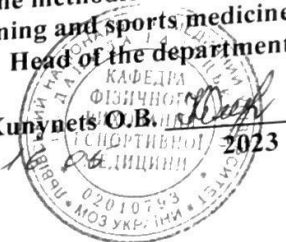


**LVIV NATIONAL MEDICAL UNIVERSITY N.A. DANYLO  
HALYTSKY**

**Department of Physical Training and Sports Medicine**

Approved at the methodical meeting of  
the department of Physical training and sports medicine  
Head of the department

k.b.s., associate prof. **Kunynets O.B.**  
Protocol № 18 from 2023



**GUIDELINES**

in the discipline

**PHYSICAL REHABILITATION AND SPORTS MEDICINE**

for 3th year students

training of specialists of the second (master's) level higher education in the field of  
knowledge 22 "Health" specialty 221 "Dentistry" for independent work in  
preparation for practical classes

**Topic 3** "Physical rehabilitation for purulent-inflammatory processes in the  
maxillofacial area. Physical rehabilitation for fractures of the jaws and bones of  
the facial skeleton."

LVIV-2023

Methodical guidelines are made in accordance with the requirements of the curriculum in the discipline "Physical Rehabilitation and Sports Medicine", compiled to train specialists of the second (master's) level of higher education in the field of knowledge 22 "Health" specialty 221 "Dentistry".

According to the curriculum, the study of physical rehabilitation and sports medicine at the medical faculty is carried out in the 3d year of study.

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Methodical guidelines were discussed and approved at the methodical meeting of the Department of Physical Education and Sports Medicine

Protocol № 18 from 16 of May 2023

## **1. Scientific and methodical justification of the topic.**

The results of numerous studies conducted in recent years indicate that the frequency of inflammatory processes in the maxillofacial area has increased significantly. This is due to the formation of resistance of the bacterial microflora to antibiotics, a decrease in the body's immune activity, the formation of allergic sensitivity and an inadequate reaction in response to the action of various external factors, as well as the spread of infections from the periodontium to the bone and soft tissues of the peri-maxillary area. Factors such as hypothermia, intoxication, and fatigue have a particularly negative effect on the body.

Inflammatory processes of the maxillofacial area are accompanied by general and local reactions of varying degrees of severity, violations of the main functions of this area. The means of FR, which are used in the complex treatment of such patients, can not only contribute to the resorption of inflammatory exudate and prevent the occurrence of gross cicatricial tissue changes, but are also capable of increasing the general non-specific resistance of the body, restoring functions disrupted due to the inflammatory process.

A dentist's knowledge of this topic will form motivation and increase professional responsibility for the timeliness, adequacy and systematicity of prescribing FR agents to patients with odontogenic inflammatory processes.

Jaw fractures are quite common injuries, their frequency is almost 15% of all bone fractures. Fractures of the lower jaw are observed much more often (more than 85% of cases). According to numerous data, the displacement of fragments with occlusal disturbances in fractures of the lower jaw most often depends on the contraction of masticatory muscle fibers, and in fractures of the upper jaw - on the strength and direction of mechanical action and the size of the fragments. Fractures are always accompanied by hemorrhages, infiltration of soft tissues, and increased tone of the masticatory muscles. The immobilization period of treatment of fractures is often complicated by the presence of functional disorders of the maxillofacial area and due to facial disfigurement - psychoemotional disorders. The whole complex of disorders is manifested by a decrease in the amplitude of movements in the temporomandibular joints, a decrease in the strength and tone of the masticatory muscles, pain in the area of ossification of muscles, tendons and joint capsules.

After providing the appropriate surgical care, the effectiveness of the treatment of such patients depends on the timely and systematic use of adequate non-medicinal drugs.

The use of FR means significantly accelerates the formation and structuring of the bone callus, restores the range of motion in the temporomandibular joints, increases the strength, speed and coordination of the chewing muscles, helps to improve the patient's quality of life.

