

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

**METHODICAL GUIDE**  
(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, III**

**Content module 1: Propedeutics of Surgical Dentistry  
(part 2)**

Recommended by the by the profile methodical commission for dentistry

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## INTRODUCTION

Curriculum for Surgical Dentistry

(in accordance with the Standard of Higher Education for the second level of higher education

(Master's Degree)

Sphere of Knowledge 22 "Healthcare"

Specialty 221 "Dentistry"

Master's Degree Program in Dentistry

**Description of the discipline (abstract).** The discipline involves the study of surgical dentistry in its main sections: "Propedeutics of surgical dentistry and MFD", "Inflammatory diseases of MFA", "Oncology of MFA", "Traumatology of MFA", "Reconstructive-Restorative Surgery of MFA", with emphasis on the study of etiology, pathogenesis, clinics, diagnostics, emergency treatment and prophylaxis of the main and most widespread diseases of MFA.

The main focus of the program is on the formation and development of students' skills in collecting anamnesis, conducting the examination and differential diagnosis of diseases of the MFA with a variety of clinical course and their complications. In the course of this program, modern approaches to the diagnosis are taught in practice, the principles of treatment and prophylaxis are studied on the basis of evidence-based medicine. Furthermore, students are introduced to the range of urgent states in practical surgical dentistry. Students are also involved into the diagnostic and treatment process of in- and out- patients under the guidance of assistants and associate professors of the department. Students also look into a wide scope of therapeutic and prophylactic measures, which are most often applied in dental surgical practice.

The study of surgical dentistry in theory and practice, contributes to the formation of a holistic view of the structure and functioning of organs of MFA, deepening of theoretical and practical training, acquisition of professional practical skills for further 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: 2</b>	<b>7 credits / 210 h</b>	<b>20</b>	<b>120</b>	<b>70</b>	<b>III year (V, VI semester)</b>	<b>credit</b>
<b>Per semester</b>						
<i>Content module 1</i>	<b>3,2 credits / 96 h</b>	<b>8</b>	<b>53</b>	<b>35</b>	<b>V semester</b>	<b>credit</b>
<i>Content module 2</i>	<b>3,8 credits / 114 h</b>	<b>12</b>	<b>67</b>	<b>35</b>	<b>VI semester</b>	<b>credit</b>

**The subject of the study** of the discipline is the pathological processes of MFA, which relate to the sphere of competence of surgical dentistry and maxillofacial surgery, their clinical course, the main diagnostic and therapeutic manipulations used in the practice of a surgical dentist.

**Interdisciplinary connections:** therapeutic dentistry, paediatric dentistry, orthopedic stomatology, normal anatomy, histology, normal physiology, pathologic physiology, topographical anatomy and operative surgery, microbiology, biochemistry, pharmacology, internal diseases, endocrinology, skin and venereal, nervous diseases, otorhinolaryngology, ophthalmology, medicine of extreme conditions.

## **1. Purpose and tasks 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 the study** 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:**

**Explain and interpret** the principles of deontology and medical ethics in surgical dentistry and MFD, the method of examination of MFD patients, involvement of adjacent specialists in the examination.

**Analyze** the indications and contraindications, especially the application of the basic methods of general and local anesthesia, sedation in the practice of a surgical dentist.

**Make a plan and conduct** a patient's examination with MFA pathology, refer to an additional research (if needed) and be able to interpret their results, plan for comprehensive examination and treatment of AIDS patients.

**Collect** anamnesis and examination results of the patient with the specified MFA pathology, fill in the relevant medical documentation; carry out cardiopulmonary resuscitation.

**Collect** the material for additional research (microbiological, cytological, histological); preventive measures and emergency care.

**Assign** an individual scheme of premedication, depending on the psycho-somatic state of the patient, the nature and extent of surgical intervention, medical therapy in the postoperative period, to provide appropriate recommendations.

**Demonstrate** the techniques of preoperative preparation of the surgeon's hands by modern techniques, the technique of antiseptic treatment of the surgical site, techniques of local anesthesia on the upper and lower jaws; operations for the removal of individual groups of teeth on the upper and lower jaw, pericoronarectomy, atypical tooth extraction

## Lecture lessons schedule

### V semester

№	Topic	Hours
1.	The history of the surgical dentistry and maxillofacial surgery department in the Danylo Halytsky Lviv National Medical University. Examination and diagnostic methods in oral and maxillofacial surgery.	2
2.	Anaesthesia in oral surgery: classification, indications, complications. General anaesthesia. Sedation methods. Neuroleptanalgesia (NLA). Local anaesthesia methods in maxillofacial surgery.	2
3.	Tooth extraction: instruments, indication and contraindications for teeth extraction, treatment planning, tooth extraction technique. Atypical (surgery) extraction. Extraction of impacted and unerupted teeth. Complications of tooth extraction.	2
4.	General and local complications in Oral and maxillofacial surgery. Cardiopulmonary resuscitation.	2
<b>Total:</b>		<b>8</b>

## Practical lessons schedule

### V semester

№	Topic	Hours
1.	<b>Topic №1.</b> Organization of dental surgery care. The structure of oral and maxillofacial surgery department. Maxillofacial examination methods. Registration of medical documentation.	3,5
2.	<b>Topic №2.</b> Principles of asepsis in oral surgery. Oral resistance factors. Prevention of socially significant infections (AIDS, tuberculosis, hepatitis, syphilis).	3,5
3.	<b>Topic №3.</b> Pain, its components, pathways of pain. Classification of anesthesia methods, indications and contraindications. General anesthesia. Sedation.	3,5
4.	<b>Topic №4.</b> Local anesthetics, their properties, side effects. Classification. Indications and contraindications for local anesthesia. Methods of topical and infiltrative anesthetics.	3,5
5.	<b>Topic №5.</b> Peripheral conductive mandible anesthesia: torus, mandibular. Indications, methods. Local complications, treatment and prevention.	3,5
6.	<b>Topic №6.</b> Peripheral conductive mandible anesthesia: mental, buccal and lingual. Indications, methods. Local complications, treatment and prevention.	3,5
7.	<b>Topic №7.</b> Peripheral conductive maxilla anesthesia: tuberal, infraorbital. Indications, methods. Local complications, treatment and prevention.	3,5
8.	<b>Topic №8.</b> Peripheral conductive maxilla anesthesia: nasopalatal (incisal), palatal. Indications, methods. Local complications, treatment and prevention.	3,5
9.	<b>Topic №9.</b> Central conductive anesthesia methods of jaws and adjacent tissues. Local complications, treatment and prevention.	3,5

10.	<b>Topic №10.</b> General complications of local anesthesia, treatment and prevention. Cardiopulmonary resuscitation.	3,5
11.	<b>Topic №11.</b> Indications and contraindications of tooth extraction. Instruments. Preoperative management of patients. Patients with concomitant pathology preparation for teeth extraction.	3,5
12.	<b>Topic №12.</b> Maxillary teeth extraction methods. Stages of the procedure.	3,5
13.	<b>Topic №13.</b> Mandible teeth extraction methods. Stages of the procedure.	3,5
14.	<b>Topic №14</b> Complications of tooth extraction: clinical signs, diagnosis, treatment and prevention.	3,5
15.	<b>Topic №15.</b> Impacted and unerupted teeth. Classification of Impacted teeth. Indications and contraindications for Impacted teeth extraction. Surgery and perioperative care. Complications of Impaction surgery. <b>Summary lesson.</b>	4
<b>Total:</b>		53

## 6. Self-study work schedule

### V semester

№	Topic	Hours	Type of Control
1.	Organization of dental surgery clinic.	3	Current control at practical classes
2.	Principles of asepsis in surgical dentistry.	4	Current control at practical classes
3.	Modern injection equipments in dentistry.	4	Current control at practical classes
4.	The peculiarities of local anaesthesia in patients with somatic diseases.	4	Current control at practical classes
5.	Intensive therapy, cardiopulmonary resuscitation in patient in oral Surgery.	4	Current control at practical classes
6.	Tooth extraction in patient's with cardiac diseases, blood system diseases and diabetes.	4	Current control at practical classes
7.	X-Ray Examination Methods in patients with dental diseases.	4	Current control at practical classes
8.	Equipments and instruments for atypical (surgical, open) teeth extraction.	4	Current control at practical classes
9.	Complex treatment of tooth retention.	4	Current control at practical classes
Total hours: 35			

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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	Topic №9. Central conductive methods of anesthesia of jaws and surrounding tissues. Local complications, their treatment.
Course	3 <sup>rd</sup>
Faculty	Dental

**Actuality of the topic:** for pathological processes that are localized in the mouth and in the oral cavity and do not allow the blockage of the peripheral branches of the trigeminal nerve, as well as in case of need for anesthesia of the entire half of the jaw with major surgery, shows the introduction of anesthetic to the main trunk - the second or third branch at the point of their exit from the cavity of the skull. This requires a deep knowledge of topographic anatomy and mastering techniques of central conduction anesthesia on the upper and lower jaws.

**Aim of the lesson:** to teach students the techniques of conducting central conduction anesthesia on the upper and lower jaws. To practice on the phantoms the technique of blockade of the second and third branches of the trigeminal nerve near the round and oval openings.

**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
Normal anatomy	Know the anatomical and physiological features of the maxillofacial area:	To be able to explain the structure of systems and organs of maxillo-facial area (MFA)



Normal physiology	<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>	
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
Pharmacology.	To know pharmacological features of preparations used for local analgesia in the maxillofacial area	To be able to characterize the anesthetics of different pharmacological groups, vasoconstrictor drugs.
<b>Intradisciplinary integration</b>		
Topic 4. (Module 1) Local anesthetics, their properties, side effects...	To know the pharmacological features of local anesthetics, indications and contraindications to use.	To be able to explain the pharmacological features of local anesthetics.

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

Duration of practical lesson is 3.5 academic hours – 2 hours. 40 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>30 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).	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>90 min.</b>			
	Formation of		Formation of	Patients with pathology of	

<p>professional skills and abilities:</p> <ol style="list-style-type: none"> <li>1. To work out on phantom technique of conducting of the central conductive anesthesia to a round foramen by a submalar-pterygoid way.</li> <li>2. To work out on phantom technique of carrying out of the central conductive anesthesia to a round foramen by a tuberal way.</li> <li>3. To work out on phantom technique of carrying out of the central conductive anesthesia to a round foramen by a palatal way.</li> <li>4. To work out on phantom technique of carrying out of the central conductive anesthesia to the oval foramen by the submalar-pterygoid way.</li> <li>5. To work out on a phantom technique of carrying out of the central conducting anesthesia to the oval foramen by submalar way.</li> <li>6. To work out on phantom technique of carrying out of the central conducting anesthesia to the oval foramen in a supramalar way</li> </ol>		<p>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>maxillofacial area. The history of the disease.  Selection of results of additional survey methods.  Situational tasks.  Algorithms.  Phantoms, surgical instruments.  Thematic videos.</p>
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<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 (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:** «Central conductive methods of anesthesia of jaws and surrounding tissues. Local complications, their treatment.»

Aim of the lesson: to teach students the techniques of conducting central conduction anesthesia on the upper and lower jaws. To practice on the phantoms the technique of blockade of the second and third branches of the trigeminal nerve near the round and oval openings.

*Motivation of educational activity.*

For pathological processes that are localized in the mouth and in the oral cavity and do not allow the blockage of the peripheral branches of the trigeminal nerve, as well as in case of need for anesthesia of the entire half of the jaw with major surgery, shows the introduction of anesthetic to the main trunk - the second or third branch at the point of their exit from the cavity of the skull. This requires a deep knowledge of topographic anatomy and mastering techniques of central conduction anesthesia on the upper and lower jaws.

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

*Questions to frontal survey:*

1. Anatomical structure of branches of the trigeminal nerve;
2. Anatomical landmarks, zone of innervation of branches of the trigeminal nerve;
3. Anesthetics used for injectable analgesia, their concentration and properties;
4. 4. The instrumentation is required for central conduction anesthesia.

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

Conducting professional training.

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

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.

Anaesthesia of the barrel of the third branch of the trigeminal nerve is done in the cases of impossibility of its conducting by the intraoral method (there is an inflammatory process in the area

of the corner of the lower jaw, reflex contraction of jaws etc).

*Submaxillary - wing-shaped way* is developed by S. N. Weisblat. In the middle of the trago-orbital line do a prick by a long needle (6-7 cm) and move it towards the rest of the external plate of the wing-shaped appendix of the sphenoid bone. The depth of penetration is fixed by a finger. A needle is pulled out to the hypoderm, not moving a finger which fixes the depth of bedding of the wing-shaped appendix. Return the tag of the needle back under a corner not less than 20° and again dip a needle into the soft tissues at the depth marked before. Reach to the target point of anaesthesia - the oval opening.

*Supramalar way* of anaesthesia was suggested by S. N. Weisblat in 1955. Prick of the needle is done in the middle of the trago-orbital line above a malar arc with an insignificant inclination, that enables to get to the external plate of the sphenoid bone. Implementation of this way of conducting anaesthesia in the following steps does not differ from the submaxillary one.

*Submalar way* was applied by S. N. Weisblat in 1937. A syringe with a needle, not less than 8 cm long, is used. The distance from the place of prick to the lower edge of a malar arc is marked in the needle by a finger or sterile elastic.

The place of prick is typical for extraoral submaxillary anaesthesia. Get into the internal surface of the branch of the lower jaw. Having passed 0,5- 0,75 cm of the marked way, take the end of the needle from a bone wall inward. For this purpose, take a syringe outside under the same corner under which we turned it inside while the previous measuring of distance from the place of prick to the lower edge of the malar arc.

*Orbital way* was suggested by S. N. Weisblat in 1956. A place of prick is near the lower edge of the eye socket nearby its lower external corner. The needle in the distance of 2-2,5 cm penetrates through a wide lateral part of the lower orbital crack into a submaxillary fossula, and then, moving up in a contact with the lower wall of the eye socket, trick into the oval opening.

*Complication.* While conducting block anaesthesia of the third branch because of violation of technique of anaesthetizing, there is a possibility of damages of the middle artery of the brain membrane, internal jaw artery, wing-shaped venous plexus, otosalpinx.

Also complications arising during local anaesthesia could be the *general* and become such as intoxication or syncope, collapse or anaphylactic shock.

- *Algorithms for the formation of professional skills.*

1. To collect anamnesis and to conduct a review of the patient with the pathology of the maxillofacial area.
2. To identify and justify the indications and contraindications to central conduction anesthesia;
3. To be able to select instruments for anesthesia;
4. To be able to choose a local anesthetic, and determine the dose of the injection;
5. To be able to determine, by means of anatomical guidelines, the location of the anesthesia target point;
6. To work out on phantom technique of conducting of the central conductive anesthesia to a round foramen by a submalar-pterygoid way.
7. To work out on phantom technique of carrying out of the central conductive anesthesia to a round foramen by a tuberal way.
8. To work out on phantom technique of carrying out of the central conductive anesthesia to a round foramen by a palatal way.
9. To work out on phantom technique of carrying out of the central conductive anesthesia to the oval foramen by the submalar-pterygoid way.
10. To work out on a phantom technique of carrying out of the central conducting anesthesia to the oval foramen by submalar way.
11. To work out on phantom technique of carrying out of the central conducting anesthesia to the oval foramen in a supramalar way.

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

Task №1.

A pain conductivity of which nerve is blocked during central anesthesia to the round opening?

- Ocular
- Occipital
- Small palatine
- Maxillary
- The mandibular

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

Patient 43, appealed to the dentist with complaints of pain in the 16th tooth, the severity of the right half of the face. X-ray examination revealed a vein of the maxillary sinus at 2/3 of the volume. In the area of the tips of the roots of the 16 tooth there is a destruction of bone tissue with a diameter of 5 mm with penetration into the lumen of the maxillary sinus. The patient is shown a radical sinus surgery with removal of 16 tooth and plastic conjugation through the hole of the removed tooth. Which method of anesthesia is optimal in this case? Make your choice, describe and demonstrate your anesthesia technique.

### **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 central conductive anaesthesia to *f.rotundum* and *f.ovale* under conditions of phantom class.
- Evaluation.

Conduct standardized final control using individual test tasks and questions (20 min.), Work check (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 anatomy of the upper and lower jaws.
2. Innervation and blood supply to the upper and lower jaws.
3. Pharmacological preparations used for local analgesia in the maxillofacial area.

