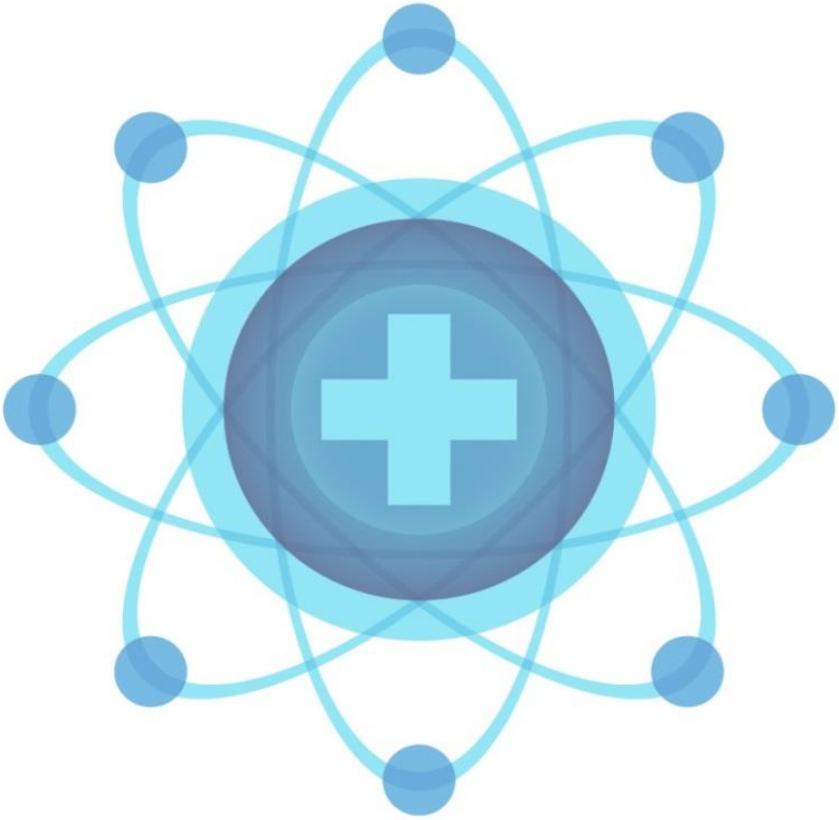

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INJURIES OF THE ANKLE JOINT IN ATHLETES. A NEW VIEW ON THE PROBLEM OF REHABILITATION

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Abstract: Foot and ankle injuries are extremely common among athletes and other physically active people. Rehabilitation programs that emphasize the use of therapeutic exercises to restore joint range of motion, muscle strength, neuromuscular coordination, and gait mechanics have shown clinical success in patients suffering from a variety of foot and ankle pathologies. Rehabilitation programs for ankle sprains, plantar fasciitis, Achilles tendinitis, and peat toe are discussed. Injuries to the ankle joint also occur in everyday household activities. Not to mention sports - a fifth of all injuries are associated with the ankle. Given the fact that the ankle joint is involved in walking and running, such injuries should be taken very seriously. Especially in cases where a sports career is an important part of your life.

Keywords: ankle, active,health,muscle,pathologies,sprains,toe, distortions, treatment, modern technologies.

The foot and ankle are among the most common sites for both acute and chronic injuries in athletes and other physically active people. While they are rarely life-threatening, they often have a detrimental effect on athletic performance and participation. When a foot or ankle injury occurs, athletes are limited in their ability to run, jump, kick, and change direction. Thus, the treatment and rehabilitation of these injuries are critical to return athletes to full participation in full functioning. When treating foot and ankle injuries, all typical clinical factors (type of injury, severity, healing time, type and level of activity, etc.) need to be considered, but other factors such as the condition of the foot are also important to consider,type, biomechanics, footwear worn during activity, and external support such as bracing or taping. The foot is the backbone of the lower quarter kinetic chain, so if rehabilitation

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and treatment is not done properly, a foot or ankle injury can eventually cause secondary injuries elsewhere in the chain.

Sprains (distortions) and ankle ligament injuries are among the most common injuries. Based on data from comparable countries, it can be assumed that in Germany alone more than 1 million people suffer an ankle injury every year. The complex of external ligaments of the ankle joint is injured in 85% of all cases.