The study of this topic will form motivation, increase professional responsibility for the timeliness, adequacy and systematicity of the prescription of FR drugs as part of the complex treatment of patients with fractures of the upper and lower jaw.

## **2. Learning goal**

### **2.1. The student should know:**

- clinical and functional justification for the appointment of FR agents to patients with odontogenic inflammatory processes.
- clinical and functional rationale for the appointment of FR agents to patients with jaw fractures.

## **2.2. Be able:**

- to substantiate and independently prescribe the means of FR as part of the complex treatment of patients with odontogenic inflammatory processes;
- describe and demonstrate special exercises to the patient.
- to justify and independently prescribe FR drugs as part of the complex treatment of patients with jaw fractures;
- describe and demonstrate special exercises to the patient.

## **2.3. Master practical skills:**

- to know independently which tasks of the FR can be assigned to the patient in the first treatment period;
- what are the general tasks in the treatment of odontogenic inflammatory processes in the maxillofacial area;
- what drugs of FR can be prescribed to the patient in the first treatment period;
- about the mechanisms of the therapeutic action of FR agents and the peculiarities of their use as part of the complex treatment of patients with odontogenic inflammatory processes.
- collect a general medical history;
- be able to fill out a physical therapy card;
- be able to issue a referral for treatment in a physiotherapy office;
- to be able to determine the periods of various diseases;
- to be able to determine movement modes.

## **3. Advice to the student:**

### **Physical rehabilitation for purulent-inflammatory diseases of the maxillofacial area.**

#### **1. Special tasks of the FR**

Improvement of blood and lymph circulation in the affected area. Acceleration of resorption of inflammatory exudate and hematoma, improvement of outflow of inflammatory exudate through drainage. Activation of reparative and regenerative processes.

Prevention of the development of rough astringent scars in the area of the mucous membrane of the mouth and skin.

Prevention of contracture development in the temporomandibular joint, muscle atrophy.

Compensation for disturbances in the function of chewing, swallowing, and speech due to unaffected tissues.

Restoring the impaired function of the facial and masticatory muscles, the tongue, the range of motion in the temporomandibular joint.

Elimination of chewing, swallowing, facial expressions and speech disorders.

#### **2. General tasks of the FR**

Prevention of congestive pneumonia, thromboembolic complications.

Stimulation of the activity of the circulatory system, respiratory organs, digestion.

Normalization of the patient's emotional state.

Restoring the patient's household and professional capacity.

### **3. Means and forms of FR, dosage of physical exertion**

**3.1. The first period** — early postoperative — before the removal of postoperative sutures.

Movement mode — bed, ward.

Physical exercises in the form of ThG; position treatment (which improves the outflow of inflammatory exudate).

The intensity and duration of the total load depend on the functional state of the life support systems

Special exercises for intact muscles (taking into account the localization of the inflammatory process) - mimic, chewing, tongue. Repeat each exercise 5-6 times in a row every 2 hours.

General development — for the distal and middle parts of the limbs at a slow pace, 5-6 repetitions, alternating with breathing exercises 1:1, 2:1, duration - 10-20 minutes.

### **3.2. The second period is the late postoperative period**

after removal of postoperative sutures, on the 5th-10th day.

The movement mode is free.

Physical exercises - in the form of therapeutic gymnastics, dosed walking, massage (in the absence of purulent secretions).

Special — including exercises for the muscles involved in the pathological process (mimic, chewing, tongue). Repeat each exercise 10-15 times in a row at least 5 times a day.

General development — all (including proximal) parts of the limbs, 6-8 repetitions of each exercise, ratio with breathing exercises - 3:1, duration of classes - 30-40 minutes. 1-2 times a day.

### **3.3. The third period is recovery**

residual disorders of the maxillofacial area functions.

Movement mode — gentle, gentle-training, training (depending on the functional state of the body's energy-supplying systems).

Physical exercises in the form of therapeutic gymnastics, dosed walking, mechanotherapy, massage.

Special — for all muscles, including exercises for masticatory muscles, performed with resistance by the hand of the patient or the methodologist.

