


MINISTRY OF HEALTH PROTECTION OF UKRAINE  
ODESSA NATIONAL MEDICAL UNIVERSITY  
FACULTY OF DENTISTRY  
DEPARTMENT OF ORTHOPEDIC DENTISTRY



METHODOLOGICAL DEVELOPMENT  
TO PRACTICAL LESSONS  
FROM EDUCATIONAL DISCIPLINE

Faculty **of dentistry**, course **5**

Educational discipline **Use of aesthetic approaches in planning orthopedic interventions**

Approved:  
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## **PRACTICAL LESSON No. 1**

**Topic: Anatomical and physiological foundations of aesthetics. The use of elements of aesthetics in the manufacture of orthopedic structures. Maxillofacial area. Chewing apparatus and dental-jaw system. The human body and the golden ratio. Face proportions.**

**Goal:** Acquaint applicants with the basics of aesthetics, with the structure of the maxillofacial system. Formation of the principles of medical ethics and deontology in applicants.

**Basic concepts:** aesthetics, chewing muscles, upper jaw, lower jaw.

**Equipment:** Computer, multimedia projector, phantoms.

### **Plan:**

1. Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

2. Control of the reference level of knowledge:

2.1. requirements for students' theoretical readiness to perform practical classes (knowledge requirements, list of didactic units);

Know:

- Aesthetics of the future restoration;
- Structure of the upper jaw;
- The structure of the lower jaw;
- Functions of masticatory muscles
- Contour forces
- Determination of the color of the patient's teeth

Be able:

- Palpate the masticatory muscles;
- Palpate TMJ
- Determine the color of the teeth according to the Vita scale;

2.2. questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

- History and clinical examination.
- Main complaints.
- Dental history.
- Medical history.

— Examination. External overview. The degree of reduction of the lower third of the face, the expression of facial skin folds, the degree of mouth opening (free, difficult).

3. Formation of professional skills, skills (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):

3.1 Content of tasks (tasks, clinical situations, etc.);

Movements of the lower jaw occur as a result of the complex interaction of masticatory muscles, temporomandibular joints and teeth, coordinated and controlled by the central nervous system. All movements of the lower jaw can be performed arbitrarily, under the control of the cerebral cortex. Movements of the lower jaw associated with the performance of its specific function, for example, chewing, are carried out reflexively or subconsciously. These movements occur when the mandibular brain centers are disturbed and can be either conditioned or unconditioned reflexes. To carry out such voluntary or reflex activity, motor centers need sensory information, which they receive with the help of peripheral nerve receptors. These receptors are located in periodontal ligaments, muscle fibers, structural elements of temporomandibular joints, tendons and mucous membrane. They transmit information to brain centers through afferent neurons.

The information received and transmitted by these receptors includes:

- 1) the degree of pressure on the teeth and its direction;
- 2) speed and force of muscle contraction;
- 3) muscle length;
- 4) degree of stretching of muscles, ligaments and tendons;
- 5) position of fixed and moving elements in space;
- 6) the relationship between the articular head and fossa in motion;
- 7) consistency, shape and taste of foreign bodies in the oral cavity.

The temporomandibular joint (*articulatio temporomandibularis*) is a paired articulation of the articular heads of the lower jaw with the articular surfaces of the high bones. The right and left joints physiologically form one system, movements in them occur simultaneously. According to its structure, the temporomandibular joint has a number of common features with other joints, but it also has specific features that determine its peculiar function. Each joint consists of a joint, articular process of the lower jaw, articular fossa of the tympanic part of the temporal bone, articular tubercle, disc, capsule and ligaments.

Incongruent, i.e. discrepancy in the size of the articular fossa and the articular head, is equalized thanks to two factors. First, the joint capsule is attached not outside the fossa (as in other joints), but inside it - at the front edge of the stony drum (glazer) gap, which causes the narrowing of the joint cavity. And, secondly, the articular disk, being located in the form of a biconcave plate between the articular surfaces, creates a different pit with its lower surface, more correspondingly the articular head.

The articular head is an ellipsoidal roller (length up to 20 mm, width up to 10 mm) at the end of the articular process of the lower jaw, covered with fibrous cartilage (Fig. 20). It consists of a thin layer of compact bone, under which there is spongy bone substance. The front surface of the articular process has a pterygoid fossa, where the lower bundles of the external pterygoid muscle are attached. The upper (smaller) bundles of this muscle are attached to the joint

capsule and disc. Incongruent articular surfaces create instability of intra-articular relationships, complete dependence of these relationships on the closing of the tooth rows, the state of the masticatory muscles.

The articular head, making excursions along the posterior slope of the articular tubercle, normally transmits masticatory pressure through the articular disc to the thick bony articular tubercle. Such topographic relations are normally supported by the occlusion of the tooth rows and the tension of the external pterygoid muscles. In case of occlusion disorders and displacement of the articular heads, microtrauma of the soft tissues of the joint occurs, and then inflammatory and degenerative processes, pain and dysfunction of the joint occur.

The articular disc is a biconcave plate of oval shape with anterior and posterior thickenings (poles).

It consists of dense fibrous connective tissue similar to cartilage and contains cartilage cells. The disc is located between the articular surfaces, repeats their shape, increases the area of contact, cushions the chewing pressure falling from the head to the articular fossa. Its lower surface forms, as it were, a sliding fossa for the articular head. The disc is fused along the edges with the capsule of the joint, therefore it divides the cavity of the joint into two parts - upper and lower. The volume of the upper part is 1.5 ml, and the lower one - about 0.5 ml. In the upper part, mainly translational movements of the articular head and sliding of the disc along the slope of the articular tubercle take place, and in the lower part there are rotational movements of the articular head around the horizontal axis. Both departments perform a single function, as movements occur simultaneously. The fibers of the upper bundle of the external pterygoid muscle intertwine in the front part of the disc, causing its movement along the posterior slope of the articular tubercle down and forward. In addition, due to its elasticity, the disc is a buffer between the articular surfaces, which weakens chewing blows.

The joint capsule of TMJ consists of two layers: outer (fibrous) and inner (synovial). The synovial layer is lined with endothelial cells that secrete synovial fluid, which facilitates the friction of the joint surfaces. This fluid is also an immunobiological environment to protect the joint from the introduction of infection.

Masticatory muscles:

Masticatory muscle, *m. masseter*, starts from the lower edge of the zygomatic arch (*punctum fixum*, i.e. a fixed point) in two parts: superficial and deep. The superficial part (*pars superficialis*) begins with tendon bundles from the front and middle parts of the zygomatic arch; the deep part (*pars profunda*) begins directly with muscle tissue from the middle and back sections of the zygomatic arch, goes obliquely down and forward. Both parts are connected and attached to the outer surface of the branch and the angle of the jaw in the area of *tuberositas masseterica* (*punctum mobile* or moving point). The main function of the muscle consists in lifting the lower jaw, and the superficial part is also involved in pushing it forward.

Lateral pterygoid muscle, *m. pterygoideus lateralis (externus)*, begins in two parts: the upper one - from the *fades infraorbitalis* and *crista infratemporalis* of the large wing of the main bone and is attached to the articular bag of the temporomandibular joint and the articular disc, pulling it forward during contraction. The lower head starts from the outer surface of the *lamina lateralis processus pterygoideus* of the main bone and, going back, is attached to the *fovea pterygoidea* of the lower jaw. With one-sided contraction, it moves the lower jaw to the opposite side, with bilateral contraction, it pushes it forward.

Medial pterygoid muscle, *m. pterygoideus medialis (interna)*, starts from the walls of the *fossa pterygoidea* of the main bone (*punctum fixum*, that is, a fixed point), goes back and down, attaching to the *tuberositas pterygoidea* of the lower jaw (*punctum mobile*, that is, a moving point). With bilateral reduction, it raises the lowered lower jaw and helps to push it forward; with one-sided reduction, it will mix the jaw and the opposite side.

Temporal muscle, *m. temporalis*, is located in the temporal fossa, starting from the temporal surface of the large wing of the main bone and the scale of the temporal bone (*fixed point* or *punctum fixum*). The temporal muscle can be divided into three components: anterior, middle and posterior.

The bundles of muscles, going down, convert and invert the powerful tendon, which passes medially from the zygomatic arch and is attached to the coronal process (*mobile point* or *punctum mobile*) of the lower jaw. When all the bundles are shortened, the muscle raises the lower jaw, when the middle and rear bundles are shortened, the forward-protruding lower jaw is pulled back.

Maxillohyoid muscle, *m. mylohyoideus* (Figs. 9, 10, 12, 13), flat, irregularly triangular in shape. It starts from the *linea mylohyoidea* (*internal oblique line - linea obliqua interna*). The bundles of the muscle go from top to bottom, back to front and, connecting along the middle line with the same bundles of the opposite side, form a seam - *raphe m. mylohyoidei*, which participates in the formation of the floor of the oral cavity and is also called the diaphragm of the oral cavity. The back bundles of the muscle are attached to the front surface of the body of the hyoid bone. The muscle does not have a permanent fixed point of attachment, i.e. *punctum fixum*, when the lower jaw is fixed, it pulls the hyoid bone up and forward, when the hyoid bone is fixed, it participates in lowering the lower jaw.

Double abdominal muscle, *m. digastricus* or *biventer* (Figs. 7, 9, 10, 12, 13), has two bellies, front and back, which are connected to each other by a tendon. The anterior abdomen (*venter anterior*, marked with an arrow in Fig. 12) begins in the *fossa digastrica mandibulae*, goes back and down and passes into the tendon, which is attached to the body of the hyoid bone by a process of the middle fascia of the neck; this tendon, bending back and up, passes into the posterior abdomen (*venter posterior*), which is attached to the *incisura mastoidea* of the temporal bone. With a fixed hyoid bone, it participates in lowering the lower jaw; with a fixed lower jaw, the biceps muscle pulls the hyoid bone up.

Muscles that take part in the act of chewing:

Chin-hyoid muscle, *m. geniohyoidcus* (Figs. 9, 10, 13), starts from the chin of the spine of the lower jaw, goes down and slightly back, being located above *m. mylogyoideus*, and is attached to the front surface of the hyoid bone; with a fixed hyoid cyst, it participates in lowering the lower jaw; when the lower jaw is fixed, it pulls the hyoid bone up and forward.

Chin-lingual muscle, *m. gcnioGLOSSUS*, fig. 9, 10, is located directly under the mucous membrane and is attached through an aponeurosis to the elevation located in the center of the lingual surface of the lower jaw (*spina mentalis*); its fibers go on both sides of the frenulum of the tongue and are attached to the fascia under its back, partially merging with the longitudinal and vertical muscles of the tongue (Fig. 14).

When this muscle is shortened, the tongue is pushed forward from the oral cavity, and when it is unilaterally shortened, it is also forward, but with the tip deflected in the opposite direction.

The hypoglossal muscle (*m. hyoglossus*) is located deeper than the chin-hyoid muscle, partially covering it. When contracting, this muscle lowers the root of the tongue, thanks to which a small indentation is formed on the tongue between the back of the tongue, on the one hand, and the hard and soft palate, on the other, along which the edible ball moves during the process of swallowing food.

