Sports And Performance Nutrition

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Lecture-26: Three R principal

A warm hello to everybody who is listening. In this lecture, we are going to be focusing on recovery protocol, which are the pillars of recovery, dietary recovery practices, touching upon training periodization to manage the load to prevent injuries and enhance recovery for athletes. By now you must be surely well versed with the three pillars of recovery. The first approach is always food and water that needs to address athletic performance. Treating carbohydrate foods and protein after workout can help rebuild glycogen stores in the body and also muscles. And most importantly, periods of rest where an athlete does not do anything can boost recovery.

Prolonged physical activity either in athletes or even in individuals who are passionate about sports can lead to several challenges. For athletes to maximize the Vivo2 max or the oxygen carrying capacity to having strain on the muscles and bones to break down of the RBCs due to impact sports or sometimes even having higher bilirubin which is also because of the breakdown of red blood cells which can have an anti-inflammatory or a antioxidant effect. To being faced with a lot of GI issues and the way the athlete can address some of these challenges through the right recovery protocol can boost his athletic performance. Perhaps other than the three pillars of recovery with today's emphasis on mental health issues and the well-being of the athlete, periods of rest which can enhance recovery also has highlighted the aspect of rejuvenation.

In addition to the sleep, consuming foods that are rich in antioxidants can revitalize the athlete's health and the consumption of omega-3 can also improve his mental status. So an athlete paying attention to minor details can have big benefits. If you remember, we talked of how nutrient periodization in the prime anabolic window period can maximize nutrient uptake. Also choosing local and indigenous cuisine and ingredients that are easily available and accessible can make this whole process simple. From ensuring good amount or adequate carbohydrate intake before, during and after workout can support exercise.

Similarly for sports where the training or competitions can last more than one hour, using simple carbohydrates in larger amounts which is carbohydrate loading and we had a detailed chapter on that can be very useful. High quality proteins can offer essential amino acids or boost the repair and rebuilding of the muscles and don't forget leucine content of protein foods which is the elixir of muscle building. Water consumption several hours before the training and not necessarily only during the training and adequate water with electrolytes before, during and even after the workout to ensure peri-vuline color can be very very beneficial. Adequate consumption of omega-3 can strengthen muscles and prevent delayed onset muscle soreness thereby contributing to the recovery after training sessions. Even in injured athletes a high

consumption of omega-3 up to 2 to 3 grams each day can enhance repairing of muscles, prevent muscle loss and support the recovery process and if you recollect the alpha linolenic acid conversion can be as little as even 3%.

So vegetarians must take care to consume very large portions of the vegetarian form of the omega-3. In context to antioxidants which can clear the free radicals, dark colored fruits vegetables, catacombs from tea, the curcumin from the turmeric and traditional Indian spices can be a daily addition in athlete meals. Some of these fruits are also extremely important for the prevention of DOMS. You don't have to fret if dark cherries are expensive imported or not in season. The Indian cousin of it is pomegranate and even daily intake of pomegranate can help reduce delayed onset muscle soreness.

If you remember we talked about bromelain from the pineapple or the nitrates from the beetroot juice which not only increase the oxygen carrying capacity they also help in preventing DOMS. And in the recovery process it is also very important to moderate or keep the use of certain foods which are high in trans fats to a minimum use or indulgence in these foods on occasions or rarity only. Trans fats are pro-inflammatory so consuming a lot of fast food or deep fried items which are commercially available baked goods or bakery items and a lot of ready to eat sausages or pre cuts can be a source of trans fats apart the meals consumed. There are a few supplements which can also enhance recovery for an athlete. If you recollect my lecture, creatine monohydrate is not only a very useful supplement that can ensure the regeneration of ATP or adenosine triphosphate in high intensity exercise.

It is also a powerful antioxidant and can enhance the recovery process. It also takes care of cognition or brain health. Do keep in mind when you consume larger amounts of creatine that can lead to bloating and sometimes it is unnecessary to do larger amounts in a loading phase. If you remember best to stick to 3 to 5 grams with a high carbohydrate meal, consume it for longer duration of time. However there is a marginal water retention due to creatine within the cell and that can lead to about half kg to 1 kg of increase in body weight.

So if a athlete is in a competition phase this can lead to additional body weight. A fast digesting protein supplement as a whey isolate can also enhance recovery being a complete protein quick to absorb especially in multiple training sessions. The protein intake can be very very beneficial for athletes where they have the energy to bounce back into the next training session. This slow digesting protein supplement such as casein or even consuming its food alternative such as paneer can ensure there is adequate amino acids available for the repair and rebuilding of the muscles through the night. So apart the food and fluids what are the other ways we can ensure recovery among athletes? The athlete monitoring approaches can help us address certain concerns and also notice red flags.

