classification, clinical features, diagnostics, treatment.
Course	4 <sup>th</sup>
Faculty	Dental

Lviv – 2019

**Actuality of the topic:** injuries of the soft tissue of the face occur, in both peacetime and wartime. The face is the least protected part of the human body, because here there are important organs through which the people constantly perceive information about the outside world, communicating with him, and therefore, the face must be open for this communication. Anatomical and functional features of blood supply and innervations of the face have high specificity in providing care to patients that requires correct diagnosis, adequate knowledge and skills of dental surgeons.

The correct diagnostics in case of injury of the soft tissues of the face is the basis for establishing the correct diagnosis and prescription of effective treatment.

**The aim of the lesson:** to consider the classification of injuries of soft tissues, study of clinical signs and methods of diagnostics of injuries of the soft tissues of the maxillofacial region, to provide students with additional methods of examination used for the diagnosis of these injuries.

**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)
General surgery	Know the techniques for applying the basic types of soft wound dressings	Temporarily stop bleeding.
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
Microbiology  Virusology	To know the species identification of microorganisms of oral cavity; notions of pathogenic and pathogenic microorganisms, their role. To know the possible ways of transmission of the infection.	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 dental practice	To be able to explain the principles on which these or other methods are based (X-ray, CT, MRI, ultrasound)
Propedeutics of internal diseases.	To know the methods of examination of the organs and systems of the organs of the patient	Be able to apply the scheme of examination of the patient, describe the medical history.
Therapeutic dentistry  Pediatric dentistry	To know the diseases of the oral mucosa. To know the additional methods of examination used in dental practice.	Be able to carry out an oral examination. Be able to diagnose diseases of the oral mucosa.

#### 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 education and control	Materials of methodical support
1.	<b>Preparatory stage</b>	<b>20 min.</b>		

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 interview.	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.
<b>2.</b>	<b>Main Stage</b>	<b>30 min.</b>			
	<p>Formation of professional skills and competences:</p> <ol style="list-style-type: none"> <li>1. To collect anamnesis and to conduct a review of the patient with the pathology of the maxillofacial area.</li> <li>2. Set up a patient survey plan.</li> <li>3. Make a plan for additional research methods.</li> <li>4. Complete the relevant medical documentation.</li> <li>5. To work out a method of examination and palpation of the maxillofacial area during the examination.</li> <li>6. To work out the method of examination and palpation of vestibulum of the oral cavity.</li> <li>7. To work out the method of examination and palpation of the oral cavity itself.</li> <li>8. To work out a survey method, percussion, determination of degree of mobility of teeth, depth of tooth-gingivalpockets.</li> <li>9. To work out the method of determining the degree of limitation of opening the mouth.</li> <li>10. Learn to fill the patient's dental formula.</li> <li>11. Learn to formalize the documentation for additional diagnostic methods.</li> </ol>	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.		
<b>3.</b>	<b>Final stage</b>	<b>30 min.</b>			
3.1	Control and correction of the level of professional skills and abilities		Individual skills control. Contr	Phantoms, surgical instruments. The history of the disease. Selection of results of	

			ol of skills by solving non-typical situational problems with illustrative material.	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:** «Soft tissue injuries: classification, clinical features, diagnostics, treatment.»

**Aim of the lesson:** to consider the classification of injuries of soft tissues, study of clinical signs and methods of diagnostics of injuries of the soft tissues of the maxillofacial region, to provide students with additional methods of examination used for the diagnosis of these injuries.

- *Motivation of educational activity.* Injuries of the soft tissue of the face occur, in both peacetime and wartime. The face is the least protected part of the human body, because here there are important organs through which the people constantly perceive information about the outside world, communicating with him, and therefore, the face must be open for this communication. Anatomical and functional features of blood supply and innervations of the face have high specificity in providing care to patients that requires correct diagnosis, adequate knowledge and skills of dental surgeons.

The correct diagnostics in case of injury of the soft tissues of the face is the basis for establishing the correct diagnosis and prescription of effective treatment.

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

*Questions to frontal survey:*

1. Anatomical and functional features of soft facial tissues (facial and masticatory muscles, innervation, vascularization).
2. Subjective examination of a surgical dental patient (complaints, medical history, life history).
3. Methods of examination of the general condition of a surgical dental patient.
4. Method of local extra-oral examination of a surgical dental patient.
5. Methods of local intra-oral examination of a surgical dental patient. Instruments for Oral examination.
6. Laboratory, instrumental and functional supplementary examination methods.



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

Conducting professional training.

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

**Abrasions.** Abrasions are a type of injury caused by shear forces that remove a superficial layer of the skin. These superficial injuries usually heal without scarring. It is important to determine whether foreign bodies which have been embedded in the wound can cause permanent “tattooing” of the soft tissue. Treatment consists in wound cleaning and covering with a thin layer of topical antibiotic ointment to minimize desiccation and secondary crusting of the wound. Reepithelialization as usual is complete in 7 to 10 days if the epidermal pegs have not been completely removed. If the laceration significantly extends into the reticular dermal layer, significant scarring is likely.

**Contusions.** Contusions are caused by blunt trauma that causes edema and hematoma formation in the subcutaneous tissues. The associated soft tissue swelling and ecchymosis can be extensive. Small hematomas usually resolve without treatment; hypopigmentation or hyperpigmentation of the involved tissue can occur, but is rarely permanent. Large hematomas should be drained to prevent permanent pigmentary changes and secondary subcutaneous atrophy. In case of infection formed abscess has to be drained and treated in a usual way.

**Wounds.** Wound is a type of injury when consistency of the skin or mucosa is impaired (cut, stabbed, lacerated). Classification and clinical picture according to injure pattern and traumatizing object:

#### *Cut wound*

A sharp object causes these wounds. The surrounding tissues damage is not substantial. But the sharp object can go through covering tissues and affect internal organs and tissues. Damage of blood vessels and nerve trunks can lead to faint pain syndrome and massive bleeding.

#### *Stab wound*

Stab wound is caused by sharp pointed object and has the large depth and small area of the injured skin and mucosa. The pain syndrome is slight, hiatus is absent, the external bleeding is absent, but hematoma can develop.

#### *Contused wound*

These wound caused with a blunt object. Before the skin rupture, the blunt object damages the deeper soft tissues or organs (muscles, bones). A wide zone of smashed tissues around wound is peculiar. Contused wound causes pain syndrome, but there is no obvious external bleeding and can be infected easily. According to these complications contused wounds more often heal by secondary tension.

#### *Lacerated wound*

A blunt object causes these wounds but this object is directed under the acute angle to the skin. We can observe a big separation and sometimes to scalp of the skin. According to this separation skin can necrotize. Sometimes this kind of wounds can be caused by fractured parts of bones.

#### *Crushed wound*

The mechanism of this damage is equal to contused and lacerated wounds, but the degree of injury is maximal. Crushed wounds can be infected heal worse.

#### *Slash wound*

Slash wound caused by big and sharp object (like axe, saber). It has signs of incised and contused wound simultaneously. In this type of injury the internal organs and bones can be damaged very often. Necrosis of affected tissues can be observed. Pain syndrome is very strong. Bleeding not severe, but massive diapedesis hemorrhages are present.

#### *Bite wound*

Injury caused by animal or human bite. Bite wounds can be primarily infected with special infection. So, thorough wound irrigation and debridement are important in reducing infection and

further complications. Animal and human bites are most often polymicrobial, containing aerobic and anaerobic organisms.

#### *Mixed wound*

These wounds may connect two and more kinds of wounds.

- Algorithms for the formation of professional skills.

1. To work out a method of examination and palpation of the maxillofacial area during the examination.
2. To work out the method of examination and palpation of vestibulum of the oral cavity.
3. To work out the method of examination and palpation of the oral cavity itself.
4. To work out the method of determining the degree of limitation of opening the mouth.
5. Learn to formalize the documentation for additional diagnostic methods.

- Practical tasks (typical, atypical, unpredictable situations). Individual tasks:

Individual tasks:

Task #1. In the patient from a work injury a wound of the right parotid region with uneven edges and a significant area of damage arose. What kind of wound has arisen?

- A. Contused
- B. Cut
- C. Stab
- D. Chopped.
- E. Smashed

Task #2. What injury is called a wound?

- A. Injury of the skin, which is accompanied by bleeding
- B. With the damage of the integrity of the skin
- C. With the injury of the integrity of the bone
- D. With the injury of the integrity of the skin or mucous membrane
- E. With mucosal damage

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

At the medical station of regiment an affected was delivered with a gunshot wound of the right parotid- masticatory area. A patient cannot close a right eye, and lowered right corner of the mouth. What happened?

#### **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 maxillofacial area
2. Subjective examination of patients.
3. Objective (general and local) examination.
4. Basic methods of examination (examination, palpation, percussion, auscultation).

**List of questions to be studied by the student:**

1. Classification of soft tissue facial injuries in peacetime.
2. Contusion of facial soft tissues - clinical features, diagnosis, emergency.
3. Abrasions and wounds of the soft tissues of the face (contusion, ragged, cut, split, chopped, bite, crushed, scalp).
4. Peculiarities of the clinical picture of soft tissue wounds depending on their location.

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

1. To work out a method of examination and palpation of the maxillofacial area during the examination.
2. To work out the method of examination and palpation of vestibulum of the oral cavity.
3. To work out the method of examination and palpation of the oral cavity itself.
4. To work out the method of determining the degree of limitation of opening the mouth.
5. Learn to formalize the documentation for additional diagnostic methods.

**Situational tasks and questions on the topic of the lesson:**

1. A 48-year-old patient was transferred to the maxillofacial unit for a combined craniocerebral injury, a concussion of the brain, a fracture of the upper jaw for Le For III, and numerous hemorrhages on the face. 9 days ago was injured in an accident. During the examination it is noted that the skin in the area of hemorrhage is yellow. Which enzyme causes the specified color of hemorrhages:
  - A. Methemoglobin
  - B. Hemoglobin
  - C. Deoxyhemoglobin
  - D. Hemosiderin
  - E. Verodogemoglobin
2. In the patient from a work injury a wound of the right parotid region with uneven edges and a significant area of damage arose. What kind of wound has arisen?
  - A. Contused
  - B. Cut
  - C. Stab
  - D. Chopped.
  - E. Smashed
3. What injury is called a wound?
  - A. Injury of the skin, which is accompanied by bleeding
  - B. With the damage of the integrity of the skin
  - C. With the injury of the integrity of the bone
  - D. With the injury of the integrity of the skin or mucous membrane
  - E. With mucosal damage

4. Deoxyhemoglobin paints the skin at hemorrhage in:

- A. Yellow color
- B. Green
- C. Yellow-green color
- D. Brown color
- E. Blue

5. In the victim after road trauma, the fracture and rupture of the tissues of the left spinal cord and the infraorbital area, which penetrates the maxillary sinus, is determined. What kind of wound arose under the influence of these factors?

- A. Contused
- B. Cut
- C. Stab
- D. Chopped.
- E. Smashed

#### **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.
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4. Bauml, Philips R.W., Lund M.R. Textbook 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.
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**Ministry of Health of Ukraine**  
**Danylo Halytsky Lviv National Medical University**

“Approved”  
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	<b>Topic №3.</b> Surgical debridement of soft tissue wounds. Sequence of reparation. Suturing methods. Postoperative wound care.
Course	4 <sup>th</sup>
Faculty	Dental

Lviv – 2019

**Actuality of the topic:** soft tissue injuries of the maxillofacial area in peacetime often occur due to mechanical trauma. They may be accompanied by significant bleeding, damage to the branches of the facial nerve, infection of wounds with soft tissue defects. Lack of awareness of the doctor in the surgical treatment of wounds of the soft tissues leads to negative consequences in the form of distorting the appearance of the patient, the violation of such functions as speech, breathing, chewing. That is why the dentist must be familiar with the peculiarities of surgical treatment of wounds of the face in order To prevent complications you need to carry out surgical treatment, taking into account topographic-anatomical features of the area of intervention and care in the postoperative period.

**Aim of the lesson:** to consider in detail methods of surgical treatment of wounds of soft tissues depending on the clinical situation. To explore the types of stitches those are used for surgical treatment of wounds of the face and the indications for their use. To learn features of surgical treatment of wounds of 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
<b>Previous:</b>		
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
General surgery	To know types of bleeding. To know methods of stopping of the bleeding	To be able to provide first aid for bleeding. Be able to put the dressings.
Pharmacology	Know the pharmacological features of the drugs used for topical and general treatment of wounds.	Be able to prescribe drugs of different pharmacological groups
<b>Intradisciplinary integration:</b>		
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. (Module 1. “Propedeutics of surgical dentistry”): Methods of aseptic and antiseptic.	To know the principles of aseptic and antiseptic.	Be able to provide antiseptic cleaning of hands and operation field.

### 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 education and control	Materials of methodical support	
<b>1.</b>	<b>Preparatory stage</b>	<b>20 min.</b>			
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.	Question for an individual oral and	Tables, phantoms, collapsible jaws,

			Solving typical tasks. Test control. Written interview.	written evaluation. Typical situational tasks and tests.	textbooks, manuals, reference books, atlas, methodical recommendations, video films.
<b>2.</b>	<b>Main Stage</b>	<b>30 min.</b>			
	<p>Formation of professional skills and abilities:</p> <ol style="list-style-type: none"> <li>1. To collect anamnesis and make examination of a patient with non-gunshot wounds of the soft tissues of the MFA.</li> <li>2. Make a plan for the examination of a patient with non-gunshot soft tissues injury of the MFA.</li> <li>3. To work out an algorithm of carrying out primary surgical debridement of wounds.</li> <li>4. To work out the techniques of suturing.</li> <li>5. Work out methods of stopping bleeding.</li> <li>6. To make a plan for local and general medical treatment of patients with non-gunshot soft tissue wounds of the MFA.</li> <li>7. Fill in the appropriate medical documents.</li> </ol>		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.	
<b>3.</b>	<b>Final stage</b>	<b>30 min.</b>			
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		Final		



	of professional skills and abilities.		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 (30 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:** «Surgical debridement of soft tissue wounds. Sequence of reparation. Suturing methods. Postoperative wound care.»