The subcutaneous muscle of the neck, *platysma*, in the form of a thin muscle plate is located under the skin of the neck, tightly growing with it. Muscular bundles of the *platysma*, starting in the chest area at the level of the 2nd rib, are directed upward and medially, intertwining with the bundles of the opposite side, attached to the edge of the lower jaw, participating in its lowering; lateral bundles of *platysma* pass to the face, reaching the corner of the mouth, and when shortened, pull it down and outward.

3.2. recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.);

3.3. requirements for work results, including registration;

- Conduct an examination of a patient with partial absence of teeth.
- Palpate the masticatory muscles.
- Perform TMJ palpation.
- Determine the tactics of treatment of a patient with partial absence of teeth in the clinic of orthopedic dentistry.

3.4. control materials for the final stage of the lesson: tasks, assignments, tests, etc. (if necessary).

control materials for the final stage of the lesson: tasks, assignments, tests, etc. (if necessary).

1. The shift of the lower jaw to the right is facilitated by the contraction of the following muscle:

- A. right medial pterygium;
- B. left medial pterygoid;
- C. right lateral pterygium;
- D. left lateral pterygoid;
- E. both maxillo-hyoid.

2. Which of the listed muscles are masticatory:

- A. buccal, temporal, zygomatic, actually chewing;
- B. temporal, which raises the upper lip, transverse of the nose;
- C. lateral and medial pterygoid, temporal and actually masticatory;
- D. temporal, chin, zygomatic major and minor, chin;
- E. cheek, chin, large zygomatic muscles.

3. What muscles move the lower jaw forward?

- A. temporal;
- B. internal pterygoids;
- C. external pterygoid;
- D. double-abdominal;
- E. actual chewing.

4. Combined joints are characterized by the presence of:

- A. movements around 2-3 axes;
- B. movements that occur simultaneously in 2 joints;
- C. 2-3 or more articular surfaces;
- D. discs, menisci, ligaments in the joint cavity;
- E. all of the above.

5. What chewing movements can the lower jaw perform:

- A. sagittal and transversal;
- B. sagittal and vertical;
- C. sagittal, vertical, transversal;
- D. sagittal, vertical, horizontal;
- E. vertical, horizontal, transversal.

6. How does the articular head move n / h when moving n / h on the side of contraction?

- A. the articular head moves down forward and slightly outward;
- B. the articular head rotates along its axis;
- C. the articular head moves down and along its axis;
- D. the articular head moves forward and deep;

E. the articular head does not move.

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4. Summary:

4.1 What is the specificity of the structure and function of the temporomandibular joints compared to other joints?

4.2. How and with what muscle is the articular disc articulated in the front and central parts?

4.3. Fibers of which muscles, penetrating into the inner parts of the articular discs, are determined to ensure active tension of the disc?

4.4. Where is the synovial fluid of the temporomandibular joints located and what function does it perform?

4.5. What layers does the masticatory muscle consist of, and during which movement of the lower jaw is it active?

4.6. What type of movements is the upper lateral pterygoid muscle responsible for, and what is the lower lateral pterygoid muscle responsible for?

4.7. How many parts does the temporalis muscle consist of, and what functions does it perform?

4.8. what muscles interacts with the medial pterygoid muscle when lifting the lower

5. List of recommended literature (main, additional, electronic information resources)

Main:

1. Orthopedic dentistry: textbook / Rozhko M.M., Nespryadko V.P., I.V. Paliychuk and others; under the editorship M.M. Rozhka, V.P. Nespryadka. - K.: Medical Center "Medicine"; 2020. - 720 p.

2. Rozhko M.M., Nespryadko V.P., Mykhaylenko T.M. and others. Dentoprosthetic technique. K.: Book plus; 2016. 604 p.

3. Rozhko M.M., Popovych Z.B., Kuroyedova V.D. Dentistry. Textbook. K.: Medical University "Medicine"; 2018. 872 p.

Additional:

4. Dentistry: in 2 books. : textbook. Book 2 / M.M. Rozhko, I.I. Kirylenko, O.G. Denisenko and others. ; under the editorship M.M. Horn — 2nd edition. — K.: VSV "Medicine", 2018. — 992 p. ; color kind.

5. Materials science in dentistry: a study guide / [Korol D.M., Korol M.D., Ojubeiska O.D. etc.]; in general ed. King D.M. – Vinnytsia: New book, 2019. – 400 p.

Electronic information resources:

- State Expert Center of the Ministry of Health of Ukraine <http://www.dec.gov.ua/index.php/ua/>

- National scientific medical library of Ukraine <http://library.gov.ua/>



## **PRACTICAL LESSON No. 2**

**Topic: Clinical examination of patients with defects of teeth and dental rows. Special examination methods. Drawing up an aesthetic treatment plan. Peculiarities of preparing the oral cavity for prosthetics depending on the choice of prosthesis design.**

**Goal:** Acquaint applicants with modern clinical examination and methods of oral cavity preparation for prosthetics. Formation of the principles of medical ethics and deontology in students.

**Basic concepts:** history, diagnosis, radiography, tomography, galvanometry, electromyography.

**Equipment:** Computer, multimedia projector, phantoms.

### **Plan:**

1. Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

2. Control of the reference level of knowledge:

2.1. requirements for students' theoretical readiness to perform practical classes (knowledge requirements, list of didactic units);

Know:

- Tasks of orthopedic treatment;
- Rules for keeping an orthopedic patient's medical history;
- Additional special examination methods;

Be able:

- Draw up a treatment plan for a dental patient;
- Correctly interpret the data of the anamnesis and objective examination of the patient to make a diagnosis;

2.2. questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

- History and clinical examination.
- Main complaints.
- Dental history.
- Medical history.
- Examination. External overview. The degree of reduction of the lower third of the face, the expression of facial skin folds, the degree of mouth opening (free, difficult).

3. Formation of professional skills, skills (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):

3.1 Content of tasks (tasks, clinical situations, etc.);

On the basis of the received data, a diagnosis is formulated and a treatment plan is drawn up, which often includes a number of consecutive measures, the purpose of which is not only to restore the integrity of the tooth rows, but also to eliminate other morphological disorders, as well as to normalize the functions of the organs of the maxillofacial system and the muscles of the oral and perioral regions. Among these measures, prosthetics is usually the last and final.

Designs of prostheses are designed by the doctor taking into account the entire medical complex, and the question of preparing the patient for the chosen method of prosthetics is decided accordingly.

The peculiarity of the diagnosis in the orthopedic dentistry clinic is that the main disease for which the patient consults a doctor is usually a consequence of other diseases (caries, periodontal disease, trauma, etc.). The essence of the diagnosis is a violation of the integrity or shape of the teeth, dental rows or other organs of the maxillofacial system and their functions. Additionally, data on complications of the condition and concomitant diseases (dental and general) are entered.

Thus, the diagnosis should consist of two parts: 1) the main disease and its complications; 2) accompanying diseases - dental and general. A question may arise as to which disease should be considered the main one, and which one should be considered secondary. The majority of clinicians recommend to consider as the main disease that: 1) is more serious in terms of preserving work capacity, health and life, 2) brought the patient to the doctor at the present time, that is, the one about which he applied; 3) on the treatment of which the main attention of the doctor is directed.

3.2 Preparing the patient for dental prosthetics

The success of prosthetics depends not only on the diligent performance of clinical and laboratory stages, but also on how correctly the patient's preparation plan was drawn up and executed. Preparation for prosthetics begins with sanitation of the oral cavity, that is, with general health measures. The latter are a mandatory part of any plan of preparation for prosthetics. This includes removal of dental deposits, treatment of diseases of the mucous membrane, simple and complicated caries (pulpitis, periodontitis), removal of teeth and roots that cannot be treated.

In addition to general recreational activities, special preparatory events are also held. They follow the rehabilitation of the oral cavity and, in contrast to it, have a direction determined by the method of prosthetics.

Special training includes a number of therapeutic, surgical and orthopedic measures, the volume and sequence of which largely depend on the design of the prosthesis.

Therapeutic special preparation of the oral cavity for prosthetics. It should include depulping of teeth that are not affected by caries, only according to certain indicators.

Depulping is an extreme measure, which should be carried out in the following indications:

1) if it is necessary to polish a significant layer of hard tissues of the tooth, when preparing it for a semi-crown, inlay, plastic or porcelain crown, if a wide cavity of the tooth is determined radiographically;

2) if there is a need for a significant shortening of the crown of the tooth, which violates the occlusal surface, when there are no indications for an instrumental and surgical method of treatment, and the study of the radiograph of the tooth and diagnostic models indicates the need for its depulping;

3) before splinting of the frontal teeth, in case of periodontitis, periodontosis, when after studying the diagnostic models and radiographs, a significant reduction of the clinical crowns of the teeth is shown, which is impossible without their prior depulping, even under anesthesia;

4) with pathological abrasion of the third degree, when there is a decline of the crown part of the teeth by  $2/3$  or more of its height and the decrease of the interalveolar ridge is not compensated by the reconstruction of the alveolar process, and on the X-ray the cavity of the tooth and the root canals are not completely obliterated, preliminary depulping for the manufacture of pins is shown structures;

5) when persistent hyperesthesia occurs after tooth preparation, which does not go away after repeated treatment (electrophoresis with silver) or when the pulp is exposed;

6) depulping of teeth inclined into a defect and intended as a support for bridge-like and braced prostheses depends on the amount of inclination;

7) indications for preliminary depulping of teeth for the purpose of prosthetics are expanded depending on the degree of exposure of their roots.

Absolute contraindications to depulping:

a) hypertensive disease of the third stage (during a crisis);

b) myocardial infarction within 6-12 months after its occurrence;

c) clenching of the jaws (of different nature);

d) microstomia of various genesis (scars after burns, injuries, etc.);

e) epileptic status;

f) the mental deficiency of the patient (oligophrenia, etc.), which makes contact with him difficult.

Surgical special training includes:

1) removal of single teeth,

2) correction of the shape of the alveolar process,

- 3) plastic surgery of the alveolar process,
- 4) creating an artificial hole,
- 5) insertion of a metal subperiosteal or other implant,
- 6) preparation of the hard palate,
- 7) elimination of stretch marks and scars on the mucous membrane of the prosthetic bed,
- 8) deepening of the vestibule and floor of the oral cavity.

Orthopedic and (or) orthodontic special preparation of the oral cavity:

- alignment of the occlusal surface of the tooth rows by increasing the bite
- alignment of the occlusal surface of the tooth rows by shortening the teeth

Medical history. The medical history or ambulatory card of a dental patient is a mandatory official and medical document in which the examination data, diagnosis, orthopedic treatment plan and its implementation are entered. All data must be recorded consistently and completely, so that not only the medical history can be filled out, but also another doctor can form a complete picture of the patient, the validity of the chosen method of prosthetics and its result. For a young person who is just starting his practice as a doctor, it is not superfluous to remember that this document, reflecting the dynamics of the development of the disease, the method of treatment and its result, is at the same time a certificate of medical maturity, which indicates the level of clinical thinking of the doctor, his capacity for work.

The medical history must be filled in so that the sequence of treatment can be carried out. In other words, another doctor who will continue to treat the patient, based on the records, must clearly imagine the clinical picture that existed before the treatment, the validity of the diagnosis and the method of treatment.