General development — with maximum amplitude, at an average and fast pace, the number of repetitions 8-12 times, the ratio with breathing exercises - 4:1, duration - 30-45 minutes 1-2 times a day. Hardening.

## **1. Principles of fracture treatment**

1.1. Alignment of fragments by open (operational) or closed (manual) method

1.2. Immobilization (maintenance) of juxtaposed fragments in the correct position

Application of various splints (single, double-jaw), use of extra-oral devices of a special design.

With the help of operative fixation with steel wire, metal plates, screws, needles and other accessories (osteosynthesis).

1.3. Prevention, reduction of the severity of trophic disorders of tissues in the area of immobilized jaws.

1.4. Elimination of trophic disorders caused by immobilization, restoration of chewing and

speech functions, improvement of the patient's quality of life.

## **2. Complications due to immobilization**

Hypotrophy, atrophy of masticatory muscles, facial skin due to reduction of assimilation processes.

Temporomandibular joint contracture as a result of deterioration of articular cartilage trophism, decrease in the amount of synovial fluid produced during joint movements.

Ossification of muscles, tendons, joint capsule due to fibroblasts, which are formed on the periphery of the hematoma on the 7th day and are the cause of pain and contractures.

## **3. Tasks of the FR**

3.1. The first period of immobilization is the period of formation of the primary bone callus:

- stimulation of resorption of post-traumatic infiltration of tissues and hemorrhages in the area of the injured jaw;
- normalization of the trophic system of the musculoskeletal system, skin;
- normalization of trophic articular cartilage and stimulation of the formation of synovial fluid, which prevents joint contracture;
- stimulation of the processes of formation of the primary bone callus

3.2. The second period of immobilization (from the beginning of the 3rd week) - loosening of the intermaxillary fixation or replacing the double-jaw splint with a removable splint:

- stimulation of bone callus formation;
- normalization of the trophism of chewing muscles, ligaments and articular cartilages;
- restoration of range of motion in the temporomandibular joint

3.3. The third period (removal of immobilization) - restoration of functions maxillofacial area:

- stimulation of the restructuring of the primary bone callus into the secondary;
- restoration of full range of motion in the temporomandibular joint;
- restoration of strength, speed and coordination of chewing muscles;
- restoring the functional capabilities of the body's life support systems and improving the patient's quality of life

## **4. FR means, forms, dosage methods of physical exertion as part of complex treatment of patients with fractures of the upper and lower jaws:**

4.1. The moving mode depends on:

- the nature of the fracture;
- treatment period;
- accompanying pathology (brain concussion, cerebral contusion, stroke, myocardial infarction, etc.);
- in the absence of somatic pathology: in the hospital — free mode, in outpatient conditions — gentle

4.2. Exercise:

- gymnastic, applied sports, ideomotor;
- active and passive;
- dynamic and isometric (ideomotor);

- respiratory (dynamic and static)

Forms of using physical exercises:

- therapeutic gymnastics;
- independent classes on a special task in front of a mirror;
- mechanotherapy;
- metered walking;
- sedentary, mobile sports games;
- massage (manual, cryo massage)

Methods of conducting classes:

- depend on the nature of the fracture, the period of treatment, accompanying somatic pathology;

- in the absence of somatic pathology — supplement the group method with independent classes

The intensity and duration of the total load depend on:

- the nature of the fracture;
- accompanying pathology;
- functional capabilities of life support systems

## **5. Peculiarities of using physical exercises**

### **5.1. The first period of immobilization**

Avoid sharp bends of the body, jumps, sharp turns of the head.

Perform ideomotor exercises with bimaxillary splinting for masticatory muscles.

The arrival of impulses to the contraction of the masticatory muscles with closed teeth at a slow pace with an interval of 1-2 s.

Perform exercises in front of a mirror for facial muscles, tongue, and neck muscles.

With single-jaw splinting or osteosynthesis, on the 2nd-3rd day, open and close the mouth, make slow movements of the lower jaw to the sides, chewing movements.

