

Sports And Performance Nutrition

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Lecture-34: Young and adolescent athletes

Hi everybody, in the module on Special Groups, let us understand the nutritional needs of young children. Growing children or youth athletes have specific nutritional needs. Let us learn more about their specific nutritional requirement and the implications of their deficiencies. Growing children have very high demand of calorie and nutrients to support their growth. Prime puberty brings with it the need for high nutrient demand. In fact, the maximum bone formation occurs in the prime puberty up to the age of 20 years.

Bones formed in early years of life, in fact, ironically have to last till one lives and generally children lead a very active life even if they do not pursue sports. So this also calls for the requirement of higher B vitamins and if you remember the fundamentals of vitamins lecture, B vitamins support energy or the glucose metabolism. Also in young children, young children can also store lowered glycolin and hence children must consume adequate carbohydrate intake before, during and after workout due to this reason. In addition to supporting the higher nutrient demand for growth, athletes who pursue sports have additional needs to meet the requirement of energy expenditure towards physical exercise.

With the onset of puberty, the sexual hormones come into play. Girls attain puberty slightly earlier than boys around the average age of about 11 years, whereas boys attain puberty about 13 years. And by now I am sure you heard me say several times the male sexual hormone is testosterone which helps male athletes have more muscle mass whereas the female sexual hormone is estrogen and estrogen also can lead to higher adipose tissue once there is onset of menarche. Therefore, for growth and for physical activity, young children will have the need to consume adequate energy and if you remember the energy availability chapter, sometimes the calorie intake of the minimum 45 kilocalories per kg of lean body mass can be even doubled. If there is low energy availability, it can lead to relative energy deficiency in sport and we have discussed this in several other lectures.

Having less food can delay the onset of puberty and growth. It can also increase the risk of frequent infections in children and in girls, there can be primary amenorrhea or the delay in the onset of the first menstrual cycle called menarche. With the first menstrual cycle, the anabolic hormone estrogen comes into play. Just like testosterone, estrogen helps in increasing muscle mass and bone mineral density and estrogen also helps to oxidize more fats which is glycogen sparing and in the lecture on female athletes, if you recollect, I discussed how the hormones can change during the various phases of the menstrual cycle. Also girls can be cognizant of their very specific macronutrient intake or focus on a specific food group for those couple of weeks of the phase of the menstrual cycle.

From the onset of the menstrual cycle to about 13 or 14 days in the follicular phase, girls use more carbohydrates and hence can consume more carbohydrate foods and after the ovulation in the luteal phase, girls can burn more fats and therefore interestingly girls can consume more fats in their meals. And yes, young children who are females must ensure they address their food craving just as they approach the next menstrual cycle and also ensure hydration when there is lowered thirst sensation. I have already highlighted how the bone formation or ossification is maximum in the puberty. So taking care of calcium and vitamin D is extremely crucial in these prime years of bone formation and to support the growth and physical activity, iron is a very important mineral. Young children who participate in impact sports such as racquet sports like tennis, badminton or any high intensity workout where they land with force.

There is occurrence of the breakdown of red blood cells of foot strike hemolysis. When the RBCs rupture, there is a loss of iron. This can sometimes lead to lowered iron stores in the body causing anaemia and in girls with the loss of menstrual blood if they do not take care to consume iron rich foods and again please do visit the lecture on iron where we have discussed in detail of what are heme sources of iron, non-heme sources of iron which are combined with vitamin C to enhance absorption, how to separate the iron intake for hours post training to improve iron absorption and yes in vegetarian meals when the consumption of grains, pulses, vegetables is higher there are some other nutrients that can bring down the absorption of iron and we have also discussed this in detail. So keeping those principles in mind you can improve your iron absorption. For the improved absorption of vitamin D magnesium is an important mineral and this can be got from dark green leafy vegetables and nuts particularly almonds.