**Aim of the lesson:** to consider in detail methods of surgical treatment of wounds of soft tissues depending on the clinical situation. To explore the types of stitches those are used for surgical treatment of wounds of the face and the indications for their use. To learn features of surgical treatment of wounds of maxillofacial area.

- *Motivation of educational activity.* Soft tissue injuries of the maxillofacial area in peacetime often occur due to mechanical trauma. They may be accompanied by significant bleeding, damage to the branches of the facial nerve, infection of wounds with soft tissue defects. Lack of awareness of the doctor in the surgical treatment of wounds of the soft tissues leads to negative consequences in the form of distorting the appearance of the patient, the violation of such functions as speech, breathing, chewing. That is why the dentist must be familiar with the peculiarities of surgical treatment of wounds of the face in order To prevent complications you need to carry out surgical treatment, taking into account topographic-anatomical features of the area of intervention and care in the postoperative period.

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

*Questions to frontal survey:*

1. Topographic and anatomical features of soft tissues of MFA.
2. Layered structure of soft tissues in different topographic areas of the face.
3. Emergency care for bleeding.
4. Principles of aseptic and antiseptic.
5. Anesthesia of maxillofacial area.
6. Peculiarities of narcosis in dentistry, oral and maxillofacial surgery.

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

Conducting professional training.

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

The initial examination involves evaluating and stabilizing the trauma patient. Any life-threatening conditions should be identified and managed immediately. The conditions of the airway, breathing, and circulation are examined, followed by a general neurologic assessment with particular attention to cervical spine and cranial injuries. Radiographs are used to diagnose fractures of the face, because, facial fractures are ideally treated prior to soft tissue repair. If repair of the facial bones is delayed, it is optimal to close the lacerations initially. The wounds can be reentered and revised if needed to access the fracture site.

It is important to achieve hemostasis when stabilizing and evaluating the patient who has sustained trauma. Most bleeding will respond to application of a pressure dressing. Occasionally surgical exploration and packing of the wound under general anesthesia may be indicated. In rare instances vessels in the neck may need to be ligated. Indiscriminate clamping inside the wound should be avoided because damage to important structures such as the facial nerve or parotid duct may result. It is unusual for bleeding from soft tissue injuries to the face to result in a shock state.

Lacerations involving the scalp can occasionally be difficult to control with pressure and may require clamping, ligation, or electrocautery. In soft tissue injuries not involving the face the length of time from initial injury to treatment is important. Secondary risk of infection increases with the lapse of time. Because of the rich vascularity of the face there is no "golden period" for suture repair of facial wounds. In fact healing of facial wounds is unaffected by the interval between injury and repair. Patients who are immunized and have received a booster injection within the last 10 years do not require tetanus prophylaxis if the wound is not tetanus prone. Tetanus-prone wounds are those with heavy contamination from soil or manure, devitalized tissue, or deep puncture wounds.

If the wound is tetanus prone and the patient has not received a booster injection within 5 years prior to the injury, a 0.5 mL tetanus toxoid boost injection should be given. If the patient has not received a booster within 10 years prior, they should receive a booster injection for any wound. Patients who are not immunized should receive both a booster injection and 250 units of tetanus immunoglobulin, followed by a full course of immunization. Treatment of soft tissue injuries involves early reconstructive procedures addressing both the soft tissue and the underlying bony injury in a minimum number of stages 6,7. Occasionally it is better to delay soft tissue repair until the facial fractures have been addressed.

In patients with large avulsion of tissue, definitive early reconstruction of the tissue loss with regional or microvascular flaps may be required. After adequate anesthesia has been obtained, the wound is thoroughly debrided. Nonvital tissue is conservatively excised in an attempt to salvage most of the tissue. Devitalized tissue potentiates infection, which inhibits phagocytosis. Repair of facial soft tissue injuries can be performed under local anesthetic with dosage 0.5 to 2%. It is usually administered with epinephrine 1:100,000. Lidocaine has a rapid onset of action, a wide margin of safety, and a low incidence of allergic sensitivity. One should avoid injecting directly into the wound when important landmarks could be dislocated and distorted.

Regional nerve blocks are beneficial in minimizing the amount of local anesthesia required and also prevent distortion of the tissues. Proper cleaning and good surgical technique are imperative in minimizing infection. Infections are rare when wound is closed so that no dead space, devitalized tissue, or foreign bodies remain beneath the sutured skin. Hydrogen peroxide is minimally bactericidal and toxic to fibroblasts even when diluted to 1:100. Diluted hydrogen peroxide is useful in the postoperative period in cleaning crusts away from incision lines in order to minimize crusting.

Common methods for closing wounds include suturing, applying adhesives, and stapling. It is preferable to suture complex facial lacerations secondary to esthetic considerations. A layered closure is almost always necessary and eliminates dead space beneath the wound. If the dead space is not obliterated, accumulation of inflammatory exudates may occur. This leads to infection, which in turn may cause tension across the epidermis. Tension can cause necrosis of the skin edges due to impairment of the vascular supply and may cause an increase in scarring. Injuries involving anatomic borders such as the vermilion of the lip must be reapproximated precisely. Examples of these landmarks include eyebrows, lip margins, and eyelids. Lacerations should be closed by placing a suture in the center of the laceration to avoid creating excessive

tissue on the end of the laceration (dog-ear). Deep layers should be reapproximated with 3-0 or 4-0 buried resorbable sutures. The superficial skin is closed with 5-0 or 6-0 suture. It is important to avoid causing puncture marks when grasping the wound edges. Margins should be undermined to allow slight eversion of the wound margin. Skin sutures should be removed 4 to 6 days after placement. Delayed primary closure may be necessary in some instances. Patients who may benefit from a delayed procedure include those with extensive facial edema, a subcutaneous hematoma, or those with wounds that are severely contused and contain devitalized tissue. Secondary revision procedures are usually undertaken months later to allow for scar maturation.

- Algorithms for the formation of professional skills.

1. To collect anamnesis and provide examination of a patient with non-inflammatory soft wounds of the tissues of the MFA.
2. Make a plan for the examination of a patient with non-gunshot soft tissue injury of the MFA.
3. To work out an algorithm of carrying out WFD of wounds.
4. Work out the techniques of suturing.
5. Work out methods of stopping bleeding.
6. Develop a plan for local and general medical treatment of patients with non-gunshot and non-inflammatory soft tissue wounds of the MFA.

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

Individual tasks:

Task #1. Patient with soft tissue injuries appealed to the dental surgeon 12 hours after the injury. Surgical debridement is indicated. What is the maximum period of the early primary surgical treatment of the facial wounds?

- A. 36 hours
- B. 10 hours
- C. 18 hours
- D. 12 hours
- E. 24 hours

Task #2. The patient appealed to the doctor with the cut wound of the buccal area, which happened 30 hours ago. What kind of debridement is indicated in this case?

- A. Secondary early
- B. Primary delayed
- C. Primary early
- D. Secondary late
- E. Primary late

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

In an affected patient a gunshot injury penetrating into mouth, perforating wound of the cheek and lips with loss of soft tissues and mandibular fracture is revealed. What sutures should be applied during the primary surgical treatment of the wounds? 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. Topographic and anatomical features of soft tissues of thyroid.
2. Layered structure of soft tissues in different topographic areas of the face.
3. Emergency care for bleeding.
4. Principles of aseptic and antiseptic.
5. Anesthesia of maxillofacial area.
6. Peculiarities of narcosis in dentistry, oral and maxillofacial surgery.

**List of questions to be studied by the student:**

1. Basic principles of primary surgical debridement of wounds.
2. Peculiarities of surgical treatment of facial wounds.
3. Specific features of maxillofacial soft tissues affecting the processes of wound healing.
4. Medicinal treatment of wounds in the postoperative period.
5. Physiotherapy treatment of wounds.
6. Classification, clinical features and treatment of complications of facial wounds, their prevention.
7. Medical care for the wounded at place of injury and during medical evacuation.
8. Types of sutures and suture materials. Plastic stitches: purpose and modification.
9. Influence of facial aesthetic disturbances on the psychical status of the patient.

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

1. To collect anamnesis and provide examination of a patient with non-inflammatory soft wounds of the tissues of the MFA.
2. Make a plan for the examination of a patient with non-gunshot soft tissue injury of the MFA.
3. To work out an algorithm of carrying out WFD of wounds.
4. Work out the techniques of suturing.
5. Work out methods of stopping bleeding.
6. Develop a plan for local and general medical treatment of patients with non-gunshot soft tissue wounds of the MFA.

**Situational tasks and questions on the topic of the lesson:**

1. What is the optimal timing of purulent wounds treatment?
  - A. 3-4 days
  - B. 8-12 days
  - C. 14-21 days
  - D. 7-8 days
  - E. 5-6-days
2. Treatment of bleeding consists of:
  - A. Symptomatic treatment of haemorrhagic syndrome
  - B. Compensation for circulating blood volume
  - C. There is no correct answer
  - D. All the answers are correct
  - E. Stopping of bleeding (temporary, permanent haemostasis)
3. A patient appealed with injury of the right parotid area with jagged edges. What wound occurred?
  - A. Scored

- B. Crushed
  - C. Chopped
  - D. Stabbing
  - E. Cutting
4. The patient appealed to the doctor on the third day after the trauma. Diagnosis: scored wound of the left supraorbital area. Make a plan of treatment.
- A. Put the sutures and drainage
  - B. Sew the wound tightly
  - C. Apply bandages with antibiotics ointments
  - D. Apply guiding plate sutures
  - E. Wound irrigation with antiseptics and everyday dressings
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 tom edges, no maxillary premolars. Pulsating bleeding from cheek wound is observed. Which blood vessels can be damaged?
- A. Mental artery
  - B. Infraorbital artery
  - C. Superficial temporal artery
  - D. Facial artery
  - E. Facial vein

### **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 – 2<sup>nd</sup> 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. Weysocki – 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. Textbook 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	<b>Topic №4.</b> Teeth dislocations and fractures: classification, clinical signs, diagnostics, methods of stabilization, treatment.
Course	4 <sup>th</sup>
Faculty	Dental

Lviv – 2019



	- 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 Virusology	To know the species identification of microorganisms of oral cavity; notions of pathogenic and pathogenic microorganisms, their role. To know the possible ways of transmission of the infection.	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 dental practice	To be able to explain the principles on which these or other methods are based (X-ray, CT, MRI, ultrasound)
Therapeutic dentistry Pediatric dentistry	To know the diseases of the tissues of the teeth. To know the additional methods of examination used in dental practice.	Be able to carry out an intraoral examination of the teeth.

### 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 education and control	Materials of methodical support	
<b>1.</b>	<b>Preparatory stage</b>	<b>20 min.</b>			
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.
<b>2.</b>	<b>Main Stage</b>	<b>30 min.</b>			



	<p>Formation of professional skills and abilities:</p> <ol style="list-style-type: none"> <li>1. To collect anamnesis and to conduct a review of the patient with the pathology of the maxillofacial area.</li> <li>2. Set up a patient survey plan.</li> <li>3. Make a plan for additional research methods.</li> <li>4. Complete the relevant medical documentation.</li> <li>5. To work out a method of examination and palpation of the maxillofacial area during the examination.</li> <li>6. To work out the method of examination and palpation of vestibulum of the oral cavity.</li> <li>7. To work out the method of examination and palpation of the oral cavity itself.</li> <li>8. To work out a survey method, percussion, determination of degree of mobility of teeth, depth of tooth-gingival pockets.</li> <li>9. To work out the method of determining the degree of limitation of opening the mouth.</li> <li>10. Learn to fill the patient's dental formula.</li> <li>11. Learn to formalize the documentation for additional diagnostic methods.</li> </ol>		<p>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.</p>	<p>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.</p>
<b>3.</b>	<b>Final stage</b>	<b>30 min.</b>		
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:** «Teeth dislocations and fractures: classification, clinical signs, diagnostics, methods of stabilization, treatment.»

**Aim of the lesson:** To consider classification of fractures and dislocations of teeth, to study clinical signs, diagnostics and treatment of fractures and dislocations of teeth.

- *Motivation of educational activity.* dislocations and fractures occur with traumatic mechanical damage, isolated or simultaneously with fractures of the bones of the facial skull. Timely diagnosis and adequate treatment ensure full recovery of chewing function.

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

*Questions to frontal survey:*

1. Anatomical and functional features of the teeth.
2. Subjective examination of a surgical dental patient (complaints, medical history, life history).
3. Methods of examination of the general condition of a surgical dental patient.
4. Method of local extra-oral examination of a surgical dental patient.
5. Methods of local intra-oral examination of a surgical dental patient. Instruments for Oral examination.
6. Laboratory, instrumental and functional supplementary examination methods.
7. Indications for hospitalization of surgical dental patients.

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

Conducting professional training.

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

Isolated injuries to teeth are quite common and may require the expertise of various dental specialists. Oral surgeons usually are involved in treating fractures in the supporting bone or in replanting teeth which have been displaced or "knocked out". These types of injuries are treated by one of a number of forms of "splinting" (stabilizing by wiring or bonding teeth together). If a tooth is "knocked out", it should be placed in salt water or milk. The sooner the tooth is re-inserted into the dental socket, the better chance it will survive. Therefore, the patient should visit a dentist or oral surgeon as soon as possible. Never attempt to "wipe the tooth off", since remnants of the ligament which hold the tooth in the jaw are attached and are vital to the success of replanting the tooth. Other dental specialists may be called upon such as endodontists, who may be asked to perform root canal therapy, and/or restorative dentists who may need to repair or rebuild fractured teeth. In the event that injured teeth cannot be saved or repaired, dental implants are often now utilized as replacements for missing teeth.

- Algorithms for the formation of professional skills.

1. To work out the procedure of examination and palpation of the maxillofacial area of the patient with a fractured (dislocated) tooth in the extra-curricular examination.
2. To develop a procedure for examination and palpation of the mouth of the patient with a fractured (dislocated) tooth.
3. To develop a method of examination and palpation of the oral cavity of a patient with fractured (dislocated) tooth.