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

1. Classification of central conductive anesthesia.
2. Submalar-pterygoid way of anesthesia to the round foramen: the place of the injection of the needle, the direction and depth of needle insertion, the target point of anesthesia, the amount of injected anesthetic. Clinical effect of anesthesia. Zone of anesthesia.
3. Tuberal way of anesthesia to the round foramen: the place of the injection of the needle, the direction and depth of needle insertion, the target point of anesthesia, the amount of anesthetic administered. Clinical effect of anesthesia. Zone of anesthesia.
4. Palatine way: needle position, direction and depth of needle insertion, target point of anesthesia, the amount of injected anesthetic. Clinical effect of anesthesia. Zone of anesthesia.
5. Inframalar-pterygoid way of anesthesia to the oval foramen: place of the injection of the needle direction and depth of needle insertion, the target point of anesthesia, the amount of injected anesthetic. Clinical effect of anesthesia. Zone of anesthesia.

6. Inframalar way of anesthesia to the oval foramen: the place of the injection of the needle, the direction and depth of needle insertion, the target point of anesthesia, the amount of injected anesthetic. Clinical effect of anesthesia. Zone of anesthesia.

7. Supramalar way of anesthesia to the oval foramen: the place of the injection of the needle, direction and depth of needle insertion, the target point of anesthesia, the amount of injected anesthetic. Clinical effect of anesthesia. Zone of anesthesia.

8. Local complications when conducting central conductive anesthesia causes of their occurrence. Clinical manifestations.

9. Treatment of the patient in the case of complications.

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

1. To work out on phantom technique of conducting of the central conductive anesthesia to a round foramen by a submalar-pterygoid way.
2. To work out on phantom technique of carrying out of the central conductive anesthesia to a round foramen by a tuberal way.
3. To work out on phantom technique of carrying out of the central conductive anesthesia to a round foramen by a palatal way.
4. To work out on phantom technique of carrying out of the central conductive anesthesia to the oval foramen by the submalar-pterygoid way.
5. To work out on a phantom technique of carrying out of the central conducting anesthesia to the oval foramen by submalar way.
6. To work out on phantom technique of carrying out of the central conducting anesthesia to the oval foramen in a supramalar way

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

1. The patient for the blockade of the mandibular nerve is shown trunkular anesthesia. Which opening should the anesthetic be drawn to?

- A. To the foramen ovale.
- B. To the foramen rotundum.
- C. To the foramen jugulare.
- D. To foramen caroticum.
- E. To the foramen spinosum.

2. Which anesthetic route does not apply to anesthesia to the oval opening?

- A. Submalar-pterygoid.
- B. Malar.
- C. Mandibular.
- D. Palatinal.

3. When undergoing central conduction anesthesia by tuberal route, the needle should be advanced to the depth of:

- A. Up to 1 - 1.5 cm.
- B. Up to 2 - 2.5 cm.
- C. Up to 3 - 3.5 cm.
- D. Up to 4 - 4.5 cm.

4. Determine the injection site of the needle during central conduction anesthesia with the submalar-pterygoid path:

- A. 2 cm to the front of the goat ear.
- B. The middle of the trace orbital line.
- C. The outer third of the trace orbital line.
- D. 1 cm to the front of the goat ear.
- E. 0.5 cm to the front of the goat ear.

5. A man 35 years old, went to the dentist for removal of 26 teeth. During central conduction anesthesia, a tubular route showed a rapid increase in tissue edema and a restriction on the opening of the oral cavity. What causes this condition?

- A. Vascular injury.
- B. Muscle trauma during anesthesia.
- C. Injury to nerve trunks.
- D. Anesthetics for patients with intolerance.
- E. Anaphylactic shock.

**Literature:**

Basic:

1. Oral and Maxillofacial Surgery: Textbook, Part 1, 2 / V.O. Malanchuk. – Vinnytsia: Nova Knyha Publishers, 2011. – 453p.
2. Principles of Dental Local Anaesthesia and Teeth Removal / Ya. E. Vares, R. Z. Ogonovsky, Ch. R. Pohranychna – LNMU, 2007. – 63p.
3. Atlas of Human Anatomy / F. Netter – 2<sup>nd</sup> ed. – New Jersey: ICON Learning Systems. – 592 p.

Additional:

1. 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. – 1477 p.

**Ministry of Health of Ukraine**  
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“Approved”  
on the meeting of the Department  
of Surgical Dentistry  
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Head of the Department:  
professor Ya. E. Vares

METHODICAL GIUDE FOR PRACTICAL LESSONS

Educational discipline	SURGICAL DENTISTRY
Topic of the lesson	Topic №10. General complications of local anesthesia, their prevention and treatment. Cardiopulmonary resuscitation.
Course	3 <sup>rd</sup>
Faculty	Dental



**Actuality of the topic:** great amount of the dental interventions are performed under local anesthesia. Anamnesis collection, individual anesthetic selection and dose determination, careful adherence to local anesthesia techniques allow the safe use of local anesthesia in practice. However, even with strict adherence to the rules and algorithms of local anesthesia, there is a risk of complications of a general nature. The dentist is obliged to quickly diagnose the patient's condition and immediately provide him with urgent help, and in cardiac conditions to perform cardiopulmonary resuscitation.

**Aim of the lesson:** to acquaint students with the possible general complications arising from local anesthesia of the tissues of the maxillofacial area, their treatment and prevention. To develop students with systemic integrated clinical thinking and professional clinical skills, to be able to differentiate the complications of local anesthesia and to provide emergency medical care if necessary.

**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
Normal anatomy	Know the anatomical and	To be able to explain the

Normal physiology	<p>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>	structure of systems and organs of maxillo-facial area (MFA)
Topographical anatomy	To know the topography of the organs of MFA	To be able to explain the topography of the organs of MFA
Hystology	To know histological structure of soft and hard tissues of MFA	To be able to explain the stages of manufacturing of cytological, histological preparations

Internal diseases.	Know the basic clinical symptoms, principles of diagnosis and treatment of somatic diseases (hypertension, myocardial infarction, stroke, etc.).	Be able to explain the main clinical symptoms, principles of diagnosis and treatment of somatic diseases (hypertension, myocardial infarction, stroke, etc.).
Pharmacology.	To know pharmacological features of preparations used for local analgesia in the maxillofacial area	To be able to characterize the anesthetics of different pharmacological groups, vasoconstrictor drugs.
<b>Intradisciplinary integration:</b>		
Topic 1. (Module 1). ... Provision, documentation of the surgical dental office and the hospital department. Methods of examination of surgical dental patient.	<p>To know the provision, documentation of the surgical dental office and the hospital department.</p> <p>To have a method of examination of a surgical dental patient.</p> <p>To know the organization of work and equipment of the surgical department (office).</p> <p>To know additional methods of examination.</p>	<p>To be able to characterize the provision, documentation of the surgical dental office and the hospital department.</p> <p>To be able to explain the stages of examination of a surgical dental patient.</p> <p>To be able to explain the results of additional survey methods.</p>
Topic 4. (Module 1) Local anesthetics, their properties, side effects...	To know the pharmacological features of local anesthetics, indications and contraindications to use.	To be able to explain the pharmacological features of local anesthetics.

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

Duration of practical lesson is 3.5 academic hours – 2 hours. 40 minutes including 10 minutes for a break.

<b>№</b>	<b>The main stages of the lesson, their</b>	<b>Time period</b>	<b>Methods of education and control</b>	<b>Materials of methodical support</b>
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	<b>functions and content</b>				
<b>1.</b>	<b>Preparatory stage</b>	<b>30 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).	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>90 min.</b>			
	Formation of professional skills: 1. To make the most probable diagnosis of the complication of local anesthesia, to choose the appropriate treatment tactics. 2. Perform a differential diagnosis of complications of local anesthesia. 3. Emergency medical assistance. 4. Perform the necessary medical manipulations (measure blood pressure and pulse, conduct auscultation of the heart and lungs, conduct venipuncture and connect a drip with the appropriate medications, administer medicines in person or sublingually, perform artificial respiration and		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.	

	indirect heart massage, fix the tongue). 5. Conduct on a phantom cardiopulmonary resuscitation (indirect heart massage and artificial respiration). 6. To fill in the required medical documentation. 7. Perform a prevention of complications of local anesthesia.			
<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 (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: «**General complications of local anesthesia, their prevention and treatment. Cardiopulmonary resuscitation.**»

Aim of the lesson: to acquaint students with the possible general complications arising from local anesthesia of the tissues of the maxillofacial area, their treatment and prevention. To develop students with systemic integrated clinical thinking and professional clinical skills, to be able to differentiate the complications of local anesthesia and to provide emergency medical care if necessary.

*Motivation of educational activity.*

Great amount of the dental interventions are performed under local anesthesia. Anamnesis collection, individual anesthetic selection and dose determination, careful adherence to local anesthesia techniques allow the safe use of local anesthesia in practice. However, even with strict

adherence to the rules and algorithms of local anesthesia, there is a risk of complications of a general nature. The dentist is obliged to quickly diagnose the patient's condition and immediately provide him with urgent help, and in cardiac conditions to perform cardiopulmonary resuscitation.

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

#### *Questions to frontal survey:*

1. Classification of complications of local anesthesia of the maxillofacial area (general and local, directly during and after some time after anesthesia).
2. Loss of consciousness: causes, clinic, diagnosis, treatment and prevention.
3. Collapse: causes, clinic, diagnosis, treatment and prevention.
4. Anaphylactic shock: causes, clinic, diagnosis, treatment and prevention.
5. Anesthetic and vasoconstrictor intoxication: causes, clinic, diagnosis, treatment and prevention.
6. Idiosyncrasy: causes, clinic, diagnosis, treatment and prevention.
7. Principles of cardio-pulmonary resuscitation in the practice of a dental surgeon.

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

Conducting professional training.

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

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.

There are essential drugs and items of equipment that every dental practitioner should have available for use in an emergency. Some of these are based on providing simple and uncomplicated treatments while others necessitate providing early definitive treatment. Acute asthma and anaphylaxis are two examples of emergencies where simple first aid measures are inadequate and definitive treatment should be started by the dentist while waiting for the ambulance service to transfer the patient to an accident and emergency (A&E) department. This essential treatment is described as *first-line treatment* in the following protocols. Some drugs are available in preloaded syringes for fast preparation.

#### **Syncope**

Signs and symptoms: may be preceded by nausea and closing in of visual fields; pallor and sweating; heart rate below 60 beats/min (bradycardia) during attack. First line treatment including:

- Lay flat
- Give oxygen
- Expect prompt recovery.

The main causes of faint could be pain or anxiety.

Principles of treatment:

- Need to encourage oxygenated blood flow to brain as rapidly as possible
- May need to block vagal activity with atropine and allow heart rate to increase.

#### **Hyperventilation**

Signs and symptoms: light-headed; tingling in the extremities; muscle spasm may lead to characteristic finger position (carpo-pedal spasm).

First line: reassure; ask patient to re-breathe from cupped hands or reservoir bag of inhalational sedation or general anesthetic apparatus.

Causes - anxiety.

Principles of treatment: reduce anxiety; over-breathing has blown off carbon dioxide, resulting in brain blood vessel vasoconstriction. Return carbon dioxide levels in blood to normal.

#### **Postural hypotension**

Signs and symptoms: light-headed; dizzy; loss of consciousness on returning to upright or standing position from supine position.

Treatment:

- Lay the patient flat and give oxygen

- Sit the patient up very slowly.

More likely to occur if the patient is taking beta-blockers which reduce the capacity to compensate for normal cardiovascular postural changes.

Principles of treatment: encourage oxygenated blood flow to brain.

### **Diabetic emergencies: hypoglycaemia**

Signs and symptoms: shaking and trembling; sweating; hunger; headache and confusion.

- If the patient is conscious, give three sugar lumps or glucose and a little water or glucose oral gel; repeated if necessary in 10 minutes

Cause: usually known diabetic; the patient may have taken medication as normal but not eaten before a dental visit.

The main principles of treatment is to return blood glucose level to normal by giving glucose or by converting the patient's own glycogen to glucose by giving glucagon.

Further management

- Transfer the patient to A&E
- Give up to 50 ml 20% glucose i.v. infusion followed by 0.9% saline flush as the glucose damages the vein
- Expect prompt recovery.

### **Anaphylactic shock**

Signs and symptoms:

- Paresthesia, flushing and swelling of face, especially eyelids and lips
- Generalized urticaria, especially the hands and feet
- Wheezing and difficulty in breathing
- Rapid weak pulse.

These may develop over 15 to 30 minutes following the oral administration of a drug or rapidly over a few minutes or seconds following i.v. drug administration.

- Lay the patient flat and raise his feet
- Give oxygen
- Give 0.5 ml epinephrine (adrenaline) 1 mg/ml (1 in 1000) intramuscular - 0.25 ml for 6-12 years; - 0.12 ml (or 6 months to 6 years)
- Repeated every 10 min until improvement.

Principles of treatment

Requires prompt energetic treatment of

- laryngeal oedema
- bronchospasm
- hypotension.

Further management

- Transfer to A&V.
- Chlorphenamine (chlorpheniramine) 10 mg in 1 ml intramuscular or slow i.v. injection
- Hydrocortisone sodium succinate 200 mg by slow i.v. injection: valuable as action persists after that of adrenaline has worn off
- Fluids i.v. (colloids) infused rapidly if shock not responding quickly to adrenaline.

### **Stroke**

Stroke results from either cerebral haemorrhage or cerebral ischaemia. Signs and symptoms

- Confusion followed by signs and symptoms of focal brain damage
- Hemiplegia or quadriplegia
- Sensory loss
- Dysphasia
- Locked-in syndrome (aware, but unable to respond).

First line: reassure; transfer to A&E.

Principles of treatment

Maintain and transfer for further investigation.

### **Early basic life support for cardiac arrest**

The following instructions are based on the UK Resuscitation Council guidelines for basic life

support. The essential features are remembered by ABC: airway, breathing and circulation.

#### Risks to the rescuer

- Before starting a resuscitation attempt, the rescuer must rapidly assess the risks: traffic, falling masonry, toxic fumes and other potential hazards relevant to the environment
- Mucous membrane exposure to hepatitis B virus (HBV) and human immunodeficiency virus (HIV) is less of a risk than needle stick exposure, strongly suggesting that the chance of infection from mouth-to-mouth ventilation is negligible. However, the US Centers for Disease Control and Prevention advises universal precautions.

#### Basic life support

- Initial patient assessment, airway maintenance, expired air ventilation and chest compression constitute basic life support (BLS) or cardiopulmonary resuscitation.
- BLS is a “holding operation” maintaining ventilation and circulation until treatment of the underlying cause can be instigated.
- BLS implies that no equipment is used. Where a simple airway or face mask is used, this is described as ‘basic life support with airway adjunct’.

#### Theory of chest compression

- The ‘thoracic pump’ theory proposes that chest compression, an increasing intrathoracic pressure, propels blood out of the thorax, forward flow occurring because veins at the thoracic inlet collapse while the arteries remain patent.
- Even when performed optimally, chest compressions do not achieve more than 30% of the normal cerebral perfusion.

#### Basic airway management

- Jaw thrust rather than chin lift is method of choice for the trauma victim .
- An oropharyngeal airway such as a Guedel or nasopharyngeal airway, may be used
- A face mask used for ventilation allows oxygen enrichment. Sequence of actions
  1. Ensure safety of rescuer and victim (referred to below as he, for simplicity).
  2. Check whether casualty is responsive.
  3. If he responds by answering or moving
    - leave him in the position in which you find him (providing he is not in further danger), check his condition and get help if needed
    - reassess him regularly. If he does *not* respond
    - shout for help
    - open the airway by tilting the head and lifting the chin
  4. Keeping the airway open; look, listen and feel for breathing.
  5. If he is breathing
    - turn him into the recovery position;
    - check for continued breathing
    - send someone for help.

#### If he is *not* breathing

- send someone for help or, if you are on your own, leave the victim and go or help
- turn victim onto his back
- remove visible obstruction from the victim’s mouth
- give 2 breaths.
- 6. Assess the victim for signs of a circulation
  - check the carotid pulse
  - take no more than 10 seconds to do this.
- 7. If you are confident that you can detect signs of a circulation
  - continue rescue breathing
  - check circulation about every minute
  - if the victim starts to breathe on his own but remains unconscious, turn him into the recovery position.

