

## REHABILITATION AFTER KNEE INJURY JOINTS

Matkomilov J.A

Andijan State Medical Institute

**Annotation:** Knee injury is damage to the soft tissues and bone structures that form the knee joint. It occurs often. Occurs when you fall or hit the knee joint. The knee joint often suffers during various sports, while the severity and nature of injuries can vary greatly. This article proposes a method of post-traumatic training for athletes who have suffered a knee injury, which can be used as a scheme for conducting better work of coaches with athletes from beginners to high-class athletes.

**Keywords:** recovery, knee joint, rehabilitation technique, load, post-traumatic training, athlete.

Athletes who have suffered a knee injury (most often meniscus injury) and their coach, after surgery and treatment in a hospital or polyclinic, invariably ask questions: when and how can I start training, which technique to use. There are essentially no scientifically sound answers to these questions. There are only indications of the general timing of the start of training sessions. Thus, after the athlete is discharged from the hospital, an undesirable delay in the rehabilitation period is created [2]. Already within the walls of a medical institution, it is important to know the specifics of the injury: the nature of the knee joint injury, the individual reaction to the injury and surgical intervention, so that this can be taken into account in subsequent rehabilitation. Treatment will not give a positive result unless a proper step-by-step recovery is carried out, taking into account possible deviations in the functional state of the joint. Therefore, the task arises to develop individually for each athlete a methodology and a scheme of post-traumatic training in order to help the coach in further training work.

As you know, too early under-dosed loads lead to negative reactions (synovitis, joint pain). On the other hand, weak loads cause an undesirable prolongation of recovery time. Therefore, the entire rehabilitation process can be conditionally divided into two periods; the period of rehabilitation of the operated limb (stationary) and the period of rehabilitation of athletic performance (active).

In the hospital, on the 4th — 7th day after surgery, athletes begin to perform movements in the knee joint (mostly passive) in a supine position, with the support of the diseased foot on the heel. As a rule, a sliding surface (a board made of organic glass) is placed under the foot. The exercises are performed under the supervision of a physical therapy therapist. The complex includes general developmental exercises, isometric tension of the quadriceps femoral muscle, as well as active movements in healthy ankle and hip joints and passive movements in the knee joint. A mandatory point is that all these movements should not cause pain in the operated joint.

On the 10th — 15th day after the operation, the stitches are removed. During this period, athletes with meniscus damage, in addition to physical therapy (physical therapy) (in a sitting or standing position), are prescribed physiotherapy in the form of electrical stimulation of the thigh muscles and quartz irradiation. Massage, thermal baths, and paraffin-ozokerite applications are also used. During this period, the athlete walks on crutches, stepping on the sore leg very easily.

On the 20th — 30th day after the operation, the athlete walks with a stick, and before discharge without a stick, fully loading the operated limb. The athlete continues physiotherapy, massage and physical therapy, the task of which in this period is to achieve a full range of movements in the joint, restore tone and strength of the thigh muscles.

After discharge, an active period begins, which is carried out according to the rehabilitation scheme and also provides for two stages. At the first stage, the patient conducts a control workout, including walking at a walking pace until pain appears in the knee joint. The next day, based on the distance traveled the day before, post-traumatic training begins. 50-100 meters are discarded from the distance

traveled during the control training, and the athlete passes the resulting footage at a walking pace, the next day, the athlete walks the same distance, and on the 3rd day, the distance increases by 30%. Such an increase in workload (every 3rd day by 30%) is carried out for two weeks. In the next two weeks, the footage increases by 40%, in the last two weeks — by 50% every 3rd day.

Thus, the distance in dosed walking gradually increases and reaches 20 kilometers. Naturally, with increasing distance, the physical load on the operated limb and the body as a whole increases. Physical therapy classes continue simultaneously with the training, massage and electrical stimulation of the thigh muscles are prescribed.

