Insulin Pump Therapy… Is It Right for You?

Compliments of
Novo Nordisk Pharmaceuticals, Inc.

NovoLog®
Insulin aspart (rDNA origin) injection

Who should consider the insulin pump option?

More and more people with diabetes are switching from injecting insulin to using an insulin pump. This brochure is intended to answer some of the questions you may have about insulin pumps.

People who might want to consider using an insulin pump:

- Take **insulin*** more than 3 times per day
- Have high or low blood **glucose** often
- Are tired of multiple daily injections (all the time)
- Want to improve blood glucose (sugar) levels
- Want less frequent or severe **hypoglycemia** (low blood glucose)[1,2]
- Want to lower the risk of long-term diabetes complications[3]
- Want a more flexible lifestyle

"Without a doubt, the decision to start pumping was a very good one. While the pump obviously has not cured my diabetes, it sure has made it easier to effectively deal with it… I feel better, have more energy, can work and play harder, and have more enthusiasm for life."

—**Bob***, California

Be sure to talk to your doctor or diabetes educator (CDE) to find out if an insulin pump is right for you.

Words that appear **bold** are defined in the Glossary, beginning on page 17 of this brochure.

**Individual results may vary.*

Please see full Prescribing Information in this brochure.

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NovoLog®
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Should you consider an insulin pump?

Are you a candidate for an insulin pump?

If you take insulin, have frequent episodes of high or low blood glucose, and are tired of the routine of multiple daily injections, you could be a candidate for an insulin pump. Any decision about using an insulin pump must be made with the help of your doctor.

What responsibilities come with an insulin pump?

While you will be freed from multiple daily injections, using an insulin pump means you must pay close attention to the responsibilities of managing your diabetes. You must be willing to:

- Check your blood glucose levels frequently (at least 4 times daily, always before each meal) in order to know how much insulin you need to keep your blood glucose under control
- Use blood glucose results to adjust your insulin dosages to make sure you are covering the food you are about to eat and to adjust your blood glucose if it is high or low
- Learn to count carbohydrates and adjust your insulin doses to match food intake
- Understand which foods can make your blood glucose very high or take much longer to affect you so you can give different amounts of insulin when you eat those foods
- Use a correction or sensitivity calculation to make immediate adjustments
- Respond quickly when your blood glucose levels show **hyperglycemia** and/or if there are **ketones** in your urine
- Regularly monitor your pump and the insertion site for any problems

Please see full Prescribing Information in this brochure.

Why are more people choosing to use insulin pumps?

While as yet there is no cure for diabetes, medical treatment has come a long way in making it easier for people to live better with it. Today, there are many new devices, such as the insulin pump, and new types of insulin that can help you avoid the rigid rules and loss of freedom that used to be associated with diabetes. You still have to watch your diet and get regular exercise. But if you are an active person with diabetes, an insulin pump may be a good tool for living a more active and flexible life. The pump is considered to be a safe and reliable way to deliver insulin and to give people with diabetes more freedom in their daily activities.

Why do doctors recommend insulin pump therapy?

Insulin pumps are recommended to help people better manage their blood glucose and reduce their risk of long-term diabetes complications. A 10-year study involving more than 1000 people with type 1 diabetes completed by the National Institute of Health (NIH) in 1993 showed that this type of intensive insulin therapy can effectively reduce the risk of complications. Called the Diabetes Control and Complications Trial (DCCT), this study proved that intensive insulin therapy—the kind of therapy you're on when you use an insulin pump—could help reduce many complications common to people with diabetes. The study showed that intensive insulin therapy[3]:

- Reduced complications leading to blindness by **76%**
- Reduced complications leading to amputation by **60%**
- Reduced kidney disease by **54%**

Should you consider an insulin pump?

Why were diabetes complications reduced so much?

The DCCT showed reduced diabetes complications because intensive insulin therapy helps keep blood glucose under "tight control." This means giving insulin more often to keep blood glucose levels as close as possible to normal throughout the day and night. Insulin therapy with a pump comes close to imitating the pattern of how insulin is released in a person without diabetes.

What is a normal pattern of insulin release?