If (there are no signs of a circulation or you are at all unsure

- start chest compression

- combine rescue breathing and compression in the ratio of 2:15.
- Continue until successful, help arrives, you become exhausted.

- *Algorithms for the formation of professional skills.*

1. To collect anamnesis and to conduct a review of the patient with the pathology of the maxillofacial area.
2. Learn how to identify and justify indications and contraindications to local anesthesia.
3. To be able to choose a local anesthetic, and determine the dose of the injection.
4. To make the most probable diagnosis of the complication of local anesthesia, to choose the appropriate treatment tactics.
5. Perform a differential diagnosis of complications of local anesthesia. Emergency medical assistance.
6. Perform the necessary medical manipulations (measure blood pressure and pulse, conduct auscultation of the heart and lungs, conduct venipuncture and connect a drip with the appropriate medications, administer medicines in person or sublingually, perform artificial respiration and indirect heart massage, fix the tongue)
7. Conduct on a phantom cardiopulmonary resuscitation (indirect heart massage and artificial respiration).
8. Learn to fill in the required medical documentation.
9. Perform a prevention of complications of local anesthesia

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

Task №1.

During local anesthesia, a patient, 34 years of age, experienced dizziness, spastic cough, shortness of breath, fainting, a sharp decrease in blood pressure. What is the complication?

- A. Anaphylactic shock.
- B. Collapse.
- C. Dizziness.
- D. Edema of Quincke.
- E. Swelling of the larynx.

Task №2.

The patient, 55 years, after anesthesia felt a sharp weakness, a sharp pain behind the sternum, which radiates to the left arm, shoulder blade, heartbeat. Objectively: the patient is tired, sluggish, his forehead is covered with cold sweat, the paleness of the skin is defined, the blood pressure is 180/100 mmHg, the tone of the heart is deaf, the pulse is filamentous arrhythmic. What condition has developed in the patient?

- A. Hypertensive crisis.
- B. Cardiogenic form of anaphylactic shock.
- C. Angina attack.
- D. Cardiac pain.
- E. Myocardial infarction.

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

In 1 minute after a torus anesthesia with 2% solution of novocaine - 4 ml, there were complaints of the patient with difficulty breathing. Upper and lower lip, larynx mucosa and mouth are swollen, sharply hyperemic. What complication did the patient experience? What additional survey methods should be performed? What is the help algorithm? What drugs should be used, in what sequence and doses? Justify your answers.

**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 CPR.
- Evaluation.

Conduct standardized final control using individual test tasks and questions (20 min.), Work check (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 physiological features of the structure of the maxillofacial area.
2. Innervation and blood supply to hard and soft facial tissues.
3. Clinic, diagnosis, treatment of somatic pathology (hypertension, myocardial infarction, stroke, epilepsy, bronchial asthma).
4. Pharmacological properties of drugs used for the treatment and prevention of complications of local anesthesia.

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

1. Classification of complications of local anesthesia of the maxillofacial area (general and local, directly during and after some time after anesthesia).
2. Loss of consciousness: causes, clinic, diagnosis, treatment and prevention.
3. Collapse: causes, clinic, diagnosis, treatment and prevention.
4. Anaphylactic shock: causes, clinic, diagnosis, treatment and prevention.
5. Anesthetic and vasoconstrictor intoxication: causes, clinic, diagnosis, treatment and prevention.
6. Idiosyncrasy: causes, clinic, diagnosis, treatment and prevention.
7. Principles of cardio-pulmonary resuscitation in the practice of a dental surgeon.

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

1. To make the most probable diagnosis of the complication of local anesthesia, to choose the appropriate treatment tactics.
2. Perform a differential diagnosis of complications of local anesthesia.
3. Emergency medical assistance.
4. Perform the necessary medical manipulations (measure blood pressure and pulse, conduct auscultation of the heart and lungs, conduct venipuncture and connect a drip with the appropriate medications, administer medicines in person or sublingually, perform artificial respiration and indirect heart massage, fix the tongue).
5. Conduct on a phantom cardiopulmonary resuscitation (indirect heart massage and artificial respiration).
6. To fill in the required medical documentation.
7. Perform a prevention of complications of local anesthesia.

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

1. During local anesthesia, a patient, 34 years of age, experienced dizziness, spastic cough, shortness of breath, fainting, a sharp decrease in blood pressure. What is the complication?  
A. Anaphylactic shock.  
V. Collapse.  
C. Dizziness.

- D. Edema of Quincke.
- E. Swelling of the larynx.

2. The patient, 55 years, after anesthesia felt a sharp weakness, a sharp pain behind the sternum, which radiates to the left arm, shoulder blade, heartbeat. Objectively: the patient with consciousness, sluggish, forehead covered with cold sweat, is determined by the pallor of the skin, blood pressure 180/100 mm Hg, heart sounds are deaf, the pulse is filamentous arrhythmic. What condition has developed in the patient?

- A. Hypertensive crisis.
- B. Cardiogenic form of anaphylactic shock.
- C. Angina attack.
- D. Cardiac pain.
- E. Myocardial infarction.

3. In 1 minute after a torus anesthesia with 2% solution of novocaine - 4 ml, there were complaints of the patient with difficulty breathing. Upper and lower lip, larynx mucosa and mouth are swollen, sharply hyperemic. What complication did the patient experience?

- A. Anaphylactic shock.
- B. Edema of Quincke.
- S. Collapse.
- D. Anesthetic intoxication.
- E. Acute pulmonary insufficiency

4. After anesthesia, after 2 minutes, the patient lost consciousness. The red border of the lips and the skin are pale, sweat drops on the surface of the skin, palms moist. What condition did the patient have?

- A. Collapse.
- B. Fainting.
- C. Acute myocardial infarction.
- D. Anesthetic intoxication.
- E. Anaphylactic shock.

5. During the removal of 46 teeth in a patient of 34 years, a brief eclipse of consciousness, pallor of the mucous membranes and skin appeared. Pulse is weak and frequent, blood pressure is 90/60 mmHg. What first aid should be given to the patient?

- A. To give the patient the position of Trendelenburg.
- C. Introduce doses of 0.5 ml. 0.1% of adrenaline.
- C. Introduce 1ml. 1% solution of dimedrol.
- D. Enter 2ml. the district of dexamethasone.
- E. Introduce 2ml. the district of cordyamine.

### **Literature:**

Basic:

1. Oral and Maxillofacial Surgery: Textbook, Part 1, 2 / V.O. Malanchuk. – Vinnytsia: Nova Knyha Publishers, 2011. – 453p.
2. Principles of Dental Local Anaesthesia and Teeth Removal / Ya. E. Vares, R. Z. Ogonovsky, Ch. R. Pohranychna – LNMU, 2007. – 63p.
3. Atlas of Human Anatomy / F. Netter – 2<sup>nd</sup> ed. – New Jersey: ICON Learning Systems. – 592 p.

Additional:

1. 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. – 1477 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	Topic №11. Indications and contraindications to the operation of tooth extraction. Instruments for tooth extraction. Preparation of patients with concomitant pathology for tooth extraction.
Course	3 <sup>rd</sup>
Faculty	Dental

**Actuality of the topic:** One of the main tasks of dentistry is the fight for the preservation of teeth. In light of the latest advances in modern dentistry, tooth extraction is being attempted not so often. Nonetheless, tooth extraction is still one of the most common surgical interventions in polyclinic dental practice; it is a radical measure, but there are situations in which it is impossible to avoid removal. After tooth extraction, certain changes occur not only in the area of the alveolar process where the tooth was placed, but also in adjacent areas and anatomical structures. The loss of a large number of teeth negatively affects the functioning of the whole body. All this gives reason to believe that the operation of tooth extraction should be performed only on narrow indications, weighing all the positive and negative consequences of this intervention.

**Aim of the lesson:** to teach students clear indications and contraindications to tooth extraction. To familiarize with surgical tools for tooth extraction; principles of preparation of patients with concomitant pathology.

**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
Normal anatomy	Know the anatomical and	To be able to explain the

Normal physiology	<p>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>	structure of systems and organs of maxillo-facial area (MFA)
Pathologic anatomy Pathologic physiology	To know the appearance and flow of the pathological processes in the tissues and organs of MFA	To be able to explain the appearance and flow of the pathological processes in the tissues and organs of MFA
Topographical anatomy	To know the topography of the organs of MFA	To be able to explain the topography of the organs of MFA
Histology	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	To know the species identification of microorganisms in the oral cavity	To be able to explain the stages of manufacturing of microbiological preparations and the essence of bacteriological examination
Radiation diagnostics.	To know the methods of radiological examination used in 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 diseases of hard tissues of tooth and pulp. To know additional methods of examination, which are used in dental practice.	Be able to carry out an intra-oral examination of individual teeth. Be able to diagnose caries, pulpitis of temporary and permanent teeth.

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

Duration of practical lesson is 3.5 academic hours – 2 hours. 40 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>30 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).	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>90 min.</b>			
	Formation of professional skills and abilities: 1. Be able to determine general and local immediate (absolute) indications before tooth extraction. 2. Be able to determine planned (relative) indications before tooth extraction: - sanation; - prosthetic; - esthetic. 3. Be able to identify general and local contraindications to tooth extraction. 4. Learn to distinguish tools for tooth extraction (forceps, elevators) on different grounds. 5. Select instruments to extract different groups of teeth on the upper and lower jaw		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 of professional skills and abilities.		Final evaluation of the students		
3.3	Homework.			Recommended literature	

	Informing students about the topic of the next lesson.			
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**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: «**Indications and contraindications to the operation of tooth extraction. Instruments for tooth extraction. Preparation of patients with concomitant pathology for tooth extraction**».

Aim of the lesson: to teach students clear indications and contraindications to tooth extraction. To familiarize with surgical tools for tooth extraction; principles of preparation of patients with concomitant pathology.

- *Motivation of educational activity.*

One of the main tasks of dentistry is the fight for the preservation of teeth. In light of the latest advances in modern dentistry, tooth extraction is being attempted not so often. Nonetheless, tooth extraction is still one of the most common surgical interventions in polyclinic dental practice; it is a radical measure, but there are situations in which it is impossible to avoid removal. After tooth extraction, certain changes occur not only in the area of the alveolar process where the tooth was placed, but also in adjacent areas and anatomical structures. The loss of a large number of teeth negatively affects the functioning of the whole body. All this gives reason to believe that the operation of tooth extraction should be performed only on narrow indications, weighing all the positive and negative consequences of this intervention.

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

*Questions to frontal survey:*

1. Basic indications before tooth extraction.
2. The main urgent (absolute) indications for the teeth extraction.
3. Relative indications to tooth extraction.
4. Prosthetic, aesthetic, sanation indications for the teeth extraction.
5. The main general and local contraindications for the teeth extraction.
6. Classification of instruments for tooth extraction on the lower jaw, specificity of forceps and elevators.
7. Classification of instruments for tooth extraction on the upper jaw, specificity of forceps and elevators.

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

Conducting professional training.

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

Exodontia means extraction or removal of teeth. Exodontia is a procedure that incorporates the principles of surgery and many principles from physics and mechanics. When these principles are applied correctly, a tooth must probably be removed intact from the alveolar process without untoward sequelae. This operation does not require a large amount of brute force and rather can be accomplished with finesse and controlled force in such a manner that the tooth is not pulled from the bone but instead is lifted gently from the alveolar process.

During the preoperative period the degree of difficulty that is anticipated for removing a particular tooth is assessed. If the preoperative assessment leads the surgeon to believe that the degree of difficulty will be high and the initial attempts at tooth removal confirm this, a deliberate surgical approach should be taken. Excessive force may injure local tissues and destroy surrounding bone and teeth. Moreover, excessive force heightens the intraoperative discomfort and anxiety of the patient. The most efficient way to remove a tooth is slowly.

While the great majority of extractions can be safely done in the dental office, some patients require hospitalization for this surgery because of systemic conditions which make them poor surgical risks. Teeth may require removal for many reasons including the following:

I. GENERAL INDICATIONS (morbid conditions caused by decayed teeth as a source of infection): odontogenous chroniosepsis and chronic odontogenous intoxication, odontogenous disease of any organ (in the background of chroniosepsis).

II. LOCAL INDICATIONS is divided into 6 groups:

Sanation; Functional; Prosthetic; Orthodontic; Esthetic; Combination of above mentioned

I. Sanation

- Chronic granulating or granulomatous periodontitis in case of curved or obstructed root canals

- Acute purulent periodontitis, if there is no possibility to evacuate pus through root canal.
- Acute odontogenous osteomyelitis.
- Presence of pathological process around semi-impacted tooth (retro- molar periostitis).
- Decidui teeth, in presence of inflammatory process.
- Decidui teeth, which cause acute septic conditions.

II. Functional - indications which concerns cases of injury of soft tissues by impacted or semi-impacted tooth (buccal mucosa, pterygomandibular fossa); supernumerary teeth; in case of birth with erupted teeth, and there is no possibility to cover it with a protective plate.

III. Prosthetic including the following:

Single teeth, which compromises denture stability; “gangrenous” roots, which cannot be filled and used as support for denture; teeth extended from dentition (Godon-Popov phenomena), which interferes with forming of occlusal arch significantly decayed permanent 1st molars in children (making room for correct eruption of 7 and 8 teeth).

IV. Orthodontic: 4th permanent teeth, which interferes orthodontic moving of anterior teeth; teeth extraction in case of space deficiency in orthodontic treatment.

V. Esthetic: supernumerary teeth, malposed and teratic teeth; teeth, that spoil appearance, especially while smiling

VI. Combination of local indications

Complications associated with treatment of teeth (perforation of the tooth cavity floor, root); impacted teeth in uneffective orthodontic treatment; diseases or conditions when it is impossible to perform tooth treatment; the patient insists on tooth extraction.

There are no *absolute contraindications* for tooth extraction but there are some diseases and conditions which require operation suspending or, if possible, preoperative medication.

*Relative contraindications:*

1. Heart disease (Angina, arrhythmia, reumatism, endocarditis in acute course, heart failure).
2. Kidney disease (acute glomerulonephritis, renal failure).
3. Infectious diseases (diphtheria, hepatitis)
4. Blood disease (haemophilia, leukosis, trombocytopenia).
5. CNS diseases (meningitis, encephalitis).
6. Mental diseases in acute condition (epilepsy, schizophrenia).
7. Teeth placed in malignant tumor or hemangioma.
8. Acute diseases of the respiratory tract (ARD, flu, bronchitis)
9. Pregnancy.

The information from the history and examination is used to formulate the best plan for the patient. This will include measures for adequate preparation for the procedure and also the selection of anaesthesia: whether local anaesthesia, conscious sedation with local anaesthesia or general



anaesthesia. Anticipated difficulties are better discussed with the patient before treatment rather than during treatment, when they may be perceived as excuses for inadequate planning or experience.

Presurgical assessment of the patient includes evaluation of the level of anxiety, determination of health status and any necessary modifications of routine procedures, evaluation of the clinical presentation of the tooth to be removed, and radiographic evaluation of the tooth root and bone. All four of these major factors must be weighed when estimating the difficulty of the extraction. If any factor or combination of factors presents a level of difficulty that seems too great, the dentist should refer the patient to an oral and maxillofacial surgeon.

Surgeons must prevent inadvertent injury or transmission of infection to their patients or to themselves. The concept of universal precautions states that all patients must be viewed as having blood-borne diseases that can be transmitted to the surgical team. To prevent this transmission, surgical gloves, surgical mask, and eyewear with side shields are required. Additionally most authorities recommend that the surgical team wear long-sleeved gowns that can be changed when they become visibly soiled.

Surgeon has to use protective eyeglasses, mask, and gloves. Surgeons should have short or pinned-back hair and should wear long-sleeved smocks that are changed daily or sooner if they become soiled. The patient should have full, waterproof drape. If the surgeon has long hair, it is essential that the hair be held in position with barrettes or other holding devices or be covered with a surgical cap. It is a major breach in aseptic technique to allow the surgeon's hair to hang over the patient's face and mouth. Before the patient undergoes the surgical procedure, a minimal amount of draping is necessary. A sterile drape should be put across the patient's chest to decrease the risk of contamination.

Before the extraction, patients should vigorously rinse their mouths with an antiseptic mouth rinse, such as chlorhexidine 0.5 mg. This reduces the gross bacterial contamination in the patient's mouth, which helps to reduce the incidence of postoperative infection.