The medical history in some cases can play the role of a legal document, so the entries in it should be clear and given in sufficient volume.

Scheme for filling out medical history

I. Official data (full name, age, profession, address)

II. Complaints of the patient (violations of chewing, aesthetics, defect of crowns, mobility, increased wear of teeth, pain in the temporomandibular joint; pain under the base of a schematic prosthesis, pain in a tooth under an artificial crown, etc.)

III. Anamnesis of the disease (transmitted and accompanying diseases, hereditary diseases; development of the real disease - indicates whether the patient has a connection between the pathology of the teeth and working conditions, living conditions, transferred diseases, at what age did he start losing teeth and which ones, in what sequence, etc.)

IV. Objective data:

A) External examination (type of face, condition of the skin of the face, prominence of the chin and nasolabial folds, the nature of closing the lips, corners of the mouth, position of the chin, height of the lower third of the face)

B) Examination of the temporomandibular joint (the degree of mouth opening, the nature of the movement of the lower jaw, the presence of confusion of the lower jaw, palpation data of the heads of the lower jaw, auscultation data).

B) Examination of the oral cavity (general characteristics of the mucous membrane of the oral cavity, salivation, state of oral hygiene, dental formula, type of bite, dental examination, periodontal examination, number of antagonizing pairs of teeth, characteristics of dentition defects, condition of the edentulous alveolar process of the upper jaw, characteristics of the relief of the hard palate, characteristics of the mucous membrane of the prosthetic bed on the upper jaw, the state of the bone base of the prosthetic bed on the lower jaw, characteristics of the mucous membrane of the prosthetic bed on the lower jaw, the size and shape of the sublingual space, the size and shape of the sublingual space in the front lower jaw, submandibular salivary glands, size and tone of the tongue, tone of the muscles of the floor of the mouth, cheeks and lips)

V. Data of special examination methods:

1. X-ray characteristics of teeth and peri-dental tissues
2. Data of X-ray examination of TMJ.
3. Tomography and teleroentgenography data.
4. Data on the study of diagnostic models of the jaws.

VI. Diagnosis and differential diagnosis.

Based on the data of the patient's clinical examination, a diagnosis is made, which should consist of the main and secondary.

1. The main disease and its complications:

a) the main disease refers to the one that prompted the patient to go to the orthopedic clinic;

b) complications should include those disorders that are pathogenically related to the main disease.

2. Associated diseases are those treated by dentists

other profiles. If necessary, differential diagnosis is carried out.

3. In the diagnosis "Partial loss of teeth" it is necessary to specify the type of tooth row defect according to Kennedy, and "Complete loss of teeth" - the type of toothless jaw according to I.M. Oxman.

VII. Oral cavity preparation plan for prosthetics:

1. General sanitation measures (removal of dental deposits, treatment of teeth, removal of roots and teeth with mobility of the III degree, treatment of diseases of the mucous membrane of the oral cavity, etc.)

2. Special preparation of the oral cavity (depulpation of teeth, elimination of occlusal disorders, orthodontic preparation, alveolotomy, excision of scars, transfer of the attachment site of frenulums, mucous cords, deepening of the vestibule of the mouth, floor of the oral cavity, etc.).

### VIII. Orthopedic course plan.

Specify the type of prosthetics (immediate, near, remote). To justify the choice of the design of the prosthesis as a treatment tool.

### IX. Diary of orthopedic treatment.

All visits to the patient are recorded with the date and a detailed description of the performed clinical procedures. During the repeated visits of the patient after the prosthesis has been applied, complaints, objective research data, the nature of the assistance provided and the peculiarities of the patient's getting used to the prosthesis are described. To evaluate the immediate results of prosthetics (prosthetic quality, functional properties, state and reaction of prosthetic bed tissues, number of corrections, patient feedback, etc.)

### X. Epicrisis and prognosis of orthopedic treatment.

P.I.B. are indicated. , age and complaints of the patient on the day of the visit to the clinic. What was the diagnosis? Beginning and end of treatment. The type of prosthetics and the design of the prosthesis.

Describe the patient's condition as a result of the treatment and indicate the prognosis.

1. recommendations (instructions) for the performance of tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.);

2. requirements for work results, including registration;

– Conduct an examination of a patient with partial absence of teeth.

– To analyze the results of the examination of a dental patient with partial absence of teeth.

– Make a plan for an additional examination of a patient with partial missing teeth.

– Explain the results of clinical and special (additional) research methods.

– To determine the tactics of treatment of a patient with partial absence of teeth in the clinic of orthopedic dentistry.

3. control materials for the final stage of the lesson: tasks, assignments, tests, etc. (if necessary).

1. A 35-year-old female patient complains of a metallic taste in her mouth, a sour feeling when chewing food, burning of the tongue, impaired salivation, headache, irritability, which appeared 2 months after prosthetics. Objectively: in the oral cavity there are bridge-like prostheses with support at 45, 47, 35, 37 made of stainless steel and gold crowns at 15, 16, 17. The lateral surfaces of the tongue are hyperemic, there is slight swelling. Which method of examination is the most informative?

A. General blood test

B. Measurement of potential difference

- C. Try for Kulazhenko
- D. Determination of trace elements of saliva
- E. Determination of pH of saliva

2. Patient P., 40 years old. Complaints about bleeding gums, hyperemia, edema. What method of functional diagnostics is used to determine the state of periodontal vessels for orthopedic treatment?

- A. Radiography
- B. Rheoperiodontography
- C. Galvanometry
- D. Mastication
- E. Myography

3. A 28-year-old patient complains of a broken crown of the 23rd tooth. Objectively: there is filling material in the mouth of the root canal, percussion is painless. What are the doctor's tactics?

- A. Remove the 23rd tooth
- B. Restore the 23rd tooth with photopolymer
- C. Make a crown according to Belkin.
- D. Make a pin tooth
- E. X-ray examination of tooth 23

4. A military serviceman applied to the dental office of the medical unit for prosthetics of missing 14, 15, 16, 24, 25, 26 teeth. Loss of what percentage of masticatory efficiency according to Agapov with an intermittent defect is an absolute indicator for prosthetics of a serviceman?

- A. 18-20%
- B. 27-30%
- C. 38-40%
- D. 50-64%
- E. 44-46%

5. Patient L., 37 years old, applied to the clinic of orthopedic dentistry for the purpose of prosthetics in connection with the loss of the central incisor on the upper jaw as a result of trauma. I have not had prosthetics before. History: bronchial asthma. What are the primary measures to prevent bronchospasm?

- A. Make a temporary structure
- B. Conduct allergy tests for sensitivity to plastics and metals
- C. Carry out dissection after anesthesia
- D. Apply sedatives
- E. Treat the teeth with a remineralizing solution

6. An 18-year-old woman applied in connection with a domestic facial injury. During the examination: in 21, 1/3 of the crown of the tooth was broken, probing along the line of the fracture is painful, the reaction to a cold stimulus is short-term pain, percussion is painless. What research is necessary to make a diagnosis and choose a treatment method?

- A. Electroodontometry +
- B. radiography
- C. Thermometry
- D. Luminescent diagnostics
- E. Vital coloring

7. The patient, 42 years old, complained of burning tongue, impaired taste, dry mouth. Suffers from chronic cholecystitis. Objectively: the oral cavity is sanitized. In 36,46 fillings with amalgams. Golden bridge prosthesis with supports 23,26. Single crowns with MZP 45,44, when touched with an iron, painful sensations are determined. What research should be conducted first of all to establish a diagnosis?

- A. Measurement of microcurrents of the oral cavity +
- B. Every sample.
- C. Determination of pH of saliva.
- D. Determination of taste sensitivity.
- E. Definition of traumatic occlusion.

8. A 52-year-old patient complained of a metallic taste in his mouth and burning tongue. About: defects of the dentition of the upper and lower jaw are replaced by soldered bridge prostheses made of stainless steel. What research should be conducted?

- A. Galvanometer +
- B. Gnathodynamometry
- C. Mastication
- D. Occlusionography
- E. Electromyography

9. A 55-year-old patient underwent elective teeth grinding. what research method should be used to control it?

- A. Occlusionography +
- B. Periodontogram
- C. Chewing test
- D. Odontodiagnostics
- E. Gnathodynamometry



10. Patient M., 50 years old, was shown placement of implants on the upper and lower jaw for the purpose of prosthetics. Which additional research method should be preferred when planning implantological treatment?

- A. Orthopantomography +
- B. Electromyomastography
- C. Masticatory dynamometry
- D. Myotonometry
- E. Myography

#### 4. Summary:

- Examination of the patient. Life history and disease history. Examination, survey, percussion, palpation.
- Additional examination methods. Study of diagnostic models.
- Clinical examination methods.

5. List of recommended literature (main, additional, electronic information resources)

#### Main:

1. Orthopedic dentistry: textbook / Rozhko M.M., Nespryadko V.P., I.V. Paliychuk and others; under the editorship M.M. Rozhka, V.P. Nespryadka. - K.: Medical Center "Medicine"; 2020. - 720 p.

2. Rozhko M.M., Nespryadko V.P., Mykhaylenko T.M. and others. Dentoprosthetic technique. K.: Book plus; 2016. 604 p.

3. Rozhko M.M., Popovych Z.B., Kuroyedova V.D. Dentistry. Textbook. K.: Medical University "Medicine"; 2018. 872 p.

#### Additional:

4. Dentistry: in 2 books. : textbook. Book 2 / M.M. Rozhko, I.I. Kirylenko, O.G. Denisenko and others. ; under the editorship M.M. Horn — 2nd edition. — K.: VSV "Medicine", 2018. — 992 p. ; color kind.

5. Materials science in dentistry: a study guide / [Korol D.M., Korol M.D., Ojubeiska O.D. etc.]; in general ed. King D.M. – Vinnytsia: New book, 2019. – 400 p.

#### Electronic information resources:

- State Expert Center of the Ministry of Health of Ukraine <http://www.dec.gov.ua/index.php/ua/>

- National scientific medical library of Ukraine <http://library.gov.ua/>

- National Library of Ukraine named after V.I. Vernadskyi <http://www.nbuv.gov.ua/>

**Topic: Planning metal-ceramic and all-ceramic restorations taking into account the anatomical and physiological features of the patient. Planning and manufacturing of highly aesthetic fixed structures.**

**Goal:** To acquaint students with the manufacturing method and planning of metal-ceramic and solid cast crowns

**Basic concepts:** Metal-ceramic crowns, all-cast crowns, aesthetics of unchanged structures.

**Equipment:** Computer, multimedia projector, phantoms.

**Plan:**

1. Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

2. Control of the reference level of knowledge:

2.1 Indications for the manufacture of a metal-ceramic crown.

- Features of tooth preparation for a metal-ceramic crown.
- Know the clinical and laboratory stages of making metal-ceramic crowns.

- Indications for the manufacture of a solid crown.

- Peculiarities of preparing teeth for a solid crown.

- Know the clinical and laboratory stages of production of solid crowns.