Cryomassage of the entire face with an emphasis on the area of the traumatic process, self-massage of the inner tooth-jaw surface with the tongue, stroking the face.

### **5.2. The second period of immobilization (from the beginning of the 3rd week)**

Loosen the intermaxillary fixation or apply a removable spike in the case of double-jaw splinting.

Introduce active exercises for the chewing muscles at a slow pace with incomplete amplitude, avoiding painful sensations.

With single-jaw splinting, more energetic exercises for the masticatory muscles can be recommended. Carefully use passive movements and elements of mechanotherapy.

Cryomassage, self-massage of the inner tooth-jaw surface with the tongue, facial massage using stroking techniques, gentle kneading and vibration.

Active exercises for neck muscles and facial muscles.

### **5.3. The third, post-immobilization, recovery period**

Active - passive exercises with maximum amplitude for chewing muscles: opening the mouth, lateral movements of the lower jaw, pushing it forward.

Active exercises for chewing muscles with resistance.

Mechanotherapy with the help of "oscillating beds" of Limborg, kneading apparatus with paddles or spoons, apparatus of Matesis, Oxman, lip expander.

In the massage procedure, include more active rubbing, kneading and vibration.

Increase the intensity and duration of the total load on the body in accordance with the functional capabilities of the energy supply systems.

**6. Assessment of the adequacy of the direct effect of physical exertion during operational control to achieve the safety of classes and a positive cumulative effect:**

The values of heart rate and blood pressure should not exceed the functional capabilities of the patient's body.

For patients with a concussion or brain injury, the heart rate and blood pressure values should not exceed those at rest.

Absence of pain in the maxillofacial region.

### **7. Evaluation of the cumulative effect of the used FR means by stages of treatment**

7.1. At the end of the immobilization period

X-ray confirmation of the formation of a primary bone callus in a specified period.

Absence of an inflammatory process in the maxillofacial area. Absence of swelling and ossification of muscles, tendons, joint capsules in the maxillofacial area.

Absence of maxillofacial contracture.

Absence of a significant decrease in functional reserves of life support systems.

7.2. At the end of the recovery period

X-ray confirmation of the formation of a secondary bone callus at the fracture site in a specified period.

Restoration of movements of the lower jaw forward, to the sides Restoration of "working opening of the mouth" - at least 2 transverse dimensions of the patient's middle finger.

Restoration of strength, tone, coordination and efficiency of the masticatory muscles.

### **Control questions:**

1. Name the special tasks of FR in the treatment of odontogenic inflammatory processes in the maxillofacial area.

2. What is the trophic mechanism of action of FR means related to?

3. What problems can be solved if local blood flow is improved?

4. How long after the operation can FR agents be prescribed to a patient with odontogenic inflammatory processes in the maxillofacial area?

1. How is retention (immobilization) of fragments of jaw bones carried out?

2. What complications can be caused by immobilization of fragments of paired jaw bones?

3. Tasks of the first immobilization period of treatment of patients with jaw bone fractures?

4. What complications can be caused by immobilization of fragments of paired jaw bones?

5. Tasks of the first immobilization period of treatment of patients with jaw bone fractures?

6. Tasks of the second immobilization period of treatment patients?

7. Tasks of the third period of treatment patients (after removal of immobilization)?



8. What does the movement mode of a patient with a fracture of the jaw bones depend on?
9. What physical exercises are used to solve special problems in patients with jaw bone fractures from the first days of treatment?
10. How does massage work with jaw fractures?
11. What depends on the choice of the method of carrying out physical exercises for patients with fractures of the jaw bones?
12. What does the intensity of the general physical load during classes with patients depend on?
13. What is the essence of the second immobilization period of treatment patients with jaw bone fractures?
14. What are the tasks of the second period immobilization of jaw bone fractures?
15. What are the tasks of the third period of treatment of jaw bone fractures?
16. What are the features of using physical exercises in the first period of immobilization?
17. What are the features of using physical exercises in the second period of immobilization?
18. What are the features of using physical exercises during the recovery period?

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