To prevent teeth or fragments of teeth from falling into the mouth and potentially being swallowed or aspirated into the lungs, many surgeons prefer to place the 5 x 5 cm gauze loosely into the back of the mouth. This oral partition serves as a barrier so that, should a tooth slip from the forceps or shatter under the pressure of the forceps, it will be caught in the gauze rather than be swallowed or aspirated. The surgeon must take care that the gauze is not positioned so far posterior that it makes the patient gag. The surgeon should explain the purpose of the partition to gain the patient's acceptance and cooperation for allowing the gauze to be placed.

- *Algorithms for the formation of professional skills.*
  1. Be able to determine general and local immediate (absolute) indications before tooth extraction.
  2. Be able to determine planned (relative) indications before tooth extraction:
    - sanitation;
    - prosthetic;
    - esthetic.
  3. Be able to identify general and local contraindications to tooth extraction.
  4. Learn to distinguish tools for tooth extraction (forceps, elevators) on different grounds.
  5. Select instruments to extract different groups of teeth on the upper and lower jaw.
- *Practical tasks (typical, atypical, unpredictable situations). Individual tasks:*

*Task №1.*

A 45-year-old patient complains of lower jaw pain after removal of 36. Objectively, the cell is covered with a blood clot. The radiograph shows no removed distal root 36. What tools are necessary to remove this root?

- A. Elevator at right angle
- B. Elevator at an angle, left
- C. The straight elevator

- D. S-shaped forceps
- E. Bayonet forceps

*Task №2.*

A 70-year-old female patient applied for an appointment with a dental surgeon to remove central maxillary incisors with III stage mobility. Which tool should I use?

- A. Straight tongs
- B. Direct elevator
- C. Beak-shaped forceps
- D. Bayonet forceps
- E. S-shaped forceps

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

The patient of 30 years went to the doctor for removal of 26 teeth about the exacerbation of chronic periodontitis. Objectively: Crown 26 is destroyed 1/3. What additional examination methods are needed to diagnose it? Which method of analgesia will you choose? What tools can be used to remove this tooth? What are the stages of tooth extraction? 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 (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 physiological features of the structure of the jaw bones and teeth.
2. Innervation and blood supply to hard and soft facial tissues.
3. Diseases of hard tissues of tooth, pulp, periodontium.

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

1. Basic indications before tooth extraction.
2. The main urgent (absolute) indications for the teeth extraction.
3. Relative indications to tooth extraction.
4. Prosthetic, aesthetic, sanitation indications for the teeth extraction.
5. The main general and local contraindications for the teeth extraction.
6. Classification of instruments for tooth extraction on the lower jaw, specificity of forceps and elevators.
7. Classification of instruments for tooth extraction on the upper jaw, specificity of forceps and elevators.

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

1. Be able to determine general and local immediate (absolute) indications before tooth extraction.

2. Be able to determine planned (relative) indications before tooth extraction:
  - sanitation;
  - prosthetic;
  - esthetic.
3. Be able to identify general and local contraindications to tooth extraction.
4. Learn to distinguish tools for tooth extraction (forceps, elevators) on different grounds.
5. Select instruments to extract different groups of teeth on the upper and lower jaw

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

1. Patient H. 38 years old, went to the surgical office of the dental clinic to remove 36 teeth. Complaints of intermittent lower jaw pain on the left. Objectively: the crown of the 36 tooth is destroyed by the carious process to the level of the gum margin. Tooth percussion is painless. On a radiograph: rarefaction of rounded bone tissue with clear contours in the area of the apex of the root of a 36 tooth with a diameter of about 1 cm. What is the indication for the removal of this tooth?

- A. Local relative
- B. Absolute local
- C. Absolute common
- D. There are no indications
- E. Local Absolute

2. A 35-year-old man is sent to a surgery room to remove 24 teeth due to exacerbation of chronic periodontitis. The tooth crown is preserved. Which tool should I remove?

- A. S-shaped forceps without spikes on cheeks
- B. Beak-shaped forceps, with cheekbones converging
- C. Straight forceps
- D. Beak-shaped forceps, with cheeks that do not converge
- E. S-shaped forceps with spikes on cheeks

3. The student is directed by a dentist to remove 21 teeth for purulent periodontitis. Which tool should I use in this case?

- A. Straight forceps
- B. Straight elevator
- C. Beak-shaped forceps
- D. Forceps curved in plane
- E. Angular elevator

4. In a patient of 37 years, the medial root 36 was removed and the distal root fractured in the middle third. Which tool will you use to remove the root?

- A. Elevator at right angle
- B. Elevator at an angle, left
- C. Straight elevator
- D. Beak-shaped forceps with non-converging cheeks
- E. Beak-shaped forceps with converging cheeks

5. A patient consulted an oral surgeon about maxillary pain on the left, which arose three days ago. After examination, the patient was diagnosed with exacerbation of chronic periodontitis of the 17 tooth. The 17 tooth is indicated for extraction. What nerves should be blocked for a painless extraction of the 17 tooth?

- A. Posterior alveolar nerves and greater palatine nerve
- B. Greater palatine nerve
- C. Anterior alveolar nerves and incisive nerve
- D. Middle alveolar nerves and greater palatine nerve

## E. Nasopalatine nerve

### **Literature:**

#### Basic:

1. Oral and Maxillofacial Surgery: Textbook, Part 1, 2 / V.O. Malanchuk. – Vinnytsia: Nova Knyha Publishers, 2011. – 453p.
2. Principles of Dental Local Anaesthesia and Teeth Removal / Ya. E. Vares, R. Z. Ogonovsky, Ch. R. Pohranychna – LNMU, 2007. – 63p.
3. Atlas of Human Anatomy / F. Netter – 2<sup>nd</sup> ed. – New Jersey: ICON Learning Systems. – 592 p.

#### Additional:

1. 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. – 1477 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	Topic №12. Methods of the teeth extraction on the upper jaw. Stages of operation.
Course	3 <sup>rd</sup>
Faculty	Dental

**Actuality of the topic:** Tooth extraction should be as atraumatic as possible, regardless of the complexity (i.e. with minimal damage to the surrounding tissues). This is necessary for faster healing of the surgical wound and prevention of complications during the rehabilitation period, as well as for reducing the size of the bone defect at the site of the removed tooth. The latter is especially true with subsequent implantation. The dentist-surgeon should strictly adhere to the stage of surgery and take into account the features of removal of different groups of teeth on the upper jaw.

**Aim of the lesson:** to acquaint students with the tools and stages of the operation of tooth extraction in the upper jaw. Perform the steps of removing different groups of teeth on the phantoms.

**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. Knowledge of jaws anatomy.

➤ *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>
Normal anatomy	Know the anatomical and physiological features of the maxillofacial area:	To be able to explain the structure of systems and organs of maxillo-facial area (MFA)

Normal physiology	<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>	
Pathologic anatomy Pathologic physiology	To know the appearance and flow of the pathological processes in the tissues and organs of MFA	To be able to explain the appearance and flow of the pathological processes in the tissues and organs of MFA
Topographical anatomy	To know the topography of the organs of MFA	To be able to explain the topography of the organs of MFA
Histology	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	To know the species identification of microorganisms in the oral cavity	To be able to explain the stages of manufacturing of microbiological preparations and the essence of bacteriological examination
Radiation diagnostics.	To know the methods of radiological examination used in 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 diseases of hard tissues of tooth and pulp. To know additional methods of examination, which are used in dental practice.	Be able to carry out an intra-oral examination of individual teeth. Be able to diagnose caries, pulpitis of temporary and permanent teeth.

Intradisciplinary integration		
Topic 1. (Module 1). ... Provision, documentation of the surgical dental office and the hospital department. Methods of examination of surgical dental patient.	To know the provision, documentation of the surgical dental office and the hospital department. To have a method of examination of a surgical dental patient. To know the organization of work and equipment of the surgical department (office). To know additional methods of examination.	To be able to characterize the provision, documentation of the surgical dental office and the hospital department. To be able to explain the stages of examination of a surgical dental patient. To be able to explain the results of additional survey methods.
Topic 7, 8. (Module 1) Conductive anesthesia on the upper jaw: indications, methods of conducting. ...	To know the techniques of conducting anesthesia on the upper jaw. To know the clinical effect of anesthesia, the area of anesthesia.	To be able to explain the techniques of conducting anesthesia on the upper jaw. To be able to characterize the clinical effect of anesthesia,

		the area of anesthesia.
Topic 11. (Module 1) Indications and contraindications to the operation of tooth extraction. Teeth Removal Tool.	To know the indications and contraindications to tooth extraction. To know the classification of tools for teeth extraction in the upper and lower jaws, signs of forceps and elevators.	To be able to identify the indications and contraindications to tooth extraction. To be able to select tools for tooth extraction on the upper and lower jaw.

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

Duration of practical lesson is 3.5 academic hours – 2 hours. 40 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>30 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).	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>90 min.</b>			
	Formation of professional skills and abilities: 1. Select instruments to extract different groups of teeth on the upper jaw. 2. Develop ways to hold tools to extract teeth. 3. To work on phantom stages of operation of removal of different groups of teeth on the upper jaw. 4. To work on		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.	



	phantom technique of conducting a typical tooth extraction on the upper jaw.			
<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 (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: «**Methods of the teeth extraction on the upper jaw. Stages of operation.**»

Aim of the lesson: to acquaint students with the tools and stages of the operation of tooth extraction in the upper jaw. Perform the steps of removing different groups of teeth on the phantoms.

*Motivation of educational activity.*

Tooth extraction should be as atraumatic as possible, regardless of the complexity (i.e. with minimal damage to the surrounding tissues). This is necessary for faster healing of the surgical wound and prevention of complications during the rehabilitation period, as well as for reducing the size of the bone defect at the site of the removed tooth. The latter is especially true with subsequent implantation. The dentist-surgeon should strictly adhere to the stage of surgery and take into account the features of removal of different groups of teeth on the upper jaw.

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

*Questions to frontal survey:*

1. The position of the patient and doctor at the removal of the teeth on the upper jaw.
2. Position of the patient and the doctor at the removal of the teeth on the lower jaw.
3. Stages of the tooth extraction operation.
4. Features of removal of single-root teeth on the upper and lower jaws.
5. Features of removing multi-root teeth on the upper and lower jaws.
6. Features of removal of the upper third molars. Instruments.
7. Features of removing the lower third molars. Instruments.
8. Features of removal of roots of teeth. Instruments.

## 9. Healing the wound after tooth extraction.

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

Conducting professional training.

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

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.

To extract a tooth from the alveolus, periodontal attachment must be disrupted and the bony dental socket enlarged to allow withdrawal of the tooth. To achieve this, various instruments have been developed, extraction techniques described and some basic principles and guidance required when learning.

1. Proper position of the patient in a chair.
2. Elevation of circular ligament.
3. Applying the forceps on a tooth.
4. Advancing the forceps to enamel-cement line (in normal conditions it is marked by alveolar ridge).
5. Closing up (fixing) the forceps with whole hand.
6. Loosening of a tooth.
7. Pulling a tooth out from socket.

Principles of tooth extraction

1. Beaks should be applied only on vestibular and oral surfaces of a tooth
2. Long axis of beaks should match with axis of a tooth.
3. Avoid applying beak tips on an alveolar ridge and therefore subperiosteal socket ridge resection.

To extract a tooth from the alveolus, the periodontal attachment must be disrupted and the bony dental socket enlarged to allow withdrawal of the tooth. To achieve this, various instruments have been developed:

- elevators: curved chisel-shaped instruments that fit the curvature of tooth roots; an elevator has a single blade
- luxators: similar to elevators but finer blade
- forceps: have paired blades that are hinged to permit the root to be grasped
- peritome: has a finer blade with which to sever the periodontal attachment and is preferred where it is important not to damage the bony support of the tooth, for example when immediately replacing a tooth with a dental implant.

The design of forceps has remained remarkably constant over many years: it is difficult to improve on the basic shapes. All forceps consist of two blades and handles joined at a hinge. The inner aspects of the blades are concave to fit the root accurately; they should not touch the crown of the tooth. The blades have sharp edges to cut periodontal ligament fibres and are wedge-shaped to dilate the socket. The blades are applied to the buccal and lingual aspects of the root. There are many designs, but for the purpose of this guide we will restrict discussion to those most commonly used.

Forceps for extracting upper anterior teeth are of a simple design. The handles are straight and 12-14 cm long, joined at a hinge to the beaks, which are 2-3 cm long. The handles are contoured on their outer surface to allow a good grip. The beaks are both concave on their inner aspect, shaped to fit around the root of the tooth as closely as possible, when the forceps are applied in the long axis of the tooth. The beaks are applied labially and palatally. All extraction forceps can be seen as modifications of this basic design.

Fit of the beaks of upper straights around a tooth root. If the blades fit closely around the root, the load will be evenly distributed (left). If there is a poor fit, the load will be concentrated at the points of contact (right).

These forceps can be applied to the long axis of anterior teeth, gaining access by the patient

opening their mouth fairly widely. However, if one were to attempt to use these forceps on an upper first premolar, there is a risk of traumatizing the lower lip. Forceps for use in the upper jaw further back than the canine have a curve in the beak, which keeps them above the lip when they are in the long axis of the tooth. The beaks of these forceps are also concave on their inner aspect to fit the root of upper premolars.

These forceps could be used to extract posterior teeth, but for teeth with multiple roots, forceps are available with beaks specifically designed to fit complex root forms. In principle, the more closely the beaks are adapted to the roots, the more widely the forces of extraction are distributed and the lower the likelihood of tooth fracture. The buccal beak has a point to fit into the bifurcation, with concavities on either side to fit around the buccal roots and a broader concave palatal beak. Because of this distinction between buccal and palatal beaks, there must be separate designs for left and right sides of the mouth.

For all upper extractions it is necessary to push firmly in the long axis of the tooth during extraction. For this reason many forceps for upper posterior teeth have a curve at the end of the handle so that they fit in the palm of the hand.

- *Algorithms for the formation of professional skills.*

1. To collect anamnesis and to conduct a review of the patient with the pathology of the maxillofacial area.
2. Select instruments to extract different groups of teeth on the upper jaw;
3. Develop ways to hold tools to extract teeth;
4. To work on phantom stages of operation of removal of different groups of teeth on the upper jaw;
5. To work on phantom technique of conducting a typical tooth extraction on the upper jaw.

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

Task №1.

The patient, 48 years old, complains of permanent pain in the 28 tooth area. The crown of the 28 tooth is destroyed. What forceps can remove the root of a 28 tooth?

- A. Straight root.
- B. S-shaped left.
- C. Bayonet for root.
- D. S-shaped with converging cheeks.
- E. S-like cheeks that do not converge.

Task №2.

The patient has periodontitis of 22 teeth, tooth mobility of the third degree. Select forceps to remove 22 teeth.

- A. Curved in plane.
- B. Direct.
- C. Beak-shaped with spikes on cheeks.
- D. Con-beak-shaped.
- E. Bayonet for root.

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

Patient B., 42, went to the surgical office of the dental clinic complaining of constant aching pain in the area of chewing teeth of the upper jaw on the left. Therapeutic endodontic treatment of the 26 tooth does not bring a positive result due to the obstruction of the canals. Objectively: the crown of the 26 tooth is almost completely destroyed by the caries process. Tooth percussion is slightly painful. On the radiograph: a rarefaction of a rounded bone without clear contours in the area of the tops of the buccal roots of a tooth of about 0.6 cm in diameter, reminiscent of "flame tongues". What kind of anesthesia should be performed to remove 26 teeth? Justify your choice,

describe and demonstrate your anesthesia technique. Which tool should you choose to remove the root of the tooth? What is the technique of working with the chosen toolkit? What complications are possible when removing the teeth of the upper jaw?

### **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 tooth extraction on upper jaw.
- Evaluation.

Conduct standardized final control using individual test tasks and questions (20 min.), Work check (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 physiological features of the structure of the jaw bones and teeth.
2. Innervation and blood supply to hard and soft facial tissues.
3. Local conductive anaesthesia on the upper jaw.
4. Classification of tools for removal of teeth on the upper jaw, signs of forceps and elevators.

