

Essentials of Sports Injury Prevention & Rehabilitation

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Lecture – 2

Rehabilitation and Reconditioning

Good morning, ladies and gentlemen, and welcome to lecture 2 of week 1 of this course on Sports Injuries and Rehabilitation. We will be discussing rehabilitation and reconditioning in this lecture. They are two slightly different concepts, and they need to be elucidated in detail to enable us to go forward. I will be conducting this lecture as per the following outline. We will define rehabilitation, we will talk about the role of exercise in rehabilitation, we will talk about the stages of rehabilitation, we will define something called reconditioning, we will talk about how reconditioning is different from rehabilitation, we will talk about a model for reconditioning and we will conclude by having a take home message. So, what is rehabilitation? As per the standard textbook of clinical sports medicine, rehabilitation focuses on return to sports participation and aims to return the sports person to their pre-injury level of performance.

Simply put, rehabilitation wants to start after an injury and bring the sports person back to his pre-injury level of sports performance. Once the athlete has returned to sport successfully, rehabilitation can be modified to adapt a preventive approach. Rehabilitation is a medical or a clinical model for treating individuals who may or may not be athletes. Rehabilitation is used in the normal population also.

Generally, the medical team will design and or direct this protocol. That means, the medical team will read this protocol and they will design and they will be with the athlete every step of the way. The focus of the protocol is generally on the surgery, the wound healing and early stages of rehabilitation. During rehabilitation, you try to protect the peripheral lesion first and then promote slow controlled motion and start the activities of daily living. Generally, rehabilitation is spread over months and the first principle of rehabilitation is to do no harm to the repair.

Eventually once the graft is well settled, the graft is healed, biological healing has occurred, basic athletic preparation is begun. The difference or the concept here is that once the healing has occurred and the athlete is released by the medical team, then you start the basic athletic preparation. Who is the team or who all comprise the team who lead this rehabilitation effort? The team is led by the team physician. He may be the sports medicine doctor or he may be the

surgeon who has done the repair. The team is comprised of physical therapists who do all the rehabilitation, healing, all the exercises, therapeutic exercises, etcetera with the athlete.

You have strength and conditioning coaches who work with the athlete during the rehab, and after the physical therapists have released the patients. You have sports nutritionists, who develop a specialized nutrition plan for these athletes even during their rehab because as we know the nutritional requirements during rehabilitation are slightly different and generally are much lower than the nutritional requirements during training or competition. You have a specialized person called a sports psychologist who works with these athletes and works upon the psychological aspects of rehabilitation. Once the athlete is back on the field, the technical sports coaches take over and start with the technical training of the athlete. What is the role of exercise or what is the role of therapeutic exercise in rehabilitation? Generally, exercise programs will aim to address the following.

Number one, we want good muscle activation and muscle control. We want good control over our motor activities. We want to develop muscle strength, power and endurance as early as possible. We want to maintain the flexibility of the joints and the muscles because that is a very important component of rehab. We would like to develop the proprioception sense.

Basically, it is the sense of where the joint is in three-dimensional space. This is called proprioception. So, we want to develop this proprioception as early as possible. We want to maintain and redevelop the cardiovascular fitness of the patient. We develop functional exercises.

We have developed a lot of functional exercises for athletes so that they can come back to full function as soon as possible. Once the functional training is done, we put them through what is called sports specific skills, and so that they relearn or properly relearn the skills, the techniques which are necessary for them to participate in their sport. We also correct the biomechanical abnormalities as soon as possible; and all these corrections are possible through something called therapeutic exercise. There are different stages of rehabilitation, initial stage, intermediate stage, advanced stage and return to play. In the initial stage, the athlete generally has poor functional levels and the management is mainly focused on reduction of the inflammation, retraining the muscles and the motor areas, range of motion and flexibility improvement and pain reduction.

Be aware that this is a very initial stage after injury. So, you have to reduce the inflammation, you have to get the muscles working in the right order, you have to maintain the range of motion and flexibility and you have to reduce the pain. Generally, in the initial stage, there is no sports specific training. In the intermediate stage, the athlete generally has good functional levels and therefore, the rehab focuses on adding neuromuscular training, improving strength and improving agility. Isolated sports specific skill training is commenced; that is sports specific skill training while protecting the injured body part.

In the advanced stage of rehab, the athlete generally has good functional levels and the rehab focuses on improving strength, power, agility and better neuromuscular control. Here, you do add more sports specific agility and game drills. By this time, the athlete is already back on the field. Being back on the field, and returning to play or returning to sport is a different aspect altogether. At this RTP stage, the athlete generally has excellent functional levels, power, strength, speed, flexibility and agility training have been done and they are progressing well.

So, you generally have something called RTP criteria which the athlete has to meet before he is returned to full play. Pain-free mobility of the injured part, there should be no biomechanical abnormality, there should be no swelling of the injured part, there should be good strength, good flexibility, good endurance, balance should be proper and proprioception should be complete and recovered fully. Strength of the limb should be within 10 percent of the uninvolved limb and the sports psychologist should also have certified the athlete ready for return to sport. Now, we have talked about rehabilitation. Now, let us talk about reconditioning.

Basically, rehabilitation has been led by the medical team historically, and reconditioning the coaching team or the athletic trainers, the physical conditioners and S&C coaches, and the coaches, they want something by which they can get in early and get the athlete back to sport much earlier. So, the model is called reconditioning model. It is a performance-based model for training athletes following injury or surgery. It is directed by the performance team and it is supported by the medical team. The program begins with an end goal in mind, which is a return to competition.