- Aesthetic requirements for a metal-ceramic crown

2.2. questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

1. To be able to prepare a tooth for a metal-ceramic crown.

2. To be able to prepare a tooth for an integral crown.

3. Formation of professional skills, skills (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):

3.1 Content of tasks (tasks, clinical situations, etc.);

Preparation is a preparatory stage of processing a tooth, during which the doctor evenly rounds off the layers of dentin and tooth enamel from the surface. Correct grinding ensures the tightest fit of prostheses to the stump: inlays, dental crowns, bridges. Depending on the material of the orthopedic structures, the teeth can be subjected to strong or minimal grinding. For example, a larger layer of tooth enamel should be polished under metal-ceramics than when prosthetics are made with zirconium or ceramic crowns.

In this topic, we talk about the methods of preparing teeth, and what features each type of grinding has. Rules for grinding teeth. The doctor must prepare the

patient: explain that you cannot move sharply during the dissection, and if necessary, you must give a sign with your left hand.

Facing living teeth under a metal-ceramic crown is performed only under anesthesia. The preparation is carried out as sparingly as possible: the doctor should not grind hard tissues more than is necessary to restore the tooth with a crown while preserving its anatomical shape. It is possible to grind teeth continuously: there should be frequent breaks during processing, during which the tooth is irrigated with water to avoid overheating of hard tissues.

Before work, the dentist must check the technical condition of the drill and the fixation of burs in the tip for turning. Features Let's consider the main features of the preparation: It is important to start work from the lateral surfaces so that the adjacent teeth are not damaged, while approximately 0.3 millimeters of the surface is removed. When installing a metal-ceramic crown, the nerve must be removed from the tooth. Then it is processed and a ledge is made. The ledge for the porcelain crown should be approximately 0.1 millimeters, and the stump should be conical or cylindrical in shape. Plastic crowns are also processed similar to the processing of porcelain products. The ledge for the stamped crown should be from 0.2 to 0.3 millimeters, and the tooth is given the shape of a cylinder. How thick the tooth will be is individual for each patient.

Types of tooth preparation for crowns.

1) Tunnel turning. Refers to the classic method of turning under a metal-ceramic crown, in which the teeth are polished using a drill and a tip made of metal or diamond. High revolutions of the turbine device can lead to overheating, so a stream of water is supplied simultaneously with the treatment. The advantages of this type of preparation include control over the removed layers, which makes it possible to predict the result. But the drill can also often injure the mucous membrane, form microcracks and chips on the tooth.

2) Ultrasound preparation. Such grinding of teeth under crowns is painless and atraumatic. After preparation with ultrasound, the polished teeth remain free of chips, damage to the enamel, injuries of the nerve bundle - during treatment, the device does not come into contact with the teeth. The method can be used only in cases where it is necessary to drain a small amount of dental tissues.

3) Laser treatment. A modern method of grinding teeth with caries or under a crown. The laser instantly heats the water in the surface tissues of the enamel, which leads to microscopic destruction in the tooth. Tooth fragments are removed using a water-air mixture. Such turning is more expensive than others, but the price is justified by the maximum speed of the procedure, low-traumatic, painless. Removal of hard fabrics with an air-abrasive mixture.

The principles of tooth preparation with an abrasive jet consist in fast and accurate processing of hard tissues without heating them. A mixture of water and abrasive particles is supplied under high pressure, providing painless turning. The

method is especially suitable for clinical cases of grinding teeth with living pulp. Use of chemically active substances for grinding under dental crowns.

Reagents that soften the enamel are applied to the surface of the tooth. With such grinding, there is no need for anesthetics - it is a gentle processing method that does not form chips and cracks, but it takes up to 30 minutes to wait for the effect of the chemical composition. principles of dissection For a long time, doctors acted exclusively according to Black's method.

The main principles of preparation are to remove the edges of enamel without support so that they do not break off later, dentin affected by caries, expansion of the cavity to areas of the tooth that are not susceptible. It was believed that this way you can protect the tooth from its further destruction. The cavity for the seal was created in the form of a box. Black was sure that such a preparation is the ideal option for the filling to be stable and withstand the load during chewing. Currently, the following principle of carious cavity removal is a priority in dentistry. It was proposed in 1955 by I. H. Lukomskyi. It is called the principle of biological expediency.

Modern dentists try to preserve areas of enamel and dentin as much as possible, tooth preparation is done carefully and economically. They cut the cavity to the visible healthy tissues of the tooth. Peculiarities of preparation of teeth for installation of crowns. Facing of teeth for crowns can be carried out in different ways, depending on the method of prosthetics, the material of the orthopedic structures, and the state of the hard tissues of the tooth. Let's analyze some common features of turning.

The clinical and laboratory stages of manufacturing porcelain bridge prostheses are carried out using ceramic beams offered by the Vita company. The supporting teeth are prepared as for ordinary porcelain crowns, seeking the possibility of their parallelism (the use of an intra-oral parallelometer is desirable). Molds on the ring or double and combined collapsible model are obtained, as in the manufacture of porcelain crowns. Prepared teeth are covered with temporary plastic crowns or caps. Porcelain crowns are made according to a well-known method, firing them to the "biscuit" stage, they are checked on the model taking into account the occlusion and, if necessary, correction is carried out. Then the intermediate part of the prosthesis is formed. For this, a standard, factory-made porcelain beam of round shape, available in the "Vita" set, is installed between the crowns and fits well, attaching it to the supporting crowns with sticky wax. The glued parts of the prosthesis are carefully removed from the model and immersed in a refractory mass, while filling the platinum caps and leaving only the places of gluing free.

The model prepared in this way is placed in a furnace (temperature 850°C), where the wax is burned out, dried, and the refractory mass is fired. After that, the beam is connected to the supporting crowns with porcelain mass, which fills the voids during vibration, created with a fluted spatula, and is baked in the oven. The structure is placed on its bed in the model, having previously removed the

refractory mass, the intermediate part of the bridge-like prosthesis made of porcelain is modeled on the beam and fired. Then 11 corrections of the prosthesis are carried out on the model, adding porcelain mass if necessary, followed by re-firing.

The prosthesis is sent to the clinic for fitting. After that, the final firing (glazing) of the porcelain bridge prosthesis is performed, completing all stages with fixation on the abutment teeth using "Visphat cement", if there is no need for temporary fixation. According to another method of manufacturing a porcelain bridge prosthesis is as follows.

Clinical and laboratory stages, including obtaining a combined model, are carried out in the manner described above. Then, the stump of the tooth that replaces the tooth row defect is selected according to the size, which is prepared in advance from plastic, superplaster or amalgam in the form of several standard sizes and installed in the bed formed on the plaster model between the supporting teeth. Platinum caps are made on the stumps of the abutment teeth and the installed intermediate tooth according to the usual method. The latter are degreased in acetone and placed on ceramic trays in the oven for 8-10 minutes. at 1000 ° C to relieve metal stress. Annealed platinum caps are removed from the trager and re-installed on the model, a pound layer of porcelain mass is applied and firing is done.

The manufactured ceramic structures are carefully fitted to the model, achieving tight contact with them from the proximal sides, polishing if necessary or adding porcelain mass. In the latter case, additional firing is carried out. After fitting, the caps are glued together with sticky wax, removed from the model and installed on a prepared base made of fire-resistant mass. The wax is melted with a jet of hot water and the structure is placed in the furnace with a gradual increase in temperature to 940 ° for 8-10 minutes. They take it out of the furnace and fill the joints from the proximal surfaces with ground porcelain mass to produce a firing.

The structure is fitted on the model, after which the next layers of porcelain mass (dentin, enamel, transparent mass) are applied, forming a crown, and firing is done. The finished prosthesis is again fitted on the model, if necessary, correction is carried out. Then platinum foil is removed from the intermediate cap of the future artificial tooth, and the inner surface of the crown is treated with a spherical diamond head, filled with dentin mass, and dried in a vacuum oven for 5 minutes. and firing is carried out. The design is fitted to the model and glaze. Platinum foil is removed from the supporting crowns of the finished bridge-like prosthesis, the edges of the crowns adjacent to the cervical ledge are smoothed with an elastic circle, selected according to the color of "Visphat-cement" and the prosthesis is fixed on the supporting teeth.

3.2. recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and

skills, etc.);

3.3. requirements for work results, including registration;

3.4. control materials for the final stage of the lesson: tasks, assignments, tests, etc. (if necessary).

1. A 52-year-old patient complains of tooth wear, an aesthetic defect, and increased sensitivity to temperature stimuli. Objectively: all teeth are eroded by 1/3 of the length of the crown, the interalveolar height is reduced by 5-6 mm. All teeth are stable. What structures are appropriate to restore the interalveolar height.

- A. half-crown
- B. plastic crowns
- C. three-quarter crowns
- D. solid crowns
- E. Stamped - soldered crowns

2. A 35-year-old patient is undergoing preparation of teeth 21 and 22 for plastic crowns. The teeth are large, not depulped, discolored, defects in the crowns of the teeth are replaced by fillings. What process in the tissues of the teeth prevails when this manipulation is performed?

- A. Vascular reaction.
- B. aseptic inflammation
- C. Pulp dystrophy.
- D. Education of replacement dentin.
- E. Destructive changes in nervous structures.

3. Patient M. applied to the clinic for prosthetics. Objectively: in 24, a defect of hard tissues within the mantle dentine, a cavity of the M.O. type. The destruction index of the occlusal surface of the tooth according to V.Yu. Milikevic is equal to 0.59. Choose a structure to replace the defect.

- A. Tab.
- B. Stamped crown.
- C. Seal.
- D. Pin construction.
- E. Half crowns.

4. For a 43-year-old patient, full stamped crowns are made for 26 27. What material should be used for making stamps.

- A. stainless steel
- B. low-melting alloy
- C. solder
- D. KXC
- E. Silver-palladium alloy

5. Patient T., 32 years old, complained about the destruction of the crowns of the lower chewing teeth, frequent loss of fillings. Objectively: the crowns of 36, 37 teeth are significantly destroyed, repeatedly filled, stable. On the X-ray, the canals are sealed to the tops. It is recommended to make restorative stamped crowns for 36,37 teeth. The thickness of the metal crown is:

- A. 0.18-0.21 mm
- B. 0.2-0.25 mm
- C. 0.25-0.3 mm
- D. 0.3-0.35 mm
- E. 4-0.45 mm.

5. List of recommended literature (main, additional, electronic information resources):

Main:

- Orthopedic dentistry: textbook / Rozhko M.M., Nespryadko V.P., I.V. Paliychuk and others; under the editorship M.M. Rozhka, V.P. Nespryadka. - K.: Medical Center "Medicine"; 2020. - 720 p.

- Rozhko M.M., Nespryadko V.P., Mykhaylenko T.M. and others. Dentoprosthetic technique. K.: Book plus; 2016. 604 p.

- Rozhko M.M., Popovych Z.B., Kuroyedova V.D. Dentistry. Textbook. K.: Medical University "Medicine"; 2018. 872 p.

Additional:

- Dentistry: in 2 books. : textbook. Book 2 / M.M. Rozhko, I.I. Kirylenko, O.G. Denisenko and others. ; under the editorship M.M. Horn — 2nd edition. — K.: VSV "Medicine", 2018. — 992 p. ; color kind.

