

## Trial-and-Error Tips

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Making appropriate regimen changes will always take some trial-and-error on your part because there is no one approach that works for everyone and every activity.

A number of factors may impact your blood glucose responses, though, and the more you know about those, the better equipped you will be to figure out what works best for you in almost every situation. Be prepared to use your blood glucose meter frequently to test, test, test to learn your responses!

Try these strategies if you're having any of these issues with diabetes motion:

### **LOWS Exercise-Related Hypoglycemia (low blood glucose):**

#### **DURING AND AFTER EXERCISE—FOOD INTAKE**

- Treat lows with glucose or other rapidly absorbed carbohydrate first, and follow that up with other balanced foods and drinks if needed to keep from dropping later
- Choose pre-exercise foods that require the smallest amount of (or no) insulin to cover them to keep your circulating insulin lower during activities
- Take in extra carbohydrate before, during, and after activities (depending on your exercise intensity and duration, starting blood glucose, normal diet, and other factors)
- Consider using protein and/or fat intake during prolonged activities to help prevent lows, especially past the first hour of activity, because they take longer to digest
- Consume some protein and/or fat shortly after exercise and possibly also at bedtime to counteract lows later on and overnight

#### **LOWS DURING AND AFTER EXERCISE—INSULIN ADJUSTMENTS**

- Exercise when your insulin levels are lower, such as before meals or first thing in the morning before taking any bolus insulin
- Before doing longer duration exercise, lower your insulin levels in anticipation by cutting back on your dose(s) of bolus and/or basal insulin
- Lower the dose of any rapid-acting insulin you take within 2 to 3 hours before doing an activity (or set a lower basal rate on your insulin pump, if you use one)
- If using an insulin pump, consider lowering your basal rate for up to 2 hours before the start of exercise as well as during (and likely after) the activity
- If you are prone to lows after exercise, reduce your dose of rapid-acting insulin given after any activity, or set a temporary lower basal rate on your pump for 4 to 12 hours

- If you inject your basal insulin (Lantus, Basaglar, Levemir, or Toujeo), consider splitting the dose (although not necessarily evenly) to give it twice daily to allow for easier dose reductions before and after activity
- If you use an even longer-acting basal insulin like Tresiba, watch out for possible insulin “stacking” on subsequent days, particularly when you are more active than normal

## TRAINING EFFECTS AND OTHER CONSIDERATIONS

- Check your blood glucose more often when doing a new activity or unaccustomed exercise because both are more likely to result in lows, both during and afterward
- Check frequently if you have had a bad low or exercised hard in the 24 hours before your latest workout because both may blunt your release of glucose-raising hormones
- Try doing an all-out sprint for 10 to 30 seconds to help counteract most lows during exercise, but only if your insulin levels are not too high
- If you plan on doing both aerobic and resistance training during a workout, vary the order based on whether you want your glucose to stay more stable (during resistance work) or possibly decrease (during moderate aerobic work, although intense training may raise it)
- Keep in mind that the rate of insulin absorption from skin depots depends on the size of the dose: smaller doses (1 to 3 units) are absorbed more rapidly than larger ones (5 or more units), which linger longer while you are active
- Do not forget that your overall insulin needs are lower when you are regularly active; you may need permanently lower basal (and mealtime bolus) insulin doses
- Avoid massaging the area where you just gave some insulin—massaging it can speed up its absorption
- Remember that getting in a hot tub or having other prolonged heat exposure can speed up the absorption of any insulin taken (causing lows first, then highs later)
- See the "[Dealing With Hypos](#)" pdf. for additional ideas
- Consult [The Athlete's Guide to Diabetes](#) for many more real-life athlete examples of managing blood glucose during 165 sports and activities

## Exercise-Related Hyperglycemia (high blood glucose):

### HIGHS BEFORE EXERCISE

- If your blood glucose is over 250 mg/dL (13.9 mmol/L) and has been elevated for a few hours, consider giving yourself some insulin and waiting for the level to decrease before starting to exercise (especially with moderate or higher blood and urine ketones)
- If you take a dose of insulin to lower your glucose with a plan to start exercising shortly thereafter, take less than you normally would (50 percent or less) to prevent your blood glucose from dropping too rapidly during the activity

- If your blood glucose is over 300 mg/dL (16.7 mmol/L) with no ketones, exercise only if you feel well and use caution because you can dehydrate more easily.

