

The Katrina Aftermath
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Summary Prepared by Rob Lindsay, MD

Exercise

As many of my patients have told me over the years, this is a four-letter word from teenagers (a least a virtual four-letter word). There were two sessions on exercise that I wanted to touch on. The first was Exercise in Adolescents with Diabetes-No Child Left Inside. This sounded like a great topic but unfortunately there was not a whole lot of information. The first speaker pointed out that there have been few studies done on the fitness of children with Type I diabetes and for the most part there are inconclusive results. The exercise capacity of children with Type II diabetes is significantly decreased compared to non-diabetic controls and in Type I diabetes is moderately decreased. The recommendations are to have three or more sessions of exercise per week that last at least twenty minutes. *Many of my patients know I push for even more if possible-as if they really care.* The speaker reported that the fear of nocturnal hypoglycemia is preventing many children from exercising. The hypoglycemia can come from increased insulin levels in diabetics and attenuated counter regulatory hormones. She noted that athletes who exercise six to seven times per week had more late hypoglycemia than sedentary patients. The patients are in triple jeopardy in that their counter regulation is decreased by sleep, their glucose uptake is increased secondary to the exercise and there is no change in insulin level as there would be in a child secreting his or her own insulin. Her recommendation was that a complex carbohydrate snack with protein before bed would be the safest way to overcome this problem. She noted that despite this fear, studies have shown that diabetic children tend to exercise more than their non-diabetic peers. *I suspect this comes about only from fear of their diabetologist.* Another speaker spoke on how to motivate kids but mostly talked about some of the problems. She noted that many patients have TVs in their bedrooms and that the number of TVs in the home predicts the hours spent in front of the TV. Surveys have shown that over half of 8 to 18 year old children have no TV rules in their home. TV time is significantly correlated with weight gain and metabolic deterioration. A sad fact that she also mentioned was that in the ten years from 9 years of age 19 years of age, girls had an 83% drop in activity on average. My notes do not go into any good motivational tools that she offered. *I think she was more effective in demonstrating the problem than coming up with answers to it. My rule for TV is that a child can earn an hour of TV with an hour of play outside beforehand- it is not popular but works when implemented.*

Another session was entitled "Fueling the Serious Athlete". Karla Cox talked about strategies for fueling the athletes-what to eat, when to eat. She noted that one of the major problems with athletes with diabetes was preventing hypoglycemia during and after the event. She felt that generally patients should take 5 to 10 grams of carbohydrate per kilogram of body weight before and during exercise to maximize glycogen storage and to maintain glucose levels. If it is a major event (like some of our patients who do marathons), she recommended 8 to 10 grams of carbohydrate per kilogram per body weight for the three days leading up to the event. On the day of the event before the exercise, she recommended 200 to 300 grams of carbohydrate three to four hours before the event. During the event athletes should take 0.7 grams of carbohydrate per kilogram per hour if they are having high intensity exercise and she recommended that it be through a 6-8% carbohydrate beverage which could be a gel or liquid. The carbohydrate is best ingested every 15 to 20 minutes. Post exercise, the athlete should take 1 to 1 ½ grams of carbohydrate per kilogram within 30 minutes and every two hours up to approximately six hours after the event. She recommended that serious athletes should take 1.2 to 1.4 grams of protein per kilogram per day to maintain muscle production and maintenance. Pre-exercise, he or she should take 0.15 to 0.25 grams of protein per kilogram three to four hours prior to the event along with the extra carbohydrate. These recommendations would improve protein balance and performance and offset muscle damage. She felt that fats should consist of 0.5 to 1.0 grams per kilogram of weight per day which is 20-35% of total caloric intake. She recommended that blood sugars should be approximately 180 to 200 mg/dL before exercise. She also recommended if the blood sugar is 250 mg/dL with ketones or greater than 300 mg/dL without ketones, the athlete should treat the hyperglycemia and wait until the blood sugar is down before exercising. Dr. Anne Peters gave some guidelines for the prevention of hypoglycemia in diabetic athletes. She recommended the daily carbohydrate load should be 6 to 10 grams per kilogram of weight per day. Before exercise, patients should take fluids, low in fat and fiber and high in carbohydrate. During exercise, patients should take 30 to 60 grams of carbohydrate per hour and replace all fluid loss. After exercise her guidelines were the same as presented by Ms. Cox. Dr. Peters pointed out the causes of hypoglycemia in diabetic athletes. 1) The inability to reduce basal insulins, 2) more rapid insulin absorption. 3) changes in insulin sensitivity. She also had some recommendations for reduction of pre-meal bolus insulin before exercise. She stated that ideally eating should be about 90 minutes before the exercise and on average the insulin should be reduced by 50%. If you break that down, if there is going to be 30 minutes of exercise, the pre-meal insulin should be reduced 25%, if there is going to be 60 minutes of exercise, the pre-meal insulin should be reduced 50% and if there is going to be 90 minutes of exercise, the pre-meal bolus insulin should be reduced 75%. She pointed out that not only can you reduce the pre-meal exercise bolus insulin but you can also diminish the pre-exercise basal insulin and increase carbohydrate intake, learning the balance through experience. She also recommended that there be a reduction in the basal insulin dosing post exercise to help prevent the delayed effect. *It is very interesting to me to see the detailed recommendations that people are starting to make for exercise and athletics. It is a far cry from the earlier days when we were using regular and NPH and could not fine-tune the insulin for the time of exercise anywhere near as well. Our diabetic athletes are very lucky to be in the era that they are.*

ZITS

by Scott & Borgman

