

# Athletes With Type 1 Diabetes

## Athlete Scenario

*I am a competitive sprint distance triathlete and short circuit cyclist. I struggle with how much to eat and how to adjust my insulin during training and competition. I often have large fluctuations in my blood glucose, especially when I am biking and running. Sometimes I have low blood glucose values the night after longer training days and would like some recommendations to help minimize the risks of nighttime hypoglycemia.*

## Challenges & Considerations of Blood Sugar Management with Exercise:

- Every athlete has a unique blood glucose (BG) response before, during and after exercise, which can be influenced by: the type and amount of carbohydrate in foods and beverages, intensity and duration of the activity, time of day, temperature and altitude, and performance anxiety/excitement.
- Because of a delay in peak insulin action (1/2 - 2 hr. for rapid acting), carefully consider the amount of insulin to take before exercise to prevent hypo- or hyperglycemia. Always follow insulin delivery with frequent BG checks
- Daytime and nocturnal hypoglycemia are common during and after exercise.
- Adjusting basal and/or long acting insulin may be necessary to prevent BG values from dropping too sharply.

## Goals

### Prior to Exercise

- Carbohydrates fuel exercise, and athletes with diabetes need them too! Follow the standard recommendations for carbohydrate for athletes (see the Eating Before Exercise fact sheet), but also include frequent BG checks and insulin adjustments to achieve your goal BG.
- Delay activity and/or consume carbohydrates if BG is less than 100 mg/dl. A BG of 120-180 mg/dl is generally a good starting point for activity. Check for ketones in the urine if BG is greater than 250 mg/dl, and talk to your medical provider about what you should do in the presence of elevated ketones.



## Tips to Take With You

1. Use practice situations to learn how your body uniquely responds to the demands of exercise, and tailor your fuel and insulin to your specific needs.
2. Check your BG prior to exercise and have your glucometer and/or sensor available during training and competition.
3. Fuel your body with carbohydrates throughout activity, particularly if it lasts longer than 60 minutes.
4. Always carry emergency glucose, such as glucose tablets or gels, with you during training and competition.
5. Nighttime hypoglycemia is more frequent after longer duration or higher intensity exercise. Consider a bedtime snack and/or reducing overnight insulin.
6. Consult with a sports registered dietitian nutritionist (RDN) to determine optimal fueling and hydration practices. A certified diabetes educator (CDE) can help you adjust insulin doses and patterns according to your sport.

## Goals

### During Exercise

- Monitor your BG levels during practice sessions to better understand your BG response. Consider using an insulin pump and/or glucose sensor to more closely monitor BG levels; check during any breaks in competition.
- For endurance events over 60 minutes, aim to consume 15-30 grams of carbohydrate every 30-60 minutes starting within 15 minutes of exercise, unless BG is high at the start (see table below).
- During activity, the immediate consumption of an extra 30-45 grams of carbohydrate may be required to treat hypoglycemia. Fast-acting emergency glucose sources (e.g. sports drinks, gels, or glucose tablets) should be available at all times.

### Carbohydrate During Exercise

Food/Beverage (amount)	Approximate Amount of Carbohydrate (g)
Energy gel/chews (1 pouch)	22 – 27
Sports drink (16 oz.)	30
Medium banana	27
Pretzels (1 oz.)	23
Fruit puree (1 pouch)	20

### After Exercise

- Check BG immediately after exercise and tailor carbohydrate intake accordingly.
- Replenish muscle and liver glycogen and jump-start muscle protein synthesis by consuming a mix of macronutrients (carbohydrate + protein) as soon as possible after exercise (see table in sidebar). If you must delay eating a full meal, at least have a snack. Quick recovery snacks include: graham crackers + peanut butter, chocolate milk, Greek yogurt + berries, or whole grain cereal + milk.
- Nighttime hypoglycemia is a frequent risk related to daytime exercise. Prevention strategies include consuming additional carbohydrate and/or reducing basal rate or long-acting insulin the night after extended practice or competition.

## Post-Exercise Meal Ideas

45-60 g Carbohydrate Meals	
Meal Item	Carbohydrate (g)
2-egg veggie omelet	0-10
1 slice whole grain toast	15
Small apple	15
6 oz. chocolate milk	20
<b>Total</b>	<b>50-60</b>
3 oz. grilled chicken	0
2/3 c. baked sweet potato	25
1 c. steamed broccoli	10
1 c. tomato soup made with water	15
<b>Total</b>	<b>50</b>
75-90 g Carbohydrate Meals	
Meal Item	Carbohydrate (g)
3 oz. grilled fish	0
1 c. quinoa	40
1 c. grilled zucchini	10
1 c. minestrone soup	15
Small orange	15
<b>Total</b>	<b>80</b>
2 small beef tacos	30
½ c. black beans	20
1/3 c. brown rice	15
Mixed green side salad w/1 TBSP vinaigrette	0-10
1 1/4 c. watermelon	15
<b>Total</b>	<b>80-90</b>

**Contact SCAN**  
[www.scandpg.org](http://www.scandpg.org)  
**800.249.2875**

Written by SCAN registered dietitian nutritionists (RDN) to provide nutrition guidance. The key to optimal meal planning is individualization. For personalized nutrition plans contact a SCAN sports dietitian or Board Certified Specialist in Sports Dietetics (CSSD) by accessing "Find a SCAN Dietitian" at [www.scandpg.org](http://www.scandpg.org)