4. To work out the method of examination, percussion, determination of the degree of mobility of the teeth of a patient with fractured (dislocated) tooth.
5. Learn how to fill a patient's dental formula with a fractured (dislocated) tooth.
6. Learn to formalize the documentation for additional diagnostic methods.

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

Individual tasks:

Task #1. A 10-year-old child complains of pain when she takes a hard meal in 12 tooth after a trauma of the past 24 hours. Objectively: 12 tooth is in the right position in the tooth arch, percussion is slightly painful. No X-rays of pathological changes were detected. Mobility of the tooth is not defined. Mucous membrane in the area of 12 tooth unchanged. Make a diagnosis.

1. Contusion of the tooth
2. Subluxation of the tooth
3. Dislocation of the tooth
4. Tooth crown fracture
5. Tooth root fracture.

Task #2. Tactics of a doctor in case of impacted dislocation of a permanent tooth:

- A. Surgical reposition and splinting for 2-4 weeks
- B. There is no right answer
- C. Tooth extraction
- D. Soft diet, anti-inflammatory therapy, observation
- E. Repositioning of a tooth up with the help of apparatus, with endodontic treatment in case of pulp necrosis

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

1. A 20 year old patient got a trauma in the area of his upper jaw. He applied to a dentist and complained about mobility of his frontal upper teeth, pain during cutting and joining of teeth. Objectively: the 11 and 21 teeth have II-III degree mobility. Tooth crowns are intact but have oral position. Complete joining of teeth is impossible because the teeth are situated beyond the dental arch. X-ray picture shows a slight broadening of periodontal fissure of the 11 tooth up to 0,5-2 mm. The roots are intact. Make a correct diagnosis and create a plan of treatment.

### **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 teeth of the upper and lower jaws

2. Subjective examination of patients.
3. Objective (general and local) examination.
4. Basic methods of examination (examination, palpation, percussion, auscultation).
5. Additional methods of examination of patients.

**List of questions to be studied by the student:**

1. Statistics, classification of dislocations of the mandible.
2. Features of etiology and pathogenesis of dislocation of the mandible.
3. Clinic of anterior dislocation of the mandible.
4. Clinic of posterior dislocation of the mandible.
5. Methods of diagnosis of dislocation of the mandible.
6. Examination of the patient with dislocation of the mandible.
7. Theoretical and clinical studies of the problem of dislocation of the mandible.
8. Make a plan for prevention of dislocation of the mandible.
9. To make a plan of treatment of dislocations of the mandible.
10. Conservative methods of treatment of dislocation of the mandible.
11. Surgical methods of treatment of dislocation of the mandible.
12. Rehabilitation of patients with dislocations of the mandible.

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

1. To work out the method of examination and palpation of the maxillofacial area during extra-curricular examination in patients with tooth injuries.
2. To work out a procedure for examination and palpation of the oral cavity in patients with tooth injuries.
3. To work out a procedure for examination and palpation of the oral cavity in patients with tooth injuries.
4. To work out the methodology of examination, percussion, determination of the degree of mobility of the teeth.
5. Learn to fill a patient's dental formula with a tooth injury.
6. Learn to formalize the documentation for additional diagnostic methods
7. To work out a method of tooth restoration (on phantoms)
8. To work out methods of splinting of teeth at their dislocation (on phantoms).

**Situational tasks and questions on the topic of the lesson:**

1. A 2-years-old child of was injured in teeth. Objectively: crowns 51 and 61 are shorter than the neighboring by 1/3. Mucous membrane in the region of 51 and 61 teeth is diverted, edematous. On X-ray images, the periodontal gap is absent in the apical part of the roots of 51 and 61 teeth. What treatment tactics will be optimal?
  - A. Extraction of 51, 61 teeth
  - B. Ligature wiring of 51, 61 teeth
  - C. Replantation of 51, 61 teeth
  - D. Dispensary observation
  - E. Repositioning of 51, 61 teeth
  
2. The patient is 12 years old, appealed with complaints about the mobility of 12 tooth, pain during stinging. These complaints appeared two days ago after an injury. On intraoral x-ray of 12 tooth - transverse band of eclipse, interruption of the contours of the root. What is your diagnosis?
  - A. Transverse fracture of the root of the tooth.
  - B. Longitudinal fracture of the root of the tooth.
  - C. The stage of formation of the root of the tooth.
  - D. Exacerbation of chronic periodontitis.

E. Oblique fracture of the root of the tooth.

3. Tactics of a doctor in case of injury to the tooth:

- A. To remove the tooth from occlusion, dynamic observation.
- B. To provide teeth wiring for 2-4 weeks, dynamic observation.
- C. Endodontic therapy.
- D. There is no correct answer.
- E. Tooth extraction.

4. Tactics of a doctor in case of impacted dislocation of a milk tooth

- A. Surgical reposition and splinting for 2-4 weeks.
- B. Tooth extraction.
- C. Soft diet, anti-inflammatory therapy, observation.
- D. Repositioning of a tooth up with the help of apparatus, with endodontic treatment in case of pulp necrosis.
- E. There is no correct answer.

5. In case of permanent tooth fracture in the area of the neck next treatment is indicated:

- A. Pulp amputation.
- B. Pulp extirpation.
- C. Extraction of the root of the tooth.
- D. Treatment by biological method.
- E. There is no correct answer.

### **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 – 2<sup>nd</sup> 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. Wyrsocki – 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. Textbook 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**

“Approved”  
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	<b>Topic №5.</b> Mandibular dislocation: clinical features, diagnostics, treatment.
Course	4 <sup>th</sup>
Faculty	Dental

**Actuality of the topic:** A significant place in the structure of the pathology of the maxillofacial area belongs to the dislocation of the temporomandibular joint. It is more common in people of working and retirement age, mainly in women, which is related to the gender characteristics of the anatomical structure. Incorrect treatment and subsequent curation often results in a habitual dislocation, which may impair the quality of life of such patients in the future.

**Aim of the lesson:** To consider the causes of different types of dislocation of the mandible. To get acquainted with features of a clinical picture and methods of treatment depending on their nosological form. To study the principles of rehabilitation of patients after treatment of dislocation of the mandible.

**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	To be able to explain the structure of systems and organs

Normal physiology	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.	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
Radiation diagnostics.	To know the methods of radiological examination used in dental practice	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 temporomandibular joint.	Be able to prescribe drugs of different pharmacological groups
<b>Intradisciplinary integration:</b>		
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.

### 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 education and control	Materials of methodical support	
<b>1.</b>	<b>Preparatory stage</b>	<b>20 min.</b>			
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 interview.	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.



<b>2.</b>	<b>Main Stage</b>	<b>30 min.</b>		
	<p>Formation of professional skills and abilities:</p> <ol style="list-style-type: none"> <li>1.To collect anamnesis and to examine the patient with dislocation of the mandible</li> <li>2.To plan the examination of the patient with dislocation of the mandible</li> <li>3.To develop methods of conducting anesthesia used in the management of dislocation of the mandible</li> <li>4.To work out the algorithm of repositioning of the mandible by different methods.</li> <li>5.To work out methods of imposing a mento-parietal bandage.</li> <li>6. Fill in the appropriate medical documentation.</li> </ol>		<p>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.</p>	<p>Patients with pathology of maxillofacial area. The history of the disease.Selection of results of additional survey methods. Situational tasks.Algorithms.Photomorphs, surgical instruments.Thematic videos.</p>
<b>3.</b>	<b>Final stage</b>	<b>30 min.</b>		
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:** «Mandibular dislocation: clinical features, diagnostics, treatment.»

**Aim of the lesson:** To consider the causes of different types of dislocation of the mandible. To get acquainted with features of a clinical picture and methods of treatment depending on their nosological form. To study the principles of rehabilitation of patients after treatment of dislocation of the mandible.

• *Motivation of educational activity.* A significant place in the structure of the pathology of the maxillofacial area belongs to the dislocation of the temporomandibular joint. It is more common in people of working and retirement age, mainly in women, which is related to the gender characteristics of the anatomical structure. Incorrect treatment and subsequent curation often results in a habitual dislocation, which may impair the quality of life of such patients in the future.

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

*Questions to frontal survey:*

1. Topographic and anatomical features of the structure of the temporomandibular joint.
2. Functions of the temporomandibular joint.
3. The structure of masticatory muscles and its function.
4. Innervation of the masticatory muscles.
5. Methods of conductive anesthesia used to eliminate the contracture of the masticatory muscles.

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

Conducting professional training.

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

Temporomandibular joint dislocation (luxation) — pathological displacement of the condyle process that leads to the permanent incongruence of joint surfaces.

Hippocrate was first who described the method of the mandible reposition after TMJ anterior luxation. It was in the 5th century B.C.

Classification:

partial and complete joint luxation;  
anterior, posterior, medial and lateral luxation;  
acute, chronic and habitual joint luxation;  
mono- or bilateral.

A separate nosologic group is presented by fractures of the condyle process of the mandible combined with luxation.

*Etiology* — trauma, a wide mouth opening, destructive changes of anatomical structures of the joint (flattening of joint surfaces, laxity of the capsule of the joint and its tendons). Clinical features of TMJ displacement

*Anterior bilateral temporomandibular joint luxation* is the most often case in clinical practice. The patient's mouth is widely opened, he can not close or move mandible, can not talk or eat. Saliva flows out, open bite.

Unilateral anterior TMJ displacement is characterized by the same symptoms combined with the asymmetry of the chin and cross bite.

Treatment of temporomandibular joint luxation aimed on reposition of displaced condyle and renewal of the normal mandible movements.

Treatment methods directed on: reposition of bone structures of the joint with renewal of anatomical relations of joint surfaces; partial immobilization for recovery of altered tendons and joint capsule; habitual joint luxation needs surgical intervention for correction of tendons, disc position or bone structures of the joint. There are different devices for restriction of mouth opening.

#### Hippocrates method of TMJ reposition

A patient is sitting vertically, the head is fixed backwards. The doctor is standing in front of the patient. The patient's mandible has to be on the level of the doctor's elbow. Put the big fingers put on the lower molars. Other fingers capture the lower margin of the mandible. The first step is to push down the mandible ramus by the big fingers and push up the chin by other fingers. The second step is to push the mandible ramus backwards and upwards. The shortening of masticatory muscles may be very strong and quick, so it is better to secure the big fingers by sterile gauze.

Chodorovich P.V. modified Hippocrates method, he proposed to put the big fingers on the retromolar space and external oblique line in order to secure them from biting.

Chronic cases of TMJ are displacement combined with the contracture of the masticatory muscles and scarring of the capsule and tendons of the joint. These pathologic changes make obstacles for reposition of TMJ. That is why treatment of chronic displacement of TMJ must be performed under general anesthesia with miorelaxants. After reposition intermaxillary fixation is obviously used for 3-4 weeks.

#### • Algorithms for the formation of professional skills.

1. To collect anamnesis and to examine the patient with dislocation of the mandible
2. To plan the examination of the patient with dislocation of the mandible
3. To work out methods of conducting anesthesia used in the management of dislocation of the mandible
4. To work out the algorithm of repositioning of the mandible by different methods.
5. To work out methods of imposing a mento-parietal bandage.
6. Fill in the appropriate medical documentation.

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

##### Individual tasks:

Task #1. A 57-year-old man has a habitual dislocation of the mandible. To restrict the opening of the mouth the doctor decided to made the device of Yadrosova. What should be the term of treatment:

- A. 12 months.
- B. 18 months.
- C. 6 months.
- D. 9 months.
- E. 3 months.

Task #2. A 58 year old patient complains about clicking in the TMJ during eating. Periodically as a result of wide mouth opening the mandible takes up such a position that makes mouth closing impossible. The mandible can be easily placed into its initial position by pressing with fingers upon its coronoid processes. What is your primary diagnosis?

- A. Habitual dislocation of mandible.
- B. Acute dislocation of mandible .
- C. Subluxation of mandible Subluxation of mandible.
- D. Anterior dislocation.
- E. Posterior dislocation.

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

A maxillofacial surgery department admitted a patient with a half-open mouth, his chin was put forward and deviated to the right. On palpation, the left mandibular fossa was found to be empty. Internal palpation failed to detect the left articular head. Mandibular movements were possible but restricted. What is the most likely diagnosis?

### **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. Topographic and anatomical features of the structure of the temporomandibular joint.
2. Functions of the temporomandibular joint.
3. The structure of masticatory muscles and its function.
4. Innervation of the masticatory muscles.
5. Methods of conductive anesthesia used to eliminate the contracture of the masticatory muscles.

#### **List of questions to be studied by the student:**

1. Statistics, classification of dislocations of the mandible.
2. Features of etiology and pathogenesis of dislocation of the mandible.
3. Clinic of anterior dislocation of the mandible.
4. Clinic of posterior dislocation of the mandible.
5. Methods of diagnosis of dislocation of the mandible.
6. Examination of the patient with dislocation of the mandible.
7. Theoretical and clinical studies of the problem of dislocation of the mandible.
8. Make a plan for prevention of dislocation of the mandible.
9. To make a plan of treatment of dislocations of the mandible.
10. Conservative methods of treatment of dislocation of the mandible.
11. Surgical methods of treatment of dislocation of the mandible.
12. Rehabilitation of patients with dislocations of the mandible.

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

1. To collect anamnesis and to examine the patient with dislocation of the mandible
2. To plan the examination of the patient with dislocation of the mandible
3. To work out methods of conducting anesthesia used in the management of dislocation of the mandible
4. To work out the algorithm of repositioning of the mandible by different methods.
5. To work out methods of imposing a mento-parietal bandage.

6. Fill in the appropriate medical documentation.

**Situational tasks and questions on the topic of the lesson:**

1. A patient 30 years old complains of frequent dislocations of the lower jaw. Objectively: dental rows are preserved, orthognathic bite. A click is found in the temporomandibular joint when opening the mouth. Which of the following devices will prevent the dislocation?

