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## Problems of Physical Rehabilitation of Children with Down Syndrome with Injuries of The Lower Limb.

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### ABSTRACT

The development of the society is accompanied by a continuous search for means of treatment and rehabilitation of people with disabilities. Recently, children with Down's syndrome often have injuries of the lower limbs, which require a competent rehabilitation for the fullest restoration of the function. Objective: to highlight the main components of physical rehabilitation of children with Down's syndrome with injuries of the lower limb. The success of rehabilitation with this pathology is possible when using complex therapeutic physical training, therapeutic massage, physiotherapy. The therapeutic physical culture allows restoring movements in the lower limb, reduces swelling of the injured leg, prevents the development of traumatic flat feet, deformities of the foot and the curving of the fingers, restores the functions of the damaged limb and the movement skill. Massage promotes acceleration of regeneration processes at the site of fracture and elimination of stiffness. To restore the functions of the lower limb, the combination of massage with mud therapy, apparatus physiotherapy and mechanotherapy has a good effect. Also, to achieve full recovery of lost function of ankle joints, an increase in motor activity in the form of soccer can be used. Only with the complex application of these remedies, recovery occurs quickly enough, with the least dysfunction and preservation of working capacity. Key words: lower limb, Down's syndrome, therapeutic physical culture, massage, physiotherapy, football.

**Keywords:** rehabilitation, down syndrome, lower limb.

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## INTRODUCTION

The development of society is accompanied by a continuous search for means of healing the human body [1,2] at any age and at any pathology [3,4]. With this purpose, actively carried out the experimental studies [5-7] and clinical observations [8,9]. It is increasingly clear the need of development and improvement of rehabilitation techniques in pathology in people with genetic disorders [10,11]. With this purpose, there are different effects [12,13], which helps to restore the physical condition of the person and ensures its integration into society [14,15].

In the modern world remains relatively high prevalence of injuries of the lower extremities, which occur in 10-15% of cases of all injuries in children with down syndrome [16]. This is largely due to manifestations of trisomy on the 21st pair of chromosomes [17].

Practice shows that during the recovery phase after injuries of the lower extremity requires the use of physical rehabilitation. Fractures of the bones forming the lower limb, the situation is aggravated by the need for long fixation. This leads to weakening and atrophy of the muscles that dictates the need for the intelligent application of rehabilitation influences. It is noticed that the early start of physical rehabilitation, the faster and better will go to restore lost functions [18]. It is recognized that in this state the most efficient is the integrated use of means of physical rehabilitation, including therapeutic physical culture (physical therapy), therapeutic massage and physiotherapy [19].

In the analysis of the available literature we can conclude about the lack of compilation of information about the most effective methods of physical rehabilitation of children with down syndrome, suffered a fracture of the lower limbs [20,21]. Given that the recovery period after lower leg damage is quite extensive and covers three phases: stationary phase, early outpatient phase and late ambulatory stage [22], it seemed important to consider means of physical rehabilitation in injuries of the lower extremity in children with down syndrome, the most effective at all stages of recovery.

Objective: to highlight the main components of physical rehabilitation of children with down syndrome in injuries of the lower extremity.

### **Therapeutic physical culture in the rehabilitation system**

**LFK at the hospital stage.** In the first day, regardless of the type of treatment, the damaged limb, to reduce swelling, is placed on the Beller's gypsum. Walking on crutches to the patient is allowed on the 8-10th day without the support of a sick limb. If the fragments are correctly positioned, without an operation, the victim is sent home after a week in the hospital, and after surgical treatment - at the end of the second week. At this stage, in order to improve blood circulation and reduce edema, it is recommended that the injured person receive a periodic lowering of the damaged leg from the bed, and returning it to an elevated position [23].

LFK at an early outpatient stage solves several tasks for rehabilitation: recovery of movement in the joint of the lower limb; reduction of swelling of the injured leg; prevention of the development of traumatic flat feet, deformation of the foot and bending of the fingers; restoration of the function of the injured limb and the skill of movement.

After stopping the fixation, all exercises are performed in a lightweight mode. Exercises with muscle tension alternate with muscle relaxation. This period of recovery includes all kinds of movements for the damaged limb. Exercises are performed in the initial lying position, on the abdomen, while sitting; standing on all fours. After skeletal traction, with oblique and comminuted fractures, the first determination of the tolerance of the injured limb is carried out in 3,5-4 weeks. When combining a bone fracture with a metal rod, a screw and a beam, the training of the supporting function is started on the 15th-21st day. If the stabilization of the fragments is achieved by means of compression-distraction apparatus, the load with support on the injured leg is given on the 7th-10th day [24].

