

Basal-Bolus Insulin

Long-acting and rapid-acting insulin therapy

What do the words basal-bolus insulin mean?

Many people with Type 1 diabetes use a combination of long-acting (basal) and rapid-acting (bolus) insulin. This is called “basal-bolus” insulin. You will work with your diabetes educator to learn how to figure out how much basal-bolus insulin you will need every day.

Your goal is to use basal-bolus insulin to keep your blood glucose in target range. This handout is mostly about calculating **bolus insulin**.

Basal insulin (long acting)

Refers to the insulin you inject as background insulin to control blood glucose levels overnight and between meals.

Insulin name: Glargine (Lantus/Basaglar)

- Works to keep blood glucose in the target range between meals and through the night. It works with the glucose that is released by the liver.
 - Dose usually remains the same from day to day. Your doctor or diabetes educator will recommend an adjustment when blood glucose is not in target range.
 - Lasts 12-24 hours.
 - Taken at the same time every day.
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Bolus insulin (rapid acting)

An insulin injection given as a burst to quickly counter carbs eaten and/or to lower high blood glucose.

Insulin names: Humalog, Novolog

- Works to provide insulin in the right amount for the food you are eating (this is called a “Carb Bolus”) and/or to lower high blood glucose (this is called a “Correction Bolus”).
 - Dose will be different each time you take it depending on blood glucose and the food/amount of carbohydrates you are eating.
 - Lasts about 3 hours.
 - Usually taken before meals and snacks (when you eat carbohydrates).
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To Learn More

- Endocrine
206-987-2640
- Ask your child’s healthcare provider
- seattlechildrens.org/patient-education

Free Interpreter Services

- In the hospital, ask your nurse.
- From outside the hospital, call the toll-free Family Interpreting Line, 1-866-583-1527. Tell the interpreter the name or extension you need.



Figuring out your bolus (Humalog/Novolog) insulin doses

How do you know how much rapid acting bolus insulin you need for mealtimes and snacks?

Ask yourself these 3 questions:

- How many grams of carbohydrates are you going to eat?
- What is your blood glucose (BG) now?
- How active are you going to be during the next few hours?

1. How many carbs are you going to eat?

First, add up the grams of carbohydrates in the meal or snack.

Insulin/Carbohydrate Ratio

- You need to know your Insulin/Carbohydrate Ratio. It tells you how many units of insulin you need to take for the grams of carbs you are going to eat.
- Everyone has a different insulin/carbohydrate ratio – it's based on your size/weight and your body's sensitivity to insulin.
- Ratio example #1: 1 unit of Humalog/Novolog per 10 carbs – 1:10
- Ratio example #2: ½ unit of Humalog/Novolog per 30 carbs – ½:30
- Once you know your carb ratio number (your insulin/ carbohydrate ratio), you will use it to figure out your Carb Bolus.
- You should inject Humalog/Novolog 15 minutes before you eat. Young children can get this after their meal if it is uncertain how much of the meal or snack they will eat.

Your insulin/carb ratio is: _____

Grams of Carbohydrates ÷ Insulin/Carbohydrate Ratio = Carb Bolus

2. What is your blood glucose number?

The Correction Bolus is taken when you need to correct (lower) a high blood glucose number. You will need a Correction Bolus when your blood glucose goes above the number determined by your doctor.

Correction Factor

Your Correction Factor tells you how sensitive you are to insulin – it is an estimate of how much Humalog/ Novolog you need to lower your blood glucose down to your target number. You will have a different target number for daytime and bedtime/middle of the night. Everyone has a Correction factor, unique to them, determined by their doctor. A Correction Factor of 50 means that 1 unit of Humalog/Novolog lowers your blood glucose by 50 points.

Your personal correction factor is: _____

To calculate your Correction Bolus, you need to know your Correction Factor.

Your target blood glucose



Daytime:

Bedtime/middle of the night:

Now, let's figure out your **Correction Bolus**:

$$(\text{Current blood glucose} - \text{target blood glucose}) \div \text{Correction Factor} = \text{Correction Bolus}$$



Current blood glucose

target blood glucose

Correction Factor

DO NOT give a Correction Bolus if it has been less than 3 hours since the last Humalog/Novolog injection was given.

$$\text{Carb Bolus} + \text{Correction Bolus} = \text{Total Bolus Dose (Humalog/Novolog)}$$

Example:

Time	BG	Carb Bolus	Correction Bolus
8 a.m. breakfast	315	Yes	Yes
10 a.m. snack	170	Yes	No (only 2 hours since last bolus dose with correction bolus)
12 p.m. lunch	150	Yes	No (only 2 hours since bolus dose; no correction dose as blood glucose now on target)
3 p.m. snack	298	Yes	Yes (3 hours since last injection and blood glucose high)
5 p.m. dinner	236	Yes	No (only 2 hours since last bolus dose)
8 p.m.	315	No	Yes using bedtime target.

3. How much activity will you be doing in the next few hours?

- For every 30-60 minutes of increased activity, eat an extra 15-gram carb snack. **DO NOT TAKE INSULIN TO COVER THESE CARBS.**
Or
- If you know you are going to be active within a few hours after a meal or snack, you may want to subtract 15 grams from the total number of carbohydrates you are counting for your meal or snack. This will give you less Humalog/Novolog for that dose.

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Adjusting insulin dosages:

- Take insulin dose adjustment class to learn how to change insulin doses on your own.
- Call into Blood Glucose Line daily, then as instructed.

Blood Glucose Line 206-987-2640

or email to endonurse@seattlechildrens.org

You may also call into the Blood Glucose Line any time you need help with insulin dosages.

Today's Dose (Basal)

Lantus/Basaglar
(basal)

Bedtime (8-10 p.m.)

Morning (8-10 a.m.)

Today's Dose (Bolus)

Humalog/
Novolog

_____ unit per _____ grams carbs

Correction Factor is _____

Daytime target is _____

Bedtime/middle of the night target is _____