- A. The Zbarazh's apparatus
- B. The Petrosov's apparatus
- C. The Oxman's apparatus
- D. The Shur's apparatus
- E. The Limberg's apparatus

2. Depending on the difference in articular surfaces, the dislocation of the mandible may be:

- A. acute and chronic
- B. front and rear
- C. full and partial
- D. unilateral and bilateral
- E. traumatic, habitual, pathological

3. Due to the time elapsed from the moment of injury, the dislocation of the mandible is divided into:

- A. unilateral and bilateral
- B. full and partial
- C. traumatic, habitual, pathological
- D. front and rear
- E. acute and chronic

4. Depending on the localization of the dislocation, they can be:

- A. full and partial
- B. traumatic, habitual, pathological
- C. acute and chronic
- D. unilateral and bilateral
- E. front and rear

5. Depending on the localization of the dislocation, they can be:

- A. full and partial
- B. traumatic, habitual, pathological
- C. acute and chronic
- D. unilateral and bilateral
- E. front and rear

**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 – 2<sup>nd</sup> ed. – New Jersey: ICON Learning Systems. – 592 p.

Additional:

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**Danylo Halytsky Lviv National Medical University**

“Approved”  
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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	<b>Topic №6.</b> Mandibular fractures: classification, clinical signs, treatment.
Course	4 <sup>th</sup>
Faculty	Dental

**Actuality of the topic:** One of the important problems of modern maxillofacial surgery is the treatment and prevention of traumatic injuries of the maxillofacial area, in particular, fractures of the lower jaw, which make up the largest percentage of all injuries of the face and neck of peacetime. This is due to the significant increase in the frequency of road accidents, domestic injuries, the use of various types of weapons and the increase in street crime and social tension. The study of this topic will allow the future doctor to be clearly guided in the issues of the clinic, diagnostics, methods of providing of the first aid to the victims with trauma of the upper jaw. Using of this knowelge in future practice will allow to avoid numerous complications.

**Aim of the lesson:** To consider the features of symptoms of mandibular fractures, depending on their location. To get acquainted with the methods of diagnosis of mandibular fractures and methods of their treatment. To study their effectiveness, advantages and disadvantages.

**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**

<b>Disciplines</b>	<b>Student should know</b>	<b>Student should be able to</b>
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)
Topographical anatomy	To know the topography of the organs of MFA	To be able to explain the topography of the organs of MFA
Pathologic anatomy	To know stages of reparative osteogenesis	To be able to explain possible complications of reparative osteogenesis and ways of their prevention
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
<b>Intradisciplinary integration:</b>		
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 5. (Module 1. “Propedeutics of surgical dentistry”): Local conductive anesthesia on the mandible	To know the methods and techniques of local anesthesia	To be able to provide conductive anesthesia on the mandible

### **Plan and organizational structure of practical lesson of the discipline**

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

<b>№</b>	<b>The main stages of the lesson, their functions and content</b>	<b>Time period</b>	<b>Methods of education and control</b>	<b>Materials of methodical support</b>
<b>1.</b>	<b>Preparatory stage</b>	<b>20 min.</b>		

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 interview.	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.
<b>2.</b>	<b>Main Stage</b>	<b>30 min.</b>			
	<p>Formation of professional skills and abilities:</p> <p>1. To work out the method of examination of patients with fractures of the mandible;</p> <p>a) to study the patient's complaints;</p> <p>b) to collect anamnesis;</p> <p>c) evaluate the patient's general condition;</p> <p>d) conduct extra- and intra-oral examination of MFA;</p> <p>2. To work out the technique of palpatory examination of the mandible.</p> <p>2. To make a plan for additional survey methods.</p> <p>3. To learn how to interpret radiographs.</p> <p>4. To learn how to plan a medication plan based on clinical manifestations.</p> <p>5. To learn how to reasonably choose treatment tactics for a tooth located in the fracture line.</p>		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.	
<b>3.</b>	<b>Final stage</b>	<b>30 min.</b>			
3.1	Control and correction of the level of professional skills and abilities		Individual skills control. Control of skills by solving non-	Phantoms, surgical instruments. The history of the disease. Selection of results of additional methods of examination of thematic	

			typical situational problems with illustrative material.	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 (30 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:** «Mandibular fractures: classification, clinical signs, treatment.»

**Aim of the lesson:** To consider the features of symptoms of mandibular fractures, depending on their location. To get acquainted with the methods of diagnosis of mandibular fractures and methods of their treatment. To study their effectiveness, advantages and disadvantages.

• *Motivation of educational activity.* One of the important problems of modern maxillofacial surgery is the treatment and prevention of traumatic injuries of the maxillofacial area, in particular, fractures of the lower jaw, which make up the largest percentage of all injuries of the face and neck of peacetime. This is due to the significant increase in the frequency of road accidents, domestic injuries, the use of various types of weapons and the increase in street crime and social tension. The study of this topic will allow the future doctor to be clearly guided in the issues of the clinic, diagnostics, methods of providing of the first aid to the victims with trauma of the upper jaw. Using of this knowelge in future practice will allow to avoid numerous complications.

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

*Questions to frontal survey:*

1. Anatomical structure of the mandible.
2. Attachment points for lower and lower jaw muscles.
3. Blood supply and innervation in the mandible.
4. Bacterial flora of the oral cavity.
5. Features of the structure and position of the third molars of the mandible.

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

Conducting professional training.

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

Mandibular fractures and dentoalveolar injuries are most commonly (80%) the result of motor vehicle accidents, interpersonal violence and assault, other causes are sporting and industrial accidents, or falls. Most fractures occur in the mandibular body, angle, or condyle regions, with lower percentages in the mandibular ramus, coronoid and symphysis regions. The literature

demonstrates that many patients with mandible fractures have more than one fracture location. This may be due to a number of variables such as direction and force of the blow, mechanism of injury, teeth present or not, among others.

The first step in the development of an appropriate treatment plan is to establish a clear understanding of the type of injury the patient has suffered, in order to provide an adequate surgical solution. A number of classification schemes have been presented to describe mandible fractures. Mandibular fractures are classified according to various parameters. The most useful is classification by the pattern of fracture present and by anatomic location.

#### **Anatomic Location**

-Dentoalveolar fracture: Any fracture that is limited to the tooth-bearing area of the mandible without disruption of continuity of the underlying osseous structure

-Symphysis fracture: Any fracture in the region of the incisors that runs from the alveolar process through the inferior border of the mandible in a vertical or almost vertical direction

-Parasymphysis fracture: A fracture that occurs between the mental foramen and the distal aspect of the lateral mandibular incisor extending from the alveolar process through the inferior border

-Body fracture: Any fracture that occurs in the region between the mental foramen and the distal portion of the second molar and extends from the alveolar process through the inferior border

-Angle fracture: Any fracture distal to the second molar, extending from any point on the curve formed by the junction of the body and ramus in the retromolar area to any point on the curve formed by the inferior border of the body and posterior border of the ramus of the mandible

-Ascending ramus fracture: A fracture in which the fracture line extends horizontally through both the anterior and posterior borders of the ramus or that runs vertically from the sigmoid notch to the inferior border of the mandible

-Condylar process fracture: A fracture that runs from the sigmoid notch to the posterior border of the ramus of the mandible along the superior aspect of the ramus; fractures involving the condylar area can be classified as extracapsular or intracapsular, depending on the relation of the fracture to the capsular attachment

#### **Pattern of Fracture**

-Simple fracture: A simple fracture consists of a single fracture line that does not communicate with the exterior. In mandibular fractures this implies a fracture of the ramus or condyle or a fracture in an edentulous portion with no tears in the periosteum.

-Compound fracture: These fractures have a communication with the external environment, usually by the periodontal ligament of a tooth, and involve all fractures of the tooth-bearing portions of the jaws. In addition, if there is a breach of the mucosa leading to an intraoral communication or a laceration of the skin communicating with the fracture site, edentulous portions of the mandible may be involved.

-Greenstick fracture: This type of fracture frequently occurs in children and involves incomplete loss of continuity of the bone. Usually one cortex is fractured and the other is bent, leading to distortion without complete section. There is no mobility between the proximal and distal fragments.

-Comminuted fractures: These are fractures that exhibit multiple fragmentation of the bone at one fracture site. These are usually the result of greater forces than would normally be encountered in simple fractures.

-Complex or complicated fracture: This type of injury implies damage to structures adjacent to the bone such as major vessels, nerves, or joint structures. This usually implies damage to the inferior alveolar artery, vein, and nerve in mandibular fractures proximal to the mental foramen and distal to the mandibular foramen. On rare occasions a peripheral branch of the facial nerve may be damaged or the inferior alveolar nerve injured in subcondylar fractures.

-Telescoped or impacted fracture: This type of injury is rarely seen in the mandible, but it implies that one bony fragment is forcibly driven into the other. This type of injury must be disimpacted before clinical movement between the fragments is detectable.

-Indirect fracture: Direct fractures arise immediately adjacent to the point of contact of the trauma, whereas indirect fractures arise at a point distant from the site of the fracturing force. An example of this is a subcondylar fracture occurring in combination with a symphysis fracture.

-Pathologic fracture: A pathologic fracture is said to occur when a fracture results from normal function or minimal trauma in a bone weakened by pathology. The pathology involved may be localized to the fracture site, such as the result of a cyst or metastatic tumor, or as part of a generalized skeletal disorder, such as osteopetrosis.

-Displaced fracture: Fractures may be nondisplaced, deviated, or displaced.

-A nondisplaced fracture is a linear fracture with the proximal fragment retaining its usual anatomic relationship with the distal fragment. In a deviated fracture, a simple angulation of the condylar process exists in relation to the remaining mandibular fragment, without development of a gap or overlap between the two segments.

*Displacement* is defined as movement of the condylar fragment in relation to the mandibular segment with movement at the fracture site. The fragment can be displaced in a lateral, medial, or anteroposterior direction. In displaced fractures the articular surface of the condyle remains within the glenoid fossa and does not herniate through the joint capsule.

-Dislocated fracture: A dislocation occurs when the head of the condyle moves in such a way that it no longer articulates with the glenoid fossa. When this is associated with a fracture of the condyle, it is termed a *fracture dislocation*. Fracture dislocations are discussed more completely later in this chapter. The mandibular condyle may also be dislocated as a result of trauma without an associated condylar fracture. Dislocations can occur anteriorly, posteriorly, laterally, and superiorly.

-Special situations: Other types of fractures that do not readily fit the above classification include grossly comminuted fractures or fractures involving adjacent bony structures, such as the glenoid fossa or tympanic plate; open or compound fractures; and fractures in which a combination of several different types of fractures exist. Open fractures of the condyle are usually caused by missiles such as bullets.

### **Diagnosis**

The diagnosis of mandibular fractures must begin with careful history and clinical examination. Immediate attention should be given to problems associated with bleeding and airway compromise, which may threaten patient's life. In the diagnostic work-up phase, the lack of standardized ways to assess and characterize the nature and severity of the orofacial injury engenders variation in practice patterns. Symptoms of mandibular fractures include pain, malocclusion, numbness of the chin or lower lip, and abnormal lower jaw movement. A careful history should be taken from the patient. What was the mechanism of the injury: fist, shod foot, baseball bat, fall, motor vehicle accident? Was the injury witnessed? Was there any loss of consciousness? Is there a previous history of facial trauma or fractures, either treated or untreated? Were there any pre-existing dental conditions such as deviated or limited opening of the mouth.

### **Clinical Examination**

The clinical examination should consist of inspection and palpation. It is best to proceed in an orderly fashion and to perform this evaluation as a component part of the entire head and neck examination of the trauma patient. The skin of the face and, in particular, the area around the mandible should be inspected for swelling, hematomas, and lacerations. Examination should first seek out intraoral and extraoral lacerations, abrasions, and ecchymoses. Common signs include sublingual hematoma; loose, avulsed, or fractured teeth; steps in the occlusal plane; or lack of complete intercuspation. The external auditory canal should be examined because displaced condylar fragments occasionally

pierce the canal, causing it to fill with blood while the tympanic membrane remains intact. Inability to open the mouth due to trismus (spasm of the masticatory muscles) or deviation of the chin to one side are also seen. Palpation anterior to the tragus will produce pain and reveal abnormal condyle motion in condylar neck fractures. Steps in the mandibular borders or mobile segments of the tooth-bearing alveolus suggest body fractures.

Patients often complain of the following:

- Pain or tenderness is often present at the site of impact with the possibility of a direct fracture, or at a distant site in the case of an indirect fracture.
- Difficulty in chewing. Pain could be limiting mandibular function or there may be a malocclusion or mobility at the fracture site.
- Malocclusion. The patient may be able to tell the clinician about an alteration in the bite from normal; however, patients are not always reliable and may claim that the bite feels normal when it is not and vice versa.
- Numbness in the distribution of the inferior alveolar nerve. This usually indicates a displaced fracture in the region of the body or angle of the mandible on the affected side. A nondisplaced fracture often does not give rise to numbness in the distribution of the inferior alveolar nerve.

### **Treatment**

Mandibular fractures, once properly diagnosed, should be treated in a timely fashion. Coordination of treatment of the multiply injured patient by all involved services (general or trauma surgery, oral and maxillofacial surgery, otolaryngology, neurosurgery, etc.) is critical to ensure optimal patient care. Most fractures can and should generally be treated within 48 h of initial presentation. Because many mandible fractures involve gingival tears extending to the teeth and alveolus, they are by definition compound into the oral cavity and prone to invasion by saliva and oral bacteria. Early immobilization of segments has been shown to reduce the risk of wound infections. Because of the high risk of bacterial contamination in mandible fractures, antibiotic treatment is a necessity in all compound mandible fractures both pre- and postoperatively. Teeth adjacent to fracture sites should be evaluated and assessed for their relative value for retention vs. risk to treatment. Teeth in the line of the fracture that are periodontally compromised, mobile, or fractured beyond restorability should be removed prior to definitive treatment. These pose the risk of infection (and nonunion) as well as recuperative-phase pain to the patient. Partially fractured teeth in a patient with limited dentition may be useful to aid in closed reduction. In this situation, the tooth could be retained until the fracture treatment is complete before a final decision is made to remove or restore the tooth. Wisdom teeth (third molars) in the line of mandibular angle fractures can pose a significant infection risk. The decision to retain or remove these teeth is not simple, and should be made considering such factors as patient compliance and hygiene, interference with proper bony segment reduction, difficulty and risk of removal, relative bone available at the fracture site, open vs. closed reduction, and favorable vs. Unfavorable fracture. Maintenance of proper oral hygiene, both pre- and postoperatively, is an important treatment adjunct in the management of mandible fractures. Loss of tissue barriers to bacterial invasion due to compound fractures in the line of teeth, gingival tears, hematomas, edema, and interference with natural cleaning mechanisms all increase infection risk. Proper oral hygiene using saline, peroxide, or medicated (chlorhexidine gluconate) rinses should be encouraged. Increased frequency of tooth brushing should be encouraged and the use of pulsatile irrigating devices is helpful in selected patients.