Mid day sunlight between 10 am and 12 pm is an ideal time when the UVB rays are needed as an exposure on the naked skin for the synthesis of 125 dihydroxycalciferol which is the vitamin D3 which is needed in the body. Not many foods offer vitamin D egg yolks, oily fish, sun grown mushrooms in vegetarians so vitamin D may require nutritional supplementation when the levels are low even in young children. In our consultations we often see immunity challenges in growing children. For example, we have a lot of nuts seeds and fermented foods for improving the good bacteria in the gut can be very useful to improve immunity and it's a good protocol to include omega 3 rich foods very early in life and for those who don't get enough it is best to consume an omega 3 supplement which has the most potent form of EPA DHA. The most important theme for this lecture is hydration.

We have already discussed at length how U hydration can enhance physical exercise. There is a very important role of hydration in young children for thermoregulation or managing the heat that is formed during exercise. Children have not fully developed thermoregulatory mechanisms unlike adults and hence they need monitored water consumption. Dehydration can increase the co body temperature thereby lowering athletic performance. Young children have lower blood volume and also lose less sodium in sweat.

So children sweat lesser than adults sweating and the evaporation of the sweat on the skin is a cooling technique. When one sweats the evaporation of the sweat offers a cooling mechanism especially in exercise. So that way by cooling the body the core body temperature is lower and there is a delay in onset of fatigue. So the body can push itself for longer duration of exercise. Since children sweat less they rely mainly on water that can circulate throughout the body

considering there is already a lower blood volume unlike adults to cool the increased body temperature.

Hence since children have lowered thermoregulation mechanism water intake becomes extremely important and some studies have suggested that children start training in a dehydrated state. Therefore it is important to have a protocol of measuring hydration either by weighing before training and after training or by monitoring urine colour which we have discussed in the hydration chapter. If young children do not take care of hydration practices the core body temperature can increase due to several parameters such as the type of sports, the sports gear worn, the weather conditions and the rise in the body temperature not only leads to fatigue and lowered athletic performance children can be exposed to a higher risk of heat injury. So since children sweat less they must ensure adequate intake of water to lower the increased body temperature during exercise. If you recollect the hydration chapter if an athlete has lost half kg of body weight the athlete must ensure the consumption of at least half litre of water with electrolytes to not only prevent exercise induced hyponatremia but to ensure the right hydration practice.

Also to reiterate relying only on thirst may not be the right approach so planned intake of water especially in young children is very important. In my interaction with young children I have also perceived that either the parents or the coaches emphasize on water consumption only during the training period. In my opinion rather it is more beneficial to ensure you start the training hydrated. So prior to half hour or one hour before the start of a training session it is best a young athlete can consume either a tender coconut water with some additional salt or a lemonade even a fruit juice for that matter which can be a good hydration practice. Another important requirement in young children is adequate hours of sleep to support the growth from late evening training sessions to children being in school and colleges from the assignments to the destruction of gadgets.

Sleep is the least of priority and highly overlooked ergogenic support. If you recollect I have time and again talked of how growth hormone is secreted close to midnight and for a child to grow more increase muscle mass have more bone length they need to ensure they go to bed early, consume high carbohydrate meals with a gap of at least two to three hours to ensure adequate amount of growth hormone. Growth hormone also helps to repair and enhance the recovery process when the muscles are being remade. So I definitely will request an urge for each of you who is listening to take care of good sleep hygiene and we have had an entire lecture on how to improve the sleep pattern in athletes. Another concern sometimes seen in young children are erratic eating habits and overtly restricting food can sometimes be a warning sign that our support staff we need to watch out for.

From practices of highly restricting food intake to over consuming food and then inducing vomiting are very unhealthy practices which we do not recommend at all times. With the puberty onset the body undergoes a few changes and this can lead to body image challenges in young minds. Weight making practices can get exaggerated in some aesthetic sports as gymnastics which starts very early in even preteens or in weight restricted sports where one needs to maintain a certain weight to fit into the category. So if you see outliers from the normal eating habits which are not healthy as support staff this requires an intervention. As support staff we need to be highly sensitive to these practices.

