

Basal Testing with Insulin Pumps

by diaVerge Diabetes, with info from <http://integrateddiabetes.com/basal-testing/>

Vocabulary Used:

MDI = Multiple Daily Injections

Basal insulin = continuous, small dose background insulin in a pump

Bolus insulin = fast-acting insulin for mealtime or correction insulin dose

BG = blood glucose level = blood sugar level

BG meter = blood glucose meter = glucometer

mg/dL = milligrams per deciliter. Standard measurement for BG meters in the USA & other countries

mmol/L = millimoles per liter. Standard measurement for BG meters in the UK, Canada & other countries

The purpose of basal testing is to determine the proper basal dose of insulin without the influence of any food, exercise, or bolus insulin in your body. To test your current basal rate of insulin, you need to either fast for a full 24-hour period, or schedule times of fasting at various parts of the day over the course of a week in order to see results for a full 24-hour average day.

If you choose to schedule your fasting in phases, I recommend dividing 24 hours into 4 time blocks: overnight, morning, afternoon and evening.

Although basal tests can be conducted in any order, it is usually advisable to test the overnight basal rates first, and then move on to daytime testing/fine-tuning. Setting proper overnight basal rates does not mean that the daytime settings are correct: each phase of the day (morning, afternoon, evening, and overnight) should be tested independently.

Target different times of the day:

Morning fasting: Skip breakfast and don't eat until noon. Many who use intermittent fasting already do this daily.

Afternoon: Eat breakfast, but nothing else until a later dinner

Evening: Eat breakfast and lunch then nothing else afterward until breakfast the next day (or a small midnight snack if needed)

Overnight: You're already fasting. Nothing needs to be done except for testing and documentation every couple of hours.

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Two possible schedules:

1. Choose 2-3 days in a row to test each of the 4 fasting phases. Example: Monday, is morning fasting, then on Tuesday fine-tune and test the morning again, on Wednesday test the morning again to make sure it's steady. On Wednesday, test afternoon then confirm your fine tuning on Thursday and Friday, and keep going with 2-4 days in a row testing one of the fasting phases.
2. Choose one of the 4 fasting phase to test each day in a week, then repeat the following week to confirm any fine tuning. Example: Monday, is morning fasting, Tuesday is afternoon, Wednesday is evening fasting, Thursday is overnight, etc. Then repeat for the next week to test your results and changes. This requires more documentation to remember what you ate beforehand, what changes you made, and your exact results.

GUIDELINES FOR ACCURATE BASAL TESTING:

- 1. No food being digested**
 - a. Do not consume any calories for at least 4 hours leading up to the basal test.
 - b. The meal/snack preceding the basal test should be low in fat.
 - c. Do not consume any calories during the basal test, unless your blood glucose drops low.
 - d. You may have water, diet beverages and other non-caloric foods during the test.
 - e. No caffeinated beverages during the basal test.
- 2. No bolus insulin working during the basal test**
 - a. Start testing at least 4 hours after last bolus.
 - b. Bolus normally (do not extend the bolus) for the last meal/snack.
 - c. Do not bolus during the test, unless your blood glucose is above 150 mg/dL / 8.3 mmol/L.
- 3. No changes in the body's normal glucose output**
 - a. No hypoglycemic episodes for at least 6 hours preceding the basal test.
 - b. No illnesses during the testing (fever, infection, virus)
 - c. No steroid medications being used.
 - d. Avoid testing basal rates within a week of starting a menstrual cycle.
- 4. Allow basal insulin to be delivered uninterrupted**
 - a. Do not put the pump into suspend.
 - b. Do not disconnect from the pump.
 - c. Do not have a temporary basal rate running.
 - d. Do not change your cartridge, tubing or infusion set during the test.
- 5. Maintain normal daily activities during basal test.**
 - a. You may perform light/moderate exercise soon after your last meal/snack if it is your normal time to do so.
 - b. Do not engage in heavy exercise once the basal test begins.
- 6. Check blood glucose level every 1-2 hours during daytime tests & every 2-3 hours during overnight tests.**

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EVALUATING RESULTS:

If your BG level drops by more than 10-15 mg/dl during the test period, the basal insulin rate is too high. If it rises by more than 10-15 mg/dl, the basal rate may be too low. The basal rate should be changed in increments of .05 to .2 units/hr depending on your usual settings and the magnitude of the rise or drop that took place.

Note that basal rates are usually changed one or two hours BEFORE the observed rise or fall in the blood sugar, since the rapid-acting insulin infused by the pump takes about an hour to peak.

For example, if your blood sugar rises between 3 am and 7 am, you would increase the basal rate between 2 am and 6 am. Also, keep in mind that it is rare to have multiple peaks and valleys to a basal insulin program using an insulin pump and this is a sign that your basal rates need adjustment. Adjust basal rates slowly and conservatively to avoid these swings in BG level.

For more information, please contact diaVerge Diabetes www.diaVerge.com

**The information contained herein is to be used for educational purposes only and is not to be considered medical advice. Please consult your medical professional with all changes to your medication timing and dosage.*
