7.1 Find Your Average TDD on Multiple Injections

If you are switching from MDI to a pump or AID, your average TDD on multiple injections is your best guide to finding an accurate basal rate, CarbF, and CorrF. Get your average TDD by recording all long-acting and rapid-acting insulin doses you inject for seven days. Use paper or a phone app. Then, add these doses, and divide the total units by the number of days you've recorded.

Total units in 7 days = _____ units / 7 days = _____ units per day
Current avg. TDD

For example, for 280 total units in 7 days, 280 u ÷ 7 = 40 u/day as the current average TDD.

If your average glucose is below 160 mg/dL without frequent lows, your recent average TDD on injections can be used in Table 9.7 to find your starting settings. Otherwise, you want to find a better TDD (betterTDD) below to correct a low or high average glucose.

7.2 When to Stop Injected Long-Acting Insulin Before Starting an AID System

Follow your clinician's instructions to discontinue your long-acting insulin before starting an AID system. The glucose-lowering activity of Lantus usually disappears 28 hours after the last injection. Long-acting insulin analogs like Toujeo (U-300 long-acting glargine) and Tresiba (degludec) take 36 to 42 hours to stop lowering your glucose. Test your basal rates and bolus doses once the last dose of long-acting insulin is no longer active.

If you inject Lantus in the morning, you'll likely take this dose the morning of the day before your start, but not on your start day. If you inject at bedtime, your clinician may advise you to cut your bedtime dose of Lantus in half the night before you start. Inject rapid-acting insulin to cover high glucose that night and breakfast the following morning. With Toujeo and Tresiba insulins, use a temp basal until all the residual insulin is gone.

After starting, you or your clinician can offset any residual insulin activity from long-acting insulin with a temporary basal rate reduction. Temp basal rates automatically return to normal rates when they time out.

Usual Time for LA Dose		LA Dose Day Before Start		LA Doses on Start Day	
AM	**PM**	**AM**	**PM**	**AM**	**PM**
✓		✓		X*	
	✓		half dose*		X
✓	✓	✓	half dose*	X*	X

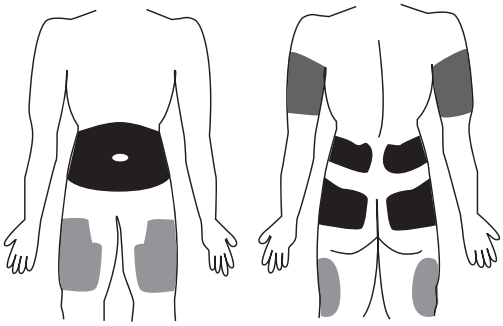
✓ = take dose
X = skip dose

* Use rapid-acting insulin until your pump start to cover basal need, carbs, and to correct any high reading. To offset any remaining long-acting IOB on start day, use a temp basal reduction.

7.3 What to Bring to Your Pump or AID Training

- Comfortable 2-piece clothing and your list of questions.
- A data download from your devices or a written glucose and insulin dose record.
- CGM sensors and glucose meter supplies – meter, strips, lancets, lancing device.
- Fast-acting carbs to treat low glucose.
- 3 pump cartridges and 3 infusion sets, or 3 pods for a patch pump.
- A bottle of rapid insulin.
- 70% alcohol pads.
- A roll of 1" tape (3M Durapore, Transpore, Blenderm, Micropore, or Smith and Nephew Hypafix).
- If requested, an additional adhesive dressing like IV 3000, Tegaderm HP,
- Polyskin II, DuoDerm, or Opsite Flexifix .