- Material science in dentistry: a study guide / [Korol D.M., Korol M.D., Ojubeiska O.D. etc.]; in general ed. King D.M. – Vinnytsia: New book, 2019. – 400 p.

Electronic information resources:

- State Expert Center of the Ministry of Health of Ukraine <http://www.dec.gov.ua/index.php/ua/>

- National Scientific Medical Library of Ukraine <http://library.gov.ua/>

- National Library of Ukraine named after V.I. Vernadskyi <http://www.nbuv.gov.ua/>

#### **PRACTICAL LESSON No. 4**

**Topic: Planning of partial removable plate prostheses and highly aesthetic buckle prostheses, taking into account the anatomical formations of the oral cavity and face.**

**Goal:** To acquaint students with the structural features of the CZM, to acquaint them with the planning of partial replacement prostheses

Basic concepts: clasp line, prosthesis base, fixing elements, central occlusion.

Plan:

1. Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

2. Control of the reference level of knowledge:

2.1. requirements for students' theoretical readiness to perform practical classes (knowledge requirements, list of didactic units);

— types of constructions of cleaning plate prostheses.

— choose and apply options for partial lamellar prostheses.

— to correlate the jaws with different groups of defects

— Indications and contraindications for brace prostheses

3. Formation of professional abilities and skills (mastery of skills, curation, determination of treatment regimen, laboratory research, etc.):

3.1. content of tasks (tasks, clinical situations, etc.);

The constituent elements of a partial removable lamellar prosthesis are a base (plastic or metal), artificial teeth made of various materials and all kinds of mechanical devices for fixation.

Despite the variety of existing designs, parts that are repeated in all types of removable prostheses can be found in them. They should include the base, retaining devices (clips) and artificial teeth. In addition to the base, retaining elements, the arch prosthesis also includes an arch and its extensions.

A lamellar prosthesis consists of a base that rests on the alveolar process, the body of the jaw, artificial teeth that restore the integrity of the dentition, and clasps (hooks) or other mechanical devices that fix the prosthesis on natural teeth.

The main feature of lamellar prostheses with retaining clasps is that they are located on tissues that are not adapted to perceive chewing pressure. Therefore, it cannot reach the same value as with a bridge prosthesis, when chewing pressure is transmitted in a more natural way, that is, through the periodontium of the supporting teeth. Therefore, the functional value or masticatory efficiency of non-supported removable plate prostheses is significantly lower than that of bridges. If in the latter it is 90-95%, then in lamellar - 25-30% and no more than 40%. And the main reason for such a difference is the perception of pressure by a non-specialized tissue.

The pressure of the base on those subject to the fabric of the prosthetic bed causes their atrophy. There is increased desquamation of the epithelium. This breaks the endurance of the mucous membrane to external irritations, as a result of which a chronic inflammatory process often occurs in it.



The part of the prosthesis, adjacent to the necks of the teeth and the edge of the teeth, causes cervical caries and gingivitis with the formation of a gingival pathological pocket. The clasps that fix the prosthesis constantly slide on the surface of the tooth crown as a result of the prosthesis sinking into the mucous membrane under load and returning to its original position when it is removed. As a result, the enamel is injured, hyperesthesia appears, and caries is often the case.

However, removable prostheses have an advantage over non-removable bridges in that they are more hygienic.

Taking into account the shortcomings of both prostheses, which remove defects of the dentition, their evolution was along the lines of preserving the variability and reducing the prosthetic base, uniform distribution of chewing pressure between the mucous membrane of the prosthetic bed and the teeth, while simultaneously increasing the stability and functional value of the prosthesis. If the base of the removable lamellar prosthesis is reduced, then the specific pressure will increase, that is, the pressure per unit of the mucous membrane of the prosthetic bed. How can this be compensated? Naturally, redistribute part of the load on the mucous membrane on the teeth. This trend led to the emergence of supported prostheses.

The size of the prosthetic base depends on the number of teeth that have been preserved, the degree of atrophy of the alveolar process, the degree of contraction of the hard palate, the presence of a torus on it, the pliability of the mucous membrane, etc. The fewer teeth are left, the larger the base. Good conditions for fixation of the prosthesis (high alveolar process, pronounced erection of the hard palate or an increase in the number of clasps) allow reducing the base of the prosthesis.

The base of the prosthesis has the following maximum limits on the upper jaw. On the buccal and labial sides of the edentulous area of the alveolar process, the border of the prosthesis passes 0.5-1 mm below the transition fold, bypassing the mobile buccal-alveolar tracts of the mucous membrane and the frenulum of the lip. The distal edge of the prosthesis does not reach the "A" line, that is, the border between the hard and soft palate, which is clearly visible when pronouncing the "A" sound. The hump of the upper jaw must necessarily overlap with the prosthesis, which is the most important condition for its fixation and stabilization.

In relation to the preserved teeth, the location of the base is different in the anterior and lateral sections. Front teeth with an orthognathic bite overlap with the base of the prosthesis to the thickness of the wax base plate (1.5 mm), and with a deep bite, this area is completely freed from the base to prevent an increase in the interalveolar height and excessive pressure on the interdental papillae of the opposing teeth.

The lateral teeth are overlapped by the base of the prosthesis by  $\frac{2}{3}$  of the height of their crown, which prevents immersion in those subject to tissue and

peeling of the gingival margin in the cervical region of natural teeth, helps to stabilize the prosthesis and transfer pressure to the teeth.

With a pronounced torus of the hard palate, it is necessary to exclude the contact of the base of the prosthesis with the mucous membrane of this formation in order to prevent this injury and the occurrence of balancing of the prosthesis. For this, an insulation (chamber) 0.5 mm deep is created on the inner surface of the base of the prosthesis in the area of the torus.

The base plate, with a total thickness of 1.8 mm, is slightly increased in places where it adjoins the natural teeth, with the aim of further correction during fitting of the finished prosthesis in the patient's oral cavity.

The edges of the base should have a rounded shape and sufficient thickness, which depends on the severity of the cheek pockets in the lateral sections, the degree of atrophy of the alveolar process in the front section and the position of the upper lip.

Limits of the base of the prosthesis on the lower jaw. The vestibular borders of the base of the prosthesis on the lower jaw in the area of the edentulous alveolar parts pass 0.5-1 mm above the transitional fold (the deepest point of convergence), having notches against the places of attachment of the frenulum of the lower lip and the buccal-alveolar cords. In places where the base adjoins the natural teeth (front and side), the degree of overlap of the latter corresponds to 2/3 of the height of the crown in an orthognathic bite. This increases the area of the prosthetic base, improves fixation due to the tight girth of each tooth, prevents its settling into the proper mucous membrane and injury to the interdental papillae.

The lower limit of the base of the prosthesis from the oral side overlaps the internal oblique line and passes slightly above the transition fold with the release of areas corresponding to the place of attachment of the frenulum of the tongue.

In the case of terminal defects of the dentition of a large length, the distal border is recommended to be located in the area of mucous tubercles, duplication of the mucous membrane that is present, covering them partially or completely depending on the degree of their mobility and the place of attachment of the pterygoid fold.

When performing chewing, speaking and other functions, the lower jaw begins to move as a result of muscle contraction, and at the same time, the prosthesis moves, which comes into contact with the moving tissues of the oral cavity. Therefore, it is highly desirable to expand the limits of the lower prosthesis due to the retroalveolar and sublingual regions. The muscle of the same name is attached to the lower jaw in the area of the linea mylohyoidca, in the area of the angle of the lower jaw - the internal pterygoid muscle, in the area

The disadvantages of the base of the lamellar prosthesis caused a natural desire to reduce its size, and these possibilities are limited on the lower jaw. On the upper jaw, the basis was reduced primarily in the posterior third of the hard palate, where it could be the cause of vomiting. In the presence of a palatal torus

and the impossibility of its isolation and basis, a "window" is cut in the middle of the sky. This allows you to release the area, which is always covered by a thinned mucous membrane, which is very sensitive to pressure

According to some authors, reducing the area of the prosthesis base on the upper jaw by up to 20% after an oval cut in the middle or back third of the hard palate does not lead to an increase in masticatory pressure. At the same time, such a shortening of the base in the front third of the sky leads to an increase in pressure by 7-17%, while the more pliable the mucous membrane is, the more the pressure under the base increases.

The introduction of support-holding clasps, rod, rail, button, telescopic and other fixing and supporting elements into the design of removable dentures allows to reduce the area of the base and, what is especially important, to free the cervical area of the remaining teeth from abutting the base. This is of primary importance for the prevention of periodontal damage of the remaining teeth when treated with removable prostheses.

In case of uneven compliance of the soft tissues of the prosthetic bed, the use of so-called two-layer bases is recommended to avoid balancing the prosthesis base or overloading the least compliant areas. At the same time, the areas of the base adjacent to the inflexible mucous membrane are made of elastic plastic, and those located in the area of highly pliable tissues are made of ordinary hard plastic. As a result, the differentiated basis will sink into those subject to tissue without causing their overload.

When constructing the limits of the base, it is necessary to take into account that it can provide good fixation and stabilization of the prosthesis even without any mechanical devices, in particular due to anatomical retention.

Anatomic retention. Anatomical retention is created by natural anatomical formations on the upper and lower jaws, which, due to their shape and position, can limit the freedom of movement of the prosthesis during conversation or eating. Thus, the well-preserved alveolar ridges of the upper and lower jaws, the high elevation of the hard palate prevent horizontal movements of the prosthesis, which weaken the adhesion force. The alveolar ridges of the upper jaw prevent the prosthesis from sliding forward. In this regard, they act in common with the front part of the palatine complex. The best conditions for fixation of the prosthesis are when there is a moderately pronounced elevation of the hard palate, which allows both the adhesion forces and the action of the resistance nodes to be manifested, which limit the lateral and front displacements of the prosthesis. The use of adhesion (adhesion) and anatomical features of the prosthetic bed does not solve the entire problem of fixation, although because with a small base of the prosthesis, the forces of adhesion (adhesion) are negligible, and the anatomical conditions may be unfavorable. However, the latter are a great help in the prosthesis attachment system, and they should not be ignored. Mechanical devices (fixtures) play a decisive role in fixing removable prostheses.

Fasteners are divided into direct and indirect. Direct retainers are located on

the tooth and prevent vertical displacement of the prosthesis. These include clasps, attachments of all systems (lock connections). According to the location, fixators are divided into intracoronary (intracoronary) and extracoronary (extracoronary). The former include some types of attachments, the latter — staplers. Indirect retainers prevent rotation (overturning) of the prosthesis. Their role can be performed by continuous staplers, extensions, overlays, etc.

Clammer fixation of prostheses. Fixation of a partial removable prosthesis can be presented as a purely technical task, if it is considered only from the point of view of fastening the prosthesis and those devices and materials that are used for this purpose. In fact, this is a complex technical and biological problem, the final solution of which requires the efforts of many researchers.

Currently, orthopedists have at their disposal various designs of clasps, which allow even in difficult conditions to strengthen the prosthesis in the oral cavity, using natural teeth as a support.

