

Essentials of Sports Injury Prevention & Rehabilitation

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Lecture – 21

Prehabilitation and Rehabilitation

Good morning ladies and gentlemen, and welcome to lecture 2 of week 5. In today's lecture we will be discussing two important concepts called prehabilitation and rehabilitation. I will be covering this lecture as per the following outline. We will define prehabilitation and rehabilitation. We will talk about something called a sports specific injury prevention model. We will talk about a prehab model. We will talk about what is some part of sports rehabilitation. We will talk about keys to a successful sports rehab process. We will talk about the stages of rehab and we will conclude with a take home message.

Let us talk about prehabilitation. Prehab is defined as the process of enhancing functional capacity of an individual to withstand the stresses of activity or competition. Prehab also implies an exercise which prepares people for an impending surgery, especially of the musculoskeletal system. Prehab aims at injury prevention strategies by identifying the common injuries within a specified sport, and then designing an exercise program to minimize the incidents. Basically you are trying to identify what are the common injuries in a particular sport and then you are trying to design an exercise program so that those common injuries can be minimized. Prehab simply means prevention of injuries.

It does not start when the sporting season begins but should be initiated during early pre-season. Each prehab program is personalized, and should address total body balance and other sports specific requirements. It should also address an athlete's weaknesses. The exercises should help balance, should help the range of motion, should help strength, should help coordination and stabilization. A prehab activity may be a subtle focused exercise, a simple subtle focused exercise, or it may be a complex sequence of movements which are designed for dynamic stabilization in the hope that it will improve an athlete's skills.

The majority of prehab programs should focus on core strength and coordination. A prehab program must be constantly updated to match the athlete's progress. Depending on the athlete's training cycle, the prehab can be done within a practice session or it may be done as an

independent workout. If there is lack of time, you can incorporate it into the practice session. However, if you have time, prehab should always be done as an independent workout.

The session: A prehab session should always include the following. If you are resting or if you are waiting for your turn during practice, you may do a few prehab exercises. If you have been able to pinpoint the athlete's weaknesses, you should give him a detailed workout for focusing on the weaknesses. If there are off days or if there are active rest days, you give a full prehab workout to the athlete.

During team travel and recovery days, give them mini workouts. Please ensure that almost every day some element of prehab drills are being done by the athlete; because as they definitely say prevention is better than cure. So let us talk about a sport specific injury model which has been recommended for prehab. In the first stage, we establish the extent of the injury. What is the injury? How big is it? What is the grade of the injury? Are there any other factors which have contributed, or any other joints or tissues which are involved in the injury? Once you have established the extent of the injury, please try and find out why this injury has occurred.

That means, establish the etiology. If you do not know why it has occurred, it will be difficult for you to prevent the injury. Do find out the mechanism of injury either by watching videos or by eyewitness accounts. You must know the exact mechanism of this injury. Once you know all this, design testing batteries and perform a functional assessment.

Once you have performed your assessment, introduce preventive measures using training intervention. Basically, introduce preventive measures by focused exercises or by modification of training. Once you have done this, assess the effectiveness of your intervention by repeating the design testing batteries. Only when you do this over a large number of people, will you be able to know the exact effectiveness of your protocol?

So let us talk about sports rehabilitation. Sports rehabilitation aims to enable the athlete to return to sport with full function in the shortest possible time and comes into effect after the athlete has sustained an injury. Prehabilitation is before an injury. Rehabilitation is after an injury. Sports rehabilitation begins as soon as possible after the initial treatment of an acute injury. It aims to return the sports person to their pre-injury level of performance. After return to play, rehabilitation can adopt a preventive approach.

Devising a successful sports rehab program is more of an art rather than a science. Please do not follow a recipe approach, as each individual is different, his personality is different, his lifestyle factors are different. The problem is, if rehab is improper, the athlete is prone to reinjury, the athlete may be incapable of performing at pre-injury standards, and the athlete will

predispose other body parts to injury. So this is the importance of a proper sports injury rehab protocol.

There are several factors which affect the rehab program. They are career or job commitments, family, peer support, post-injury sporting goals, skill levels and degrees of competence. You may note that each of these factors are important, independent and may contribute in a positive or a negative manner towards your rehab program. You must consider each of these factors and have modifications or recommendations ready to handle each of these individual factors. There are certain keys for a successful sports rehab program. If the athlete has been given adequate explanation to his condition, to his injury, to his rehab, what are we going to do with him, how are we going to do it, how long is it going to take if he has been given adequate explanation, he will be more cooperative and more invested in his rehab program.

You have to provide a precise prescription: which day what is to be done, how much to be done and what not to be done. Please do not get into the rut of having rehab only for exotic machines and exotic equipment. Tailor your rehab programs to the available facilities and equipment. If you do not have an isokinetic dynamometer, fine, that is okay. Use a weight station, use one arm, but please do not tailor your rehab programs for exotic equipment, and then wonder why is it failing.

Begin the rehab program as soon as possible. When you talk about sports rehab, exercise programs often form a large component of an athlete's rehabilitation. They typically aim to address the following components. Muscle activation, motor control, muscle strength, power, endurance, flexibility of joints and muscles, proprioception, cardiovascular fitness, functional exercises, sports specific skills and correction of biomechanical abnormalities. These may be switched up and down depending upon the type of injury, the type of the athlete and the psychological status of the athlete and the available equipment.