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

1. The position of the patient and doctor at the removal of the teeth on the upper jaw.
2. Position of the patient and the doctor at the removal of the teeth on the lower jaw.
3. Stages of the tooth extraction operation.
4. Features of removal of single-root teeth on the upper and lower jaws.
5. Features of removing multi-root teeth on the upper and lower jaws.
6. Features of removal of the upper third molars. Instruments.
7. Features of removing the lower third molars. Instruments.
8. Features of removal of roots of teeth. Instruments.
9. Healing the wound after tooth extraction.

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

1. Select instruments to extract different groups of teeth on the upper jaw.
2. Develop ways to hold tools to extract teeth.
3. To work on phantom stages of operation of removal of different groups of teeth on the upper jaw.
4. To work on phantom technique of conducting a typical tooth extraction on the upper jaw.

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

1. A patient of 70 years, complains about the mobility of 21 teeth. The tooth has not been treated before. Objectively: 21 have grade II motility, the root is exposed by 1/2. Which tool should be used for tooth extraction?

- A. S-shaped forceps
- B. Straight elevator

- C. Beak-shaped forceps
- D. Straight forceps
- E. Bognet-like forceps

2. Patient 35 years old, applied for the removal of 14 teeth due to exacerbation of chronic periodontitis after unsuccessful therapeutic treatment. What is your choice of removal tools?

- A. S-shaped right forceps
- B. Bognet-shaped crown forceps
- C. Bognetic root forceps
- D. Straight forseps
- E. S-shaped forceps

3. A 56-year-old woman went to a dentist to remove 17 teeth. Which removal tool should I choose?

- A. Bognetic root forceps
- B. Bognet-shaped crown forceps
- C. S-shaped right forceps
- D. S-shaped left forceps
- E. Straight forceps

4. A 49-year-old patient consulted a dental surgeon about the oral cavity sanation. He has an indication for the extraction of the 16 tooth. History: the tooth hasn't been treated before, decayed within the last 4 years. Objectively: the 16 tooth's crown is destroyed by over 2/3, the mucosa exhibits no pathological changes. Which tool is required for the tooth extraction?

- A. Bayonet root forceps
- B. S-shaped forceps (right)
- C. Straight elevator
- D. S-shaped closed-beak forceps
- E. Crown bayonet forceps

5. Patient 30 years old, went to the doctor to remove 26 teeth about exacerbation of chronic periodontitis. Objectively: crown 26 is destroyed by 1/3. What forceps can be used to remove this tooth?

- A. S-shaped with a spike on the left cheek
- B. Streight elevator
- C. S-shaped without spikes
- D. S-shaped with a spike on the right cheek
- E. Straight forceps.

**Literature:**

Basic:

1. Oral and Maxillofacial Surgery: Textbook, Part 1, 2 / V.O. Malanchuk. – Vinnytsia: Nova Knyha Publishers, 2011. – 453p.
2. Principles of Dental Local Anaesthesia and Teeth Removal / Ya. E. Vares, R. Z. Ogonovsky, Ch. R. Pohranychna – LNMU, 2007. – 63p.
3. Atlas of Human Anatomy / F. Netter – 2<sup>nd</sup> ed. – New Jersey: ICON Learning Systems. – 592 p.

Additional:

1. 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. – 1477 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	Topic №13. Methods of the teeth extraction on the lower jaw. Stages of operation.
Course	3 <sup>rd</sup>
Faculty	Dental

**Actuality of the topic:** Tooth extraction should be as atraumatic as possible, regardless of the complexity (i.e. with minimal damage to the surrounding tissues). This is necessary for faster healing of the surgical wound and prevention of complications during the rehabilitation period, as well as for reducing the size of the bone defect at the site of the removed tooth. The latter is especially true with subsequent implantation. The dentist-surgeon should strictly adhere to the stage of surgery and take into account the features of removal of different groups of teeth on the lower jaws.

**Aim of the lesson:** to acquaint students with the tools and stages of the operation of tooth extraction in the lower jaw. Perform the steps of removing different groups of teeth on the phantoms.

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

Normal physiology	jaws; - innervation and vascularization of these sites; - structure of the lymphatic system of the head and neck; - structure of the muscles of the head and neck; - structure of the head and neck areas.	
Topographical anatomy	To know the topography of the organs of MFA	To be able to explain the topography of the organs of MFA
Hystology	To know histological structure of soft and hard tissues of MFA	To be able to explain the stages of manufacturing of cytological, histological preparations
Therapeutic dentistry Pediatric dentistry	To know diseases of hard tissues of tooth and pulp. To know additional methods of examination, which are used in dental practice.	Be able to carry out an intra-oral examination of individual teeth. Be able to diagnose caries, pulpitis of temporary and permanent teeth.

Intradisciplinary integration		
Topic 1. (Module 1). ... Provision, documentation of the surgical dental office and the hospital department. Methods of examination of surgical dental patient.	To know the provision, documentation of the surgical dental office and the hospital department. To have a method of examination of a surgical dental patient. To know the organization of work and equipment of the surgical department (office). To know additional methods of examination.	To be able to characterize the provision, documentation of the surgical dental office and the hospital department. To be able to explain the stages of examination of a surgical dental patient. To be able to explain the results of additional survey methods.
Topic 5, 6. (Module 1) Conductive anesthesia in the mandible: indications, methods of conducting. ...	To know the techniques of conducting anesthesia in the mandible. To know the clinical effect of anesthesia, the area of anesthesia.	To be able to explain the techniques of conducting anesthesia in the mandible. To be able to characterize the clinical effect of anesthesia, the area of anesthesia.
Topic 11. (Module 1) Indications and contraindications to the operation of tooth extraction. Teeth Removal Tool.	To know the indications and contraindications to tooth extraction. To know the classification of tools for teeth extraction in the upper and lower jaws, signs of forceps and elevators.	To be able to identify the indications and contraindications to tooth extraction. To be able to select tools for tooth extraction on the upper and lower jaw.

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

Duration of practical lesson is 3.5 academic hours – 2 hours. 40 minutes including 10 minutes for a break.

<b>№</b>	<b>The main stages of the lesson, their</b>	<b>Time period</b>	<b>Methods of education and control</b>	<b>Materials of methodical support</b>
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	<b>functions and content</b>				
<b>1.</b>	<b>Preparatory stage</b>	<b>30 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).	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>90 min.</b>			
	Formation of professional skills: 1. Select instruments to extract different groups of teeth on the lower jaw. 2. Develop ways to hold tools to extract teeth. 3. To work on phantom stages of operation of removal of different groups of teeth on the lower jaw. 4. To work on phantom technique of conducting a typical tooth extraction on the lower jaw.		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 of professional skills and abilities.		Final evaluation of the students		
3.3	Homework.				Recommended literature

	Informing students about the topic of the next lesson.			
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## 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: «**Methods of the teeth extraction on the lower jaw. Stages of operation.**»

Aim of the lesson: to acquaint students with the tools and stages of the operation of tooth extraction in the lower jaw. Perform the steps of removing different groups of teeth on the phantoms.

*Motivation of educational activity.*

Tooth extraction should be as atraumatic as possible, regardless of the complexity (i.e. with minimal damage to the surrounding tissues). This is necessary for faster healing of the surgical wound and prevention of complications during the rehabilitation period, as well as for reducing the size of the bone defect at the site of the removed tooth. The latter is especially true with subsequent implantation. The dentist-surgeon should strictly adhere to the stage of surgery and take into account the features of removal of different groups of teeth on the lower jaw.

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

*Questions to frontal survey:*

1. The position of the patient and doctor at the removal of the teeth on the upper jaw.
2. Position of the patient and the doctor at the removal of the teeth on the lower jaw.
3. Stages of the tooth extraction operation.
4. Features of removal of single-root teeth on the upper and lower jaws.
5. Features of removing multi-root teeth on the upper and lower jaws.
6. Features of removal of the upper third molars. Instruments.
7. Features of removing the lower third molars. Instruments.
8. Features of removal of roots of teeth. Instruments.
9. Healing the wound after tooth extraction.

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

Conducting professional training.

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

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.

To extract a tooth from the alveolus, periodontal attachment must be disrupted and the bony dental socket enlarged to allow withdrawal of the tooth. To achieve this, various instruments have been developed, extraction techniques described and some basic principles and guidance required when learning.

1. Proper position of the patient in a chair.
2. Elevation of circular ligament.
3. Applying the forceps on a tooth.
4. Advancing the forceps to enamel-cement line (in normal conditions it is marked by alveolar ridge).

5. Closing up (fixing) the forceps with whole hand.

6. Loosening of a tooth.

7. Pulling a tooth out from socket.

Principles of tooth extraction

1. Beaks should be applied only on vestibular and oral surfaces of a tooth

2. Long axis of beaks should match with axis of a tooth.

3. Avoid applying beak tips on an alveolar ridge and therefore subperiosteal socket ridge resection.

If you were to attempt to apply upper anterior forceps to the lower anterior teeth you would have difficulty in getting past the nose and upper alveolus. It is usual to overcome the problem by using forceps with a right-angled bend in them; this permits the handles to come straight out of the mouth when the beaks are in the long axis of the tooth. The beaks of these simple forceps are similar to those used on upper anterior teeth. Such forceps can be used effectively on all lower teeth, from second premolar to second premolar.

Just as with the forceps for upper teeth, beak design has been modified for multiple-rooted teeth. Full molar forceps have a point and two adjacent concave facets on both buccal and lingual beaks.

There are special forceps for removal of lower wisdom teeth or third molars. These forceps also have points on both beaks, but they bent on a plane, as against other lower forceps bent on an edge. In case of need we can use these tools for exodontia of all lower molars when patient has a trismus or insufficient opening of a mouth.

Smaller versions of forceps are available for use on deciduous teeth, which some operators like to use to access lower third molars where vertical space is at a premium. There were several different forceps extraction techniques described and so some basic principles and guidance are required when learning. Forceps are used to disrupt the periodontal attachment and dilate the bony socket either directly, by forcing the blades between tooth and bone, or by moving the tooth root within the socket, or both. Once this has been done, the tooth may be lifted from its socket. The movements that are required to complete the extraction may be described as a preliminary movement to sever the periodontal membrane and generally dilate the socket, followed by a second movement to complete the dilation and withdraw the tooth. The first movement requires that force is directed along the long axis of the tooth, pushing the blades of the forceps towards the root apex. This force is then maintained during the second movement, which is dependent on the tooth root and bone morphology. If a tooth has a single round root, then it may be rotated. Where the buccal bone plate is relatively thin, it may be possible to distort it significantly by moving the forceps applied to the tooth root in a buccal direction.

- *Algorithms for the formation of professional skills.*

1. To collect anamnesis and to conduct a review of the patient with the pathology of the maxillofacial area.

2. Select instruments to extract different groups of teeth on the lower jaw.

3. Develop ways to hold tools to extract teeth.

4. To work on phantom stages of operation of removal of different groups of teeth on the lower jaw.

5. To work on phantom technique of conducting a typical tooth extraction on the lower jaw.

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

Task №1.

The patient, 48 years old, complains of permanent pain in the 36 tooth area. The tooth 36 crown is destroyed. What forceps remove the roots of 36 teeth?

A. Straight for root.

B. S-shaped left.

C. Bognetic root.

D. Beak-shaped with converging cheeks.

E. Beak-shaped with non-converging cheeks.

Task №2.

The patient has periodontitis of 32 teeth, III degree. Select forceps to remove 32 teeth.

- A. Curved in plane.
- B. Direct.
- C. Beak-shaped with spikes on cheeks.
- D. Beak-shaped with non-converging cheeks.
- E. Bayonet for roots.

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

Patient V., 42, went to the surgical office of the dental clinic, complaining of constant aching pain in the lower jaw body on the left. Therapeutic endodontic treatment of 36 tooth positive does not bring about because of the obstruction of the canals. Objectively: the crown of the 36 tooth is destroyed by a carious process by one fourth of the volume of the crown. Tooth percussion is slightly painful. On the radiograph: a rarefaction of a rounded bone without clear contours in the area of the apexes of the buccal roots of 36 teeth with a diameter of about 0.6 cm, resembling “flame tongues”. What type of anesthesia should be performed to remove a 36 tooth? Justify your choice, describe and demonstrate your anesthesia technique. Which tool should you choose to remove the root of the tooth? What is the technique of working with the chosen toolkit? What complications are possible when removing the teeth of the upper jaw?

**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 tooth extraction on lower jaw.
- Evaluation.

Conduct standardized final control using individual test tasks and questions (20 min.), Work check (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 physiological features of the structure of the jaw bones and teeth.
2. Innervation and blood supply to hard and soft facial tissues.
3. Local conductive anaesthesia on the lower jaw.
4. Classification of tools for removal of teeth on the lower jaw, signs of forceps and elevators.

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

1. The position of the patient and doctor at the removal of the teeth on the upper jaw.
2. Position of the patient and the doctor at the removal of the teeth on the lower jaw.
3. Stages of the tooth extraction operation.
4. Features of removal of single-root teeth on the upper and lower jaws.
5. Features of removing multi-root teeth on the upper and lower jaws.
6. Features of removal of the upper third molars. Instruments.

7. Features of removing the lower third molars. Instruments.
8. Features of removal of roots of teeth. Instruments.
9. Healing the wound after tooth extraction.

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

1. Select instruments to extract different groups of teeth on the lower jaw.
2. Develop ways to hold tools to extract teeth.
3. To work on phantom stages of operation of removal of different groups of teeth on the lower jaw.
4. To work on phantom technique of conducting a typical tooth extraction on the lower jaw.

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

1. During removal of the 47 teeth, the distal root remained in the cell. Select the tool to complete the uninstallation.

- A. Angular left-hand elevator
- B. Angular right-hand elevator
- C. Straight elevator
- D. Universal forceps-bayonet
- E. Beak-shaped forceps for root removal

2. In the clinic of surgical dentistry, the patient is shown removal of the root of the 36 tooth, whose crown is missing, the medial root is removed. The distal root is deep in the hole. Select a tool to remove the distal root of tooth 36:

- A. The Lecluse Elevator
- B. Left-Angled elevator
- C. Beak-shaped root forceps
- D. Straight elevator
- E. Right-Angled elevator

3. During extraction of the 47 tooth its distal root was broken halfway along its length. What tool should be chosen for extraction of the residual root fragments?

- A. Left angled elevator
- B. Broad-beaked forceps
- C. Close-beaked forceps
- D. Right angled elevator
- E. Straight elevator

4. In the surgical dental office the patient complained of the presence of the roots of the destroyed 37 tooth. What tools do you need to use to remove the root of the 37 tooth?

- A. Beak-shaped forceps, root, angular elevators
- B. Plane-curved forceps, corner elevators
- C. Bognet-like forceps, straight elevator
- D. S-shaped forceps, straight and angular elevators
- E. Beak-shaped forceps, crown, straight elevator

5. A 27-year-old male patient underwent extraction of the medial root of the 36 tooth, but the distal tooth root was broken in its middle third. What tools should be applied for root extraction?

- A. Left angled elevator
- B. Right angled elevator
- C. Straight elevator
- D. Broad-beaked forceps
- E. Close-beaked forceps

**Literature:**

## Basic:

1. Oral and Maxillofacial Surgery: Textbook, Part 1, 2 / V.O. Malanchuk. – Vinnytsia: Nova Knyha Publishers, 2011. – 453p.
2. Principles of Dental Local Anaesthesia and Teeth Removal / Ya. E. Vares, R. Z. Ogonovsky, Ch. R. Pohranychna – LNMU, 2007. – 63p.
3. Atlas of Human Anatomy / F. Netter – 2<sup>nd</sup> ed. – New Jersey: ICON Learning Systems. – 592 p.

## Additional:

1. 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. – 1477 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	Topic №14. Complications during tooth extraction: clinical picture, diagnosis, treatment and prevention.
Course	3 <sup>rd</sup>
Faculty	Dental

**Actuality of the topic:** During the operation of tooth extraction there can be a number of general and local complications related to the peculiarities of the anatomical structure of the dental-maxillofacial system, significant pathological changes of the tissues of the maxillofacial area, the presence of concomitant general somatic pathology, as well as iatrogenic nature (associated with errors in diagnosis, non-observance of surgery, lack of clinical experience, etc.). Anamnesis collection, individual approach to the patient, careful adherence to surgery techniques, as a rule, allow to avoid negative consequences. However, in the event of a complication, the dentist is obliged to quickly diagnose it, provide the patient with urgent care and plan a follow-up treatment.