A proper diet and maintenance of nutritional status are additional requirements during postoperative care. Enduring 3-4 weeks of mandibular immobilization with maxillomandibular fixation (MMF) makes nutritional intake more difficult and weight loss is inevitable. However, a large selection of nutritional supplements is available to patients in liquid form that will minimize weight loss and malnutrition. Pre- and postoperative patient positioning and bedside suction devices can simplify the ability of patients to manage oral secretions and bleeding in the immediate postinjury or postsurgery period. Elevating the head of the bed to a 45 degree angle allows patients to clear secretions effectively. Postoperative steroids and the use of ice compresses can be effective at reduction of edema.

- Algorithms for the formation of professional skills.

1. To work out the technique of examination of the patient with fracture of the mandible.
2. To make a plan of the examination of a patient with a mandibular fracture.
3. To work out the algorithm of analysis of radiographs of patients with fractures of the mandible.
4. Fill in the appropriate medical documentation.

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

Individual tasks:

Task #1. What method of the lower jaw osteosynthesis is the most perspective?

- Using of U-shaped metal devices.
- Extraoral apparatus osteosynthesis.
- Polyamide thread osteosynthesis.
- Using of intrabone fixing screws.
- Miniplate osteosynthesis.

Task #2. A 12-year-old boy has been injured. In the region of the 44 and 45 teeth there is pathological displacement of the alveolar process and the body of the mandible, rupture of the mucous membrane of the alveolar process. What additional tests should be done to specify the diagnosis?

- X-Ray of skull in axillary projection.
- X-Ray of skull in the frontal projection and of mandible in Parma projection.
- X-Ray of skull in the axillary projection.
- X-Ray of mandible in the frontal and lateral projections.
- CBCT of mandible.

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

A patient has got a traumatic fracture of mandible in the area of the missing 34, 35 teeth with a slight displacement and a defect of alveolar part in the area of the 34, 35 teeth. Other teeth on both lower and upper jaws are intact. Set the primary diagnose and make the plan of treatment.

### **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:**

- Anatomical structure of the mandible.
- Attachment points for lower and lower jaw muscles.
- Blood supply and innervation in the mandible.
- Bacterial flora of the oral cavity.
- Features of the structure and position of the third molars of the mandible.

#### **List of questions to be studied by the student:**

- Classification of fractures of the mandible.
- The mechanism of displacement of the fragments of the mandible.
- Clinical symptoms of mandibular fractures.

4. X-ray symptoms of mandibular fractures.
5. Methods of diagnosis of fractures of the mandible.
6. Diagnostic techniques for palpation of the mandible.
7. Conservative methods of treatment.
8. Surgical methods of treatment.

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

1. To work out the method of examination of patients with fractures of the mandible;
  - a) to study the patient's complaints;
  - b) to collect anamnesis;
  - c) evaluate the patient's general condition;
  - d) conduct extra- and intra-oral examination of MFA;
2. To work out the technique of palpatory examination of the mandible.
2. To make a plan for additional survey methods.
3. To learn how to interpret radiographs.
4. To learn how to plan a medication plan based on clinical manifestations.
5. To learn how to reasonably choose treatment tactics for a tooth located in the fracture line.

**Situational tasks and questions on the topic of the lesson:**

1. A 25-year-old male patient got bilateral fracture of the lower jaw. A fragment in the region of the 44, 43, 42, 41, 31, 32, 33, 34 teeth is displaced downward and backward. What device should be used for the fragment reposition?
  - A. Smooth arch bar with a spreading curve.
  - B. Arch bar with guide plane.
  - B. Weber's splint.
  - C. Standard bimaxillary arch bars.
  - D. Post's splint.
2. What is the doctor's tactics in case of mandibular condyle fracture with intermedial displacement of the head?
  - A. Miniplate osteosynthesis.
  - B. Bimaxillary arch bars fixation with retraction on the side of fracture.
  - C. Bimaxillary arch bars fixation with retraction on the healthy side.
  - D. Bimaxillary arch bars fixation.
  - E. Smooth arch bar.
3. A 4-years-old child was taken to the hospital with a mandibular mental fracture without displacement of bone fragments. What method of fracture treatment is optimal in this case?
  - A. Monomaxillary smooth arch bar.
  - B. Standard bimaxillary arch bars.
  - C. Weber's splint.
  - D. Circular bandage.
  - E. Intermaxillary ligature teeth wiring.
4. What is the doctor's tactics in case of mandibular condyle fracture with intermedial displacement of the caput?
  - A. Bimaxillary arch bars fixation.
  - B. Bimaxillary arch bars fixation with retraction on the side of fracture.
  - C. Miniplate osteosynthesis.
  - D. Smooth arch bar.
  - E. Bimaxillary arch bars fixation with retraction on the healthy side.



## 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 – 2<sup>nd</sup> 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. Textbook 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**

“Approved”  
on the meeting of the Department  
of Surgical Dentistry  
and Maxillofacial Surgery

Head of the Department:  
professor Ya. E. Vares

METHODICAL GUIDE FOR PRACTICAL LESSONS

Educational discipline	SURGICAL DENTISTRY
Topic of the lesson	<b>Topic №7.</b> Maxillary fractures: classification, clinical signs, treatment.
Course	4 <sup>th</sup>
Faculty	Dental

Lviv – 2019

**Actuality of the topic:** the anatomical and functional features of the upper jaw and the close proximity of vital organs bring considerable specificity both in the clinical course of trauma and in the methods of diagnosis and treatment of fractures of the upper jaw. Isolated fractures of the upper jaw are rare, but we may see an increase in the proportion of cranio-cerebral trauma. This is due to the significant increase in the frequency of accidents, domestic injuries, the use of various types of weapons. The study of this topic will allow the future doctor to be clearly guided in the issues of the clinic, diagnostics, methods of providing of the first aid to the victims with trauma of the upper jaw. Using of this knowledge in future practice will allow to avoid numerous complications.

**Aim of the lesson:** To consider the features of symptoms of maxillary fractures, depending on their location and type. To get acquainted with the methods of diagnosis of maxillary fractures and methods of their treatment. To study their effectiveness, advantages and disadvantages.

**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	To be able to explain the structure of systems and organs

Normal physiology	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.	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
Pathologic anatomy	To know stages of reparative osteogenesis	To be able to explain possible complications of reparative osteogenesis and ways of their prevention
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 maxillary fractures.	Be able to prescribe drugs of different pharmacological groups
<b>Intradisciplinary integration:</b>		
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 6. (Module 1. “Propedeutics of surgical dentistry”): Local conductive anesthesia on the maxilla	To know the methods and techniques of local anesthesia	To be able to provide conductive anesthesia on the maxilla

### 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.

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1.1	Organizational measures			

		5 min.		
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1.3	Control of the initial level of knowledge (standardized control methods).	20 min.	Individual theoretical evaluation. Solving typical tasks. Test control. Written interview.	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.
<b>2.</b>	<b>Main Stage</b>	<b>30 min.</b>		
	<p>Formation of professional skills and abilities:</p> <p>1. To work out the method of examination of patients with fractures of the maxilla;</p> <p>a) to study the patient's complaints;</p> <p>b) to collect anamnesis;</p> <p>c) evaluate the patient's general condition;</p> <p>d) conduct extra- and intra-oral examination of MFA;</p> <p>2. To work out the technique of palpatory examination of the maxilla.</p> <p>3. To make a plan for additional survey methods.</p> <p>4. To learn how to interpret radiographs.</p> <p>5. To learn how to plan a medication plan based on clinical manifestations.</p>		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.
<b>3.</b>	<b>Final stage</b>	<b>30 min.</b>		
3.1	Control and correction of the level of professional skills and abilities		Individual skills control. Control of skills by solving non-typical	Phantoms, surgical instruments. The history of the disease. Selection of results of additional methods of examination of thematic patients. Unusual situational

			situational problems with illustrative material.	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:** «Maxillary fractures: classification, clinical signs, treatment.»

**Aim of the lesson:** To consider the features of symptoms of maxillary fractures, depending on their location and type. To get acquainted with the methods of diagnosis of mandibular fractures and methods of their treatment. To study their effectiveness, advantages and disadvantages.

• *Motivation of educational activity.* the anatomical and functional features of the upper jaw and the close proximity of vital organs bring considerable specificity both in the clinical course of trauma and in the methods of diagnosis and treatment of fractures of the upper jaw. Isolated fractures of the upper jaw are rare, but we may see an increase in the proportion of cranio-cerebral trauma. This is due to the significant increase in the frequency of accidents, domestic injuries, the use of various types of weapons. The study of this topic will allow the future doctor to be clearly guided in the issues of the clinic, diagnostics, methods of providing of the first aid to the victims with trauma of the upper jaw. Using of this knowledge in future practice will allow to avoid numerous complications.

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

*Questions to frontal survey:*

1. Anatomical structure of the upper jaw of the jaw.
2. The buttresses of the skull
3. Blood supply and innervation of tissues in the upper jaw area.
4. Bacterial flora of the oral cavity.

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

Conducting professional training.

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

The maxillary bones are paired pyramidal bones that in many ways serve as the cornerstones of the facial skeleton. Each individual maxilla can be conceptualized as a 5-sided structure, the base of which makes up the lateral nasal wall. The remaining 4 sides of the pyramid are composed of the orbital floor superiorly, the alveolar ridge inferiorly, the front wall of the maxillary sinus anteriorly, and the anterior face of the pterygopalatine fossa postero- laterally. The maxilla forms the largest

component of the middle third of the facial skeleton. It is closely associated with adjacent bones providing structural support for occlusion and protection for the globes and brain. The whole midface represents the bridge between the cranial base superiorly and the dental occlusal plane inferiorly. In a transverse plane, it bridges the 2 zygomaticoorbital complexes. Midfacial skeleton contributes to form and function by establishing vertical facial height, providing anterior facial projection, and anchoring the maxillary dentition in establishing a functional occlusal relationship. It makes the maxilla a functionally and cosmetically very important structure. It consists of alternating thick and thin sections of bone that are capable of resisting significant force. Midfacial fractures account for approximately 10-25 % of all facial fractures. They often result from high-energy blunt force injury to the facial skeleton. Typical mechanisms of trauma include motor vehicle accidents, altercations, industrial accidents and falls. Fracture of these bones is potentially life-threatening as well as disfiguring. Timely and systematic repair of these fractures provides the best chance to correct deformity and prevent unfavorable sequelae. Reestablishing continuity of the midfacial buttresses is the foundation on which maxillary fracture treatment is based.

There are horizontal and vertical buttresses or pillars of the midface that establish a relationship between the palate and alveolar process and the superior cranium and skull base region.

The major vertical buttresses of the midface include the zygomaticomaxillary, nasomaxillary and the posterior buttress. Zygomaticomaxillary buttress connects the lateral maxillary alveolus to the zygomatic process of the temporal bone. It transmits forces from the zygomatico-alveolar crest through the zygoma to the posterior aspect of the superior orbital rim and temporal bone. The nasomaxillary buttress reaches from the anterior maxillary alveolus to the frontal cranial attachment. It transmits force from the maxillary canine area through the lateral pyriform rim and frontal process of the maxilla and to the superior orbital rim. Posterior buttress involving the pterygoid plates connects the maxilla posteriorly to the sphenoid bone. It conducts force through the palatine bone to the pterygoid plates and sphenoid base. An additional unpaired midline support is the frontoethmoid-vomerine buttress. These pillars serve to diffuse the vertical forces of mastication over the broad cranial base. They are also effective shock absorbers for a vertically oriented impact to the facial skeleton.

The superior and inferior orbital rims and alveolar ridge constitute a group of weaker horizontal buttresses. While these structures provide some protection against horizontal forces, they can withstand much less force than the vertical buttresses. Therefore, vertical impact tends to be better absorbed within the facial skeleton, which resists fracture, while horizontal impact tends to overcome the weaker horizontal buttresses and shear through the vertical pillars. In a surgical approach to maxillary fractures, attempts should be made to restore the continuity of these support buttresses.

Between these structurally reinforced buttresses, the bone of the maxilla is usually thin. It covers the pneumatized maxillary sinus and forms the orbital floor.

### **Classification**

Much of the understanding of patterns of fracture propagation in midface trauma originates from the experimental work of Rene LeFort. In 1901, he reported his work on cadaver skulls that were subjected to blunt forces of various magnitudes and directions. LeFort considered several factors: the vector of force overcoming the inertia of the face; the thickness of the bone and buttresses counteracting the mass, velocity, and point of application. He concluded that predictable patterns of fractures follow certain types of injuries. The recurring fracture patterns he described are still commonly utilized.

Three predominant types were described.

#### **LeFort I Fractures**

LeFort I is also known as a horizontal maxillary fracture. It may result from a force of injury directed low on the maxillary alveolar rim in a downward direction. The fracture extends from the lower third of the nasal septum to the lateral pyriform rims, travels horizontally above the teeth

apices through the base of the maxillary sinuses, crosses below the zygomaticomaxillary junction, and traverses the pterygomaxillary junction to interrupt the pterygoid plates. It separates the alveolar processes, palate, and pterygoid processes from the facial structures above. The superior two-thirds of the maxilla remain associated with the face. Fracture dislocations of segments of the alveolus may be associated with this fracture. The fracture lines of a Le Fort I fracture may be linear (simple) or comminuted (complex). With high-energy injuries, the palate may be split in the midline in addition to the Le Fort I fracture.

