

Adjusting Your Insulin Dose

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Warning: Please work with your healthcare provider. Although the following suggestions may be common approaches to insulin dose adjustment, you want to be sure you are safe and under the guidance of a professional before changing your insulin regime. It takes time to understand these steps and to see how your body responds.

This column will focus on the arduous task of how to adjust insulin. Print in its entirety and review each step carefully. This is intense!

1. Be consistent, and be patient. If you make an insulin dose adjustment, change *one* insulin dose by a small amount and keep the dosage consistent for three days. This is the only way to see the effect on overall patterns. If you change your evening insulin by 10 units one day, skip it the next, take 15 units on the third evening, all the while changing your mealtime insulin doses by several units, you won't be able to identify a pattern or cause and effect. You'll have better luck trying to herd a group of cats.

2. Fix the fasting first. If your glucose values jump around like a hyperactive kid on a Pogo-stick, it helps to focus on the first value of the day. Basal, or background insulin has the most effect on the fasting glucose. Once the fasting value is in the target range of 90-130, the rest of the glucose values are more likely to follow suit. Adjust the long-acting insulin (Lantus, Levemir, NPH) by 2 units every 3 days until your fasting is at target. If you're awakened by a low glucose (less than 70), have nightmares or soak the bed with sweat, lower the insulin dose by 2 units and notify your doctor.

3. Figure out your insulin-to-carbohydrate ratio

For those taking rapid-acting insulin before meals (Humalog, NovoLog, Apidra), you want to know how many carbohydrates 1 unit of insulin covers. (Do not attempt to figure this out until your basal insulin has been calculated to give you a pattern of fairly stable, in-range fasting glucose values, otherwise, you can miscalculate your insulin-to-carb ratio and need to make further mealtime or bolus adjustments.) Two common methods to determine insulin-to-carb ratios are the weight method, and an individual plan.

Source: Tune in to Your Ratio(s). Gary Scheiner, M.S., C.D.E. *Diabetes Self-Management*. (March/April 2006).

4. Correcting high pre-meal values. Once your fasting is in target more times than not, and you have figured out your carb-to-insulin ratio to cover your meal, you are ready for more fine-tuning: correcting high, pre-meal glucose values.

The 1800 rule

The 1800 rule lets you set up a personal "sliding scale" to *correct* those high glucose values. Add up your total daily dose of all insulin and divide by 1800. That will estimate how much 1 unit of rapid-acting insulin (NovoLog, Humalog, Apidra) will drop your glucose. *The correction bolus can only be used after your basal / background rates are set as to prevent lows.*

Divide Your Total Daily Insulin Dose by 1800	To Calculate the Points of Glucose Drop per 1 unit of Rapid-Acting Insulin
20 units	90
25 units	75
30 units	60
35 units	51
40 units	45
50 units	36
60 units	30
75 units	24
100 units	18

TOTAL DAILY INSULIN _____ divided by 1800 = _____ points glucose drop per 1 unit

In the chart above, for someone taking 35 units total insulin units a day, 1 unit of rapid-acting insulin would be expected to lower glucose by 51 points.

Note: If you are taking Regular insulin, use the 1500 rule (divide your total daily dose by 1500 to calculate how many points of glucose will drop per 1 unit of Regular). The 1500 Rule for Regular was originally developed by Dr. Paul Davidson and was modified to the rule of 1800 for faster-acting insulins.

5. Add your pre-meal, correction factor insulin dose with your insulin-to-carb ratio dose.

Once you know how to correct for a high glucose, you can add that number to your insulin-sensitivity factor to project coverage for what you are about to eat. In other words, take your corrections dose _____ units, plus insulin-to-carb dose _____ units to equal your premeal dose _____. It takes practice and guidance from your healthcare team.

6. Factor in exercise

On the days you exercise, you may need to lower your basal / background dose from 2 to 4 units or more, depending on the type and intensity of exercise.

7. Plan for illness

Insulin requirements during illness can actually increase. Work with your healthcare provider to come up with a plan ahead of time, before you get sick.

8. Handle missed or accidental doses

(Numbers 8 and 9 were adapted from JoslinEZstart Resource Manual, 2006.)

If you missed your once-a-day, intermediate or long-acting insulin dose, and you realize it within 4 hours, the full dose can be taken. If it's more than 4 hours late, calculate the number of hours late, divide by 24, and multiply by your usual insulin dose.

9. Adjusting insulin when traveling

Are you traveling East and losing more than three to four hours of your 24 hour day? If you are on Lantus or Levemir, you can continue to take it at the same time as your "old" time zone. If you are on an intermediate-acting insulin (NPH), reduce the amount equal to the percentage of day lost (if you lost 6 hours, that equals 25 percent, which would equal a 25 percent reduction in NPH dose). Your other option is to skip the NPH dose

and cover with rapid-acting insulin every three to four hours until you arrive, in which case you can resume NPH on the “new” time zone at the time you normally would take it at home.

If you are going West and gaining three to four hours and using Lantus or Levemir, you can continue to take it at the same time or gradually adjust by one to two hours each day until it is adjusted back to your home time after you return. If you are on NPH, you may need extra rapid-acting insulin with meals.

Source: JoslinEZstart Resource Manual, 2006

10. You need more than a calculator

Calculating insulin doses based on the historical data that lead up to the point the glucose value was measured, while projecting future glucose trends and the necessary insulin coverage, requires thought and perseverance. Sometimes glucose patterns have no rhyme or reason, which can be a huge source of frustration. Don't go it alone.

This is a case of the more you know, the more you realize you don't know. Insulin does a body great. Insulin adjustment is somewhat of a fine art. With guidelines, support and practice, you can have an insulin plan that more closely mimics the work of the pancreas.