**Aim of the lesson:** to acquaint students with the methods of diagnosis and treatment of complications that occur during tooth extraction and the postoperative period. Work out algorithms for helping patients.

**Learning objectives:**

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

**Methods of training:**

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

**Interdisciplinary integration**

Disciplines	Student should know	Student should be able to
Normal anatomy	Know the anatomical and physiological features of the	To be able to explain the structure of systems and organs



Normal physiology	<p>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>	of maxillo-facial area (MFA)
Topographical anatomy	To know the topography of the organs of MFA	To be able to explain the topography of the organs of MFA
Hystology	To know histological structure of soft and hard tissues of MFA	To be able to explain the stages of manufacturing of cytological, histological preparations

Internal diseases.	Know the basic clinical symptoms, principles of diagnosis and treatment of somatic diseases (hypertension, myocardial infarction, stroke, etc.).	Be able to explain the main clinical symptoms, principles of diagnosis and treatment of somatic diseases (hypertension, myocardial infarction, stroke, etc.).
Pharmacology.	To know pharmacological features of preparations used for local analgesia in the maxillofacial area	To be able to characterize the anesthetics of different pharmacological groups, vasoconstrictor drugs.

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

Duration of practical lesson is 3.5 academic hours – 2 hours. 40 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>30 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).	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 recommendation

				s, video films
2.	Main Stage	90 min.		
	<p>Formation of professional skills and abilities:</p> <ol style="list-style-type: none"> <li>1. Make the most probable diagnosis of local complications of tooth extraction, choose treatment tactics.</li> <li>2. Make the most probable diagnosis of general complications of tooth extraction, choose treatment tactics.</li> <li>3. Learn to read X-ray images with complicated deletions.</li> <li>4. Perform a differential diagnosis of complications of tooth extraction.</li> <li>5. Learn to exercise on the phantom dislocation corection of the lower jaw.</li> <li>6. Perform the necessary medical manipulations (measure blood pressure and pulse, conduct auscultation of the heart and lungs, conduct venipuncture and connect a drip with the appropriate medications, administer medicines in person or sublingually, perform artificial respiration and indirect heart massage, fix the tongue).</li> <li>7. Conduct on a</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>

	phantom cardiopulmonary resuscitation (indirect heart and massage and artificial respiration).			
<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 (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: **«Complications during tooth extraction: clinical picture, diagnosis, treatment and prevention.»**

Aim of the lesson: to acquaint students with the methods of diagnosis and treatment of complications that occur during tooth extraction and the postoperative period. Work out algorithms for helping patients.

- *Motivation of educational activity.*

During the operation of tooth extraction there can be a number of general and local complications related to the peculiarities of the anatomical structure of the dental-maxillofacial system, significant pathological changes of the tissues of the maxillofacial area, the presence of concomitant general somatic pathology, as well as iatrogenic nature (associated with errors in diagnosis, non-observance of surgery, lack of clinical experience, etc.). Anamnesis collection, individual approach to the patient, careful adherence to surgery techniques, as a rule, allow to avoid negative consequences. However, in the event of a complication, the dentist is obliged to quickly diagnose it, provide the patient with urgent care and plan a follow-up treatment.

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

*Questions to frontal survey:*

1. Early local complications that occur during tooth extraction:
  - fracture of the tooth or its root;
  - fracture, dislocation of the neighboring tooth;

- fracture of the part of the alveolar process;
  - fracture of the tuber of the upper jaw;
  - damage to soft tissues;
  - pushing the tooth or its root into soft tissues;
  - perforation of the bottom of the maxillary sinus;
  - hit the tooth or its root in the respiratory tract.
2. Late local complications that occur after tooth extraction:
- bleeding from the alveolar socket;
  - alveolitis- alveolar pains.

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

Conducting professional training.

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

A complication is any event that would not normally occur and which might increase the patient's suffering. The range of potential complications is vast. It includes adverse events occurring locally, nearby or at distant sites, some things that occur immediately and others that occur a little later or are greatly delayed, some are rare and some frequent, some are serious and some inconsequential. There is considerable variation in the degree to which complications are predictable or preventable. The implications of adverse events are also determined in part by the patient's expectations, the reason for surgery and the manner in which the event is managed once it is recognized.

**Complications of tooth extraction**

	<b>Local</b>	<b>Regional/distant</b>
Immediate	Fractured crown, root, alveolus, tuberosity, mandible, adjacent tooth	Crushed or burnt lip; injury to inferior dental or lingual nerves; lacerated tongue or palate
	Tear of gingiva, alveolar mucosa	Swallowed or inhaled instrument or tooth
	Oroantral communication	Injury to Temporomandibular Joint
	Fractured instrument	
	Injury of regional nerves	
Delayed	Dry socket; local infection	Spreading infection
	Delayed or secondary hemorrhage	Myofascial pain
	Osteonecrosis	Hematoma
Late	Alveolar atrophy	Osteomyelitis; actinomycosis

It is axiomatic that the best and easiest way to manage a complication is to prevent it from happening. Prevention (of surgical complications is best accomplished by a thorough preoperative assessment and comprehensive treatment plan. Only when these are routinely performed can the surgeon expect to have minimal complications. It is important to realize that even with such planning, complications occasionally occur. In situations in which the dentist has planned carefully, the complication is often expected and can be managed in a routine manner.

One of the primary ways to prevent complications is by taking adequate radiographs and reviewing them carefully. The radiograph must include the entire area of surgery, including the apices of the roots of the teeth to be extracted and the local and regional anatomic structures, such as the maxillary sinus and the inferior alveolar canal. The surgeon must look for the presence of abnormal tooth root morphology. After careful examination of the radiographs, the surgeon must occasionally alter the treatment plan to prevent the complications that might be anticipated with a routine forceps (closed) extraction. Instead, the surgeon should consider surgical approaches to removing teeth in such cases.

After an adequate medical history has been taken and the radiographs have been analyzed, the surgeon must do the preoperative planning. This is not simply a preparation of a detailed surgical plan but is also a plan for managing patient anxiety and pain and postoperative recovery (instructions and modifications of normal activity for the patient). Thorough preoperative instructions and explanations for the patient are essential in preventing the majority of complications that occur in the postoperative period. If the instructions are not thoroughly explained or their importance made clear, the patient is less likely to follow them.

Finally, to keep complications at a minimum, the surgeon must always follow the basic surgical principles. There should always be clear visualization and access to the operative field, which requires adequate light, adequate soft tissue reflection (including lips, cheeks, tongue, and soft tissue flaps), and adequate suction. The teeth to be removed must have an unimpeded pathway for removal. Occasionally, bone must be removed and teeth must be sectioned to achieve this goal. Controlled force is of paramount importance; this means “finesse,” not “force.” The surgeon must follow the principles of asepsis, atraumatic handling of tissues, hemostasis, and thorough debridement of the wound after the surgical procedure.

Violation of these principles leads to an increased incidence and severity of surgical complications.

*Injuries to the soft tissue of the oral cavity* are almost always the result of the surgeon’s lack of adequate attention to the delicate nature of the mucosa and the use of excessive and uncontrolled force. The surgeon must pay careful attention to the soft tissue while working primarily on the bone and tooth structure, develop adequate-sized flaps and use minimal force for retraction of the soft tissue.

The second soft tissue injury that occurs with some frequency is inadvertent puncturing of the soft tissue. Instruments, such as a straight elevator or periosteal elevator, may slip from the surgical field and puncture or tear into the adjacent soft tissue.

Once again, this injury is the result of using uncontrolled force instead of finesse and is best prevented by the use of controlled force, with special attention given to the supporting fingers or support from the opposite hand in anticipation of slippage. If the instrument slips from the tooth or bone, the fingers thus catch the hand before injury occurs. When a puncture wound does occur, the treatment is aimed primarily at preventing infection and allowing healing to occur, usually by secondary intention. If the wound bleeds excessively, it should be controlled by direct pressure on the soft tissue. Once hemostasis is achieved, the wound is usually left open and not sutured, so that if a small infection were to occur, there would be an adequate pathway for drainage.

*Abrasions or burns of the lips and corners of the mouth* are usually the result of the rotating shank of the bur rubbing on the soft tissue. When the surgeon is focused on the cutting end of the bur, the assistant should be aware of the location of the shank of the bur in relation to the cheeks and lips. If such an abrasion does develop, the dentist should advise the patient to keep it covered with Vaseline or an antibiotic ointment. It is important that the patient keeps the ointment only on the abraded area and not spread onto intact skin, because it is quite likely to result in a rash. These abrasions usually take 5 to 10 days to heal. The patient should keep the area moist with the ointment during the entire healing period to prevent eschar formation, scarring, and delayed healing, as well as to keep the area reasonably comfortable.

The most common complication associated with the tooth being extracted is *fracture of its roots*. Long, curved, divergent roots that lie in dense bone are most likely to be fractured. The main method of preventing fracture of roots is to perform an open extraction technique and to remove bone to decrease the amount of force necessary to remove the tooth.

#### *Extraction of wrong teeth*

A complication that every dentist believes can never happen - but happens surprisingly often is extraction of the wrong tooth. This should never occur if appropriate attention is given to the planning and execution of the surgical procedure.

This problem may be the result of inadequate attention to the preoperative assessment. If the tooth to be extracted is grossly carious, it is less likely that the wrong tooth will be removed. The wrong tooth is most commonly extracted when the dentist is asked to remove teeth for orthodontic purposes, especially from patients who are in mixed dentition stages and whose orthodontists have

asked for unusual extractions. Careful preoperative planning and clinical assessment of which tooth is to be removed before the forceps is applied is the main method of preventing this complication.

#### *Fractured alveolus*

Most extractions result in delivery of the tooth, intact, with no other tissue apart from some periodontal ligament. However, bone can fracture in a number of circumstances. A small piece of buccal plate of bone is sometimes removed with the tooth. Provided that it is small, and that the mucosa is not torn in removing it, this is of little consequence. Sharp edges of bone beneath mucosa may need to be smoothed.

A maxillary molar standing alone, or associated with a large maxillary antrum, is particularly prone to fracture of the tuberosity. The tuberosity is also vulnerable to a fully erupted maxillary third molar being elevated backwards (see comments about effects of large elevators). In such circumstances, if the bone fragment is small and the antrum will not be left exposed, it may be best to dissect the bone out with the tooth then close the wound. For large fragments, however, the extraction should be abandoned and the fractured piece should be splinted (other temporary means of pain control may be required) and the tooth surgically removed about 4 weeks later, once the bone has healed.

Fractures may also occur if an instrument is forced between teeth or between roots that do not displace out of their sockets, or if undue force is used in any extraction. It is difficult to measure exactly what constitutes excessive force other than by its adverse effects. However, it is very difficult for most dentists extracting most teeth to apply sufficient force in the correct direction to actually do damage. The human body is remarkably resistant to steadily applied force. It is important to be prepared to stop if it appears that reasonable force is not achieving the goal.

#### *Fracture of maxillary tuberosity*

Fracture of a large section of bone in the maxillary tuberosity area is a situation of special concern. The maxillary tuberosity is especially important for the construction of a stable retentive maxillary denture. If a large portion of this tuberosity is removed along with the maxillary tooth, denture stability may be compromised. The fracture of the maxillary tuberosity most commonly results from extraction of an erupted maxillary third molar or from a second molar if it happens to be the last tooth in the arch.

#### *Injury to regional nerves*

The branches of the fifth cranial nerve, which provide innervation to the mucosa and skin, are the structures most likely to be injured during extraction. The most frequently involved specific branches are the mental nerve, the lingual nerve, the buccal nerve, and the nasopalatine nerve. The nasopalatine and buccal nerves are frequently sectioned during the creation of flaps for removal of impacted teeth. The area of sensory innervation of these two nerves is relatively small, and reinnervation of the affected area usually occurs rapidly. Therefore the nasopalatine and long buccal nerves can be surgically sectioned without sequelae or complications.

Surgical removal of mandibular premolar roots or impacted mandibular premolars and periapical surgery in the area of the mental nerve and mental foramen must be performed with great care. If the mental nerve is injured, the patient will have an anesthesia or paresthesia of the lip and chin. If the injury is the result of flap reflection or simple manipulation, the altered sensation usually disappears in a few weeks to a few months. If the mental nerve is sectioned at its exit from the mental foramen or torn along its course, it is likely that mental nerve function will not return, and the patient will have a permanent state of anesthesia. If surgery is to be performed in the area of the mental nerve or the mental foramen, it is imperative that surgeons have a keen awareness of the potential morbidity from injury to this nerve. If surgeons have any question concerning their ability to perform the indicated surgical procedure, they should refer the patient to an oral and maxillofacial surgeon. If a three-corner flap is to be used in the area of the mental nerve, the vertical releasing incision must be placed far enough anterior to avoid severing any portion of the mental nerve. Rarely is it advisable to make the vertical releasing incision at the interdental papilla between the canine and first premolar.

The lingual nerve is anatomically located directly against the lingual aspect of the mandible in the retromolar pad region. The lingual nerve rarely regenerates if it is severely traumatized.

Incisions made in the retromolar pad region of the mandible should be placed to avoid severing this nerve. Therefore incisions made for surgical exposure of impacted third molars or of bony areas in the posterior molar region should be made well to the buccal aspect of the mandible. Prevention of injury to the lingual nerve is of paramount importance for controlling this difficult complication. Finally, the inferior alveolar nerve may be traumatized along the course of its intrabony canal. The most common place of injury is the area of the mandibular third molar. Removal of impacted third molars may crush or sharply injure the nerve in its canal. This complication is common enough during the extraction of third molars that it is important to inform patients on a routine basis that it is a possibility. The surgeon must then take every precaution possible to avoid injuring the nerve during the extraction.

#### *Oroantral communications*

Removal of maxillary molars occasionally results in communication between the oral cavity and the maxillary sinus. If the maxillary sinus is large, if no bone exists between the roots of the teeth and the maxillary sinus, and if the roots of the tooth are widely divergent, then it is increasingly probable that a portion of the bony floor of the sinus will be removed with the tooth. If this complication occurs, appropriate measures are necessary to prevent a variety of sequelae. The two sequelae of most concern are postoperative maxillary sinusitis and formation of a chronic oroantral fistula. The probability that either of these two sequelae will occur is related to the size of the oroantral communication and the management of the exposure.

Diagnosis of the oroantral communication can be made in several ways. The first is to examine the tooth once it is removed. If a section of bone is adhered to the root ends of the tooth, the surgeon can be relatively certain that a communication between the sinus and mouth exists. If a small amount of bone or no bone adheres to the molars, a communication may exist anyway. To confirm the presence of a communication, the best technique is to use the nose-blowing test. Pinching the nostrils together occludes the patient's nose, and the patient is asked to blow gently through the nose while the surgeon observes the area of the tooth extraction. If a communication exists, there will be passage of air through the tooth socket and bubbling of blood in the socket area.

After the diagnosis of oroantral communication has been established, the surgeon must determine the approximate size of the communication, because the treatment will depend on the size of the opening. If the communication is small (2 mm in diameter or less), no additional surgical treatment is necessary. The surgeon should take measures to ensure the formation of a high-quality blood clot in the socket and then advise the patient to take sinus precautions to prevent dislocation of the blood clot.

Sinus precautions are aimed at preventing increases or decreases in the maxillary sinus air pressure that would dislodge the clot. Patients should be advised to avoid blowing the nose, violent sneezing, sucking on straws, and smoking. Patients who smoke and who cannot stop (even temporarily) should be advised to smoke in small puffs, not in deep drags, to avoid pressure changes.

The surgeon must not probe through the socket into the sinus with a periapical curette or a root tip pick. It is possible that the bone of the sinus has been removed without perforation of the sinus lining. To probe the socket with an instrument might unnecessarily lacerate the membrane. Probing of the communication may also introduce foreign material, including bacteria, into the sinus and thereby further complicate the situation. Probing of the communication is therefore absolutely contraindicated.

If the opening between the mouth and sinus is of moderate size (2 to 6 mm), additional measures should be taken. To help ensure the maintenance of the blood clot in the area, a Figure-of-eight suture should be placed over the tooth socket. The patient should also be told to follow sinus precautions. Finally, the patient should be prescribed several medications to help lessen the possibility that maxillary sinusitis will occur. Antibiotics, usually amoxicillin or clindamycin, should be prescribed for 5 days. In addition, a decongestant nasal spray should be prescribed to shrink the nasal mucosa to keep the ostium of the sinus patent. As long as the ostium is patent and normal sinus drainage can occur, sinusitis and sinus infection are less likely. An oral decongestant is also sometimes recommended.