### Le Fort II Fractures

Le Fort II is also known as a pyramidal maxillary fracture. It may result from a blow to the lower or mid maxilla. Such a fracture has a pyramidal shape and extends from the dorsum of the nose at or below the nasofrontal suture through the frontal processes of the maxilla, inferolaterally through the lacrimal bones and inferior orbital floor and rim through or near the inferior orbital foramen, and inferiorly through the anterior wall of the maxillary sinus; it then travels underneath the zygomaticomaxillary buttress, across the pterygomaxillary fissure, and through the pterygoid plates. Various amounts of the pterygoid plates usually remain attached to the posterior maxilla. Thus, maxillary fractures at the Le Fort II level involve most of the nasal bones, the maxillary bones, the palatine bones, the lower two-thirds of the nasal septum, the dentoalveolus, and the pterygoid plates. The segments may be intact below this line of fracture, but they are most often comminuted.

### LeFort III Fractures

Le Fort III is also known as a craniofacial dysjunction because the entire mass of facial bones is separated from the cranial base. These represent the most superior pattern of the maxillary fractures. It may follow impact to the nasal bridge or upper maxilla. The fracture line begins at the frontozygomatic suture along the lateral aspect of the internal orbit along the sphenozygomatic suture line to the inferior orbital fissure, extends medially across the floor of the orbit up the medial wall of the orbit towards the dorsum of the nose where it crosses and proceeds to the opposite side in the same manner. Intranasally, a branch of the fracture extends through the base of the perpendicular plate of the ethmoid, through the vomer, and through the interface of the pterygoid plates to the base of the sphenoid. Various amounts of the pterygoid plates usually remain attached to the posterior maxilla. Lefort III fractures are often associated with head injuries, dural tears with associated cerebrospinal fluid (CSF) leaks, significant orbital trauma, and other fractures of the craniofacial skeleton.

### **Clinical Evaluation and Diagnosis**

Evaluation of the maxilla and facial bones should be undertaken only after the patient has been fully stabilized and life-threatening injuries have been managed.

After initial stabilization of the trauma patient, evaluation of the facial injuries should commence with reassessment of the patient's airway neurological, visual, and cervical spine status. Oral bleeding, loose teeth, edema, or associated mandible fractures may lead to airway problems. Head injuries are often associated with midface fractures and CSF leaks should be suspected in patients with Le Fort II or III type fractures. The presence and extent of other injuries in patients with multiple trauma may influence the timing of fracture repair and patient outcomes. Information regarding the mechanism of the injury may assist in determining a diagnosis. In particular, knowing the magnitude, location, and direction of the impact is helpful. High-energy trauma is often associated with concomitant injuries. A history of mental status changes or loss of consciousness should cause concern regarding intracranial injury.

A careful and thorough evaluation of the eye and orbit is paramount. Every patient with orbital fractures should have an examination that includes visual acuity testing, visual field testing, ocular motility, binocular vision, globe position, pupillary reaction, intraocular pressure testing. In some cases preexisting optical correction by glasses or contact lenses or ocular disorders such as cataract, glaucoma, and retinal disorders can compromise basic visual acuity testing. Associated soft tissue injuries of the face need to be cleansed and evaluated regarding the need for early repair. Focal



areas of swelling or hematoma may overlie an isolated fracture. Periorbital swelling may indicate Le Fort II or III fractures.

Intraoral assessment of the patient's dentition and occlusion should begin with the examination of the palate and maxillary alveolus for loose or missing teeth, lacerations, bleeding, and abnormal mobility. The maxillary segment is displaced posteriorly and inferiorly. This may cause premature contact of the molar teeth, resulting in an anterior open bite deformity. The maxilla and palate will often be unstable and mobile on bimanual examination with Le Fort fractures and the midface may have a characteristic retrusion with loss of projection.

### **Management of the maxillary fractures**

Definitive surgery should not be undertaken until the patient has been stabilized regarding other life-threatening injuries.

Initial attention should be directed at establishing an airway and controlling hemorrhage as the patient may die of concomitant injury or failure to manage the sequelae of maxillary fractures. The most frequent cause of hemorrhage in Le Fort level fractures is a fractured septum. This bleeding may be managed by placing nasal packs including gauze packing. Bleeding from sites of laceration or abrasion may be controlled by tamponade. There are also a variety of possible injuries affecting the globe that may require immediate treatment. Pressure increase in the periorbital region due to retrobulbar hematoma can cause significant injury of the neurovascular structures with eventual loss of vision. If a retrobulbar hematoma leads to a tense, proptotic globe, emergency decompression should be considered. Transcutaneous transseptal incisions may help evacuate the hematoma and release the periorbital pressure. Alternative methods such as transconjunctival pressure release and/or lateral canthotomy and inferior cantholysis should be considered according to patient condition. Special attention has to be paid to the posterior third of the orbit and the bony optic canal. Bony dislocations in these anatomical areas are more likely to be associated with traumatic optic nerve lesions.

Careful coordination with the anesthesiologist regarding airway management using nasal or oral intubation. In many cases nasal intubation may interfere with reduction of nasal and midface fractures, while oral intubation may hamper evaluation and restoration of occlusal relationships. In this cases submental/submandibular intubation and/or tracheostomy should be considered.

In midfacial fracture repair the time frame regarded appropriate for primary fracture treatment is limited to 2 weeks (not including accompanying complications requiring immediate treatment, such as dentoalveolar trauma or post-traumatic visual loss). As soon as the general condition of the patient allows, definitive treatment should be undertaken. After 2 weeks, the treatment is regarded as delayed and thus has to follow the protocol of secondary post-traumatic reconstruction.

Extensive maxillary fractures are usually associated with significant cosmetic and functional sequelae. Expedient definitive therapy is needed to best correct these problems.

Treatment of midface fractures aims to restore preinjury facial appearance and occlusion by restoring anterior facial projection and vertical facial height. Fracture treatment should be customized to the extent and location of the fractures based on clinical evaluation and CT scan findings. Dental occlusion is the most important parameter in reestablishing facial contour, reduction of fracture, and obtaining postoperative chewing function. The most common means of placing the patient into maxillomandibular fixation is the application of arch bars. A second surgical principle is to achieve anatomical correct repositioning of all midfacial bones. The height, width, and projection must be reestablished. Successful reconstruction of midfacial fractures is obtained by reestablishing the midfacial buttresses. If available, dental casts, stereolithographic models, and/or preinjury photographs 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.

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.

- Algorithms for the formation of professional skills.

1. To work out the method of examination of patients with fractures of the maxilla;
  - a) to study the patient's complaints;
  - b) to collect anamnesis;
  - c) evaluate the patient's general condition;
  - d) conduct extra- and intra-oral examination of MFA;
2. To work out the technique of palpatory examination of the maxilla.
3. To make a plan for additional survey methods.
4. To learn how to interpret radiographs.
5. To learn how to plan a medication plan based on clinical manifestations.

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

Individual tasks:

Task #1. A 38 year old patient got a blow that resulted in upper jaw fracture. Objectively: flattening and impression of face, mobility and dangling of broken jaw with cartilage of nose and eyeballs, nasal haemorrhage, tissue edema, "glasses" symptom; palpation reveals crepitation, subcutaneous emphysema, liquorrhea, loss of sensitivity in the area of half the upper jaw, nose wing and frontal teeth. What is the most probable diagnosis?

- A. Le Fort's III fracture of upper jaw
- B. Upper jaw osteomyelitis
- C. Upper jaw odontoma
- D. Le Fort's I fracture of upper jaw
- E. Upper jaw cancer on the right

Task #2. As a result of a road accident a 45 year old patient got an injury of his upper jaw. Examination revealed elongated and flattened face, profuse nasal haemorrhage, liquorrhea from the nose and ears. These clinical presentations are typical for the following fracture of upper jaw:

- A. Subbasal (Le Fort III)
- B. Subnasal (Le Fort I)
- C. Suborbital (Le Fort II)
- D. Bilateral fracture of zygomatic bones
- E. Mandibular fracture

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

A 25-year-old patient has a face trauma. Objectively: there is a significant soft tissue swelling of the left half face, haemorrhage into the left eye sclera, crepitation in the region of nose bones. Palpation reveals the mobility of the upper jaw, its percussion reveals tympanitis. X-ray picture shows the fracture line running through the lower margin of the orbit on both sides of the sphenozygomatic suture and reaching behind the maxillary tuber. Set the primary diagnosis and create the treatment plan.

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

Summing up of the lesson

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

- Brain storm. Students demonstrate an exhaustive description of the unusual clinical situation and offer to offer the most rational diagnostic methods. After recording all the proposed diagnostic methods during the discussion, students choose the most rational.
- Tasks for 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 structure of the upper jaw of the jaw.
2. The buttresses of the skull
3. Blood supply and innervation of tissues in the upper jaw area.
4. Bacterial flora of the oral cavity.

#### **List of questions to be studied by the student:**

1. Classification of fractures of the upper jaw
2. Mechanism of displacement of fragments of the upper jaw.
3. Clinical symptoms of fractures of the upper jaw.
4. Radiographic symptoms of fractures of the upper jaw.
5. Methods of diagnosis of fractures of the upper jaw.
6. Conservative methods of treatment.

## 7. Surgical methods of treatment.

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

1. To work out the method of examination of patients with fractures of the maxilla;
  - a) to study the patient's complaints;
  - b) to collect anamnesis;
  - c) evaluate the patient's general condition;
  - d) conduct extra- and intra-oral examination of MFA;
2. To work out the technique of palpatory examination of the maxilla.
3. To make a plan for additional survey methods.
4. To learn how to interpret radiographs.
5. To learn how to plan a medication plan based on clinical manifestations.

### **Situational tasks and questions on the topic of the lesson:**

1. As a result of a car accident a 45- year-old patient got an injury of his upper jaw. Examination revealed elongated and flattened face, profuse nasal haemorrhage, liquorrhea from the nose and ears. These clinical presentations are typical for the following fracture of upper jaw:

- A. Subbasal (Le Fort III).
- B. Subnasal (Le Fort I).
- C. Suborbital (Le Fort II).
- D. Bilateral fracture of zygomatic bones.
- E. Fracture of the nasal bones.

2. A 34-year-old patient had got in a car accident. The patient stayed conscious. He complains of headache, dizziness, general weakness, nausea. 12 hours after the injury the patient got "raccoon eyes"(periorbital haematomas) within the circular muscles of eye. What fracture does the victim have?

- A. Fracture of skull base.
- B. Le Fort II fracture of maxilla.
- C. Fracture of nasal bones.
- D. Bilateral fracture of zygomatic bones.
- E. Fracture of frontal bones.

3. After a car accident a patient consulted a dentist about pain at the base of the nose. Palpation reveals tenderness of the nose wall, mobility of the nasal bones. Nasal passages are filled with blood clots. What is the provisional diagnosis?

- A. Fracture of nasal bones.
- B. Le Fort I fracture of maxilla.
- C. Le Fort II fracture of maxilla.
- D. Le Fort III fracture of maxilla.
- E. Fracture of zygoma.

4. A 36-year-old female patient complains of headache, inability to close the jaws. She has a history of an injury followed by loss of consciousness, nausea. Objectively: the midface tissues are edematous, there is bilateral eyelid hemorrhage, open bite. Palpation of the midface bones causes acute pain. In the back of nose there is marked symptom of step deformity, nasal hemorrhage is present. Palpation of the oral cavity reveals mobility of the maxilla. Make a diagnosis:

- A. Le Fort III maxillary fracture (top).
- B. Le Fort I maxillary fracture (bottom).
- C. Le Fort II maxillary fracture (middle), concussion.
- D. Le Fort II maxillary fracture (middle).
- E. Mandibular fracture.

## **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 – 2<sup>nd</sup> 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.
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4. Bauml, Philips R.W., Lund M.R. Textbook 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.
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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	<b>Topic №8.</b> Zygomatic complex and nasal fractures: classification, clinical signs, treatment.
Course	4 <sup>th</sup>
Faculty	Dental

Lviv – 2019

**Actuality of the topic:** the anatomical and functional features of the zygomatic complex and the close proximity of vital organs bring considerable specificity both in the clinical course of trauma and in the methods of diagnosis and treatment of fractures of the zygomatic complex. Isolated fractures of the zygomatic complex are rare, but we may see an increase in the proportion of cranio-cerebral trauma. This is due to the significant increase in the frequency of accidents, domestic injuries, the use of various types of weapons. The study of this topic will allow the future doctor to be clearly guided in the issues of the clinic, diagnostics, methods of providing of the first aid to the victims with trauma of the upper jaw. Using of this knowledge in future practice will allow to avoid numerous complications.

**Aim of the lesson:** To consider the features of symptoms of the fractures of the zygomatic complex, depending on their location and type. To get acquainted with the methods of diagnosis of the fractures of the zygomatic complex and methods of their treatment. To study their effectiveness, advantages and disadvantages.

**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
Pathologic anatomy	To know stages of reparative osteogenesis	To be able to explain possible complications of reparative osteogenesis and ways of their prevention
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
<b>Intradisciplinary integration:</b>		
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.

### **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.

<b>№</b>	<b>The main stages of the lesson, their functions and content</b>	<b>Time period</b>	<b>Methods of education and control</b>	<b>Materials of methodical support</b>
<b>1.</b>	<b>Preparatory stage</b>	<b>20 min.</b>		
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 interview.	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.
<b>2.</b>	<b>Main Stage</b>	<b>30 min.</b>			
	<p>Formation of professional skills and abilities:</p> <p>1. To work out the method of examination of patients with fractures of the zygomatic complex;</p> <p>a) to study the patient's complaints;</p> <p>b) to collect anamnesis;</p> <p>c) evaluate the patient's general condition;</p> <p>d) conduct extra- and intra-oral examination of MFA;</p> <p>2. To work out the technique of palpatory examination of the zygomatic complex.</p> <p>3. To make a plan for additional survey methods.</p> <p>4. To learn how to interpret radiographs.</p> <p>5. To learn how to plan a medication plan based on clinical manifestations.</p>		<p>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.</p>	<p>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.</p>	
<b>3.</b>	<b>Final stage</b>	<b>30 min.</b>			
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	Phantoms, surgical instruments. The history of the disease. Selection of results of additional methods of examination of thematic patients. Unusual situational tasks.	

			illustrative material.	
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:** «Topic №8. Zygomatic complex and nasal fractures: classification, clinical signs, treatment.»

