Health PEI

INTRODUCTION TO INSULIN PUMP THERAPY

WHAT IS AN INSULIN PUMP?

An insulin pump is a medical device used by people with diabetes. It's an alternative to multiple daily injections of insulin using a syringe or pen. Insulin pump therapy and multiple daily injections are referred to as intensive diabetes management because the blood sugars are kept in tighter range. Blood sugars must be monitored frequently for pump therapy to be safe and effective.

Insulin pumps are becoming increasingly popular. However, they are complex devices. It's important to know how to use the pump properly to avoid problems or address them if they occur. If you do not know how to use your pump properly to maintain your blood sugar levels, or if there are problems, you are at risk of serious side effects (immediate and long term) from uncontrolled diabetes.

Insulin pumps are worn externally and deliver a continuous amount of fast-acting insulin 24 hours a day. You also use it to deliver a bolus of insulin when eating foods containing carbohydrates.

There are three main components to insulin pump therapy:

- a pump (with a battery and controls), which pumps the insulin into your body
- a reservoir or a cartridge, where insulin is held
- an infusion set, which includes a thin tube that runs from the reservoir in the pump to the infusion site on your body, and a short cannula (a small tube) that is inserted under your skin (some tubeless options exist).

The main steps to using the pump include placing the insulin-filled reservoir inside the pump and inserting the cannula under your skin using a needle. The cannula is held in place with an adhesive (sticky) patch for 24 to 72 hours, after which time it should be replaced. A tube connects the cannula to the reservoir in the pump and delivers a set amount of insulin into your body.

The diabetes care team will determine if an individual is medically eligible for pump therapy. An appropriate candidate is motivated, currently on optimized basal-bolus injection therapy (i.e., multiple daily injections), willing to frequently monitor blood sugars, understands sick-day management and is willing to attend follow-up visits as required by their diabetes care team.

Most current insulin pumps are Automated Insulin Delivery Systems (AID) which include an insulin pump working with a separate continuous glucose monitor and a smart algorithm to anticipate, adjust and correct insulin delivery.

HOW DOES IT WORK?

Insulin pumps use only rapid acting insulin. Two types of insulin doses are delivered to your body by the pump:

- Basal insulin doses are delivered continuously over 24 hours and keep your blood sugar levels stable between meals and overnight.
- Bolus insulin doses are delivered when you push a button on the pump - you can use bolus insulin doses when you eat to provide insulin for carbohydrates in your food, or when needed to correct high blood sugar levels.

WHAT ARE THE BENEFITS OF INSULIN PUMP THERAPY?

1. Precise dosing. Insulin dose delivery is exact and can be matched to each person's unique needs. An insulin pump can assist in keeping blood sugars in range. It is also easier to manage the dawn phenomenon, sleeping in, overnight lows, and illness.

2. Flexibility. Since only rapid-acting insulin is used, there is no deposit of long-acting insulin waiting to be absorbed. This provides flexibility in the timing and size of meals, as well as improved control while traveling, exercising, dealing with illness, or working unpredictable schedules.

3. More predictable absorption of insulin because only rapid-acting insulin is used.

4. Potential for fewer and less severe low blood sugar events for people who are actively engaged in their diabetes management because of more predictable and more precise insulin delivery.

5. Potential for improved control of diabetes. Many insulin pump users report better control of diabetes than they were able to get with injections. To see this benefit, the person needs to be actively engaged in their diabetes care and treatment plan.

WHAT ARE THE CHALLENGES OF INSULIN PUMP THERAPY?

Challenges with insulin pump use can happen for many reasons, including:

Improper diabetes management, improper use of the insulin pump or its related components, or pump failure.

It is important to be aware when you might be having an issue with your diabetes management and know what to do if this happens. Serious complications of uncontrolled diabetes include:

- **Hyperglycemia** – This is when your blood sugar level is too high. Hyperglycemia doesn't usually cause symptoms until glucose levels are significantly elevated (11+ mmol/L). Symptoms are those of untreated

diabetes: being thirsty, urinating more often and fatigue/feeling tired. You should check your ketone level if this occurs.

- **Hypoglycemia** – This is when your blood sugar level is too low, usually under 4mmol/L. Symptoms can include hunger, confusion, disorientation, fainting or you can have a seizure and go into a coma.
- **Diabetic ketoacidosis (DKA)** - Because there is no deposit of long-acting insulin in the body when using insulin pump therapy, any interruption to the insulin delivery will cause blood sugars to rise quickly. Prolonged high blood sugar and a shortage of insulin can cause your body to burn fatty acids instead of glucose (sugar). Symptoms of DKA can include excessive thirst or urination, nausea, vomiting, a distinctive fruity odor on the breath, and abdominal pain. If left untreated, it can progress to cerebral edema (water on the brain) and coma. Pump users must carry an insulin pen with rapid-acting insulin and be prepared to use it if they have two unexplained high blood sugars in a row. They also need to check for ketones when their blood sugar is over 15 mmol/L.

Infection at the infusion site

Site rotation is just as important as it is with insulin pens. Infusion sites need to be changed every two to three days.

Body image concerns/psychological adjustment

Some people may experience an adjustment period getting used to the technology and how it looks or feels.

Steep learning curve

To succeed with insulin pump therapy, education is crucial not only when you start with a pump but continuously. You will need to do homework and readings to learn how to use an insulin pump. Insulin pump users are also expected to maintain knowledge of pump capabilities as technology changes over time. Ongoing follow-up with your diabetes/insulin pump team is required.

WHAT WILL IT COST?

The PEI Insulin Pump Program may provide up to 100% coverage to assist with the cost of the pump and quarterly pump supplies (i.e., shipment every 3 months) for those who qualify. The amount this program will provide for you depends on your private health care coverage and your household income.

The cost to the individual or family will vary. Use the Insulin Pump Payment Calculator to determine your estimated out-of-pocket costs for your insulin pump and supplies.

YOU ARE INTERESTED IN AN INSULIN PUMP. NOW WHAT?

1. If you are new to insulin pumps, complete the Are you Ready to Pump? self-assessment.
2. Determine how much you would pay and what the program would pay:

- Get your tax return for the previous year.
- Contact your private health insurance provider (if applicable) to see what percentage it covers for insulin pumps and supplies.
- Fill out the form on the Insulin Pump co-payment calculator to determine what the program would pay and what you would pay for your insulin pumps.

3. Contact your diabetes care team to complete an intake assessment. If appropriate, you will be referred to an insulin pump care team member who will determine if you are medically eligible and support your self-management goals.

If you are a PEI resident who is being followed by an out-of-province diabetes care team, you will need to follow different steps. See the Insulin Pump Program Questions and Answers for more information.

FOR MORE INFORMATION

See the Insulin Pump Program web page, Insulin Pump Program Eligibility Criteria, and the Insulin Pump Program Questions and Answers.