During the last two-week cycle of post-traumatic training, the teacher begins to prepare the athlete for running load. At this time, he can already walk 15-20 kilometers in one lesson, and the last 1-1.5 kilometers at first at an accelerated pace, and then in athletic walking. This load is a prerequisite for the transition to the second stage of training, which in its structure does not differ from the first.

The control training is being done again, but now in running. Running is conducted at a warm-up pace ("jogging") and stops when pain appears in the knee joint. During the experiment, there were cases when an athlete ran more than 2 kilometers, but the pain did not appear. In such cases, in order to prevent overloading of the knee joint, we recommended starting training according to the scheme in the future, based on an initial distance of 2 kilometers.

The second stage is divided into three two-week cycles. The athlete continues training, adding 30% in the first, 40% in the second and 50% in the third of the load volume for every 3rd day. The maximum distance in this scheme is an average of 15-20 kilometers per workout. If an athlete ran this distance in class and did not notice pain in the knee joint, he was then allowed to train according to an individual plan. For an athlete of a particular specialization, the optimal distance should be his own. Naturally, the recovery time is inversely dependent on the footage, completed during the control training. The larger the square footage, the shorter the rehabilitation period. But this does not mean that you should try to do as much as possible in the control training. Walking and running should be carried out within reasonable limits — before the appearance of joint pain. Neglecting this rule can lead to deforming arthrosis, synovitis and repeated injury.

Post-traumatic training is strictly individual for each athlete and is determined depending on the condition of the knee joint. With good regeneration of the joint after surgery, training is carried out according to the above scheme. In the presence of effusion and severe pain, the load on every third day is reduced to 20 and even up to 10%. In the latter case, post-traumatic training can be conditionally divided into several stages. The first stage will be to overcome the distance in the control training from 200 to 400 meters. The athlete who overcomes this distance trains first according to the 10% scheme, i.e. the first two weeks increases the walking distance by 10% for every 3rd day. This period can be extended until the patient has passed 300 meters. Then, for two weeks, the distance increases by 20% every 3rd day. During this period, the athlete must complete 900 — 1000 meters before moving on to the next stage, when the distance is increased by 30%. In the next two weeks, the distance increases by 30% and in the last two weeks by 40% for every 3rd day.

Indications for the appointment of this scheme are not only the distance traveled during the control training (200 — 400 meters), but also: sharp pain in the knee joint; the presence of effusion; restriction of movements in the knee joint.

The time frame for recovery and transition to running load ranges from 47 to 51 days (if the athlete will walk 20 kilometers in the last training session).

Indications for prescribing a training regimen with an increase in distance by 20% will be: sometimes appearing pain in the knee joint; incomplete restoration of the volume of movements in the joint; partial atrophy of the thigh and shin muscles; passing a distance of 400 to 1000 in a control workout meters. The principle of this scheme is as follows: for the first two weeks, the athlete adds 20% of the

distance for every 3rd day, the second two weeks by 30% and the last two weeks by 40%. The terms of rehabilitation and transition to running load in this variant will range from 30 to 36 days at the condition of passing 20 kilometers in the last training session.

Indications for the appointment of 30% of the scheme are: absence of pain in the knee joint; full range of motion in the joint; absence of effusion in the joint; passing a distance of over 1000 meters during control training. As in the previous cases, the distance increases by 30% every 3rd day for two weeks, and by 40% for the next two weeks (see above). Here, the recovery time and transition to running loads range from 13 to 24 days, taking into account the athlete's passage of 20 kilometers in the last training session.

The most common, as practice has shown, was 30% of the rehabilitation scheme, the least common was the first (10%).

V. Bashkirov, based on the experience of post-traumatic training, gives some methodological recommendations [1]:

1. Training should be carried out in a knee pad.
2. You can train only at the stadium or in the arena in order to accurately determine the distance traveled and to avoid irregularities, stones, pits.
3. Once every two weeks, it is necessary to consult a surgeon about the condition of the knee joint.
4. You should train under the supervision of a trainer.
5. After training, you need to do a massage (self-massage).

Thus, athletes who have suffered a knee injury can be offered a method of post-traumatic training, which is strictly individual for each athlete.

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