

What to do When Your Insulin Pump is Not Available (1)

- Insulin pumps give both a programmed continuous infusion of insulin called the basal rate, which provides background insulin you need whether eating or not, and allows you to give boluses to cover eating or correct high blood sugars
- If your pump stops working or you do not have supplies available, you need to replace both the basal insulin, which normally goes in automatically based on the programmed rate, plus the meal and correction boluses
- It is best to have a long-acting insulin available as a basal insulin back-up. If it is in a pen, you need pen needles. If it is a vial, you need U-100 syringes.
 - The best back-up insulin for a few days is daily insulin glargine (**Lantus, Toujeo, Basaglar, Semglee** are all brands of glargine) or twice daily **Levemir**.
 - **Tresiba** is not a good back up insulin for pumps because it takes 3 days to reach the full effect of the dose when you start it and it wears off over several days when you stop it.
 - NPH insulin (**Novolin N or Humulin N**) twice daily can also be used, but it is less consistent from one dose to the next compared to the insulins above and usually has a peak at 5-8 hours. It does have the advantage that it is cheaper and can be purchased without a prescription. Walmart sells NPH insulin in a vial for less than \$30 for a vial of 1000 units. This insulin requires mixing before injecting. After mixing, it should have a uniform milky appearance.

What to do When Your Insulin Pump is Not Available (2)

- To calculate a dose for back up, **basal is generally $\frac{1}{2}$ of the total daily dose of insulin**, but this varies from person to person. If you have access to a download of the pump or its current settings, you should be able to see how much basal insulin you normally are programmed to get. If this is not available to you, call your doctor, or you can estimate how much insulin you normally get in 24 hours and cut this dose in half.
- For basal insulin, we normally take $\frac{1}{2}$ of your total daily insulin dose. For example, if total dose is 50 units and basal total not known, then estimate 25 units. To calculate a dose of glargine, take 25 units of glargine every 24 hours, or Levemir 13 units every 12 hours, or 13 units NPH every 12 hours.
- When the pump is going to be restarted, you should start it 24 hours after the last dose of glargine or 12 hours after the last dose of NPH or Levemir.
- An alternative to taking a basal insulin is taking the rapid insulin you use in a pump every 4 hours, where you take $\frac{1}{6}$ of the total daily basal dose every 4 hours. This approach requires you to dose every 4 hours the basal dose in addition to any short acting insulin needed for food or correction, even at night. This is not recommended for more than a brief period.

What to do When Your Insulin Pump is Not Available (3)

- You also need to take insulin for correction of any high blood sugar readings plus for food. If you use a bolus calculator when using the pump, you would need to know the following in order to calculate a dose the same way the pump does:
 - Target blood sugar, for example, 120 mg/dL
 - Carb ratio: how many grams of carbs per 1 unit of insulin, for example, 1 unit for 10 grams of carbs
 - Sensitivity or correction factor: how many points your blood sugar changes with 1 unit, for example, 1 unit for 50 points (points in mg/dL, which is how US meters or CGM read)
- To estimate a dose, take number of carb grams/carb ratio + any correction for a higher than target blood sugar as $\text{current blood sugar} - \text{target} / \text{correction factor}$
- For example: for a meal with 50 grams of carbs and with a target of 120 and a pre meal blood sugar of 175, if the carb ratio was 1 unit for 10 grams and correction factor was 1 unit for 50 points:
 - $50 \text{ grams} / 10 = 5 \text{ units} + 175 - 120 = 55 / 50$ round off to 1, thus total is $5 + 1$ unit or 6 units

What to do When Your Insulin Pump is Not Available (4)

- **Call your insulin pump company first if you think there is something wrong with your pump.** They would be able to determine if it needs to be replaced or is unsafe to use. Normally a replacement pump will take 1 to 3 days to receive, and will need to be reprogrammed once you get it.
- **If you are not sure what to do, you need a basal insulin or other prescription, or you have a high blood sugar or are feeling ill, please call the office or the doctor on call for assistance**
- If you use U-500 regular insulin or U-200 Humalog insulin in your pump, please call the doctor on call if your pump is not available, and inform them which insulin you use in your pump
- When traveling, it is particularly important to have enough supplies and either a back up pump or a back up basal insulin and a way to give it and the rapid insulin you normally put in your pump. Have syringes or both types of insulin (basal and rapid) in a pen, and pen needles
- **Never withdraw Toujeo insulin from a pen and inject with a U-100 syringe.** Toujeo has 300 units in 1 milliliter compared to nearly all insulin from a vial which is 100 units per milliliter