As an ongoing conversation or even having a formal recording process to the sleep quality and quantity of an athlete can help us understand if the athlete is able to recover better or are there any challenges that needs to be addressed either through food or through supplements. Ideally an athlete needs about 7 to 8 hours of sleep minimum and in my practice there is a dearth of the number of hours of minimum sleep needed. Also at times if the training is too late in the evening or if the athlete has consumed larger fluid volume around bedtime there may be some disturbances to use the washroom or around the competition cycle if an athlete is anxious they may not get deep sleep. I cannot emphasize enough on how there needs to be an alignment to the training to the food timing where you want to either wind down with the training before

evening or a dinner at least allowing 2 to 3 hours of gap to make sure that the athlete is getting to bed on time. We will touch upon sleep as an independent lecture where we will discuss several strategies on how to improve sleep.

A very crucial aspect of athlete monitoring in female athletes is menstrual cycle. We are going to be talking about female athletes in detail too and I am sure we are going to touch upon menstrual cycle again. On an average the menstrual cycle can vary between 21 to 28 days in some cases in menarche. The girls can have cycles only once every 2 months too. So the crux of ensuring a healthy cycle is to make sure that the athlete is consuming adequate calories particularly in weight category sports or in aesthetic sports where gymnasts may cut some food to fit into their body hugging suits.

Chronic reduction in food intake can lead to several implications on health and in young athletes females may sometimes miss their menstrual cycle consecutively over a few months and this is a loss of a menstrual cycle called amenorrhea. With regular menstruation there is a release of the female anabolic hormone called oestrogen. Oestrogen protects the heart but oestrogen is also going to uphold a higher muscle mass and also ensure high bone ossification especially in puberty when the maximum osteoblasts or bone forming cells are making sure that the bones are being made. So if there is a loss of a menstrual cycle it is a huge red flag and that can also lead to the risk of bone fracture in young girls. So it is very important for support staff especially the ones who work with female athletes to have this conversation around menstrual cycle to monitor and to check if the athlete is having a regular cycle and if they are not this requires intervention and equally important monitoring is the mood of an athlete.

Does the athlete have malaise or a lack of interest? Is the athlete dejected or sullen? If a parent is always complaining about an athlete being irritated or is feeling sad and sometimes athletes are teary it is not only empathetic to have a dialogue and to check and have a conversation around what is on the athlete's mind. I have noticed that in some situations even a sad or a sullen athlete simply sometimes has a very low nutrient level in the body and in my observation I am always right to notice that a low amount of iron which is iron deficiency anemia or even vitamin D sometimes even vitamin B12 can really impact an athlete's mood and energy level and it is so wonderful to re-evaluate after a few weeks of nutritional supplementation how just overnight the mental status can change where the athlete is joyful rejuvenated or feels upbeat. Of course there are several other underlying parameters as to why an athlete can feel low but by having a meaningful discussion being non-judgmental and to genuinely offer support in a very holistic manner to check what is going on in the athlete scenario can really help address this and this should be cumulatively done as a team by all the support staff. Rate of perceived exertion is another important questionnaire that can capture how is the athlete's energy level or his ability to cope with the training session. If the athlete is complaining of a hard workout where he has to really push himself or where the athlete has to push herself to do a workout it is important for the support staff to pay heed where the athlete's training sessions must be tapered or a recovery session needs to be added for the athlete to be able to come back to a harder training session.

Rate of perceived exertion can be governed by two factors internal and external the type and the load of the training prescribed for an athlete can become an external load from the internal physiological compass to injury can dictate the internal load. Similarly in my practice I also

often hear athletes giving me feedback of how sore they are or how they are fatigued typically after hard intense training sessions or strength and conditioning or gym sessions also when they have one or two days of rest they feel stronger getting back to training and many times I often hear athletes complaining of how they are run down at the end of the week where the body aches pains and dumps can be amplified. So here it is interesting to notice the pattern and more importantly to intervene and be flexible to make adaptations of the training this way by not pushing the athlete we can ensure the athlete can preempt injuries in the athlete monitoring by keeping a very simple yardstick of checking urine color can be very effective. Fat patch tests are difficult to access and also weighing the athlete before and after training sessions or doing cumbersome calculations by equations can be challenging. When the urine color is very transparent to educate the athlete that it is hypotonic and when the urine color is very dark which signifies that the athlete is dehydrated and the urine is hypotonic we can help athletes ensure hydration.

Hypotonic urine can not only lead to kidney stones but can exaggerate the challenges of certain other kidney parameters from higher creatinine to uric acid which can be flushed out by the adequate intake of water. So this is very personal and individual to every athlete. So in this analogy here that you see an automobile or a truck an athlete is similar to this engine and I think that based on the athletes feedback and how he responds to exercise the load must be monitored and I do reiterate and urge for coaches and support staff to align their approach to this feedback of the athlete and it is important for us to support the exercise performance and recovery where the athlete has a high training load which is scaffolded and broken down and planned to have a lighter training day in between and in my practice I do see better results when the training periodization takes care to have lighter training sessions dispersed throughout most importantly keeping in mind recovery sessions or rest days to enhance the recovery of the athlete and it goes without saying that over training can thwart recovery process and rather can push the athlete towards injury. It is also equally important for the support staff to help the athlete adapt to a higher training load by a very gradual protocol. Most athletes not only spend hours of training picking up skills of their specific sport but for the overall holistic development also spend innumerable hours strength and conditioning or strength training to build a higher muscle mass.