Ankle ligaments can be overstretched or even torn when the foot is tucked in, with or without external force. Such injuries often occur during sports. Acute ankle injuries are the most common. They make up 15% to 20% of sports injuries. Sports that use frequent, rapid changes of direction, jumping, and contact with other players pose a particular risk to ankle ligaments. Football, basketball and volleyball are sports with particularly high injury rates, such as acute ankle injuries.

The risk of re-injury to the ankle is especially high among athletes. Approximately one-third of patients re-injure the ankle within 3 years; among athletes, this figure is 73% of all cases. Later, many patients complain of slight swelling in the ankle area, pain during walking and running, swelling and some instability of the ankle joint. Absolutely anyone can stretch or tear the ligaments in this joint. In everyday life, ankle sprains or fractures are more common in women who wear high heels. Among athletes, the greatest chances of getting an ankle injury are figure skaters. In addition, gymnasts are at risk. As well as those who ski, play football, basketball and handball. Due to a fall, a person can damage the ligaments or even the articular bag. It can also break bones (talus, tibia, or fibula). A dislocation of the joint is also possible. The symptoms of all these pathologies are similar, and only a specialist can understand the features. Methods of treatment in each case will be different.

Combined injuries of the ankle joint are among the most severe intra-articular fractures, the treatment of which often ends with severe dysfunction and the development of deforming arthrosis.

Recently, in case of injuries of this joint, the indications for its early surgical treatment using modern techniques have significantly expanded, in which stable fixation of fragments is carried out, which makes it possible to proceed to early mobilization of the joint in the future.

First of all, today's interest in the pathology of the ankle joint is associated with the emergence of new minimally invasive arthroscopic methods of visualization and treatment of joint pathology in general.

- These techniques, firstly, gave a new impetus to the study of normal and pathological anatomy, physiology and biomechanics of the joint.

Secondly, they made it possible to reveal the hidden mechanisms of the already seemingly studied problem of damage to the cartilaginous cover of the joint. Thirdly, the use of these techniques was, as it were, the initial stage of rehabilitation treatment and became decisive in the further rehabilitation of patients. Unfortunately, at present, the authors of special works devoted to this problem almost do not touch upon the rehabilitation period that follows the stabilization of fragments, limiting

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themselves only to general statements about the need for early joint function with late axial load on the injured limb.

The main reasons for inadequate restorative treatment, in addition to the severity of damage to the ankle joint, are: unreasonably prolonged akinesia associated with immobilization of the joint, hypokinesia due to bed rest, as well as local changes in the tissue structures of the ankle joint. All this in combination often leads to the formation of a rough postoperative scar, excessive callus, articular cartilage dystrophy, muscle hypotrophy, wrinkling of the articular bag, and the formation of deforming osteoarthritis of the ankle joint.Thus, insufficient attention to early rehabilitation treatment in the postoperative period ultimately affects the quality of social, labor and sports rehabilitation of patients. In addition, athletes very quickly reduce their endurance to physical exertion, the coordination of movements is disturbed, and the proprioceptive control inherent in nature and trained in the process of sports activity is lost.

Therefore, it is extremely necessary to quickly restore the deficiency of proprioception through early kinesitherapy and not to unbalance the complex of special motor skills of each individual athlete. Studies of domestic and foreign authors have established that the synovial environment of the damaged joint, namely the synovial membrane, synovial fluid and articular cartilage, which are also involved in proprioception, is of decisive importance for the full restoration of the cartilage cover after eliminating the anatomical discrepancy and achieving adequate blood flow.

The introduction of new technologies in operative orthopedics has significantly changed the outlook on postoperative management of patients. Reliable osteosynthesis together with. arthroscopy of the joint allows to overcome the existing "with; treatment of intra-articular fractures, the contradiction between the need for long-term and reliable immobilization of the injured limb for education! callus between fragments and the need for early movements in the joint to restore its functions.

The combination of reliable fixation of fragments and timely objective arthroscopic assessment of the state of the articular cartilage of the injured joint creates the conditions for early passive-active intensive kinesitherapy; This therapy can become an integral part of the technology of restorative treatment of intra-articular fractures, including the ankle joint, which is one of the most difficult for rehabilitation. Even with: complete restoration of the congruence of the articular surfaces, tibiofibular syndesmosis and capsular-ligamentous apparatus in such patients over time, depending on the type of primary combined injuries of the ankle joint and the adequacy of restorative treatment, deforming osteoarthritis develops.