## HIGHS DURING OR AFTER EXERCISE

- Cut back on your carbohydrate intake during exercise, reduce your insulin less, or take extra insulin after exercise (albeit less than normal)
- Remember that eating a full meal within an hour of starting exercise can slow digestion and result in high blood glucose for 1 to 2 hours afterward, particularly when you have consumed lower glycemic index (GI) items
- If you disconnect your pump during activities and your blood glucose starts to rise, reconnect at least once an hour and take at least a portion of your missed basal
- Consider giving yourself some of your “missed” basal insulin in advance in some cases, such as when you have disconnected from your pump before a swim
- Consider using an “untethered” pump regimen—that is, giving some of your insulin as an injection of long-acting insulin (e.g., Lantus, Levemir, Tresiba) and the rest via pump with a reduced basal rate; then if you disconnect, you still have some basal on board
- For early morning exercise before eating, consider giving yourself a small dose of insulin (less than normal) and/or a small snack to break your fast to reduce cortisol levels that can lead to elevations at that time of day
- If the stress or intensity of competitions affects you, keep your basal insulin higher and only give yourself 50 percent or less of your usual correction dose to lower glucose
- Stay hydrated during activities because dehydration can make blood glucose seem higher (due to being more concentrated) and lead to excess correction dosing
- Consider doing some easy aerobic exercise after more intense workouts to lower blood glucose naturally

## TRAINING EFFECTS AND OTHER CONSIDERATIONS

- After you have trained for a few weeks doing an activity, you may need fewer carbohydrates or smaller insulin reductions than before training due to a greater use of fat
- Both endurance training and fat adaptation (from a low-carbohydrate diet) increase your body’s efficiency at using fat as a fuel during aerobic activities that are submaximal
- When you get very sore from exercise (peaking 2 or 3 days afterward), you may be more insulin resistant because you cannot restore muscle glycogen until your muscle damage from the activity is repaired
- If you load up on carbohydrates before events, you should take enough insulin to cover them; otherwise, loading can raise your blood glucose and limit glycogen storage

- You should keep your insulin from getting too hot or too cold; otherwise, its action may diminish and cause your usual doses to inadequately cover your insulin needs
- Injected or pumped bolus insulin is absorbed faster in smaller doses; after a larger dose, you may end up too high first and then too low later on
- Smaller doses of injected basal insulin are also absorbed more rapidly than larger ones (think 5 units versus 20), and they often do not last as long as expected

## **Early-Onset or Excessive Fatigue:**

- Prevent both hypoglycemia and hyperglycemia to delay or prevent fatigue when you are in motion
- Keep your blood glucose as close to normal as possible for a day or two beforehand so your body can store optimal amounts of glycogen in muscle and liver
- Consume carbohydrates during exercise to provide an alternate source of blood glucose (other than the limited amount your liver can release) and fuel for muscles
- Avoid hyperglycemia by having adequate insulin in your blood to counterbalance the release of glucose-raising hormones during exercise
- Try out new food or insulin strategies in advance during practices, not during the events or competitions themselves
- Keep yourself adequately hydrated before and during all activities, especially if your blood glucose levels have been elevated (you may be dehydrated)
- If muscle cramps are causing you to stop early, consider supplementing with magnesium, electrolytes, and possibly a B vitamin complex
- Have your blood iron levels checked because anemia can cause fatigue, particularly during exercise

**Disclaimer:** *The information that is provided does not replace your relationship with your doctor. The information is for your general use, so be sure to talk to a qualified healthcare professional before making medical decisions or if you have questions about your health.*