**Aim of the lesson:** To consider the features of symptoms of the fractures of the zygomatic complex, depending on their location and type. To get acquainted with the methods of diagnosis of the fractures of the zygomatic complex and methods of their treatment. To study their effectiveness, advantages and disadvantages.

• *Motivation of educational activity.* the anatomical and functional features of the zygomatic complex and the close proximity of vital organs bring considerable specificity both in the clinical course of trauma and in the methods of diagnosis and treatment of fractures of the zygomatic complex. Isolated fractures of the zygomatic complex are rare, but we may see an increase in the proportion of cranio-cerebral trauma. This is due to the significant increase in the frequency of accidents, domestic injuries, the use of various types of weapons. The study of this topic will allow the future doctor to be clearly guided in the issues of the clinic, diagnostics, methods of providing of the first aid to the victims with trauma of the upper jaw. Using of this knowledge in future practice will allow to avoid numerous complications.

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

*Questions to frontal survey:*

1. Classification of fractures zygomatic complex and nasal bones.
2. The mechanism of displacement of the fragments zygomatic complex and nasal bones.
3. Clinical symptoms of the fractures of zygomatic complex and nasal bones.
4. X-ray symptoms of the fractures of zygomatic complex and nasal bones.
5. Methods of diagnosis of the fractures of zygomatic complex and nasal bones.
6. Diagnostic techniques for palpation of the zygomatic complex and nasal bones.
7. Conservative methods of treatment.
8. Surgical methods of treatment.
9. Instrumental additional survey methods.
10. Indications for hospitalization of surgical dental patients.
11. Conservative and surgical methods of treatment of damage to the zygomatic bone and arch, bones of the nose.
12. Scheme of medical treatment of patients with damage to the zygomatic bones and arches, bones of the nose.

13. Complications that can occur with damage to the zygomatic bone and arches, the bones of the nose.

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

Conducting professional training.

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

The zygomatic bone occupies a prominent position in the facial skeleton. It plays a key role in determining facial width as well as acting as a major buttress of the midface. Its anterior projection forms the malar eminence and is often referred to as the malar bone. The zygoma has several important articulations in the midface. From a frontal view, the zygoma can be seen to articulate with 3 bones: medially by the maxilla, superiorly by the frontal bone, and posteriorly by the greater wing of the sphenoid bone within the orbit. From a lateral view, one clearly can see the temporal process of the zygoma join the zygomatic process of the temporal bone to form the zygomatic arch. The zygoma is the main buttress between the maxilla and the skull; but in spite of its sturdiness, its prominent location makes it prone to fracture. The mechanism of injury usually involves a blow to the side of the face from a fist, object, or secondary to motor vehicle accidents. Moderate force may result in minimally or nondisplaced fractures at the suture lines. More severe blows frequently result in inferior, medial, and posterior displacement of the zygoma. Comminuted fractures of the body with separation at the suture lines are most often the result of high-velocity motor vehicle accidents. In general, displaced fractures will involve the inferior orbital rim and orbital floor, the zygomaticofrontal suture, the zygomaticomaxillary buttress, and the zygomatic arch. Occasionally, however, a direct blow to the arch will result in an isolated depressed fracture of the arch only. Attached to the zygoma anteriorly are the zygomaticus minor and major muscles, as well as part of the orbicularis oculi muscle. Laterally, the masseter muscle from below attaches to the zygomatic arch and produces displacing forces on the zygoma. Lastly, the branches of the fifth and seventh cranial nerves lie within the bounds of the midface. Particularly, the temporal and zygomatic branches of the seventh nerve and the zygomaticotemporal and zygomaticofacial branches of the fifth nerve must be identified carefully upon surgical dissection of the area to prevent complications of paresis and paresthesias, respectively.

Fracture lines usually run through the infraorbital rim, involve the posterolateral orbit, and extend to the inferior orbital fissure. The fracture line then continues to the zygomatic sphenoid suture area and on to the fronto- zygomatic suture line. Most zygomatic complex fractures involve the orbit, making visual complications a frequent occurrence.

A modern classification of zygomatic fractures is based on CT scan data. CT provides information about facial structures, including both bone segmentation and displacement, allowing for complete repair of the fractures. This system divides fractures into low-energy, medium-energy, and high- energy injuries.

Low-energy zygoma fractures result in minimal or no displacement. These types of fractures often are seen at the zygomaticofrontal suture, and inherent stability usually obviates reduction.

Middle-energy zygoma fractures result in fractures of all buttresses, mild- to-moderate displacement, and comminution. Often, an eyelid and intraoral exposure is necessary for adequate reduction and fixation.

High-energy zygoma fractures frequently occur with Le Fort or panfacial fractures. The zygomatic fractures often extend through the glenoid fossa and permit extensive posterior dislocation of the arch and malar eminence. A coronal exposure, in addition to the oral and eyelid incisions, usually is necessary to properly reposition the malar eminence.

Although isolated zygomatic complex fractures occur, fractures of this nature are usually associated with other facial skeletal and soft-tissue injury.

Initially, assessment of a zygomatic fracture in an emergent setting should be directed at prevention of life-threatening complications including major bleeding, airway compromise, aspiration, and identification of other fractures. Cervical spine injury should always be considered if the injury is the result of a high velocity event or if the patient has altered mental status. Intracranial, thoracic, extremity, and pelvic injuries require proper evaluation and management.

Once other more pressing injuries have been dealt with and the patient is stable, a thorough preoperative assessment of facial skeletal architecture can be performed. Symptoms include paresthesias in the distribution of the maxillary branch of the trigeminal nerve, trismus, diplopia, and flattening of the zygoma.

Signs classically include subconjunctival and periorbital hemorrhage and hypesthesias in the distribution of the maxillary branch of the trigeminal nerve. Flattening of the malar eminence, lateral canthal dystopia, and reduction in mandibular movement may be present. Ipsilateral epistaxis and buccal sulcus hematomas may occur. Reduced extraocular muscle function, diplopia, and enophthalmos can occur secondary to orbital floor fractures, resulting in entrapment of orbital contents.

A thorough ophthalmologic examination is required to evaluate and document ocular status. If a ruptured globe, retinal detachment, or traumatic optic neuropathy exists, treatment of these supersedes repair of a zygomatic fracture.

Radiographic evaluation of the fracture is mandatory and may include both plain films and a computed tomographic (CT) scan. Computed tomography imaging (CT scan) with three-dimensional reconstruction is most commonly used to confirm the presence of a fracture and optimize pre-surgical planning. If physical findings and plain films are not suggestive of a zygomatic fracture, the evaluation may end here. However, if they do suggest fracture, a coronal and axial CT scan should be obtained. The CT scan will accurately reveal the extent of orbital involvement, as well as degree of displacement of the fractures. This study is vital for planning the operative approach.

### **Surgical treatment**

Historically, closed reduction was the method of choice for nearly all zygomatic fractures. Multiple methods were employed, but most involved simply exerting pressure underneath the malar eminence and popping the fragments back into alignment. Closed reductions yield unpredictable results with significant chance of relapse. It was also frequently associated with complications including persistent diplopia, orbital dystopia, malunion, and significant residual deformity.

If a zygomatic fracture is displaced, an open reduction and rigid stabilization with mini-and microplates is used. The floor of the orbit is routinely explored and reconstructed, if needed, to restore orbital volume. The complications of an inadequately or unreduced zygomatic fracture are very difficult to correct secondarily and usually avoidable.

While 2-point fixation of zygomatic fractures may be used commonly, it often leaves an axis of rotation for the zygoma following an adequate reduction. Forces such as the masseter muscle often displace the zygoma postoperatively. Thus, making the diagnosis and then choosing the correct approach to establish 3-point fixation and ultimate stability is essential for obtaining a successful outcome. Since biomechanical properties are of primary importance underlying the treatment of zygoma fractures, a brief discussion is warranted. In terms of postoperative stability of a reduced zygoma fracture, 3-point fixation is undoubtedly best. However, at times, 2-point stabilization is perfectly adequate.

Rigid fixation with plates and screws restores 3-dimensional stability and allows for the least amount of motion between ends of fragments, the main cause of bone resorption and instability.

Presently, several types of microplating systems made of titanium and biodegradable materials

are available to choose from when rigid fixation is needed for stabilization.

In many situations, resorbable plates and screws are adequate. Such situations may include the presence of primarily compressive forces of relapse and sturdy bone fragments that can be fixed in direct contact, since forces of relapse are absorbed by bone fragments and not the fixation system.

Arch fractures resulting in decreased mandibular motility can be dealt with via a Gillies temporal approach or by a Limberg hook, incerted via a small infrazygomatic incision. The temporal approach allows for surgical reduction of a depressed zygomatic arch while leaving a well-camouflaged scar within the hairline. Dissection exposes the deep temporalis fascia followed by creation of a plane between the fascia and temporalis muscle. The lateral eyebrow incision of the supraorbital approach allows for additional access to the frontozygomatic suture line. A supraperiosteal dissection plane allows for access to the arch. Both approaches provide safe and direct access to the zygomatic arch, since the seventh cranial nerve lies above the dissection planes.

An instrument such a zygomatic elevator or hook is placed beneath the arch. Once the instrument is properly positioned, the arch is elevated in a superolateral vector taking care to not use surrounding facial bones as a fulcrum. Proper placement of the instrument can be confirmed with palpation by the surgeon's free hand placed within the intraoral, posterior buccal sulcus. A cracking sound is heard when the convexity of the arch is restored with full reduction. The surgeon should be cognizant of the normal flattening of the middle of the arch. A persistent protuberance will occur if care is not taken not to avoid fracture overcorrection. The wounds are closed, and the patient is advised to avoid direct contact to the area for several weeks.

Zygomatic complex fractures are usually repaired with open reduction and internal fixation. Plating systems are used to fixate the zygomaticomaxillary buttresses, zygomaticofrontal suture, and zygomatic arch. Osteotomies are indicated for fractures older than 1 month with onlay bone grafting for fractures present for 4 months or longer.

Various approaches to zygomatic complex fractures include coronal, eyebrow, upper eyelid, transconjunctival and infraciliary lower eyelid, and maxillary vestibular approaches. The approach to the zygomatic complex is dictated by the degree of injury and need for exposure for open reduction and internal fixation. In most instances, 2 areas of internal fixation are necessary to provide rigidity and satisfactory malar contour and eminence. The frontozygomatic suture and maxillary buttresses are the usual fixation points, with plating of the inferior orbital rim when reconstruction of the orbital floor is necessary.

Fractures of the zygomatic complex frequently result in sensory disturbances in the infraorbital nerve distribution. These symptoms include dysesthesia of the skin of the nose, cheek, lower eyelid, upper lip, gingiva, and teeth of the affected side. These arise because fractures generally occur in the vicinity of the infraorbital foramen and canal.

Trismus is also a common finding (45 %), particularly after a fracture involving the zygomatic arch. It results from impingement upon the coronoid process of the mandible by a depressed zygomatic arch. This may indicate a need for elevation of the depressed arch, accurate reduction, and fixation. If new bone has formed in the space below the zygomatic arch and restricts the movement of the mandible, an intraoral approach for coronoidectomy may be required to permit mandibular movement.

Diplopia may occur after zygoma fractures for numerous reasons. These include, but are not limited to, hematoma, muscle injury, motor nerve injury to the extraocular muscles, entrapment of extraocular muscles, or damage to the fine connective tissue system. Diplopia that occurs after zygoma fractures not associated with significant orbital floor fractures and entrapment is usually transitory and is probably associated with hematomas.

A symptomatic diplopia associated with a positive forced duction test and CT evidence of

entrapped muscle or soft tissue with no improvement over 1-2 weeks may be an indication for surgery. When diplopia is associated with enophthalmos, an improvement in vision can be predicted after correction of the enophthalmos. Diplopia associated with zygomatico-orbital fractures may persist longer, and young patients may recover more slowly than adults.

- Algorithms for the formation of professional skills.

1. To work out the method of examination of patients with fractures of the zygomatic complex;
  - a) to study the patient's complaints;
  - b) to collect anamnesis;
  - c) evaluate the patient's general condition;
  - d) conduct extra- and intra-oral examination of MFA;
2. To work out the technique of palpatory examination of the zygomatic complex.
3. To make a plan for additional survey methods.
4. To learn how to interpret radiographs.
5. To learn how to plan a medication plan based on clinical manifestations.

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

Individual tasks:

Task #1 A patient applied to the oral surgery department and complained about pain and edema in the right infraorbital region and right zygomatic region, skin numbness in the area of the right half of his upper lip; nasal haemorrhage. These symptoms turned up after a trauma. What disease should be suspected?

- A. Le Fort I maxillary fracture.
- B. Fracture of zygomatic bone.
- C. Fracture of nasal bones.
- D. Le Fort II maxillary fracture.
- E. Le Fort III maxillary fracture.

Task #2 A victim got a face and temporal region trauma. A doctor made a diagnosis: fracture of zygomatic arch. What processes of cranial bones are injured?

- A. Temporal process of zygomatic bone and zygomatic process of temporal bone.
- B. Zygomatic process of maxilla and zygomatic process of frontal bone.
- C. Temporal process of zygomatic bone and zygomatic process of frontal bone.
- D. Zygomatic process of maxilla and zygomatic process of temporal bone.
- E. Zygomatic process of frontal bone and zygomatic process of temporal bone.

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

A patient got a trauma that resulted in limited mouth opening, nasal haemorrhage, numbness of inferior eyelid as well as skin in the infraorbital area. Objectively: there is face deformation caused by depression of soft tissues in the region of maxillary tuber on the left; there is also a step-off deformity in the median part of the infraorbital rim and in the region of zygomatic-alveolar crest. To set primary diagnosis and make a plan of treatment.

### **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. Subjective examination of patients.
2. Objective (general and local) examination.
3. Basic methods of examination (examination, palpation, percussion, auscultation).