If the sinus opening is large (7 mm or larger), the dentist should consider closing the sinus communication with a flap procedure. This usually requires that the patient be referred to an oral and maxillofacial surgeon, because flap development and closure of a sinus opening are somewhat complex procedures that require skill and experience.

The most commonly used flap is a buccal flap. This technique mobilizes buccal soft tissue to cover the opening and provide for a primary closure. This technique should be performed as soon as possible, preferably on the same day in which the opening occurred. The same sinus precautions and medications are usually required.

#### **Postextraction haemorrhage**

After a routine extraction it is expected that bleeding will cease after no more than 10 minutes. If bleeding continues, the area should be inspected for signs of mucosal tearing or other evident cause for continued hemorrhage. In the absence of any such sign, a further period of 10 minutes with firm pressure on the wound should be tried. Every effort should be made to determine whether the bleeding is arising from mucosa or bone.

If tears in the mucosa are found they should be sutured. They can be remarkably difficult to find if they have occurred posteriorly, especially lingual to a lower third molar or posteriorly to a maxillary third molar. Suturing can be effectively performed with a variety of materials, but black watted suture permits the knot to be precisely tensioned. If bleeding continues, the next action is to suture the mucosa over the socket, not in an attempt to approximate the mucosal edges but to pull the gingival margin tightly down onto the bone edge of the socket. This restricts the blood supply to the gingiva, from which the bleeding frequently originates. A suture taking bites of tissue from all four corners of the socket, pulled together as a figure of eight, works well.

If suturing alone is not successful, a resorbable haemostatic agent (e.g. oxidized cellulose, fibrin foam, gelatin foam, collagen granules, alginate fibres) is placed in the socket and the wound resutured. Usually a bleeding socket responds to these measures. However, if bleeding continues, consideration should be given to the possibility of factors other than a purely local minor problem.

Bleeding, of almost any cause, can be arrested by packing the socket with gauze soaked in an antiseptic varnish. This material slowly sets to a firm consistency over hours to days and is well tolerated against bone. It does not become foul for a matter of weeks, so can be left in place for some time if necessary. Because of its consistency, the dressing can be compressed into the socket and secured readily with sutures. However, it should be removed, normally at about one week.

In transalveolar (surgical) removal of teeth vigorous bleeding can occur from a defined point in the bone. Such bleeds are often best dealt with by pushing a small quantity of bone wax into the bleeding point. This material is not resorbable and tends to become infected if used in large quantities; it should thus be used sparingly. Alternatively, adjacent bone may be crushed into the bleeding point with artery forceps. Significant arterial or venous bleeds from soft tissue are best dealt with by ligation. A pair of artery forceps is clipped over the bleeding point, leaving the tips showing, then a suture (such as polyglycolic acid) is tied around the forceps and slipped over the end and tightened. Smaller bleeding points can be dealt with by diathermy or even by clipping the vessel temporarily without a suture. If bleeding continues despite reasonable attempts to stop it, or if it restarts within 3 days, bleeding and clotting function tests should be performed. These include the international normalized ratio (INR) (for the extrinsic part of the coagulation cascade), activated partial thromboplastin time (APTT) (for the intrinsic part) and a platelet count, which may be done as part of a full blood count that will also include hemoglobin estimation. Any further investigations that might be indicated as a result of these tests may be better performed in a hematology unit.

It is not usual to ask patients about to have extractions to stop taking drugs they are taking to reduce platelet activity such as aspirin. The incidence of abnormal bleeding in such individuals is low. Patients on warfarin therapy, however, require very careful management. It is now recommended that provided the INR is 4.0 or less on the day of extraction, treatment may proceed but the sockets should be dressed with a resorbable haemostatic agent such as oxidized cellulose and sutured. Clinical trials have shown few serious bleeding complications with this approach.

Patients with a known blood-clotting disorder will be under the care of the regional hemophilia centre. Such units are generally extremely helpful in preparation and after care of the patient for



dental purposes, but they must be consulted early in the planning process. Patients may require both factor replacement and antifibrinolytic medication.

- *Algorithms for the formation of professional skills.*
  1. Make the most probable diagnosis of local complications of tooth extraction, choose treatment tactics.
  2. Make the most probable diagnosis of general complications of tooth extraction, choose treatment tactics.
  3. Learn to read X-ray images with complicated deletions.
  4. Perform a differential diagnosis of complications of tooth extraction.
  5. Learn to exercise on the phantom dislocation corection of the lower jaw.
  6. Perform the necessary medical manipulations (measure blood pressure and pulse, conduct auscultation of the heart and lungs, conduct venipuncture and connect a drip with the appropriate medications, administer medicines in person or sublingually, perform artificial respiration and indirect heart massage, fix the tongue).
  7. Conduct on a phantom cardiopulmonary resuscitation (indirect heart massage and artificial respiration).
  
- *Practical tasks (typical, atypical, unpredictable situations).*  
*Individual tasks:*

Task №1.

The doctor pushed the root into the jawbone soft tissues. The root is located under the mucous membrane of the alveolar part of the jaw and is clearly palpated by the finger. What is the doctor's tactics?

- A. Cut the soft tissue over the root and remove it
- B. Remove the root through the tooth socket
- C. Remove root through submandibular operative access
- D. Make a radiological examination of the patient to determine further tactics
- E. Leave root in soft tissues

Task №2.

A 27-year-old patient turned to a dentist for an exacerbation of chronic periodontitis 17. During the tooth extraction surgery, the palatal root got into the maxillary sinus. What is the doctor's tactics in this situation?

- A. Perform a radiological examination and send the patient to the hospital
- B. Fill the socket with iodine gauze
- C. Remove the root through the perforation formed
- D. Perform a sinus surgery
- E. Suture the socket of the removed tooth

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

Patient 32 years of age, was directed to remove the root of the 35 tooth due to exacerbation of chronic periodontitis. 2-3 minutes after the mandibular anesthesia, the patient began complaining of a feeling of compression in the throat, voice became loose, difficulty in breathing, there was swelling of the tongue, lower lip, tissues of the bottom of the mouth. What complication can this be? What is the doctor's tactics in this situation? 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 (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 level of knowledge:**

1. Anatomical and physiological features of the structure of the jaw bones and teeth.
2. Innervation and blood supply to hard and soft facial tissues.
3. Methods of teeth extraction on the upper and lower jaws. Stages of operation.
4. Methods of atypical tooth extraction of the upper and lower jaws.
5. Principles of performing first aid and cardiopulmonary resuscitation in the practice of dental surgeon.

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

1. Early local complications that occur during tooth extraction:
  - fracture of the tooth or its root;
  - fracture, dislocation of the neighboring tooth;
  - fracture of the part of the alveolar process;
  - fracture of the tuber of the upper jaw;
  - damage to soft tissues;
  - pushing the tooth or its root into soft tissues;
  - perforation of the bottom of the maxillary sinus;
  - hit the tooth or its root in the respiratory tract.
2. Late local complications that occur after tooth extraction:
  - bleeding from the alveolar socket;
  - alveolitis- alveolar pains.

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

1. Make the most probable diagnosis of local complications of tooth extraction, choose treatment tactics.
2. Make the most probable diagnosis of general complications of tooth extraction, choose treatment tactics.
3. Learn to read X-ray images with complicated deletions.
4. Perform a differential diagnosis of complications of tooth extraction.
5. Learn to exercise on the phantom dislocation corection of the lower jaw.
6. Perform the necessary medical manipulations (measure blood pressure and pulse, conduct auscultation of the heart and lungs, conduct venipuncture and connect a drip with the appropriate medications, administer medicines in person or sublingually, perform artificial respiration and indirect heart massage, fix the tongue).
7. Conduct on a phantom cardiopulmonary resuscitation (indirect heart massage and artificial respiration).

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

1. During the removal of 28 teeth, the patient had a fracture of the tuber of the upper jaw. What care should be given to the patient?
  - A. To remove the tuber, to mobilize the wound edges and to tighten the wound tightly.
  - B. Perform radical sinustomy with plastic closure of the oro-antral conjunction.
  - C. Remove the tuber and pad the wound with an iodine swab.
  - D. Perform osteosynthesis of the upper jaw.
  - E. Remove the tuber and drain the wound with tubular drainage.
  
2. The man went to the clinic for the removal of 17 teeth. During the tooth extraction surgery, one of the roots was pushed into the maxillary sinus. What is the doctor's tactics in this situation?
  - A. Carry out a radiological examination and send the patient to the hospital.
  - B. Do not take any action.
  - C. Remove root through perforated hole.
  - D. Perform a sinus surgery.
  - E. Suture the socket of the removed tooth.
  
3. The patient at the age of 44 years at the time of tooth extraction fractured his crown part. During further manipulation with the elevator, the forceps could not remove the root of the tooth. What kind of manipulation should the surgeon perform to successfully remove the root of the tooth:
  - A. Separate the roots with a drill and fissure bur.
  - B. Apply an angled elevator.
  - C. Send the patient to the hospital.
  - D. Finish deleting during another visit.
  - E. Apply the Lecluse elevator.
  
4. In the process of root extraction of the 38th tooth with Lecluse root elevator a dentist has pushed the root through into the perimandi-bular soft tissues. The root is situated under the alveolar arch mucosa and can be clearly palpated. What approach should the doctor choose in the given case?
  - A. Dissection of soft tissues covering the root followed by root extraction
  - B. To try and extract the root through the tooth socket
  - C. Surgical root extraction through extraoral submandibular way of access
  - D. Further actions can be determined only after X-ray examination
  - E. To leave the root in the soft tissues
  
5. The dentist surgeon applied S-shaped forceps to the crown of the 25 tooth and after the luxation movements performed the tooth traction. Thus there was a complication - a rupture of a mucous membrane of a cheek. How to prevent this complication:
  - A. Perform the stage of destruction of the circular ligament of the tooth.
  - B. Use a spatula to protect the alveolar process from the palatal side.
  - C. Use a spatula to protect the alveolar process from the sacral side.
  - D. With the fingers of the left hand to fix the alveolar process on both sides.
  - E. To perform rotational movements.

### **Literature:**

Basic:

1. Oral and Maxillofacial Surgery: Textbook, Part 1, 2 / V.O. Malanchuk. – Vinnytsia: Nova Knyha Publishers, 2011. – 453p.
2. Principles of Dental Local Anaesthesia and Teeth Removal / Ya. E. Vares, R. Z. Ogonovsky, Ch. R. Pohranychna – LNMU, 2007. – 63p.

3. Atlas of Human Anatomy / F. Netter – 2<sup>nd</sup> ed. – New Jersey: ICON Learning Systems. – 592 p.  
Additional:
1. 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. – 1477 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	<b>SURGICAL DENTISTRY</b>
Topic of the lesson	Topic №15. Retention and dystopia. Atypical tooth extraction. Stages of operation. Indications, instruments, techniques. Postoperative wound care. Final lesson " Oral Surgery Propedeutics ".
Course	3 <sup>rd</sup>
Faculty	Dental

**Actuality of the topic:** dental surgeon's clinical practice often has situations where it is impossible to perform or complete tooth or root removal with forceps and elevators. Due to the peculiarities of the placement of the tooth (eg retentive, semi-retentive, dystopic) or root (remnant of the apex of the root in the depth of the hole, features of the anatomical structure of the root, significant hypercementosis, etc.), which is radiological confirmed, atypical removal surgery proceed without making previous attempts at removal using other, less sophisticated methods. The surgery involves the removal (alveolectomy) or trepanation (alveolotomy) of the wall or jaw bone and the extraction of the exposed tooth (root).

**Aim of the lesson:** to teach students the stages of surgery atypical tooth extraction. To practice the technique of performing atypical tooth extraction on phantoms.

**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
Normal anatomy	Know the anatomical and physiological features of the	To be able to explain the structure of systems and organs

Normal physiology	<p>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>	of maxillo-facial area (MFA)
Topographical anatomy	To know the topography of the organs of MFA	To be able to explain the topography of the organs of MFA
Hystology	To know histological structure of soft and hard tissues of MFA	To be able to explain the stages of manufacturing of cytological, histological preparations

Pharmacology.	To know the pharmacological features of drugs used for premedication and local anesthesia.	To be able to characterize the drugs used for premedication and local anesthesia.
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Intradisciplinary integration:		
Topic 1. (Module 1). ... Provision, documentation of the surgical dental office and the hospital department. Methods of examination of surgical dental patient.	To know the provision, documentation of the surgical dental office and the hospital department. To have a method of examination of a surgical dental patient. To know the organization of work and equipment of the surgical department (office). To know additional methods of examination.	To be able to characterize the provision, documentation of the surgical dental office and the hospital department. To be able to explain the stages of examination of a surgical dental patient. To be able to explain the results of additional survey methods.
Topic 2. (Module 1) Aseptic and antiseptic. ...	To know the basic principles of aseptic and antiseptic.	To be able to explain how to treat the surgeon's hands, operating field and tools.
Topic 3. (Module 1) ... Local potential anesthesia.	To know the basic principles of medical preoperative preparation of the patient and the scheme of premedication.	To be able to explain the purpose and tasks of medical preoperative preparation of the patient.
Topic 4. (Module 1) Local anesthetics, their properties, side effects...	To know the pharmacological features of local anesthetics, indications and contraindications to use.	To be able to explain the pharmacological features of local anesthetics.
Topic 5, 6. (Module 1) Conductive anesthesia in the mandible: indications, methods of conducting. ...	To know the techniques of conducting anesthesia in the mandible. To know the clinical effect of anesthesia, the area of anesthesia.	To be able to explain the techniques of conducting anesthesia in the mandible. To be able to characterize the clinical effect of anesthesia, the area of anesthesia.
Topic 7, 8. (Module 1) Conductive anesthesia on	To know the techniques of conducting anesthesia on the upper	To be able to explain the techniques of conducting

the upper jaw: indications, methods of conducting. ...	jaw. To know the clinical effect of anesthesia, the area of anesthesia.	anesthesia on the upper jaw. To be able to characterize the clinical effect of anesthesia, the area of anesthesia.
Topic 11. (Module 1) Indications and contraindications to the operation of tooth extraction. Teeth Removal Tool.	To know the indications and contraindications to tooth extraction. To know the classification of tools for teeth extraction in the upper and lower jaws, signs of forceps and elevators.	To be able to identify the indications and contraindications to tooth extraction. To be able to select tools for tooth extraction on the upper and lower jaw.
Topic 12, 13. (Module 1) Methods of teeth extraction on the upper and lower jaws.	To know the techniques of teeth extraction on the upper and lower jaws.	To be able to explain the techniques of tooth extraction on the upper and lower jaws.

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

Duration of practical lesson is 3.5 academic hours – 2 hours. 40 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>30 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).	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>90 min.</b>			
	Formation of professional skills and abilities: 1.To work on a phantom technique of an operation of an atypical tooth extraction on the lower jaw. 2.To work on phantom technique of conducting an		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	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.	



	atypical tooth extraction on the upper jaw. 3. Assistance during the operation of atypical tooth extraction.		and written evaluation on standardized list of issues. Work with phantoms, view 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 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: «**Retention and dystopia. Atypical tooth extraction. Stages of operation. Indications, instruments, techniques. Postoperative wound care. Final lesson " Oral Surgery Propedeutics "**.»

Aim of the lesson: to teach students the stages of surgery atypical tooth extraction. To practice the technique of performing atypical tooth extraction on phantoms.

*Motivation of educational activity.*

Dental surgeon's clinical practice often has situations where it is impossible to perform or complete tooth or root removal with forceps and elevators. Due to the peculiarities of the placement of the tooth (eg retentive, semi-retentive, dystopic) or root (remnant of the apex of the root in the depth of the hole, features of the anatomical structure of the root, significant hypercementosis, etc.), which is radiological confirmed, atypical removal surgery proceed without making previous attempts at removal using other, less sophisticated methods. The surgery involves the removal (alvelectomy) or trepanation (alveolotomy) of the wall or jaw bone and the extraction of the exposed tooth (root).

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

*Questions to frontal survey:*

1. Indications before the operation of atypical tooth extraction.
2. The necessary instruments for the operation of atypical tooth extraction.
3. Methods of atypical removal of the teeth of the upper and lower jaws.
4. Wound healing after the operation of atypical tooth extraction.