Clamer (hook) was first used by Mouton (1764). The problem is to apply such a system of clasps that, while fixing the prosthesis, would not have a harmful effect on the supporting teeth, allowing to preserve the residual dentition for a long time. At the same time, the issue of prevention of rapid atrophy of the alveolar process should be resolved through the correct distribution of forces falling on the prosthesis between the supporting teeth and the tissues of the prosthetic bed. From this point of view, the fixation of a partial removable prosthesis is presented as a complex biomechanical problem.

Most paper clips have both advantages and disadvantages. Knowing where, when and in what order these or other staples are located is an art. It was realized by studying the clinical features of the tissues and organs of the oral cavity, as well as the mechanical properties of the clasps themselves and the way they interact. That is why there are many different constructions of clasps), used according to the relevant evidence.

Before talking about the purpose of a clasp, you should decipher such concepts as supporting, stabilizing and fixing functions. The first function refers to the transmission of chewing pressure through the support elements of the clasp to the teeth, which prevent the prosthesis from settling and overloading the tissues of the prosthetic bed. By the second - they understand the prevention of lateral displacement, and finally, by the retaining (fixing) function, they mean the prevention of slipping of the prosthesis from the prosthetic bed.

The most advanced types of staplers perform all three functions at the same time, for example, a support-holding stapler (three-armed, combined). In other clasps, one or another function prevails, which, for example, holds. Such a stapler is a regular wire retaining stapler.

Retaining clips. In the design of any retaining metal clasp, three main elements are distinguished, namely: shoulder, body and process.

In partial plate plastic prostheses, the most widely used round wire bent retaining clips (Fig. 357, 358). The shoulder of the clasp is its springy part that

covers the crown of the tooth and is located directly in the area between the equator and the neck. It should fit tightly over the entire length to the surface of the abutment tooth, repeat its configuration and have high elastic properties. Adhesion in only one point leads to a sharp increase in the specific pressure during movement of the prosthesis and causes enamel necrosis. The death of the enamel of the supporting tooth is most often the result of an uneven distribution of pressure due to a poor fit of the clasp. Clamps should be passive, i.e. do not exert pressure on the covered tooth when they are not under tension. Otherwise, there is an unusual stimulus that is constantly acting, which can be the cause of the primary traumatic occlusion. The active pressure of the clasp is, in addition, the cause of enamel necrosis, if the tooth is not covered with a metal crown. Therefore, it is important that the clips are made of a material that has good elastic deformation, and could acquire this quality with appropriate heat treatment. They are made of wire (stainless steel or gold-platinum alloy) of different diameters: 0.4-1.0 mm. The larger the diameter of the wire clip, the higher its holding force.

The properties of the staple arm depend on its length, diameter, cross-sectional shape, and material. The longer the shoulder, the more elastic it is.

Artificial teeth used to replace defects in the dentition must meet certain requirements. They must be made of material that has an irritating or harmful effect. These are general clinical requirements. In addition, the teeth must have the correct anatomical shape, beautiful and diverse color, in order to compensate for both the lack of chewing function and aesthetic disorders. In terms of color, artificial teeth imitate the natural transition of the lighter color of the translucent cutting edge to the more intense and darker coloring of the cervical region. The teeth should not be destroyed by chewing pressure and should wear little. The method of connecting the teeth to the material of the base is important, while the best teeth are those that are monolithically connected to the base of the prosthesis. Finally, the material from which the teeth are made must be available and cheap. These are special requirements.

When choosing the design of a partial removable prosthesis, the first question that arises before the doctor is the method of its fixation in the oral cavity. An effective method of fastening is one of the conditions that ensure good functional qualities of the prosthesis. To fix partial removable prostheses, adhesion, anatomical retention, artificial mechanical devices are used: clasps, pelotovs, telescopic crowns, etc.

Mechanical devices (fixtures) play a decisive role in fixing removable prostheses.

Fasteners are divided into direct and indirect. Direct retainers are located on the tooth and prevent vertical displacement of the prosthesis. These include clasps, attachments of all systems (lock connections). According to the location, fixators are divided into intracoronal (intracoronary) and external coronal (extracoronary). The former include some types of attachmen, the latter — staplers.

Types of paper clips. Clamps are divided according to different characteristics: according to the method of manufacture (bent, cast); according to the shape of the profile section (round, semi-round and ribbon); according to the degree of girth of the tooth and their number (one-arm, two-arm, overturning, double, multi-link); by function (retaining, supporting and supporting-relieving); according to the method of connection with the base of the prosthesis (rigid, semi-rigid, elastic, hinged).

Indirect retainers prevent rotation (overturning) of the prosthesis. Their role can be performed by continuous clamps, processes, overlays, etc

The number of supporting teeth and their location are of great importance for fixing the prosthesis.

Clammer line. The line connecting the supporting teeth on which the staples are located is called the staple line. Its direction depends on the position of the supporting teeth. If the supporting teeth are located on one side of the jaw, the staple line has a sagittal direction, and when the supporting teeth are located on opposite sides of the jaw, it is transverse or diagonal.

When used as a support for one tooth, the attachment of the prosthesis is called point, for two teeth - linear, for three or more teeth - planar. The least advantageous type of attachment is point attachment, when all shocks perceived by the prosthesis under functional load are transmitted to the periodontium of one tooth, leading to its overload.

The harmful effect of clamps on the periodontium of supporting teeth could be significantly reduced by using points of anatomical retention (alveolar processes or parts, maxillary humps, palatal arch, internal oblique lines) to fix the prosthesis.

From the point of view of statics, linear fastening is more expedient than point fastening. Only in the absence of the possibility of choice, it is necessary to create a sagittal staple line, which is disadvantageous from the point of view of the stability of the supporting teeth and the prosthesis itself. For example, two teeth remained on the upper jaw on one side - the first molar and the first premolar. The staple line in this case will be sagittal. In other words, when constructing a staple line, it is necessary to strive for parts of the prosthesis to be on both sides of it, that is, the staple line should be the imaginary axis of rotation of the prosthesis (transversal on the lower jaw, diagonal on the upper). However, even the most expedient linear strengthening has very significant disadvantages regarding the impact on the stability of the tooth. Under masticatory pressure, the prosthesis moves like a lever in different directions. The force of this movement is measured by the length of the lever arm. The shoulder is equal to the perpendicular restored from the middle of the staple line, that is, the line connecting the middle of the support teeth. The greater the arm of the lever, that is, the greater the force of masticatory pressure, the greater the overturning effect on the supporting teeth.

Flat mounting. To protect the tooth against the force of rotation, another

force must be resisted - the center of resistance, which is what the planar attachment serves when a system of levers with centers of resistance is formed. Depending on the number of centers, there are triangular, quadrilateral, and so on systems

For the stability of the prosthesis, it is necessary that the resistance is greater than the force of rotation during chewing. Therefore, strong multi-rooted teeth are chosen for the center of resistance. By using their stability as a positive factor for prosthetics and involving a large number of teeth to transmit chewing pressure, the balance of the prosthesis is achieved.

A staple system can be considered satisfactory if it meets the following requirements.

- 1) Performs fixation to the same extent on all supporting teeth.
- 2) Prevents overturning or rotation of the prosthesis.
- 3) Does not increase the height of the bite (interalveolar) on occlusal linings.
- 4) Minimally violates aesthetic standards.
- 5) The clasp system should not create a traumatic occlusion.

Currently, orthopedists have at their disposal various designs of clasps, which allow even in difficult conditions to strengthen the prosthesis in the oral cavity, using natural teeth as a support. Clamer (hook) was first used by Mouton (1764). The problem is to apply such a system of clasps that, while fixing the prosthesis, would not have a harmful effect on the supporting teeth, allowing to preserve the residual dentition for a long time. At the same time, the issue of prevention of rapid atrophy of the alveolar process should be resolved through the correct distribution of forces falling on the prosthesis between the supporting teeth and the tissues of the prosthetic bed. From this point of view, the fixation of a partial removable prosthesis is presented as a complex biomechanical problem.

Most paper clips have both advantages and disadvantages. Knowing where, when and in what order these or other staples are located is an art. It was realized by studying the clinical features of the tissues and organs of the oral cavity, as well as the mechanical properties of the clasps themselves and the way they interact. That is why there are many different constructions of clasps, used according to the relevant evidence.

Before talking about the purpose of a clasp, you should decipher such concepts as supporting, stabilizing and fixing functions.

The first function refers to the transmission of chewing pressure through the support elements of the clasp to the teeth, which prevent the prosthesis from settling and overloading the tissues of the prosthetic bed.

By the second - prevention of lateral displacement is understood under the retaining (fixing) function, they mean prevention of slipping of the prosthesis from the prosthetic bed.

The most advanced types of staplers perform all three functions at the same time, for example, a supporting and retaining stapler (three-armed, combined). In

other clasps, one or another function prevails, which, for example, holds. Such a stapler is a regular wire retaining stapler.

Retaining clips. In the design of any retaining metal clasp, three main elements are distinguished, namely: shoulder, body and process.

In partial plate plastic prostheses, the most widely used round wire bent retaining clips. The shoulder of the clasp is its springy part that covers the crown of the tooth and is located directly in the area between the equator and the neck. It should fit tightly over the entire length to the surface of the abutment tooth, repeat its configuration and have high elastic properties. Adhesion in only one point leads to a sharp increase in the specific pressure during movement of the prosthesis and causes enamel necrosis. The death of the enamel of the supporting tooth is most often the result of an uneven distribution of pressure due to a poor fit of the clasp. Clasps should be passive, i.e. do not exert pressure on the covered tooth when they are not under tension.

To prevent this, one shoulder should fix the prosthesis, and the other should counteract it, i.e. prevent it from moving to one side or the other (reciprocal action).

3.2. Recommendations (instructions) for the performance of tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.);

3.3. Requirements for work results, including registration;

1. What are the main requirements for supporting teeth.
2. What are the main requirements for the placement of clasps on abutment teeth.
3. What are the main requirements for NPP modeling
4. What are the requirements for a brace prosthesis
5. What are the requirements for a partially replaceable prosthesis

3.4. control materials for the final stage of the lesson: tasks, assignments, tests, etc. (if necessary).

1. Patient Ya., 49 years old, complained of partial absence of teeth, difficulty in chewing food, aesthetic disorders. Objectively: 17, 16, 13, 12, 11, 21, 22, 23, 27, the teeth are stable, the mucous membrane is pale pink. The lower jaw has all the teeth. The missing teeth were removed 3 years ago. Previously, the patient did not have prosthetics. In this case, what kind of arrangement of clasps will provide better retention of the partial lamellar prosthesis?

- A. Transversal
- B. Diagonal
- C. Sagittal
- D. Dotted
- E. Along the plane



2. Patient N., 50 years old, turned to an orthopedic doctor with complaints of partial absence of teeth, difficulty in chewing food, aesthetic dissatisfaction with the state of the teeth. Objectively: 17, 16, 12, 13, 21, 22, 23, 17, the remaining teeth are stable, the mucous membrane is pale pink. The lower jaw has all the teeth. . The alveolar process is well defined, the arch of the palate is high. Previously, the patient did not have prosthetics. How should the posterior border of a partial plate prosthesis be positioned in relation to line A?