Anorexia is a condition where athletes feel they are extremely overweight or obese and do not consume food even when there are bags of bowls. In bulimia there are practices of over eating and purging that could be either self induced vomiting or using laxatives to increase bowel movement. So these kind of extreme diet practices require a multidisciplinary approach and also the intervention from a sports psychologist. As sports nutritionist we can advocate healthy eating practices and scientific weight making protocol choosing slow digesting carbohydrates, ensuring higher protein diets, increasing muscle mass by strength training, addressing nutritional deficiencies or taking care of higher calcium to help fat excretion. We can enhance their knowledge by hand holding and guiding them just like adults even young children can have episodes of stress eating.

Be it the pressure for a selection into a team or sports performance anxiety or the exam time and the boredom eating on a rest day. I am sure each of us sometimes has gone through these several phases when there is a urge to eat more. So the sound guidance to reassure athletes that one episode of over consuming a calorie dense food or perhaps over indulging in a dish is not going to deviate them from the main objective. So to be flexible and help them align their lifestyle and the next consecutive meals can be very helpful. Even young children are diagnosed with hypothyroid and polycystic ovary syndrome.

In fact we have already discussed PCOS in the lecture on female athletes. Thyroid is a condition where there is a challenge of weight gain. Athletes must take care to consume iodized salt which is sprinkled on the food or on dishes after the cooking so the iodine does not sublime. Seafood is a good source of iodine and consuming selenium that can support the formation of thyroid hormones can be useful and with the hectic schedule which I personally observe in young athletes from the multiple training sessions to education they are running pillar to post. There can be an increase in the long term stress hormone cortisol ensuring adequate rest days and sleeping to about 8.

5 hours or more can help lower cortisol. Cortisol mobilizes more glucose and breaks down muscle mass so young children should ensure that they recover well from training and manage their schedule better. If you are a parent like me or deal with children and which I do at all times in my practice the personal likes dislikes and fussy eating habits is a commonality. So planning meals and snacks with the involvement of children where they get to contribute to some choices of dishes or just the way the menu is prepared and the dish is planned can make them more appetizing and appealing to young children. If children don't eat spinach then as simple as making a spinach roti where the puree is added into the atta can be a way of hiding the spinach into the meal and if the child is a small eater making sure the calorie density doubles you could do that by adding some good fats as avocado or perhaps replacing regular grain with sago adding aloo in atta so there are many ways you can make portion smaller by adding more calorie density into that meal by sharing knowledge educating young athletes and giving them the evidence or the reasoning for them to understand why a suggestion is being made can be very useful for them to be involved in their practices.

To have many touch points follow up on their progress to review the food intake be it the food photographs which is very easy with a smart phone today or the food journal and to add the required supplements periodized to needs of either deficiency or competition we can help improve the health status of young children. To summarize young children have very high demand of the nutrients iron calcium and vitamin D planning meals with adequate

macronutrients and micronutrients can support growth and exercise in young children since young children sweat less and rely on water consumption to lower the body heat the right hydration protocol is extremely important for thermoregulation in young children. I hope this lecture was useful for several of you and thank you for your patience and listening. Hi my name is Ayushiv Raju and I am a national level swimmer I train 5 to 6 hours every day to ensure my performance keeps improving as you all know swimming is a very high muscle strength and endurance demanding sport to help with this I work with a dietician who has recommended calcium in my diet plan because calcium is a very important mineral that supports exercise as it helps in muscle contraction in addition to this it also helps in bone growth and strengthening of bone in prime puberty hence adequate intake of calcium and vitamin D through diet or supplements is very crucial in early stages of life to prevent bone loss or lower risks of bone injury sometimes when an athlete encounters with a bone injury the athlete has to ensure rest periods which can affect their performance in near future competitions during these rest phases high calcium and vitamin D supplements are given to the athlete to foster bone healing and to repair damaged bone tissues consuming of milk and milk products almonds fish with bones like sardines and anchovies are good sources of calcium from meals in addition to supplements thank you.