There are different stages of rehab, each of which focus on particular goals and gains. In the initial stage, you have poor functional levels and the management is mainly focused on reduction of inflammation, motor re-education, range of motion and flexibility improvement and pain reduction. Generally, there is no sports specific training in the initial stage. In the intermediate stage, you have good functional levels and the rehab is focused on adding neuromuscular training, strength and agility training. Isolated sports specific skill training is also commenced.

So in initial stage, no sports specific training, intermediate stage, isolated sports specific drills are started. In the advanced stage, when you have reached good functional levels, the rehab focuses on improving strength, power, agility and neuromuscular control. Sports specific agility and game drills are added. When you have reached the return to play or return to sports stage,

the athlete has excellent functional levels. You will continue power, strength, speed, flexibility and agility training.

And when you are satisfied that he has cleared all the return to play drills, you can return him to play. However, when you talk about full return to play, you can achieve that only if the athlete meets the following criteria: Pain free mobility. The range of the joint should be pain free throughout. There should be no biomechanical abnormality. He must have full range of motion, full control over the joint and no compensatory movements. There should be no persistent swelling. He or she should have good strength, good flexibility, good endurance, decent balance and proprioception. And last but not least, the athlete should be psychologically ready for return to play. Only if he is fully ready psychologically and physically, should you even start thinking of return to play.

Let us discuss the progression of rehab with a small table. In the initial stage, when we know that the functional levels are poor, we will substitute the activities for him. We will not tell him to play any sport. We will tell him to swim or we will tell him to cycle. We will manage him with the RICE protocol.

We will give him stretching and range of motion exercises. We will give him isometric exercises which do not tax the joint at all. We will give him a stability program and we will try and maintain his fitness. In the intermediate stage, when good functional levels have been achieved, we will try and give him isolated skills such as basketball shooting or underarm bowling, something like that which are isolated skills. We will focus on stretching and range of motion exercises.

Here we will start him on isotonic strengthening. We will start him on neuromuscular exercises, agility exercises, and we will focus on a stability program and maintenance of the fitness which he has gained. When he reaches an advanced stage, when we know his functional level is good or better than the intermediate stage, we will start sport specific agility work. We will improve his sports skills, and we will start full game drills for him. Improve the strength, improve the power, increase the neuromuscular exercises and stability and functional activity.

When we are confirmed or we are confident that he is at the return to sport stage, functional level is good, sport specific training is full, we will continue his strength, power work and flexibility and return him to play. However, we will also keep monitoring him and continuing his rehab program even after he returns to play.

Program monitoring: We should monitor the program closely for safety and we should modify it based on subjective and objective assessments. That means we must be doing periodic

assessments for this athlete to find out which motor quality is improving, which is not improving.

If any adverse effects occur, the program should not be progressed. We should remain in that stage till the adverse effects are overcome. The parameters to be regularly monitored include pain and tenderness, range of motion, swelling, heat and redness, ability to perform exercises and functional activities, number of repetitions and sets of exercises until fatigue. These are periodic monitoring criteria which you will use to monitor the program regularly. There are different parameters that you may manipulate to progress the athletes program.

You may manipulate the type of activity. You may manipulate the duration of the activity. You may increase the frequency of the activity or you may decrease the frequency of the rest or vice versa, you may increase the rest periods or decrease the frequency. You may increase the intensity of the activity. You may decrease the intensity of the activity. You will increase the complexity of the activity as the athlete progresses from one stage to another.

There are several issues which affect exercise adherence. That means you can predict how this particular athlete will adhere to his exercise program or not. If the leadership is good, if you are giving positive reinforcement, if the injury rehab program is part of a regular routine, if there is no reinjury, if there is enjoyment, if there is fun, if there is variety in performance of the rehab program, if there is a good social support from the group, if you are giving the athlete regular periodic updates about his progress, if he has family and peer pressure support, then you can be sure that this athlete will adhere to an exercise program religiously, and will come out of his injury sooner rather than later. However, if any of the criteria listed under poor are present, then the exercise adherence will be poor.

Fine. So, we come to the take home message part of this lecture. Sports injuries are common and most are preventable. Prehabilitation is used to prevent injuries and pre-surgery. That means, prehabilitation is used before injury. Sports rehabilitation is a procedure which is used after an injury.

It is a long drawn scientific process from injury to return to play. We have to use the rehab stages appropriately and we must be aware of how to progress the athlete properly and safely. Please make judicious use of rehab therapy for rehab and progression of the rehab. If you know your exercises, if you know your exercise therapy, and you know how to progress them, you will be able to get the athlete back much sooner. Be aware of the factors affecting exercise adherence and make sure you are taking steps to combat them.

These are the references, ladies and gentlemen, and I urge you to go through them. If you need to get any further clarification on this topic or you want to read further regarding this topic. I

thank you for your time and patience, ladies and gentlemen. We will be glad to answer any queries or comments which you may send to us through the email or through the chat box. Thank you for your time, ladies and gentlemen, and Jai Hind.