- A. Back by 1-2 mm
- B. Along the A line
- C. + 1-3 mm ahead
- D. 15-20 mm ahead
- E. 4-5 cm ahead

3. Patient R., 65 years old, went to the district dental polyclinic to see an orthopedic doctor with complaints of partial absence of teeth, difficulty in chewing food, and aesthetic dissatisfaction with the state of the teeth. Objectively: 17, 11, 21, the remaining teeth are stable, the mucous membrane is pink. What system of fixation of a partial lamellar prosthesis should be used?

- A. I staple on 17-11-21 teeth
- B. Rumpel bar on 17-11 teeth
- C. Kulazhenko-Barchukova vestibular clamp
- D. Telescopic crowns on 11-21 teeth
- E. Telescopic crowns on 11 21, clasp on 17 teeth

4. Patient Sh., 47 years old, turned to the doctor with complaints of partial absence of teeth, difficulty chewing food, aesthetic dissatisfaction with the state of the teeth. Objectively: 16,13, 22, 23, The remaining teeth are stable, the mucous membrane is pale pink. The lower jaw has all the teeth. The missing teeth were removed due to periodontitis 2-4 years ago. Previously, the patient did not have prosthetics. On which teeth is it advisable to place the retaining clips of a partial plate prosthesis?

- A. 16 13 22
- B. 16 22 23
- C. 13 22 23
- D. 16 13 23
- E. 16 13 21

5. Patient N., 53 years old, complained about the partial absence of teeth on the upper jaw. Objectively: the remaining teeth are stable, the bite is orthognathic. The teeth have the correct anatomical shape, the equator is well defined. The mucous membrane is pale pink, moderately pliable. The patient was

recommended to make a partial lamellar prosthesis. What function does the PPP basis not violate?

- A. tactile sensitivity
- B. the degree of grinding of food
- C. language
- D. temperature reception
- E. sense of taste

6. Patient T., 50 years old, complained about the partial absence of teeth on the upper jaw. Objectively: 00 00 16 00 00 13 00 00 21 22 23 00 00 00 00 00 . The remaining teeth are stable, the bite is orthognathic. The teeth have the correct anatomical shape, the equator is well defined. The mucous membrane is pale pink, moderately pliable. Patients are recommended to make a partial lamellar prosthesis. The basis of the NPP for the upper jaw with a terminal defect is due to:

- A. leave the alveolar ridges free
- B. partially cover the hills
- C. completely cover the hills
- D. lie on the chewing surface
- E. do not reach the cheeks

7. Patient Kh., 42 years old, complained of partial absence of teeth on the upper jaw. Objectively: 18 17 16 00 00 13 00 00 00 00 00 00 00 00 27 28. The remaining teeth are stable, the bite is orthognathic. The teeth have the correct anatomical shape, the equator is well defined. The mucous membrane is pale pink, moderately pliable. Patients are recommended to make a partial lamellar prosthesis. Which of the specified elements are not used in removable lamellar prostheses?

- A. basis
- B. teeth
- C. arcs
- D. staples are bent
- E. pellots

8. Patient U., 59 years old, complained of partial absence of teeth on the upper jaw. Objectively: 16,13,25,27.. The remaining teeth are stable. The teeth have the correct anatomical shape, the equator is well defined. The mucous membrane is pale pink, moderately pliable. The patient was recommended to make a partial lamellar prosthesis. What type of staple fixation provides better retention of the prosthesis?

- A. transversal
- B. diagonal
- C. sagittal

- D. planar
- E. dotted

9. A 63-year-old man applied for prosthetics. Objectively: 43-33 teeth are destroyed by 1/2. Periodontal tissues are normal. The rest of the teeth on the lower jaw are missing. What crowns for abutment teeth must be made to fix a removable prosthesis?

- A. Telescopic crowns.
- B. Plastic.
- C. Equatorial crowns.
- D. Semi-crowns.
- E. Solid crowns.

10. A 79-year-old patient is shown the fabrication of a PRP on the upper jaw with holding clasps for 15, 24, 26 teeth. The shoulder of the retaining clip on the supporting tooth should be located:

- A. between the equator and the neck of the tooth
- B. in the base of the prosthesis
- C. at the gingival margin
- D. on the chewing surface of the tooth
- E. none of the above

11. A 76-year-old patient came to the clinic for prosthetics. Objectively, the presence of the roots of 14.23 teeth is determined on the upper jaw. What method of fixation is preferred in the presence of one or more roots on the jaw?

- A. button fasteners
- B. telescopic crowns
- C. pellots
- D. tiller rod
- E. of Kemeny's clasp

12. A 66-year-old patient applied to the orthopedic dentistry clinic for prosthetics. After an objective examination, the production of the PPP is shown. The base of the lamellar prosthesis transmits chewing pressure to:

- A. mucous membrane
- B. teeth and mucous membrane
- C. on the remaining teeth
- D. antagonistic teeth
- E. none of the above

4. Summary:

1. What are the requirements for supporting teeth
2. What does the emergency department consist of?

3. What are staple lines
4. What are the groups of defects

5. List of recommended literature (main, additional, electronic information resources):

Main:

- Orthopedic dentistry: textbook / Rozhko M.M., Nespryadko V.P., I.V. Paliychuk and others; under the editorship M.M. Rozhka, V.P. Nespryadka. - K.: Medical Center "Medicine"; 2020. - 720 p.

- Rozhko M.M., Nespryadko V.P., Mykhaylenko T.M. and others. Dentoprosthetic technique. K.: Book plus; 2016. 604 p.

- Rozhko M.M., Popovych Z.B., Kuroyedova V.D. Dentistry. Textbook. K.: Medical University "Medicine"; 2018. 872 p.

Additional:

- Dentistry: in 2 books. : textbook. Book 2 / M.M. Rozhko, I.I. Kirylenko, O.G. Denisenko and others. ; under the editorship M.M. Horn — 2nd edition. — K.: VSV "Medicine", 2018. — 992 p. ; color kind.

- Material science in dentistry: a study guide / [Korol D.M., Korol M.D., Ojubeiska O.D. etc.]; in general ed. King D.M. – Vinnytsia: New book, 2019. – 400 p.

Electronic information resources:

- State Expert Center of the Ministry of Health of Ukraine <http://www.dec.gov.ua/index.php/ua/>

- National Scientific Medical Library of Ukraine <http://library.gov.ua/>

- National Library of Ukraine named after V.I. Vernadskyi <http://www.nbuv.gov.ua/>

## **PRACTICAL LESSON No. 5**

**Topic:** . Factors that influence the color planning of the orthopedic structure. Production of highly aesthetic designs taking into account the age group. **Test.**

**Goal:** To acquaint students with the method of determining the color of a patient's teeth, color planning

**Basic concepts:** scale Vita scale, 3D MASTER, photo protocol, light refraction, veneer, metal-free ceramics

**Equipment:** Computer, multimedia projector, phantoms.

**Plan:**

1. Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

2. Control of the reference level of knowledge:
- 2.1 Indications for the manufacture of a metal-ceramic structure
  - Indications for the production of metal-free ceramics.
  - Indications for the manufacture of veneers.
  - Peculiarities of preparing teeth for highly aesthetic designs.
  - To know the clinical and laboratory stages of manufacturing highly aesthetic restorations.

2.2. questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson.

1. To be able to prepare a tooth for a veneer.
2. To be able to prepare a tooth for a metal-free ceramic restoration.

3. Formation of professional skills, skills (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.):

3.1 content of tasks.

The main task of modern orthopedic dentistry is the introduction of the latest technologies and materials into dental practice, which could ensure the most complete restoration of the integrity of teeth and dental rows, the functionality, inertness and aesthetics of which could satisfy the most demanding doctors and patients.

The analysis of literary sources indicates that the leading place in fixed prosthetics is occupied by metal-ceramic structures, which in terms of their functional and aesthetic properties do not have the disadvantages of stamped and soldered technologies, but their manufacture is a time-consuming and complex process that requires a special professional skill from the doctor and dental technician approach at all clinical and laboratory stages of production. As well as the introduction into orthopedic dentistry of such directions as veneers, luminaries, metal-free ceramics and a combination of prosthetics with implantology, this is a modern method of prosthetics. Composition and properties of porcelain masses

For the first time, R. Fauchard used porcelain as a material for dental prostheses in 1728 using the method of metal enameling developed at that time. Porcelain is a product of balanced parts of mineral origin, such as kaolin, quartz, feldspar, metal oxides (dyes), fluxes. Kaolin (white clay) together with quartz form the solid base of porcelain and give it opacity. Quartz (silica Si<sub>2</sub>) - causes hardness and chemical resistance. Feldspar (K, Na, Ca, Al silicate) causes a dense structure and adds transparency. The crystalline phase of fired porcelain turns into a product - leucite porcelain (K<sub>2</sub>O-Al<sub>2</sub>O<sub>3</sub>-4Si<sub>2</sub>).

Indications for the use of modern fixed prostheses destruction or traumatic breakage of a large part of the crown of the tooth, when it is impossible to restore

it with the help of filling materials or inserts; anomalies of the development and position of the front teeth, when it is impossible to apply orthodontic treatment:

- pathological wear of hard tissues of teeth;
- non-carious lesions of hard dental tissues (fluorosis, wedge-shaped defects, hypoplasia of enamel and dentine);
- aesthetic defect of the crowns of natural teeth (loss of shine, discoloration);
- the presence of previously manufactured unaesthetic structures that do not meet cosmetic or functional requirements;
- the presence of dentition defects, in which it is possible to use modern fixed structures (metal-ceramic dental prostheses, metal-free ceramics, veneers).

Contraindications for the use of metal-ceramic fixed prostheses There are absolute and relative contraindications. Absolute contraindications include: Teeth with living pulp in children and adolescents. Severe periodontitis. Relative contraindications to the use of metal-ceramic structures:

Bite anomalies with deep incisor overlap. Pathological abrasion of hard tissues of teeth. Parafunctions of chewing muscles (bruxism). Insufficient height of the supporting crowns of natural teeth, especially in the presence of significant defects of the dental rows. Clinical and technological stages of manufacturing metal-ceramic fixed prostheses The successive stages of manufacturing metal-ceramic structures consist of the following consecutive clinical manipulations:

Examination of the oral cavity and therapeutic rehabilitation of the hard tissues of the tooth, if there is an indication for it. Obtaining diagnostic impressions and making models on which future prosthetics are planned. Determination of the color of natural teeth. Retraction of the alveolar groove and preparation of teeth with the formation of a cervical ledge. Features of obtaining a two-layer print. Determination of central occlusion.

Indications for the use of temporary crowns on prepared teeth. Fitting of a solid metal frame and its correction. Fitting the manufactured fixed structure and its correction in the oral cavity. Fixation of the finished non-removable structure on temporary or permanent cement as indicated. Recommendations for the use of modern structures. Preparation of teeth for the production of metal-ceramic bridge-like structures. Metal-ceramic crowns consist of a metal frame and a ceramic coating. The frame provides strength to the structure.

Metal-ceramics is considered the most reliable prosthetic option of all aesthetic crowns precisely because of the metal frame. It takes on the main load, and the ceramic coating mainly provides aesthetics. The minimum thickness of the metal should be 0.4 mm. The minimum thickness of the ceramic layer is 0.8 mm. The thickness of metal ceramics can be from 1.1 mm. In reality, most often from 1.1 to 1.8 mm. But this requires adequate preparation of the supporting teeth. It is mandatory to work with a water-cooled tip, carefully interrupting during work in order to prevent burning of the pulp.