5. Local complications in the operation of the atypical tooth, causes of their occurrence, clinical manifestations, treatment and prevention.
6. Preparation for tooth extraction in patients with various concomitant pathologies (diseases of the cardiovascular, respiratory, endocrine systems, gastrointestinal tract, neuropsychiatric sphere, hematological, infectious diseases).
7. Types of premedication before tooth extraction for patients with different concomitant pathology.

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

Conducting professional training.

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

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.

Atypical (surgical) tooth extraction - method of exodontias, which is performed with chisel and bur. It's indicated when tooth or root extraction cannot be performed with dental forceps or elevators only. This method most frequently is used to extract third lower molar. The surgical approach and direction of the incision depends on tooth or root position. Access to the tooth is achieved by forming and raising a mucoperiosteal flap. Then using bur and chisel remove portions of the bone that covers the tooth. Exposed tooth can be removed. Sharp bone edges should be smoothed, the flap is returned on place.

The surgical (atypical) teeth extraction including next stages: raising a flap, removal of bone, tooth division, removal of tooth / tooth fragments, primary closure.

*A typical instruction leaflet given to patients after an extraction*

#### ON THE DAY OF TREATMENT

- Do not rinse your mouth for at least 24 hours.
- Avoid hot fluids, alcohol, hard or chewy foods.
- Choose cool drinks and soft foods.
- Avoid vigorous exercise.
- Smokers should avoid smoking.
- Should the wound start to bleed, apply a small compress. This can be made of some cotton wool in a clean handkerchief. Place this on the bleeding point and bite firmly on it for 5-10 minutes or longer if necessary.
- If you cannot stop the bleeding yourself, please seek professional advice.
- Any pain or soreness can be relieved by taking the prescribed medication. If none was prescribed, take tablets such as paracetamol (Panadol) 2 tablets every 4 hours as required. Do not take more than the recommended number per day.

#### STARTING 24 HOURS LATER

• Gently rinse the wound with hot saltwater mouth rinses (or other rinse as recommended) for a few days. This should be carried out three times a day after each meal

- *Algorithms for the formation of professional skills.*

1. To collect anamnesis and to conduct a review of the patient with the pathology of the maxillofacial area.
2. To work on a phantom technique of an operation of an atypical tooth extraction on the lower jaw.
3. To work on phantom technique of conducting an atypical tooth extraction on the upper jaw.
4. Assistance during the operation of atypical tooth extraction.

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

Task №1.

Atypical tooth extraction involves:

- A. Use in addition to forceps and elevators of bone bur, scalpel, spreader.
- B. Removal under general anesthesia.

- C. Single-implantation.
- D. Removal of teeth with atypical structure.
- E. All of the above.

Task №2.

Indications for atypical tooth extraction:

- A. Removal of the retented tooth.
- B. Removal of dystopic and retented tooth.
- C. Removal of a semi-retented tooth.
- D. When tooth extraction is not possible with forceps and elevators.
- E. All options are correct.

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

Patient O., 23, was referred to a dental surgeon to remove 48 teeth according to orthodontic indications. Objectively, the face is symmetrical, proportional. Regional lymph nodes are not palpated. During the examination of the oral cavity, only the distal humps of the 48 tooth are visualized, the medial humps are covered with a pale pink mucosa, and on the radiograph, the roots of the 48 teeth are formed. The tooth is tilted on the axis by 45 °, the medial humps rests on the root of the 47 tooth. What type of anesthesia should be performed for atypical removal of 48 teeth? Justify your choice, describe and demonstrate your anesthesia technique. Which tool should you choose for atypical tooth extraction? What are the stages of the operation? What is the technique of working with the chosen toolkit? What is the follow-up medication for patients after atypical removal? What are the possible complications in the postoperative period?

### **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 atypical tooth extraction on mandible and maxilla.
- Evaluation.

Conduct standardized final control using individual test tasks and questions (20 min.), Work check (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 physiological features of the structure of the jaw bones and teeth.
2. Innervation and blood supply to hard and soft facial tissues.
3. Local conductive anesthesia on the upper and lower jaws.
4. Pharmacological features of preparations for local anesthesia and premedication.
5. Classification of tools for tooth extraction on the upper and lower jaws, signs of forceps and elevators. Classification of surgical instruments.

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

1. Indications before the operation of atypical tooth extraction.
2. The necessary instruments for the operation of atypical tooth extraction.
3. Methods of atypical removal of the teeth of the upper and lower jaws.

4. Wound healing after the operation of atypical tooth extraction.
5. Local complications in the operation of the atypical tooth, causes of their occurrence, clinical manifestations, treatment and prevention.
6. Preparation for tooth extraction in patients with various concomitant pathologies (diseases of the cardiovascular, respiratory, endocrine systems, gastrointestinal tract, neuropsychiatric sphere, hematological, infectious diseases).
7. Types of premedication before tooth extraction for patients with different concomitant pathology.

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

1. To work on a phantom technique of an operation of an atypical tooth extraction on the lower jaw.
2. To work on phantom technique of conducting an atypical tooth extraction on the upper jaw.
3. Assistance during the operation of atypical tooth extraction.

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

1. During the removal of 28 teeth, the patient had a fracture of the tuber of the upper jaw. What care should be given to the patient?
  - A. To remove the tuber, to mobilize the wound edges and to tighten the wound tightly.
  - B. Perform radical sinustomy with plastic closure of the oro-antral conjunction.
  - C. Remove the tuber and pad the wound with an iodine swab.
  - D. Perform osteosynthesis of the upper jaw.
  - E. Remove the tuber and drain the wound with tubular drainage.
  
2. The man went to the clinic for the removal of 17 teeth. During the tooth extraction surgery, one of the roots was pushed into the maxillary sinus. What is the doctor's tactics in this situation?
  - A. Carry out a radiological examination and send the patient to the hospital.
  - B. Do not take any action.
  - C. Remove root through perforated hole.
  - D. Perform a sinus surgery.
  - E. Suture the socket of the removed tooth.
  
3. The patient at the age of 44 years at the time of tooth extraction fractured his crown part. During further manipulation with the elevator, the forceps could not remove the root of the tooth. What kind of manipulation should the surgeon perform to successfully remove the root of the tooth:
  - A. Separate the roots with a drill and fissure bur.
  - B. Apply an angled elevator.
  - C. Send the patient to the hospital.
  - D. Finish deleting during another visit.
  - E. Apply the Lecluse elevator.
  
4. In the process of root extraction of the 38th tooth with Lecluse root elevator a dentist has pushed the root through into the perimandibular soft tissues. The root is situated under the alveolar arch mucosa and can be clearly palpated. What approach should the doctor choose in the given case?
  - A. Dissection of soft tissues covering the root followed by root extraction
  - B. To try and extract the root through the tooth socket
  - C. Surgical root extraction through extraoral submandibular way of access
  - D. Further actions can be determined only after X-ray examination
  - E. To leave the root in the soft tissues

5. The dentist surgeon applied S-shaped forceps to the crown of the 25 tooth and after the luxation movements performed the tooth traction. Thus there was a complication - a rupture of a mucous membrane of a cheek. How to prevent this complication:
- A. Perform the stage of destruction of the circular ligament of the tooth.
  - B. Use a spatula to protect the alveolar process from the palatal side.
  - C. Use a spatula to protect the alveolar process from the buccal side.
  - D. With the fingers of the left hand to fix the alveolar process on both sides.
  - E. To perform rotational movements.

**Literature:**

Basic:

1. Oral and Maxillofacial Surgery: Textbook, Part 1, 2 / V.O. Malanchuk. – Vinnytsia: Nova Knyha Publishers, 2011. – 453p.
2. Principles of Dental Local Anaesthesia and Teeth Removal / Ya. E. Vares, R. Z. Ogonovsky, Ch. R. Pohranychna – LNMU, 2007. – 63p.
3. Atlas of Human Anatomy / F. Netter – 2<sup>nd</sup> ed. – New Jersey: ICON Learning Systems. – 592 p.

Additional:

1. 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. – 1477 p.

## **Control methods.**

Control measures are a necessary element of feedback in the learning process. They determine the correspondence of the level of knowledge acquired by students with the requirements of the normative documents on higher education.

Control methods and assessment system are developed in accordance with the requirements of "Criteria, rules and procedures for evaluating the results of students' educational activities at the Danylo Halytsky LNMU, approved by the Academic Council of LNMU of 02/21/2018, protocol No. 1.

Control measures in the study of "Surgical dentistry" include current control and final control, which is called a semester test.

Before studying a new course, students have to take 'entrance control' test in order to determine the level of preparation of students to the discipline (based on the fundamentals of previous studies). Entrance control is carried out on the first lesson and is based on the assignments corresponding to the program of relevant discipline studied before. The results of the entrance control are analyzed at the department (chair) meetings and also involve the representatives of methodology committee as well as the teachers of the relevant discipline. According to the results of the entrance control test, students may be provided with individual assistance or with some measures of adjusting the educational process.

Current control is carried out on every practical lesson according to the specific goals of each topic. It is based on the comprehensive evaluation of the student's activity, which takes into account the entrance control test, the quality of practical work, the level of theoretical training, the level of performance in individual assignments according to the thematic plan and the results of the final control.

In the course of assessing the educational activity of students, the preference is given to standardized methods of control: test tasks, situational tasks, control questions, oral questioning, structured written work, structured control of practical skills in conditions that are close to real ones (algorithm -based).

Final control, which is a semester credit, is a form of summarizing control, which assesses the level of student solely on the basis of the results of certain types of work in practical classes. It is conducted in accordance with the curriculum in terms set by the schedule of the educational process and in the amount of educational material determined by the program of academic discipline.

Assessment procedure for the discipline of "Surgical Dentistry", presented by the two content modules, is rating-based and is made up of the sum of evaluation points of the current educational activity, which can be gained for theoretical knowledge and practical skills in accordance with the lists determined by the discipline program.

**Current control** is carried out during the training sessions and aims at checking students' acquisition of the material, the level of theoretical and practical training. Current control can be presented in the form of testing, solving situational problems, solving clinical situational problem, demonstration of practical skills or abilities, answers to standardized theoretical questions. Forms of assessment of the current educational activity are standardized and correspond to the standards of answers.

*Assessment of current educational activity.* Evaluation of current student's progress made on each practical lessons on the 4- point scale and recorded in the register of academic success.

Knowledge of students are evaluated both theoretical and practical training by the following criteria:

**"Perfect"** – the student perfectly mastered theoretical material, shows the deep and comprehensive knowledge of the relevant subject or discipline, the basic provision of the basic textbook and recommended literature, have the logical thinking and make the answer, freely use the acquired theoretical knowledge in the analysis of practical material, expresses his attitude to various problems, demonstrates the high level of practical skills;

**"Good"** – the student learned theoretical material good, has the main aspects of the basic textbook and recommended literature, the knowledge set reasonable; has the practical skills, expressed own views of the problem, but assume certain inaccuracies in the logic of the theoretical contents presentation or by the analysis of the practical contents;

**"Satisfactory"** – the student basically mastered the theoretical knowledge of the subject or discipline, oriented in the basic textbook and recommended literature, but unconvincingly answer, confuses the notions, additional questions arouse the student uncertainty or absence of stable knowledge, answering the practical questions reveals inaccuracies in knowledge, can not estimate the facts and events, link them to the future activities;

**"Unsatisfactory"** - the student has not mastered the subject (discipline) course material, does not know the scientific facts, definitions, hardly versed in the basic textbook and recommended literature, the scientific thinking is absent, practical skills are not formed.

### ***Evaluation of self-made student work***

Material for independent work of students, which is provided simultaneously with the practical classes and estimated during the current control of the theme on the appropriate practical classes. Self-made themes are evaluated and controlled during the final control.

The final control - semester credit is performed to assess learning outcomes on a national scale and ECTS scale.

The students, who attended all the stipulated discipline curriculum classes and scored for current progress score not less than the minimum are allowed to the final control. For students, who missed classes, with the dean permission is permitted to fulfill academic debt to the fixed period within the term.

**The semester credit** is the form of final control, which is consist in the evaluation assess of the educational material mastering exclusively on the basis of the certain types of work realization at the practical classes.

The semester test performed at the end before the examinations. Credits accept teachers, who conducted practical classes in the group or hold lectures in the discipline.

A student is considered to be admitted to semester control if all kinds of work provided the curriculum and the work program have been made.

The results of students work evaluation during the semester should be documented (included in the academic journal, credit - examination sheet, student Gradebook). Performed by students during the semester control tests, individual tasks are kept at the department during the year.

In the educational process of University, the following grading scales are used: multimark (200 -point) scale, the traditional 4- point scale and ECST rating scale. The results are converted from one scale to another according to the following rules.

In evaluating the mastering of each theme for current educational student activity the score by the 4- point scale (traditional) are set. This takes into account all types of work, provided the curriculum. The student must obtain an assessment of each theme. The assessment's forms of current educational activity should include control of theoretical and practical training. Marks of traditional assessment scale are converted into the points.

***The maximum number of points***, that a student can collect for current educational activity at the subjects study is 200 points.

***The minimum number of points*** that a student must collect for current educational activity for enrollment courses is 120 points.

*Calculating the number of points* is based on student evaluations received by traditional scale while learning subjects during the semester, by calculating the arithmetic mean rounded to two decimal places. The result value is converted into points by multi- scale as follows:

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

For convenience, a table converting 200 -point scale:

Table 1

Conversion of the average score for current activity in multimark scale for disciplines ending as a credit (differentiated credit)

4- points scale	200- points scale	4- points scale	200- points scale	4- points scale	200- points scale	4- points scale	200- points scale
5	200	4.45	178	3.92	157	3.37	135
4.97	199	4.42	177	3.89	156	3.35	134
4.95	198	4.4	176	3.87	155	3.32	133
4.92	197	4.37	175	3.84	154	3.3	132
4.9	196	4.35	174	3.82	153	3.27	131
4.87	195	4.32	173	3.79	152	3.25	130
4.85	194	4.3	172	3.77	151	3.22	129
4.82	193	4.27	171	3.74	150	3.2	128
4.8	192	4.24	170	3.72	149	3.17	127
4.77	191	4.22	169	3.7	148	3.15	126
4.75	190	4.19	168	3.67	147	3.12	125
4.72	189	4.17	167	3.65	146	3.1	124
4.7	188	4.14	166	3.62	145	3.07	123
4.67	187	4.12	165	3.57	143	3.02	121
4.65	186	4.09	164	3.55	142	3	120
4.62	185	4.07	163	3.52	141	Less then	Not enough
4.6	184	4.04	162	3.5	140	3	
4.57	183	4.02	161	3.47	139		
4.52	181	3.99	160	3.45	138		
4.5	180	3.97	159	3.42	137		
4.47	179	3.94	158	3.4	136		

Evaluation of the disciplines (subjects) which the final control is the **test** is based solely on the results of current training and expressed by two points national scale: "Passed" or "Not passed". To enroll the student must receive for current training activities at least 60 % of the maximum amount of points in the discipline (120 points). Scores are ranked on a scale of discipline ECTS (Table 3) for the above scheme.

Grade F (unsatisfactory with required repeated course) put at the test or differential credit to students who attended all subject (discipline) classes, but did not reach the minimum number of points for current educational activity. These students are not obtained credit and are not allowed to pass examinations.

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



Table 2

<b>Discipline scores</b>	<b>4 – point scale</b>
From 170 to 200 points	5
From 140 to 169 points	4
From 139 points to the minimal points number, which the student must score	3
Less then the minimal points number, which the student must score	2

Evaluation of ECTS to the traditional scale is not converted because the scale of ECTS and 4-point scale are independent.

Objectivity evaluation of educational activities of students tested statistically (correlation coefficient between ECTS assessment and evaluation on of national scale).

Scores of students enrolled in one specialty, given the number of points gained in the discipline ranked on a scale ECTS as follows:

Table 3

<b>Evaluation of ECTS</b>	<b>Statistical index</b>
A	The best 10 % students
B	The next 25 % students
C	The next 30 % students
D	The next 25 % students
E	The last 10 % students

Ranking of assigning ratings of "A", "B", "C", "D", "E" held for the students of the course, who are studying for one specialty and successfully completed the study subjects. Students, who received estimates FX, F («2») are not made to the list of students who ranked. Students with an estimate after repassing FX get automatically mark "E".