

Adjusting Insulin Doses

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Knowing when and how to adjust your insulin doses can be critically important to avoid blood glucose lows and highs--before, during, and for up to a day or two after exercise as well.

Any motion increases your body's use of blood glucose, which can cause you to develop lows during or following exercise. Much of your response is determined by how much insulin is in your bloodstream when you exercise. Although being active allows your muscles to take up blood glucose *without* insulin, that effect adds to insulin's uptake. So, if your insulin levels are high during an activity, your muscles will take up even more blood glucose and you're more likely to end up with low blood glucose, even for up to 48 hours after you're done exercising.

Being able to adjust your insulin doses takes a higher level of knowledge about how insulins work, experience adjusting doses, and quite a bit of trial-and-error, no matter how much you know about your own body's responses.

Bolus insulin: short- or rapid-acting insulins (like Humalog, Novolog, Apidra, and Regular) are used to cover food intake or make corrections to blood glucose levels that are higher than desired. People who use insulin pumps usually only have this type of insulin in their pumps, which are programmed to give bolus and basal doses.

Basal insulin: this is the background insulin that your body needs on a daily basis, even if you don't eat a thing all day long. Some people with type 2 diabetes take basal insulin only (e.g., Lantus or Levemir) to supplement their bodies' own production of insulin, but almost everyone with type 1 takes both basal and bolus doses to most closely replicate the body's normal release of insulin.

These general recommendations for insulin adjustments apply mostly to rapid- or short-acting insulin given within 2-3 hours of exercise, not basal dose changes:

Table 2.3 General Bolus Insulin Reductions Before Aerobic Activities Based on Duration and Intensity

Duration (min)	Intensity (%)		
	Easy	Moderate	Vigorous
30	0-25	25-50	50-75*
60	25-50	50-75	50-100
120	25-75	50-100	75-100

Other considerations and advice:

- The above recommendations only give you a starting point for making insulin changes. You will have to do some trial-and-error to determine what works best for you in every situation
- These premeal insulin changes assume that you are not eating extra food to compensate, and that exercise starts within 1 to 2 hours after the bolus; you may need less or no insulin reduction if starting after that (such as at 3 hours)
- For insulin pump users, basal rate reductions during an activity may be greater or lesser than these, whether done alone or with reduced boluses
- You may also need insulin reductions (bolus and basal) after activities to prevent later-onset lows
- For intense, near-maximal exercise, you may need an increase in rapid-acting insulin (rather than a decrease) to counter the effects of glucose-raising hormones
- You may need to do both lower insulin and eat more for longer activities
- It always helps to eat foods prior to exercise that require smaller doses of insulin to keep circulating insulin levels lower during post-meal exercise (so consider cutting back on pre-exercise carbs)
- You may also need to lower doses after exercise (bolus and basal), both in the short run and longer term (if your training is consistent)
- If your activities are seasonal, plan on lowering insulin doses during the season and raising them again during the off-season to compensate for differences in insulin action with regular training or inactivity
- Competitions usually have more of a glucose-raising effect (especially when nervous) compared to practices, which usually lower blood glucose
- If you use a pump and disconnect it during exercise, reconnect once per hour to give yourself most or all of the basal insulin you missed
- If you use Lantus as your basal insulin and take small doses, they will not last a full 24 hours; you may want to split your Lantus into two daily doses (although not necessarily evenly) instead of one for better basal coverage

Caution: All of these are just general guidelines for changes that will require some trial-and-error (see “[Trial and Error Tips](#)” pdf.) on your part to come up with what works best for you in different situations.

If ever in doubt about how to adjust your own insulin, check with your health care provider for recommended changes and further guidance.

In addition, you can find many real-life athlete examples for 165 sports and activities in [The Athlete's Guide to Diabetes](#).

***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.*