For all sports medicine professionals, gait assessment is important for rehabilitation after lower extremity injuries. Understanding the normal gait pattern will allow the clinician to identify and correct incorrect compensation after injury. Identification of gait disorders should play a key role in the decision to refer a patient to supervised rehabilitation. The movement of the lower limb during normal walking and running can be divided into two phases: the stance phase and the swing phase.

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The stance or support phase begins with initial heel strike contact and ends with toe lift. This phase performs two important functions. First, the foot acts as a shock absorber for the impact forces during a heel strike, and then the foot adapts to the ground. Secondly, during break-off, the foot acts as a rigid level to transfer force from the foot to the ground. At initial contact, the subtalar joint is supinated and there is external rotation of the tibia. When the foot is loaded, the subtalar joint moves into a pronation position until the forefoot touches the ground. The change in subtalar movement occurs between the initial heel landing and the 20 percent stance phase of the run. Because pronation occurs at the subtalar joint, the tibia will rotate inward. Rotation in the transverse plane occurs at the knee joint due to the rotation of the tibia. Pronation of the foot unlocks the intertarsal joint and allows the foot to absorb shock and adapt to uneven surfaces. In the initial impact, it is important to reduce the ground reaction forces and evenly distribute the load on the many different anatomical structures of the foot and lower leg. Pronation is normal and allows forces to be distributed to as many structures as possible to avoid overstressing only a few structures. The subtalar joint remains in the pronated position until 55 to 85 percent of the stance phase with maximum pronation coincides with the passage of the body's center of gravity over the base of the stance. Between 70 and 90 percent of the stance phase of the foot begins to resupinate and approaches a neutral subtalar position. In supination, the intertarsal joints lock up and the foot becomes stable and stiff to prepare for push-off. This rigid position allows the foot to exert more force from the lower limb to the ground. The swing phase begins just after the toe lifts off and ends just before the heel lands. During the swing phase, the leg moves from behind the body to a position in front of the body. Foot and ankle injuries are extremely common among athletes and other physically active individuals. Rehabilitation programs that emphasize the use of therapeutic exercise to restore joint range of motion, muscle strength, neuromuscular coordination, and gait mechanics have been shown to have clinical success for patients suffering various foot and ankle pathologies. Rehabilitation programs are discussed for ankle sprains, plantar fasciitis, Achilles tendonitis, and turf toe. Ankle injuries are determined by the type of tissue that is injured—bone, ligament, or tendon. The ankle is where three bones meet - the tibia and fibula of the lower leg with the talus of the foot. These bones are held together at the ankle joint by ligaments, which are strong, elastic bands of connective tissue that hold the bones in place while allowing normal movement of the ankle joint. Tendons attach muscles to bones to keep the ankle and foot moving and also help keep joints stable.

A fracture describes a break in one or more bones. Sprain is a term that describes damage to ligaments when they are stretched beyond their normal range of motion. Ligament sprains can range from many microscopic tears in the fibers that make up the ligament to a complete tear or tear. Strain refers to damage to muscles and tendons as a result of overstretching or stretching.

Lateral ankle sprains are a common acute injury that athletes suffer from. The most common mechanism for lateral ankle sprains is excessive inversion and plantar flexion of the hindfoot at the tibia. The damaged ligaments are located on the lateral

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side of the ankle joint and include the anterior talofibular, posterior talofibular, and calcaneofibular bones. In lateral ankle sprains, the severity of the ligament injury will determine the classification and course of treatment. Grade 1 sprains are sprains with little or no joint instability. Pain and swelling with grade 1 sprains are often mild and rarely debilitating. After initial treatment for pain and swelling in a grade 1 sprain, rehabilitation can often begin immediately. The time lost from physical activity in a grade 1 sprain is usually less than one week. Dislocations of the 2nd degree are accompanied by rupture of the ligamentous fibers and moderate instability of the joint. Pain and swelling range from moderate to severe, often requiring immobilization for several days. With grade 3 sprain, a total rupture of the ligament with gross instability of the joint is observed. The pain and swelling are so debilitating that it is impossible to bear the weight for several weeks.

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