

## FORMATION OF MEASURES FOR INJURIES OF MEMBERS OF THE MUSCULOSKELETAL SYSTEM

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### **Annotation:**

Support and movement – a full-fledged life is unthinkable without them. The human musculoskeletal system consists of joints and the spine – powerful and at the same time very vulnerable natural mechanisms.

In this article highlights of formation of measures for injuries of members of the musculoskeletal system.

**Keywords:** injury, modern medicine, diagnostic and treatment, muscle, musculoskeletal system, muscle fiber, ambulance.

It is known that each striated muscle consists of a large number (from hundreds to tens of thousands) of muscle fibers. The length of the fiber ranges from several millimeters to 10-12 cm. Muscle fiber has three physiological properties:

- excitability – the ability to respond to irritation of the muscle itself or the corresponding motor nerve;
- conduction – the ability to conduct excitation throughout the muscle fiber;
- contractility – the ability to change its length or tension when excited.

The longer a muscle fiber is able to change its length the more it contracts. The thicker the fiber, the greater the force develops during contraction. The complete cycle of a single contraction of a muscle fiber consists of two phases: a contraction phase with energy expenditure and a relaxation phase with restoration of energy potential. The energy needed to contract muscle fibers is released as a result of a complex biochemical process in muscle fibers, which can occur with or without oxygen (aerobic metabolism) (anaerobic metabolism).

Aerobic metabolism prevails during intensive short-term muscle work, while anaerobic metabolism prevails during moderate physical activity and ensures long-term work. Oxygen and substances that provide energy metabolism in the muscles are delivered by the blood, and the metabolic process is regulated by the nervous system. Consequently, muscular activity is closely related to the activity of many organs and systems (nervous, cardiovascular, respiratory, digestive, excretory, etc.).

Changes in muscle activity during physical exercise inevitably cause an increase in the activity of other organs and systems. There are four types of therapeutic effects of physical exercises: tonic, trophic, the formation of compensation and normalization of functions. The

tonic effect (increase in general tone) is manifested in all cases of physical therapy, and it can be considered the main one. It manifests itself, first of all, in the restoration of impaired motor visceral reflexes, which allows, with an appropriate choice of physical exercises, to purposefully increase the tone of those organs in which it is more reduced. The trophic effect is manifested in cases of tissue damage or hypotrophy.

Trophic is a set of cellular nutrition processes that ensure the constancy of the structure and function of a tissue or organ. Initially, the trophic effect of physical exercises is manifested in accelerating the resorption of dead tissue elements due to improved local blood circulation. Then, in the defect replacement phase, increased delivery of building proteins is provided, which are used to form new tissue structures to replace the dead ones. Excessive exposure to physical exercise disrupts the regeneration processes and often leads to the formation of a connective tissue scar. With atrophy, not only a decrease in tissue volume occurs, but also structural changes of a degenerative nature appear.

Therefore, the use of physical exercises in atrophy for the purpose of full functional recovery takes a long time. The formation of compensation is manifested in cases when any function of the body is disrupted under the influence of the disease. If the dysfunction is life-threatening, compensation is formed spontaneously and immediately, otherwise (not life-threatening) compensation should be formed during treatment.

The musculoskeletal system suffers from mechanical damage more often than others. The concept of injuries of the musculoskeletal system includes various pathologies: fractures and dislocations of limbs, ligament damage, traumatization of tendons, muscles and nerve tissues. Bruises are common injuries. They are accompanied by palpable soreness, swelling, and hematomas.

Injuries can be different in localization, mechanism of formation, and complexity. The classification of injuries provides for:

- bruises are closed mechanical injuries of soft tissues, often do not significantly affect the functioning of the musculoskeletal system, however, extensive injuries can provoke acute pain syndrome and shock conditions;
- dislocation refers to a common injury and implies displacement of the ends of bones in the articular joint, it can be complete and incomplete. It requires medical intervention and fixation of the damaged organ;
- stretching or tearing of soft structures – ligaments, tendons and muscle fibers suffer from excessive exposure. In case of a complete rupture, surgical treatment is recommended;
- fractures – according to statistics, a greater percentage of injuries occur in closed limb fractures. Often, acute injuries to the bone structures of the musculoskeletal system are accompanied by a rupture of the skin. Open fractures are more often complicated and cause persistent inflammation, requiring enhanced drug therapy.

