

Optimizing Basal Insulin



Basal Insulin That Complements Your Life

Why does basal insulin need adjustment?

A functioning pancreas releases insulin continuously all day and night based on the body's needs and blood glucose (BG) levels. Since many factors can affect BG levels, it makes sense that insulin needs can change hour-to-hour, and day-by-day. A benefit to pump therapy is that your basal insulin can be adjusted to meet your often-changing BG levels.

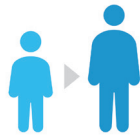
Factors that affect basal insulin needs:



Activity levels



Work and rest schedules



Life stage
(growth, hormone levels, pregnancy)



Changes in body weight



Illness/Injury



Medication

How to evaluate your current basal program

Insulin pump basal rates can be adjusted to meet your needs throughout the day. A “basal segment” is a specific time period and rate within your 24-hour basal program.

- **How do you know where a basal segment change is needed?**

First focus on BGs and basal rates during the hours you sleep—this is the easiest segment to start with since it is likely 8 hours without a meal or bolus. Look for a pattern of BGs over 2–3 days, either above or below target. A continuous glucose monitor (CGM) can be a powerful tool to help you and your healthcare provider see patterns in your BGs more clearly.

- **If you need more or less basal insulin, how much should you adjust it by?**

A little goes a long way when it comes to your basal rate changes. Start gradually, in small increments, like 10%. For example, for a basal rate of 1.0 U/hr, a 10% increase would be 1.10 U/hr.

- **How do you decide when to start that new basal rate? What about end?**

Start the new segment a few hours prior to the BG pattern you want to target in order to give the insulin time to work. For example, if BGs start trending high at 5 am, an increased basal rate may start around 3 am or 4 am. End the segment when you see your BGs trending back down to target.

- **How many basal segments should you have?**

Everyone's insulin needs are different, there is no standard number of basal segments.

Why would you need multiple basal programs?

An alternate basal program can be useful if your activity level is very different for an extended period of time (example: weekday vs. weekend). Other common uses include: variable work schedules, extended illness or stress, vacations, conferences and summer camps. Once programmed, switching between programs is fast and easy.



What about setting temporary basal rates?

Temporary situations that happen only sometimes may benefit from your pump's temporary basal feature. An increase temporarily could be helpful for high BGs associated with being sick. A decrease temporarily could help prevent low BGs related to certain types of exercise.



Work with your healthcare provider to determine situations where temporary basal rates or multiple basal programs would help you.

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Steps to Evaluate Your Basal Program

Tips before you begin:

- Try not to make changes in the first 24 hours after pump start. Your BG value could be affected by lingering effects of your long-acting insulin prior to pump start.
- Evaluate a day free of exercise, illness, increased stress, alcohol, or high fat meals.
- Break up the day into four time frames (overnight, morning, afternoon, and evening) so you can evaluate one at a time.
- Start with evaluating your hours of sleep first.

Instructions for basal rate evaluation — hours of sleep

- Eat an early dinner and choose low fat foods that allow for easy and accurate carbohydrate counting. Do not eat after dinner.
- Begin checking your BG about 4 hours after dinner—do not give a correction bolus.
- Continue checking your BG at bedtime, 2–3 hours after bedtime, and again 2–3 hours later. Test again upon waking.
- If your BG changes more than 30–40 mg/dL between BG readings, discuss changing your basal rates with your healthcare provider.

Identifying Patterns

Example for hours of sleep basal testing

Enter BG value at the times indicated. Be sure to track a few days to see a pattern.

| Date | Dinner time, BG and bolus | 4 hours after dinner | Bedtime | 2–3 hours after bedtime | Another 2–3 hours later | Upon waking |
|-------|---------------------------|----------------------|-----------------|-------------------------|-------------------------|-------------|
| 11/12 | 5:23 pm 8.65 U 178 | 9:30 pm 190 | 10:15 pm 168 | 180 | 198 | 184 |
| 11/13 | 5:45 pm 10.15 U 199 | 9:45 pm 146 | | 158 | 226 | 240 |
| 11/15 | 5 pm 12.4 U 148 | 9 pm 174 | 11 pm 144 | | 209 | 210 |

3 day worksheet

Use this blank worksheet to add in your BGs so you can discuss any changes needed in basal rates with your healthcare provider.

| Date | Dinner time, BG and bolus | 4 hours after dinner | Bedtime | 2–3 hours after bedtime | Another 2–3 hours later | Upon waking |
|------|---------------------------|----------------------|---------|-------------------------|-------------------------|-------------|
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REFERENCE

Bolderman, K. *Putting your patients on the pump*. 2nd ed. American Diabetes Association. 2013.

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