There is a difference between return to play and return to competition. If I have been injured, I complete my rehab and I start playing my game that is return to play. However, if I start playing my game competitively with opponents who are trying to defeat me, the psychological, physical and strength levels are different on my injured part. So, when this happens, I have to be much more ready than the RTP stage to take on these additional loads. Once the return to competition goal is set, the program is designed backward.

In rehabilitation, the program goes from injury to return to play. In reconditioning, the program is designed backwards from return to competition back to the injury stage. It addresses all aspects of the athlete redevelopment immediately post injury or immediately after surgery. Basically, this is an accelerated program for rehabilitation so that the time from injury to return to competition is reduced. So, this is the performance model.

If you look at it, before return to competition, there is something called return to team training, there is something called skill training and there is something called rehab. So, reconditioning starts where rehab stops and the program is designed in the opposite manner. It is designed from return to competition and back to the rehab or the injury rehab stage. What are the features?

Reconditioning follows a functional path immediately post injury. The idea is you want to return the athlete to function immediately after injury.

If he has an ankle injury in one in the right leg, so what? The left leg is free, the upper limbs are free, the back and the spine is free. So, there is nothing which stops you from functional training of the rest of the body path. It is a performance based model to prepare the athlete and it does not just treat the injury. It is done through coaching movements at the correct intensity and load, and it maintains or restores coordinated movement pattern. If I lift my arm suddenly and touch my head, this is a movement pattern.

Now if I am injured, I will not be performing these movement patterns in the correct manner. So, I would like to get back to performing these movement patterns as soon as possible and that is what the reconditioning model tries to do. If we talk about rehabilitation, the rehabilitation protocols are more interested in restoring general function. That means, rehabilitation protocols may be more suited to the general population, rather than the athletic population. Developing an athlete sustainability program is a critical part of reconditioning because it is a performance based model.

Athletes reconditioning must continue well after their return to competition. Reconditioning is identified more closely with the field of athletic development than sports therapy and we always say train around the injury. During reconditioning, if we talk about the post injury phase, now this is seen as a preparatory period and it is not seen as a rehabilitation phase. That means, immediately after the athlete is injured, try and maintain his conditioning in the rest of the body except the injured part. Give rest only to the injured body part and not to the whole body.

We talk about return to competition, not return to play. If I say return to play, it means I have come back to playing my game. But when I play that same game in a competitive manner on a playing field where opponents are trying to hit me, defeat me, kill me, then it becomes a whole new ball game. Wherein the physical, mental and emotional demands upon my body are much higher and much different. So, I have to be trained to return to competition rather than returning to play only.

If I give you an example, when we used to work with weightlifters and they used to say, lift 100 kgs during training and we used to tell them how are you going to perform during competition. So, they used to say we get into the zone and we will very easily be able to lift 5 or 10 kilos more during competition because during competition there are opponents, there is a crowd support, there are so many things, there is noise, there is motivation, there is patriotism which you are playing for the country. So, all these things combined put more demands on the body as compared to return to play, and that is why return to competition is a different entity than return to play.

Reconditioning programs are criteria based. They are not driven by protocols and there is no fixed timeline.

You always build backwards. You look at how the athlete needs, or what the athlete needs to be competitive and to reduce the risk of injury and you build backwards from return to competition stage. You develop movement quality, strength, coordination, speed and power much much early during the rehabilitation phase itself. And when we talk about rehabilitation, we talk about acceleration drills, accelerate stop, accelerate stop and we focus more on acceleration drills during rehabilitation. However, reconditioning recognizes that stopping is more important than accelerating because stopping a moving body puts more demand on the moving body. So, you train more for stopping rather than training more for acceleration.

In automobile terms, reconditioning puts more emphasis on the brake rather than the accelerator. Rehabilitation focuses or has a bigger focus on the injured body part and has a lesser focus on the athlete. However, reconditioning focuses more on the athlete and less on the injured body part. So, the difference is this between the two. So, let us talk about what we have learned in this lecture so far.

Sports injuries and rehabilitation are inevitable for athletes. Whenever they train, whenever they compete, they are at risk for sports injuries and if you are injured, rehabilitation inevitably will follow. Rehabilitation is driven by the medical team post injury or post surgery with an injury first mentality. They will always focus on the injury, on the surgery and the rehab immediately after injury. However, reconditioning is driven by the performance team and focuses on the athlete with a function first mentality.

Rehabilitation focuses on return to play, reconditioning focuses on return to competition. Simply put, rehabilitation is more suitable for the general population and reconditioning is more suitable for the athletes. However, irrespective of whether you are doing rehabilitation with the general population or reconditioning with an athlete, it is always a team effort with the initial focus on the injury and later focus on the athlete. Without a fully functioning qualified, well motivated team and a well-motivated athlete, you are not going to get anywhere whether you are doing rehabilitation or whether you are doing reconditioning.

These are the references. Ladies and gentlemen, I strongly urge you to go through the references. I thank you for your patient listening and your time. Ladies and gentlemen, I will be happy to answer any questions or comments which you will post in the comments and we will get back to you as soon as possible. Thank you for your time ladies and gentlemen. Thank you for listening and Jai Hind.

References:

Clinical Sports Medicine, Bruckner & Khan, 4e

Sports Injury Prevention and Rehabilitation; Integrating Medicine and Science for Performance Solutions by David Opar, Kevin Cross, Julie Hides, 2016.