7.4 Skin Sites and Considerations



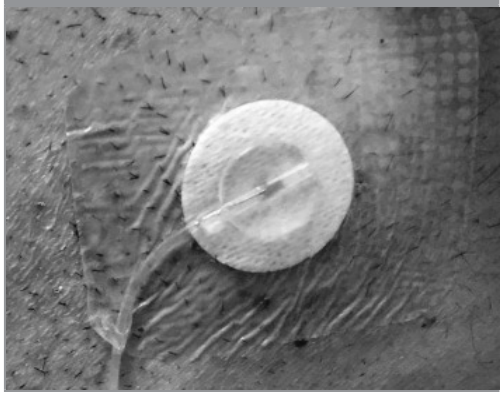
- Which body sites have enough fat padding?
- Which type and size of infusion set works best for your preferred body locations?
- Can you easily disconnect the infusion set for bathing or swimming?
- Do you want to use an insertion device?
- Does work, sports, or childcare limit specific sites?

7.5 Cannula Fill Amounts

Cannula	Fill Amount
Steel	0.0 u
6 mm plastic	0.3 u
8 mm plastic	0.4 u
9 mm plastic	0.5 u
10 mm plastic	0.6 u
13 mm plastic	0.7 u
17 mm plastic	0.7 u

Steel needles have no cannula fill. They are fully primed once insulin is visible at the needle tip. Omnipod is self-filling.

7.6 Steel Set with Overbandage



7.7 Reduce Insertion Pain

Although rarely needed, Numby Stuff and LMX 4 cream can be used to reduce insertion discomfort. EMLA, a prescription numbing cream, can also be applied to the skin about an hour before inserting an infusion set or sensor. Another handy solution is to place an ice cube or cold spoon on the site before insertion to trick the nerve endings into feeling cold instead of pain. The touch of an auto-insertion device distracts the nervous system to avoid pain. Many parents of toddlers and young children prefer the smaller needle in steel sets.

7.8 Insulin Storage Tips

- Keep insulin out of direct sunlight.
- Before entering a hot tub or sauna, disconnect and remove your pump to keep it at room temperature. Replace an Omnipod to avoid high glucose.
- The insulin bottle you use to refill your pump may be kept at room temperature for 30 days. Refrigerate insulin bottles at 36 to 45° F (2 to 8° C).
- A Frio pack keeps insulin bottles and pens cool for transport in hot weather. The insulin in your pump does not need any cooling if kept in clothing and out of direct sunlight.
- Don't leave insulin in a car.

7.9 Some Days May Go Bad

7.10 Take Extra Care with Concentrated Insulins

With U-100 insulins, each cc or ml contains 100 units, while U-200 insulins contain 200 units, and U-500 insulins contain 500 units or five times the concentration. A 200-unit cartridge covers about 3 days for those needing 60 or 65 units daily, and a 300-unit cartridge covers 3 days for those using up to 90 or 95 units daily. For those requiring larger doses, U-200 Humalog/lispro insulin pens or U-500 Regular vials can fill a pump cartridge with 2 or 5 times as much insulin.

Insulin pumps are designed for U-100 insulin. When using a more concentrated insulin, your pump settings must change. For U-200 insulin, basal rates are reduced by half and the CarbF and CorrF are doubled. For U-500 insulin, basal rates are reduced to one-fifth and the CarbF and CorrF are multiplied by five.

For example, a basal rate of 3.0 u/hr on U-100 insulin becomes 1.5 u/hr on U-200 insulin or 0.6 u/hr on U-500 insulin. In addition, a CarbF of 1u/3.0 grams of carb becomes 1u/6 grams on U-200 insulin and 1u/15 grams on U-500 insulin. Discuss these changes carefully with your healthcare professional.

With U-200 insulin, a basal rate of 1.0 u/hr now delivers 2 units each hour. Likewise, a "one unit" bolus for 10 grams now delivers 2 units for 10 grams or 1 unit for 5 grams. In data downloads, an average TDD of "120 units" for U-200 insulin is actually 240 units.

Be careful not to run out of U-200 or U-500 insulin. Once settings are changed, NEVER load the cartridge with U-100 insulin unless you change your profile or settings. You will get only half or one-fifth of your previous doses! If you need to change your insulin concentration, always change your profile or pump settings.