There is a division of injuries of the musculoskeletal system into conventional and geriatric. The latter imply age-related changes in the musculoskeletal system and the inevitable damage associated with them. In more detail, the types of injuries of the musculoskeletal system are studied in traumatology. Doctors consider the biomechanics of injuries and diseases of the musculoskeletal system in order to improve the quality of medical care.

The international classifier of diseases defines injuries and the effects of external causes in a separate category. It, in turn, consists of the following blocks:

- injuries to individual parts of the body – are in the range S00 – T14;
- complications of surgical interventions – receive the code T84, and in case of violation of bone structures due to the introduction of orthopedic structures, the disease is encoded M96.6;
- the consequences of injuries – complications after acute injury are encoded T90 – T94, depending on the location of the damage.

Mechanical influences act as provocateurs of damage. Injuries of the musculoskeletal system in mature and elderly people are often associated with diseases of joints, bones and a deficiency of nutrients in the body. But diseases of the musculoskeletal system by themselves do not provoke injury, but increase its likelihood.

First aid for any injuries to the musculoskeletal system is to ensure rest. The victim is offered to take a comfortable position. If the spine is injured due to a blow or fall, it is necessary to lay the patient down, and in the case when he is already lying, mobility should be minimized. The list of measures for first aid with injuries of the musculoskeletal system includes fixation. Immobilization is carried out using a tire. It is applied in case of dislocation or fractures of bones immediately at the scene. In case of injury to the ligaments of the joint, a pressure bandage is recommended.

Further medical care for typical injuries of the musculoskeletal system depends on the severity of the symptoms. In acute pain, a non-narcotic analgesic is given. In order to prevent swelling and bruising, the injured organ is cooled. As part of an emergency, ice wrapped in a napkin is applied for a period of no more than 15 minutes. Why, in your opinion, in case of injury to the musculoskeletal system, ice is applied for such a short time? Prolonged cooling can cause frostbite of tissues. Moreover, cold is applied mainly during the first hour after the injury. With further cooling, the positive effect of the procedure will be minimal. This explains why, in case of injury to the musculoskeletal system, it is recommended to keep ice a little and not too long.

First aid pays special attention to transport immobilization. It is better to entrust the transportation of the victim to medical workers, if this is not possible, they fix it with improvised means. If there are none, then the limbs, for example, can be connected to each other, giving an anatomical position. Such immobilization will be sufficient for the duration of transportation.

If there are no problems with first aid for injuries, then the risk of complications is minimal. The exception is severe multiple injuries that cannot be adequately treated in the field. But even in this case, first aid eliminates the possible consequences of injuries.

Diagnosis of the musculoskeletal system at the prehospital stage includes examination and examination of the patient. They provide important information for the emergency physician and allow us to draw conclusions about the nature of the injury. If a closed fracture of the spine or pelvic bones is suspected, instrumental examinations are prescribed. Radiography remains the most informative and accessible method. It reveals violations of the integrity of bone structures and pathologies in which the articular surfaces stop touching.

CT, MRI and ultrasound are recommended for soft tissue examination. They determine the physiological changes and features of individual injuries: ruptures of tendons, soft tissues in the area of the muscular abdomen, destruction of blood vessels and nerve fibers.

Emergency treatment is provided by a traumatologist. An orthopedist treats injuries and diseases of the musculoskeletal system in the clinic. Patient care is included in the nursing program. Injuries and diseases of the musculoskeletal system in athletes are dealt with by a number of doctors: from surgeons to physiotherapists.

It is difficult to say what kind of therapy will be in a particular case. In case of fractures, reposition is performed and a plaster cast is applied. Bandages and orthoses are used for dislocations and sprains. Injury prevention and treatment are carried out mainly at home, with the exception of skeletal traction procedures. As a prevention of diseases and injuries of the musculoskeletal system, the doctor prescribes the wearing of orthopedic structures, physical and occupational therapy, taking vitamins and chondoprotectors.

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