Obtaining a two-layer impression An impression for the manufacture of a

metal-ceramic bridge structure and a crown must accurately reproduce the relief of the prosthetic bed and convey the smallest details of the relationship between the crown of the tooth and the tissues adjacent to it (marginal periodontium, hard tissues of the tooth in the cervical area, the gingival margin and the gingival groove). The method of obtaining a two-layer impression consists in the retraction of the gums, in the removal of an approximate (basic) impression - the first layer, obtaining a clear impression with a corrective second layer, silicone impression materials.

Fabrication and strengthening of temporary crowns on prepared teeth After obtaining an impression, the preferably prepared teeth must be covered with temporary provisional crowns. This is necessary to prevent the possibility of displacement of teeth deprived of contact occlusion. In addition, teeth with living pulp react acutely to thermal and chemical stimuli and can easily become infected, which can lead to inflammation of the tooth pulp. Fitting a solid metal frame.

After receiving the metal frame for ceramics, the dental technician carefully checks it on the model before fitting, and carries out its mechanical processing, controlling with a micrometer. It should not have pores, shells, cracks and deformations. They also check the accuracy of the fit to the plaster stump of the tooth and on the supporting teeth in the clinic.

The cast metal frame should fit freely on the abutment teeth and be removed. In those cases, when the cast frame is strongly applied to the prepared teeth, it is necessary to carry out a sequential correction. In the case when only the vestibular surface is lined on the metal-ceramic structure, the occlusal surface of the metal frame should be in contact with the antagonistic teeth, but at the same time, the bite should not be separated. Determining the color of the ceramic veneer The color of the ceramic veneer should be checked together with the dental technician, under natural light during the day, comparing the color of the adjacent teeth or antagonists with the color scale of standard or individual shades and taking into account the wishes of the patient. Inspection of the metal-ceramic structure This is a rather important clinical stage in the manufacture of a metal-ceramic bridge prosthesis. First of all, the supporting parts of the prosthesis should be freely located on the prepared teeth.

The procedure is repeated until the structure fits smoothly on the supporting teeth. After applying the structure, you need to check the color and shape of the porcelain facing. The stage ends with the following: to correct the metal-ceramic construction of the interocclusal relationships with the antagonists and, if necessary, touch up in technical conditions and provide final finishing.

Fixation of the finished metal-ceramic bridge-like prosthesis on permanent cement Fixation of the metal-ceramic bridge-like prosthesis and crown on the supporting teeth is carried out by the traditional method, on glass-ionomer cements, taking into account the recommendations of the manufacturer's company. The patient is explained the need for a gentle regimen in the first 2-3

hours after fixing the bridge-like structures, avoiding excessive load, which contributes to high-quality cement crystallization.

Modern types of fixed prosthetics Currently, a new generation of orthopedic structures has replaced the classic fixed orthopedic treatment, which are more functional and have a more pronounced aesthetic effect, but this does not cancel the fact that the classic type of fixed prosthetics is also the basis and support of quality treatment, is in no way inferior in quality and functionality to the current orthopedic modernity. Modern permanent prosthetics include: Metal-free permanent prostheses, veneers.

Veneers Veneers are composite or ceramic overlays that restore the vestibular surface of the teeth. They make it possible to correct the restoration of the violation of the anatomical shape and color of the tooth. Veneers are made according to the individual anatomical shape, according to the color of the patient's teeth and his wishes. A veneer is a plate with a thickness of 0.2 mm or more, applied to the vestibular, i.e. labial side of the tooth and performs an aesthetic, restorative function. The composite plate is an organic bisigma resin filled with ceramic or glass microparticles. An example of a ceramic plate is lithium disilicate glass ceramic.

For the manufacture of veneers, excessive preparation of tooth enamel is not required, and in some cases (microdentia or abrasion) it is possible to manufacture veneers without preparation of tooth tissues. Ceramic veneers are made from various types of ceramics. Most often, polyphosphate ceramics (porcelain) and IPS Emax glass-ceramics are used for this, rarely ceramic veneers are made from blocks of zirconium dioxide.

Ceramic veneers are made only by the laboratory method. First, the doctor prepares the tooth, then receives an impression of the teeth, which is sent to the dental laboratory, where a permanent ceramic veneer will be made for the patient within a certain time. So that the patient does not walk with prepared teeth, a temporary plastic veneer is fixed on the tooth during production. Zirconium dioxide veneers. Such veneers are made from blocks of zirconium dioxide by milling them (CAD / CAM technology).

In terms of aesthetics, veneers made of zirconium dioxide are significantly inferior to veneers made of porcelain (polysparic ceramics), as well as made of IPS Emax material. Clinical studies have shown that the closest in terms of aesthetics to IPS Emax glass-ceramics is the material Katana® UTML (Japan), followed by the materials Katana® STML (Japan), BruxZir® Anterior or Prettau® Anterior (Germany). Representatives of ceramic masses HeraCeram - ceramic mass for classic metal alloys for facing with ceramics. The manufacturing company Esprident carries out numerous research and implementation in the field of dental ceramic masses. So, for example, they produce sets for performing special ceramic masses "Carmen" for noble alloys. Shofu Vintage MP is the finest microceramic for placing veneers over any standard, high-temperature metal-ceramic alloy, both noble, semi-noble and non-



noble, with a recommended coefficient of thermal expansion of  $13.6$  to  $15.2 \times 10^{-6} \text{K}^{-1}$ .

Representatives of glass ionomer cements Ketac Cem radiopaque is a radiopaque glass ionomer cement for fixation of inlays, overlays, crowns, bridges, abutment inlays made of metals, metal-ceramics or zirconium systems. Breeze is a high-strength cement with a double hardening effect for strong fixation of orthopedic structures.

This cement was developed in order to completely facilitate and increase the speed of the dentist's work without reducing the quality and aesthetics of the result. CX-Plus Sofu is a high-quality Japanese glass ionomer cement for fixing orthopedic works. CX Plus Shofu dental cement is intended for fixation of crowns and bridge-like prostheses, overlays, inlays, extended and orthodontic structures.

Determination of the color of natural teeth. Factors of influence.

The natural color of the teeth is affected

1) the density of the enamel - through the thin enamel, the dentin "sees through", it is naturally yellowish;

2) microrelief of the tooth - the brighter it is expressed, the whiter the color of the tooth looks;

3) the quality of the dentin - with age or due to a number of other factors, it darkens, sometimes the pulp, which has a red-brown color, begins to "see through" it.

The visual shade of the teeth is determined according to the Wit scale. The color is determined not on one part of the tooth, but on several at once, as they may have differences:

A - with a predominance of a red-brown shade;

B – yellowish-reddish;

C - mostly gray shade;

D is a reddish-gray shade.

After the group is established, the brightness is determined using the same method, but already marked with numbers from 1 to 4. Four is the darkest shade, and one will be the lightest.

3.2. recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills and skills, etc.);

3.3. requirements for work results, including registration;

3.4. control materials for the final stage of the lesson: tasks, assignments, tests, etc. (if necessary).

1. A 57-year-old patient applied to the clinic of orthopedic dentistry with complaints of poor chewing of food and an aesthetic defect of the dentition. Objectively: the mucous membrane is of normal color, the remaining teeth are immobile, without obvious signs of pathology of the hard tissues of the teeth.

00 17 16 15 14 13 12 11 21 22 23 24 25 26 27 00

00 37 36 35 34 33 32 31 41 42 43 00 00 00 47 00

A stamped and soldered bridge prosthesis with a plastic lining was made for the patient. What constructive materials affect the mucous membrane of the oral cavity?

- A. Metal ions can affect the microflora of the oral cavity, plastic can cause an allergic reaction.
- B. Metals and plastics do not affect the mucous membrane of the oral cavity.
- C. Have a beneficial effect on the mucous membrane of the oral cavity.
- D. Only metal ions affect the mucous membrane of the oral cavity.
- E. Only plastic components affect the mucous membrane of the oral cavity.

2. A 65-year-old patient sought help from the clinic of orthopedic dentistry with complaints of difficulty in chewing food due to cementation of the bridge prosthesis on the left upper jaw. Objectively: the prosthesis on the chewing surfaces of the supporting 33, 36 tooth crowns has worn off. It is necessary to rework such a prosthesis: make stamped crowns and solder the intermediate part. Why do you need low-melting metals in this process?

- A. to receive stamps and counter stamps
- B. for preparing fluxes
- C. for soldering metal parts
- D. for fitting crowns
- E. for chrome plating of crowns

3. A 35-year-old patient has a stamped-soldered bridge prosthesis made in the orthopedic dentistry clinic. Crowns are fitted in the oral cavity. What clinical stage is next

- A. design verification
- B. preparation of teeth
- S. production of the intermediate part
- D. fixation of the prosthesis
- E. removal of occlusal impression

4. Stamped-soldered bridge prostheses made of stainless steel are made for the patient. In the process of manufacturing crowns, the sleeves are calibrated. Which of the listed devices is used?

- A. Bromstrom
- V. Larina
- S. Parker
- D. Kopa
- E. Samson

5. A 56-year-old patient complained of difficulty in chewing food. Objectively: absence of 14, 25 teeth, mobility of 15, 16, 17, 26, 27 teeth of the

first degree. It is necessary to make bridge prostheses with splinting elements. Choose an impression material for taking impressions from this patient.

- A. Stens
- V. Repin
- S. Gypsum
- D. Stomalgin
- E. Orthokor

#### 4. Summary of results.

- Factors influencing the color planning of orthopedic construction.
- Production of highly aesthetic designs taking into account the age group.

5. List of recommended literature (main, additional, electronic information resources):

##### Main:

- Orthopedic dentistry: textbook / Rozhko M.M., Nespryadko V.P., I.V. Paliychuk and others; under the editorship M.M. Rozhka, V.P. Nespryadka. - K.: Medical Center "Medicine"; 2020. - 720 p.

- Rozhko M.M., Nespryadko V.P., Mykhaylenko T.M. and others. Dentoprosthetic technique. K.: Book plus; 2016. 604 p.

- Rozhko M.M., Popovych Z.B., Kuroyedova V.D. Dentistry. Textbook. K.: Medical University "Medicine"; 2018. 872 p.

##### Additional:

- Dentistry: in 2 books. : textbook. Book 2 / M.M. Rozhko, I.I. Kirylenko, O.G. Denisenko and others. ; under the editorship M.M. Horn — 2nd edition. — K.: VSV "Medicine", 2018. — 992 p. ; color kind.

- Material science in dentistry: a study guide / [Korol D.M., Korol M.D., Ojubeiska O.D. etc.]; in general ed. King D.M. – Vinnytsia: New book, 2019. – 400 p.

##### Electronic information resources:

- State Expert Center of the Ministry of Health of Ukraine <http://www.dec.gov.ua/index.php/ua/>

- National Scientific Medical Library of Ukraine <http://library.gov.ua/>

- National Library of Ukraine named after V.I. Vernadskyi