

## **Essentials of Sports Injury Prevention & Rehabilitation**

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### **Lecture - 28 Rehabilitation**

Good morning friends, myself Dr. Atul, I am your faculty for injury prevention and rehabilitation. Till now in the 6th week we have studied about the sports injuries, how many types are there, the various modifiable and risk factors, by which we can prevent the injuries. Now, we have also discussed the types of stress reactions also, and now we are discussing the rehabilitation part of the injuries or sports injuries. So, in the rehabilitation we have discussed how the rehabilitation part is designed, that is; early mobilization, protective splints or brace. Like, a person who is recovering from the ACL tear, and after his operation he is advised to wear fixed braces, fixed knee splints with the angle fixation like initially it is up to 60 degree, 30 degree then it is up to 60 degree of flexion.

So accordingly as per the week progress or as your range of motion progress, that fixation is allowed. So these splints or braces give you confidence to walk properly; and simultaneously activate your proprioceptive organs. So, the other part of rehabilitation is strength training. The strength training part begins with the isometric exercises.

Isometric exercises as I told you in my earlier lecture, these are the exercises which you have to do when there is no body movement, but your muscles got activated; like you are lifting a very heavy weight with the help of your elbow but that weight is not moved, so your biceps and your entire upper body muscles or your limb muscles got contracted. So these are examples of isometric exercises. You are sitting on a chair or you just lift your flexed knee into the knee extension and your entire thigh muscle got tightened. So this, and you are holding your knee in the extension, that is a type of isometric exercise. And isotonic exercises; when you do dumbbell curls or hamstring curl or leg press, these are examples of isotonic exercises. And plyometric and proprioceptive exercises are the specialized exercises which require trampolines or plyometric boards or plyometric jump boxes.

So these have to be done under the supervision of the physiotherapist or a qualified doctor. So, if you feel any injury, you have to start with the isometric exercises. Isometric exercises generally don't over-pressure the joint or the affected area in general. Then comes, when you achieve the range of motion; and isometric strengthening provides the post surgical muscles

enough power so they can bear the isotonic exercises. And then, when you achieve, in the beginning you do isometric then the isotonic and then the plyometric and proprioceptive exercises, then the game specific training you have to start; and once with the slow movement to fast movement and easy skilled movement to difficult skilled movement; and when you are with slow to the fast. Once you are fully confident, then you will be assessed by a specialized doctor or a physiotherapist, or biomechanist.

He will judge you on either an isokinetic machine or a specialized test like hop test or Y test, a single hop test, and then they advise you to return to sports. During this rehabilitation, your psychological training is also very much required. Why psychological training: because you are injured, you are missing your sports or your career is on stake. Sometimes, there are so many examples with the, and nowadays sports field is very cut throat like there are so number of fast bowlers are in the line or a batsman in the line if some got injured the other person is performing so well that the injured batsman got re enrolled or re entry into the team is very difficult. Like Rishabh Pant, he got in an accident, now the entire team and there is no replacement. He is going to replace that player. So it is very cut throat, so this time the psychological part comes and the sports psychologist boosts his psychology and gives him a small small task, by which he remains in good mood or with full zeal and full confidence, and full positive attitude he recovers. And with the help of all these things and his skill, he will be again a part of his team. So psychological training during rehabilitation is very much required.

Now, we will discuss a little bit about the various sports injuries. First, we discuss about the sprain. Sprain is a ligament injury, and ligaments are the bundles of collagen which join two joints, and they are generally intra synovial or inside the joint capsule. The examples are anterior cruciate ligament, posterior cruciate ligament or deltoid ligament of ankle, or acromioclavicular ligament. So they all help the joints and stabilize the joints; and the injury or these ligaments can be categorized under various grades: like grade 1, grade 2. Grade 3 generally considered to be complete tear, and grade 1 if the injury is less than 50%; if it is more than 50% grade 2, or grade 3 it is complete tear. So in the same ACL tear grade 1, chances of healing are there; grade 2: still some sort of chances or with the help of strengthening of his surrounding muscles like his quadriceps and hamstrings and his pelvic hip stabilization exercises or hip joint stability exercises, he can still perform; but with the complete tear there are some examples when an athlete is congenitally lacking his ACL or anterior cruciate ligament and he is performing at club level or at the international level. So, with the help of his muscle strengthening these injuries can be overlooked, but if a person is required or he has undergone some sort of surgery, then he has to undergo complete rehabilitation. Sometimes it might take 4 months, or 4 to 6 months. In general ACL recovery requires 6 months return to play, if the rehabilitation or rehabilitation was very good and the surgery was very good, and the motivational level of that athlete is extremely high, then he might recover in 4 months of time, but in general it requires 6 months minimum to return to play. And the initial management for any injury is either POLICE or PRICE. Initially,

again at the time of injury at the playground, give him a rest; that is provide a splint, or then apply ice, give a compression bandage, and elevate that injured body part and after if he undergoes surgery, then a proper before that he requires prehabilitation under which first the swelling has to be reduced, his surrounding muscles and that involve joint muscles the movement those required for movement muscles they are responsible for those movement active movements will be strengthen up initially with isometric exercises and the isotonic and then the comes the part of surgery and after that rehabilitation, as I briefed you under previous lecture. Similarly, strains are the injury of tendons, and muscle tendons are the end portion of the muscles, it is a thick bundle, and it is attached to the bony prominence. Sometimes the muscle pull was so strong, that it avulsed from the bone or it lead to the avulsion fracture also, and sometime that it just tear up small fibers that is grade one, and if it is more than 50 or near about 50 it is grade 2, and if the complete tear, like few people might have heard of biceps tendon that is "Popeye biceps" where the biceps tendon got rupture and abnormal shape of biceps tendon occurs; or hamstring strain is quite common in sprinters, tricep tear, pectoral tear when doing with excessive weight sometimes, doing bench press with the excessive weight and body is not properly fit that sometimes that pectoralis tendon got ruptured and there is complete lacking of your chest; and trapezius tear though it is very sprain is there that is grade 1 or grade 2 then my small fibers got injured or small spasm is there and then the same principle of sprain here also we use. That is POLICE and PRICE, but in the tendon if it is complete tear then surgery is the only treatment of choice, where surgeon has to give incision and re stitch the distal and proximal portion of the tendon and in the muscle, if the injury is bigger and he use persisting sutures or to re-suture the muscles in the strain or like in the thigh or when these injuries occur when the belly is affected the loss of blood is quite a lot so there is a chances of muscle in between the muscle layers hematoma formation, so one has to be extra careful when you feel there is some sprain or some localized tendon. So, don't massage, don't do excessive massage, or don't do massage only; it may lead to myositis ossificans, also or increase the blood loss or that will trigger the fibrosis of those muscles. So, these things in general you should not do when you suffer or you are one of your athletes suffering with the injuries. So, today we will stop here.