

Is an Insulin Pump for Me?

Answers to Some Common Questions

What Is an Insulin Pump?

- An **INSULIN PUMP** is a small, battery-powered, computerized insulin delivery device. It holds a reservoir that you fill with rapid-acting insulin.
- An insulin pump **WITH TUBING** is:
 - Connected to your body through an **INFUSION SET** which includes:
 - A **CANNULA** (tiny soft Teflon™ or steel tube) that is inserted under your skin using the attached needle (which is discarded), and
 - A thin plastic **TUBE** that runs from the cannula to the pump.
 - Worn close to your body clipped to a belt or waistband, held in a pocket or pouch, or secured in a leg garter or arm band. It can be disconnected from the infusion set for short periods for swimming, bathing, or exercise.
- Some insulin pumps are **TUBELESS** and have a cannula and retractable needle on their underside. A tubeless pump is worn directly on your body with adhesive. It is not removed for swimming or bathing.
- The infusion set can be inserted anywhere where you would normally give an insulin injection. This includes the stomach, upper buttocks and hip areas, the back of the arms, and upper legs. Infusion sets need to be changed every 2-3 days or as recommended by the manufacturer/your diabetes team and rotated to a new site.

How Does an Insulin Pump Work?

- An insulin pump replaces insulin injections by a pen or syringe. An insulin pump gives:
 1. **BASAL INSULIN:** Tiny amounts of rapid-acting insulin continuously to cover background insulin needs. You can program basal insulin delivery based on your individualized needs. A basal profile can include multiple basal rates over a 24-hour period. Basal insulin can also be automatically determined or adjusted by some pumps when used with an integrated glucose sensor (see *Can I use an Insulin Pump with a Glucose Sensor?*, page 2).
 2. **BOLUS INSULIN:** Larger amounts of rapid-acting insulin. There are 2 types of boluses:
 - a) **FOOD BOLUS** – for meals and snacks. The amount of the food bolus is based on how much carbohydrate is eaten. **Food boluses are not automatic – you must enter the amount of carbs and tell the pump to deliver the carb bolus.**
 - b) **CORRECTION BOLUS** – to bring down glucose that is above target. The amount of the correction bolus is based on the current glucose value and your **INSULIN SENSITIVITY (OR CORRECTION) FACTOR** programmed into the pump. Correction boluses can sometimes be automatic with some insulin pumps when used with an integrated glucose sensor (see *Can I use an Insulin Pump with a Glucose Sensor?*, page 2). Otherwise, you must tell the pump to deliver the correction bolus.

All insulin pumps have a built-in **BOLUS CALCULATOR** (or separate app) to calculate the bolus amount. The calculation is based on the glucose value (entered manually, by paired blood glucose meter, or paired glucose sensor) and/or the amount of carbohydrate eaten (entered manually).

Can I Use an Insulin Pump with a Glucose Sensor?

- Yes, insulin pumps can be used on their own (stand-alone) or can be paired with a glucose sensor. There are different ways an insulin pump and glucose sensor can work together:
 1. **SENSOR AUGMENTED PUMP** – the most basic pairing, where the sensor glucose values are automatically sent to the insulin pump. The insulin pump does not react to the value.
 2. **SUSPEND ON LOW** – some insulin pumps can suspend (temporarily stop) insulin delivery when the sensor glucose is low.
 3. **PREDICTIVE LOW GLUCOSE SUSPEND** – some insulin pumps can suspend (temporarily stop) insulin delivery when the sensor shows that a low is likely to occur soon (but hasn't happened yet).
 4. **AUTOMATED INSULIN DELIVERY (AID)** – some insulin pumps can automatically adjust (increase, decrease, or temporarily stop) insulin delivery to keep glucose near target. Some can also give an automatic correction bolus when glucose is predicted to rise above target.
- Depending on the specific insulin pump or paired system used, a user can set temporary basal rates or a temporary glucose target for special circumstances (e.g., for illness or physical activity), suspend (temporarily stop) and resume (start) insulin delivery, and turn on special modes (e.g., “Exercise” and “Sleep” Modes).
- All pumps can be used on their own without the sensor if needed, but settings must be up to date.

What Are the Advantages of Insulin Pump Therapy?

- **MORE PRECISE INSULIN DOSES** - Basal insulin can be delivered in very small amounts (or temporarily stopped). Food and correction boluses do NOT need to be rounded to the nearest whole or half unit. It becomes easier to manage things like the dawn phenomenon (high morning glucose), sleeping in, overnight lows, travel, illness and sports/activity through use of multiple/temporary basal rates, or by using an AID system.
- **SAFETY FEATURES** such as ‘insulin on board’ to prevent insulin stacking (all pumps), as well as low glucose/predictive low glucose suspend (with certain paired systems).
- **MORE FLEXIBILITY** with respect to meal timing and carbohydrate amounts (all pumps).
- **EASE OF BOLUSING** – not having to give an injection for food or corrections (all pumps)!
- **ADVANCED BOLUS OPTIONS** to better match how quickly or slowly certain foods/meals raise glucose or for special occasions where the carb amount may be eaten over an extended time (all pumps in manual mode).
- **FEWER AND/OR LESS SEVERE LOWS** (all pumps).
- **IMPROVED GLUCOSE VALUES** – A1C can improve (all pumps). People using an AID system can achieve more time in range (less lows and highs), especially overnight.

What Are the Potential Disadvantages of Insulin Pump Therapy?

- Risk of **DIABETIC KETOACIDOSIS (DKA)**. This happens because the pump only uses rapid-acting insulin – there is no long-acting insulin working over an extended time. Any interruption in insulin delivery will cause a rise in blood glucose. If not responded to quickly, DKA can develop.
- Ongoing **COMMITMENT** to daily diabetes management, including checking/reviewing glucose, carb counting, and giving food boluses.
- **GLUCOSE MAY WORSEN RATHER THAN IMPROVE** – A very common problem is that boluses are often forgotten. Setting timers/reminders can help!
- **WEIGHT GAIN** – With increased flexibility with meals and snacks, and the ease of bolusing, some people may gain extra weight. It is important to make healthy food choices. However, if there is less hypoglycemia requiring treatment pumps may help to prevent weight gain.
- **BODY IMAGE CONCERNS** – Some people do not like the idea of having a pump attached to them as a constant reminder of their diabetes.
- **RISK OF INFECTION** at the insertion site. This can be prevented with good insertion technique and site rotation every 2-3 days or as recommended by the manufacturer/your diabetes team.
- **SKIN IRRITATION** can happen from the adhesive used to hold the pump site in place. The pump company/your diabetes team can help with strategies to deal with this issue.
- **COST** – The pump costs ~\$7,000.00, with monthly pump supplies costing an additional \$200 to \$300. Depending on family income and size, some costs may be covered by the [Nova Scotia Insulin Pump Program \(NSIPP\)](#). Sensor glucose supplies, if used, will cost extra.

Education, training, and ongoing support is needed to be successful with insulin pump therapy! It takes time, commitment, and realistic expectations.

Insulin Pump Manufacturers (alphabetical order)

- **Insulet** | www.omnipod.com/en-ca | 1-855-POD-INFO (1-855-763-4636) | omnipodcanada@insulet.ca
- **Medtronic** | www.medtronicdiabetes.ca | 1-800-284-4416 | medtronicdiabetescc@medtronic.com
- **Tandem** | www.tandemdiabetes.com/en-ca | 1-833-509-3598
- **Ypsomed** | <https://www.mylife-diabetescare.com/en-CA> | 1-833-695-5959 | info@ypsomed.ca