In the future, the exercises include foot movements, exercises with weights and resistance and with gymnastic objects. Gradually, the occupation is entered the initial position standing upright and on the knees. Other options for walking: on socks, heels, on the outside or inside edge of the feet, forward back, sideways,

cross-step, in the semicircle, etc. Positive signs are: absence of pain during palpation in the fracture region and axial load and absence of edema [25].

**LFK in the late ambulatory stage solves two main tasks:** the final restoration of the motion of the damaged limb and the normalization of all body functions.

Late outpatient stage begins with the moment of removal of gypsum fixation and lasts until the clinical and functional recovery of the patient. In this period the patient receives exercise therapy in combination with a massage. An increase in the surface of the exposed massage (shin, thigh and buttocks) promotes the restoration of lower limb function regardless of the localization of the fracture and improves the effect of exercise therapy. The load on the leg can be used after restoring active movements in the lower limb in the absence of pain and 2-3 weeks after the immobilization ceases. LFK at this stage of rehabilitation can restore the normal amplitude of movements in the joints, strengthen the strength of the muscles of the entire body, eliminate contractures and prevent flat feet [26].

### **Therapeutic massage in the rehabilitation system**

Massage promotes the acceleration of regeneration processes at the site of fracture and improvement of mobility. Early massage starts from the 3rd-5th day after repositioning. Massage the diseased limb is possible in a plaster bandage and with superimposed skeletal traction. When a plaster bandage is applied to a limb, vibration reflex-segmental massage is recommended, which is performed in a certain reflex area, which corresponds to the lumbar region of the spine, segment L3-L4. Given the reflex effect of massage, you should massage your healthy leg every day for 3-5 minutes [27].

With a skeletal traction for the heel bone massage is performed on the thigh and shin areas, focusing on the reduction of muscle tone, which can be increased not only at the site of the fracture. In these cases, a gentle vibrating massage lasting 3-5 minutes every other day with a relaxed limb musculature is used. From receptions of manual massage apply alternately uninterrupted and intermittent stroking in the centripetal direction.

If there is swelling of the foot, start with a light suction massage in the direction from the edge to the center. After reduction of the edema, they pass to intermittent stroking according to the type of zigzag movements, avoiding the fracture site [28].

2-3 weeks after the removal of the gypsum, hugging intermittent stroking is performed, with the hands moving towards each other. A month after the removal of the plaster bandage, a flat deep stroking begins, and then embracing, intermittent, intermittent stroking, slight pinching, continuous kneading in the longitudinal, circular direction and, finally, active mobilization of the ankle joint. All these methods of massage are combined with exercise therapy. To restore the functions of the ankle joint, a combination of massage with mud therapy, apparatus physiotherapy and mechanotherapy has a good effect [29].

### **The use of physiotherapy in the rehabilitation system**

With lesions of the lower limb, the best results are noted when applying: ionophoresis with novocaine (with pain syndrome) every 2 days; phonophoresis (ultrasound) with hydrocortisone (after 3 days); with obligatory bandage of the lower limb [30]. This will improve blood circulation in vessels of any caliber [31, 32] and accelerate the reparative process to the highest possible level [33,34].

The use of football training elements in the rehabilitation system Football is not just a game, it is a great opportunity for full-fledged physical and emotional development. Football develops coordination, endurance, collectivism, promotes the increase of intelligence. Also, football can be used in physical rehabilitation to achieve full recovery of the lost function of the lower limb [35]. The lessons on football will teach you to improve the functioning of the limbs with individual movements. Football teaches to repeat after the trainer and independently carry out certain motor actions, forming skills of motor improvisation in a child with Down's syndrome. Classes develop imaginative thinking and imagination, they will give a harmonious plastic development. In football, not only are the main moves that are characteristic of football valuable. The basic model of the football session includes stimulation of the breathing process, easy stretching, helps in the

development of plastics and all this is done in harmony, in the company of peers. Communication in football training is not only a training or fun, it is an opportunity for self-realization and recovery. Football will help to eliminate emotional and physical disorders and restore the condition of a child with Down syndrome [31].

### CONCLUSION

Damage to the lower limb is an actual problem of our time. Various injuries of the lower limb in children with Down syndrome often lead to a prolonged limitation of mobility, have a negative impact on the leading physiological systems of the body, on health indicators in general and the level of overall performance. Children with Down syndrome with fractures of the lower limb need physical rehabilitation at all stages of restorative treatment. In fractures of the lower extremity in children with Down's syndrome, the situation is aggravated by the need for prolonged fixation of the joint in a certain position, which always leads to weakening and atrophy of the muscles, which further complicates the rehabilitation process and makes it more prolonged. In the complex application of physical therapy, massage, physiotherapy and football, physical rehabilitation can be maximally effective, ensuring full restoration of the functions of the injured lower limb.

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