**List of questions to be studied by the student:**

1. Classification of fractures zygomatic complex and nazal bones.
2. The mechanism of displacement of the fragments zygomatic complex and nazal bones.
3. Clinical symptoms of the fractures of zygomatic complex and nazal bones.
4. X-ray symptoms of the fractures of zygomatic complex and nazal bones.
5. Methods of diagnosis of the fractures of zygomatic complex and nazal bones.
6. Diagnostic techniques for palpation of the zygomatic complex and nazal bones.
7. Conservative methods of treatment.
8. Surgical methods of treatment.
9. Instrumental additional survey methods.
10. Indications for hospitalization of surgical dental patients.
11. Conservative and surgical methods of treatment of damage to the zygomatic bone and arch, bones of the nose.
12. Scheme of medical treatment of patients with damage to the zygomatic bones and arches, bones of the nose.
13. Complications that can occur with damage to the zygomatic bone and arches, the bones of the nose.

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

1. To work out the method of examination of patients with fractures of the zygomatic complex;
  - a) to study the patient's complaints;
  - b) to collect anamnesis;
  - c) evaluate the patient's general condition;
  - d) conduct extra- and intra-oral examination of MFA;
2. To work out the technique of palpatory examination of the zygomatic complex.
3. To make a plan for additional survey methods.
4. To learn how to interpret radiographs.
5. To learn how to plan a medication plan based on clinical manifestations.

**Situational tasks and questions on the topic of the lesson:**

1. Patient after trauma feels pain in the left zygomatic and suborbital areas, complication in mouth opening, bleeding from the nose, dizziness and weakness. There's a swelling and hematoma in the left zygomatic and suborbital areas, mouth opening up to 2 cm wide, pain and "bone step" in the zygomo-maxillary suture, bone retraction in the area of zygomo-temporal suture, hematoma of the transitional fold of the upper jaw left side, blood clots in the left nose. What is the diagnosis?
  - A. Traumatic fracture of the maxilla and bones of the nose
  - B. Traumatic fracture of the left zygomatic bone and arch with dislocation of fragments,

- hematoma of zygomatic and suborbital areas from the left
- C. Traumatic fracture of the left branch of the mandible
  - D. Traumatic fracture of the left zygomatic bone and arch
  - E. Traumatic sinusitis, hematoma of the left zygomatic and suborbital areas from the left
2. Patient has complaints on the pain, bleeding from the nose, complicated nose breathing, deformation of the noseband, and hematoma near the eyes. There's a bone crepitation while palpation of the nasal bones fragments. What is the diagnosis?
    - A. Fracture of the condylar processes
    - B. Air emphysema, contusion of the nose
    - C. Fracture of the maxilla
    - D. Fracture of the zygomatic bone
    - E. Fracture of the nasal bones
  3. What is the mandatory symptom for the fracture of the skull base?
    - A. Bleeding from the nose
    - B. Bleeding from the external auditory canal
    - C. Liquorrhea
    - D. Bilateral symptom of "eyeglasses"
    - E. Anesthesia in the area of suborbital nerve
  4. Which of the symptoms characterizes the fracture of the nasal bones?
    - A. Movement of the nasal bones
    - B. Nasal bleeding
    - C. Deformation of the noseband
    - D. Swelling of the soft tissues around the nose
    - E. Complicated nasal breathing

### 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 – 2<sup>nd</sup> 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. Wyrsocki – 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. Textbook 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	<b>Topic №9.</b> Temporary (transport) immobilization of the facial bones fractures: types, requirements.
Course	4 <sup>th</sup>
Faculty	Dental

**Actuality of the topic:** knowledge of the stage treatment of patients with injuries of the bones of the facial skeleton, possession of methods of temporary (transport) immobilization of fragments will allow the dentist to organize and provide rational medical care to the maxillofacial injured in peacetime and in extreme situations.

**Aim of the lesson:** To learn how to temporarily immobilize fragments of the bones of the facial skull. To analyze the volume and procedure of providing medical care to patients with traumatic injuries of the bones of the facial skeleton 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 jaws;	To be able to explain the structure of systems and organs of maxillo-facial area (MFA)

Normal physiology	- 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	Be able to explain the topography of the maxillofacial organs. Be able to schematically depict fracture lines of the MFA. Be able to schematically depict fracture lines on upper jaw by Le Fort.
Pathologic anatomy	To know stages of reparative osteogenesis	To be able to explain possible complications of reparative osteogenesis and ways of their prevention
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
<b>Intradisciplinary integration:</b>		
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.
Topics 6, 7. (Module 1. "Traumatology of maxillofacial area"):	Know the classification, clinical picture of fractures of lower and upper jaws.	To be able to set primary diagnosis to the patient with fracture of the facial 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 education and control	Materials of methodical support
<b>1.</b>	<b>Preparatory stage</b>	<b>20 min.</b>		
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	10 min.	Individual	Question for Tables,

	knowledge (standardized control methods).		theoretical evaluation. Solving typical tasks. Test control. Written interview.	an individual oral and written evaluation. Typical situational tasks and tests.	phantoms, collapsible jaws, textbooks, manuals, reference books, atlas, methodical recommendations, video films.
<b>2.</b>	<b>Main Stage</b>	<b>30 min.</b>			
	<p>Formation of professional skills and abilities:</p> <ol style="list-style-type: none"> <li>1. To work out the technique of applying of the circular bandage.</li> <li>2. To work out a technique for applying of an individual mento-parietal circular bandage.</li> <li>3. To work out the method of applying of standard transport ties (elastic bandage by Pomerantseva-Urbanska, Entin's tight chin sling, etc.).</li> <li>4. To work out the technique of Intermaxillary wiring by Limberg.</li> <li>5. To work out the technique of Intermaxillary wiring by Ivy.</li> <li>6. To work out the technique of Intermaxillary wiring by to Gotzko.</li> <li>7. Learn how to create a comprehensive treatment plan: determine the type of immobilization, prescribe the medicaments needed for treatment.</li> </ol>		<p>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.</p>	<p>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.</p>	
<b>3.</b>	<b>Final stage</b>	<b>30 min.</b>			
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	Phantoms, surgical instruments. The history of the disease. Selection of results of additional methods of examination of thematic patients. Unusual situational tasks.	

			material.	
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:** «Topic №9. Temporary (transport) immobilization of the facial bones fractures: types, requirements.»

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

- *Motivation of educational activity.* knowledge of the stage treatment of patients with injuries of the bones of the facial skeleton, possession of methods of temporary (transport) immobilization of fragments will allow the dentist to organize and provide rational medical care to the maxillofacial injured in peacetime and in extreme situations.

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

*Questions to frontal survey:*

1. The procedure and volume of medical care for patients with traumatic injuries of the facial bones at the pre-hospital stage.
2. Basic principles of evacuation-transport immobilization.
3. Types of methods of immobilization of fragments of bones of the facial skull.
4. Methods of temporary immobilization.
5. Types of temporary immobilization in fractures of the mandible.
6. Types of temporary transport immobilization in fractures of the upper jaw (Faltin's, Limberg's, Entin's, etc.)
7. Indications and contraindications for ligature wiring of teeth and jaws.
8. Methods for ligature bonding of teeth and jaws (by Limberg, Ivy, Gotzko, etc.).

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

Conducting professional training.

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

Immobilization of fragments in case of injuries of the jaws has its own peculiarities and should be carried out in the first stages of first aid, since the early fixation of the fragments causes the further success of the fracture treatment.

Temporary transport immobilization can be carried out by improvised means. In the absence of dressing material, first aid can be made with an improvised bandage of any piece of material consisting of a triangular kerchief.

In the case of fracture of the lower and upper jaws, standard transport bandages can be applied: the parietal-chin bandage, the elastic bandage by Pomerantseva-Urbanska, the rigid chin strap of Entin and others. This type of immobilization is carried out outside the specialized medical institution or at the scene by average medical professionals, doctors of other specialties, sometimes in mutual assistance. In case of mass admission of victims, it can be carried out in a specialized ward for several hours (days) before rendering specialized help in full.

Circular bandage parietal chin bandage. Circular bandages of bandage, passing through the chin of the mandible and parietal bones, do not allow the fragments to shift during transportation of the victim. For this purpose it is possible to use a mesh elastic bandage.

The standard transport bandage provides more secure fixing of fragments. It consists of a solid chin sling and a support cap (dimensionless). The latter has 3 pairs of loops to secure the rubber rings, which tightly press the sling to the chin area. The cap is placed in such a way that it tightly covers the occipital tubercle, and its straps were tied on the forehead. The hard chin tuft is filled with a cotton gauze tab so that it overlaps the edges of the tuft around its perimeter to prevent excessive pressure on the soft tissues.

The elastic bandage by Pomerantseva-Urbanska is made of several layers of fabric. The intermediate is represented by two wide elastic bands that pass into the peripheral section of the bandage, made of the same material as its chin part. The latter has a lacing that allows you to adjust the degree of tension of the rubber bands of the sling. This bandage is convenient for patients, easy to use and provides good fixation of fragments.

Metal tire-spoons with non-rotary rods can be used for fracture of the upper jaw when there are no teeth on the lower jaw or not enough. A spoon filled with a gauze tab is inserted into the mouth and pressed into the teeth of the upper jaw. The non-rotary rods are attached to the patient's head with a bandage or standard cap. However, non-rotary rods cause a lot of inconvenience to patients, the spoon is not tight enough to the teeth. Currently, this method of immobilization is used very rarely. For temporary fixation of the fragments of the upper jaw, standard transport or prostrate bandages can be used, which fix the fragments of the upper jaw to the undamaged lower one. Removable dentures can also be used if they are present in a patient.

Jaw ligature wiring reliably prevents displacement of mandibular fragments and is performed at the stage of specialist medical care by a dentist. For its implementation it is necessary that at each fragment there should be at least two nearby located teeth and two teeth-antagonists. The dressing should not include teeth that are located in the fracture gap and have signs of traumatic periodontitis or pulpitis, pathological mobility.

Contraindications to the mandibular ligature wiring are the concussion, the possibility of bleeding from the tissues of the oral cavity, the risk of vomiting with aspiration of the vomiting masses. This bandage cannot be imposed for the duration of the transport of the victim, especially by water and air transport.

For the bandage used bronze-aluminum wire with a cross section of 0.5-0.6 mm. Necessary tools: hemostatic clamp, anatomical forceps, crampon forceps, scissors for metal. There are many techniques for jaw ligament bonding using wire ligatures (Limberg, Ivy, etc.) and polyamide thread (Gotzko). Ligature binding should be performed quickly, carefully, avoiding injury to the soft gum tissue, tightly tighten the neck of the tooth, tighten the wire ligatures taut, clockwise. Twisted ends should be bent to avoid injury to the mucous membrane. It is desirable to couple ligature ligature teeth with a chin-to-parietal ligament.

Ligature wiring of teeth is a method of temporary (transport) immobilization that can be successfully used in patients with fractures of the mandible to transport a patient from the scene or a separate hospital to a specialized inpatient unit, if comprehensive medical care is impossible in these conditions. Ligature bonding of teeth is used for a period of no more than 3-5 days.

Ligature wiring of the teeth is also used in the surgical treatment of jaw bone fractures (osteosynthesis) to fix central occlusion at the time of bone fragment reposition.

- Algorithms for the formation of professional skills.

1. To work out the technique of applying of the circular bandage.
2. To work out a technique for applying of an individual mento-parietal circular bandage.
3. To work out the method of applying of standard transport ties (elastic bandage by Pomerantseva-Urbanska, Entin's tight chin sling, etc.).
4. To work out the technique of Intermaxillary wiring by Limberg.
5. To work out the technique of Intermaxillary wiring by Ivy.
6. To work out the technique of Intermaxillary wiring by to Gotzko.
7. Learn how to create a comprehensive treatment plan: determine the type of immobilization, prescribe the medicaments needed for treatment.

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

Individual tasks:

Task #1. 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. Vasiliev's arch bars
- B. Weber's splint with extraoral wires
- C. Elastic splint with a wire frame
- D. Limberg's splint
- E. Zbarazh's apparatus

Task #2. 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 indicated 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

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

Patient 34 years complains of pain in the area of the mandible on the right, limited opening of the mouth. Objectively: dental arches of the upper and lower jaw are intact, 46 and 47 teeth displaced (supraocclusion). Diagnosis "traumatic fracture of the mandible in the area of 46 tooth with the displacement of fragments". Determine the method of temporary immobilization of fragments of the mandible. 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. To work out the technique of applying of the circular bandage.
2. To work out a technique for applying of an individual mento-parietal circular bandage.
3. To work out the method of applying of standard transport ties (elastic bandage by Pomerantseva-Urbanska, Entin's tight chin sling, etc.).
4. To work out the technique of Intermaxillary wiring by Limberg.
5. To work out the technique of Intermaxillary wiring by Ivy.
6. To work out the technique of Intermaxillary wiring by to Gotzko.
7. Learn how to create a comprehensive treatment plan: determine the type of immobilization, prescribe the medicaments needed for treatment.

**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. Transport 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 – 2<sup>nd</sup> 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. Textbook 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.

## Assessment 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:

**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

<b>Grade in discipline</b>	<b>Grade under 4-point scale</b>
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 examiner 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 examiner 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 examiner 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 examiner 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 examiner 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
<b>I. Test tasks (supplement No.1). 40 tests</b>	<b>40 points</b> <b>(1 point – 1 test)</b>
<b>II. Description of anesthesia methods (two questions):</b>	<b>2 × 10 points:</b>
1. <i>injection site (anatomical landmarks)</i>	2 points
2. <i>direction and depth of needle movement</i>	2 points
3. <i>anesthetic dose</i>	1 point
4. <i>target point; nerves that are blocked</i>	2 points
5. <i>anesthesia zone</i>	3 points
<b>III. Description of tooth extraction procedure (two questions):</b>	<b>2 × 10 points:</b>
1. <i>position of patient and doctor</i>	2 points
2. <i>choice of local anesthesia method</i>	2 points

3. <i>choice of necessary instruments</i>	2 points
4. <i>extraction stages</i>	2 points
5. <i>typical local complications</i>	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:

<b>Points in discipline</b>	<b>Grade under 4-point scale</b>
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 distractors. 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 checked 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 Council.

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:

<b>Points of Discipline</b>	<b>Scores by 4-points scale</b>
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.