So it is very important where there is an onset of delayed onset muscle soreness the athletes must have gentler sessions be it a recovery running or be it a sports specific recovery set. So balancing cardio with strength training is an absolute must. So here is a chart that can depict training periodization where in my practice and experience I have observed by interacting with athletes and by attending professional development conferences we have learnt that training periodization can prevent injuries and uphold the recovery process for an athlete. So on a weekly off typically a Sunday when it is a rest day an athlete can take extra time to sleep longer particularly to make up for the sleep debt where there is a deficit of sleep through the week and this is an absolute must at least a couple of days every week. So the athlete can have a light recovery session perhaps go for a swim or even a massage on a rest day.

On a Monday if the athlete has intense badminton sessions so Tuesday morning can be a recovery set and they can be strength training in the noon to plan the day. I hope this chart helps you understand how typically the training can incorporate sports specific skills and cardio or recovery sessions. Today athletes have the luxury of wearable sports technology be it a smart watch or a mobile phone. Several parameters can be easily tracked and this can give

us a progress chart and a ballpark point to how athletes are adapting to training or managing their food and lifestyle. From physiological functions to the calorie consumed technology is definitely making life simpler for athletes.

However for those athletes who give me a huge chunk of calories burnt during an exercise activity do bear in mind that these overestimate the calories burnt and cannot be taken at face value. The data got from the wearable technology can help us track athletic training, recovery and this can be important to optimize performance. Please hear Dr. Amaya a sports physician's input on recovery protocol. Sports medicine and nutrition they both are complementary to each other.

Exercise induced muscle damage is characterized by histopathological muscle tissue changes that originate skeletal muscle damage. The destruction of these muscle fibers causes an inflammatory response that is very much temporary but if ignored can lead to a more serious injury when it comes to an athletic population. It can decrease the athlete's physical capacity and hence play an important role in reduced athletic performance. Thus muscle recovery becomes essential and has become a priority for elite athletes in different sporting modalities. Recovery strategies may include biological, pharmacological, mechanical and nutritional in the hope of improving physiological responses and competitive performance.

Among these strategies employed the nutritional plan has a decisive influence on the stimulation of muscle recovery. However it is necessary to optimize the consumption of adequate amounts of energy, nutrients and liquids establishing the correct frequency and the nutritional plan that needs to be in sync with day to day training. In the long term the competition dates known well in advance for the athlete could be extremely beneficial for both not just the athlete but even the nutritionist who is willing to chalk out an exhaustive diet plan. Studies on proteins, amino acids, carbs, antioxidants, dietary supplements have demonstrated their importance and effectiveness in muscle recovery. It is thus essential to take into account guidelines on quantity, time and composition of each of the nutritional elements to maximize their effectiveness.

Taking into account obviously the principle of sport specificity and the body type of that particular individual. In the market nowadays there are sports drinks, gels, bars, sports confectionery, protein powders, protein bars and so many of things available. Athletes may run pill at the post that's when it plays a crucial role for a nutrition to give the adequate guideline and a diet to a budding athlete up to an elite athlete. So athletes must prioritize food first approach, pay close attention to monitoring their challenges align nutritional supplements to address deficiencies, focus on light recovery sessions after high intensity workout and periods of rest when not doing anything can be important for the recovery. So to summarize hydration with electrolytes from the macronutrients of carbohydrates, proteins and the good fats can boost recovery process.

To have recovery sets and adequate rest days helps rejuvenation. Sleep is a highly overlooked approach to enhance recovery. I will request and emphasize each of those who participate in physical activity and exercise who are so concerned about eating right and taking the supplements on time and in loads. Please look at basics and sleep is one important one. I hope you could have a few important takeaways from this lecture.

Thank you for listening. Thank you.

I am going to tell you about my nutritional supplements that keep me energetic and healthy. Secondly focus and hard work of course is very important. Thirdly, according to me, my physiotherapist also plays an important role. These three complement each other and optimize my recovery.

I am a physician . I am a national level long jump. I am a full level body. I am a personal best 6.09 meter. I am doing a Bangalore IOU. I practice and I am also doing a nutrition job. I am a vegetarian. I am a vegetarian and I am also doing a lot of food. I am not sure what I should do.

I am not sure what I should do. I should do something about my vegetables. I am a pro team sports athlete. I am a very important athlete. I have a strong muscle recovery and I am very happy. I am also doing a performance and I am very happy.

I am doing a federation. I am starting my day. Hopefully, I will be able to do it. I will practice and I will do my diet. I will do my work and my hard work. I will be able to focus on my full focus and practice.

I will do my work and help my health. Thank you so much.