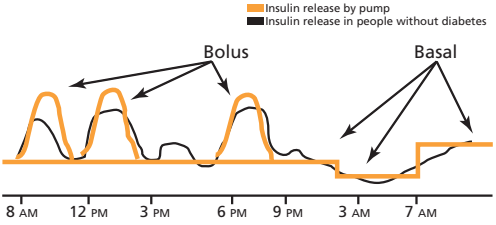
Insulin is needed to get the glucose out of the blood and into the body's cells, where it is used for energy. Normally, an organ called the pancreas produces small amounts of insulin (called **basal insulin**) continuously throughout the day. The amount of insulin increases as your need for energy changes. For example, in the early morning hours, the pancreas will make more insulin as your body completes its rest cycle in preparation for a new day. The pancreas also releases larger bursts of insulin (**bolus insulin**) when a meal or snack is eaten. Some of the food you eat is broken down into glucose, which travels in your blood to your cells.

How does the insulin pump compare with normal insulin action?

Before the insulin pump, the only way to imitate the normal use of insulin was by taking many injections each day, often combining long- and short-acting kinds of insulin. Pumps work similar to the pancreas, allowing a person with diabetes to get insulin delivered automatically or whenever it's needed. This provides a convenient alternative for people with diabetes who have a multiple daily injection.

Normal physiologic insulin action

Pumps imitate normal pancreas function*



*Created by Barbara Schreiner, RN, MN, CDE, BC-ADM.

What are insulin pumps?

What are the advantages of using an insulin pump?

An insulin pump can allow a person with diabetes to effectively deal with common everyday situations, such as eating meals at different times, irregular work schedules, different activity levels, and changes in blood glucose levels resulting from hormonal swings or medications.

In addition to helping to reduce the risk of long-term diabetes complications, intensive insulin therapy with a pump can help decrease episodes of severe low blood glucose (hypoglycemia).

What is an insulin pump?

An insulin pump is a small battery-operated device about the size of a pager. It continuously delivers small doses of insulin. It can be conveniently clipped to your belt or waistband or carried in your pocket.

Although new pumps can have very sophisticated features, they are still only a means of delivering insulin. They do not measure blood glucose levels or automatically deliver a specific dose of insulin. You will still need to do those activities for yourself.

How do insulin pumps work?

An insulin pump contains a reservoir (or syringe) filled with insulin and a microcomputer that lets you adjust how much insulin is to be delivered. Insulin is pumped through an **infusion line** fitted with a tiny plastic tube (called a **cannula**) that is inserted just under the skin—usually low on your stomach—and taped in place. You must change this *infusion set* every few days. Some people think that the infusion set must be surgically implanted. Not so! You can easily insert the infusion set yourself—thousands of people around the world do it every day.

Since a pump allows you to change your insulin regimen when your schedule changes, you may be able to more effectively control your blood glucose levels, and be free from a rigid multi-injection schedule.

What type of insulin is used in insulin pumps?

Almost any type of short- or rapid-acting insulin or insulin analog can be used in an insulin pump. Pumps can only use buffered **short-acting** or **rapid-acting insulin**—not long- or intermediate-acting insulin.

What types of insulin pumps are available?

Right now, the companies that sell insulin pumps in the United States include:

Animas Corporation	(877) 767-7373
Dana Diabecare	(866) 342-2322
Deltec	(651) 633-2556
Disetronic Medical Systems, Inc.	(800) 280-7801
Medtronic MiniMed, Inc.	(800) 646-4633
Nipro Diabetes Systems, Inc.	(305) 599-7174

Will an insulin pump affect your lifestyle?

Is using an insulin pump more flexible than insulin injections?

Insulin pumps provide very precise control of insulin dose levels. This means that there can be fewer wide swings in blood glucose levels. The pump allows you to decide when and how much you wish to eat—or even if you want to skip or delay meals.

What is it like to have an insulin pump attached to you all the time?

After a while, many people who use insulin pumps actually forget they are wearing them. Often, the hardest part about wearing a pump is explaining what it is to people who comment or ask questions. This may be an opportunity for you to discuss diabetes with people who may not understand it.

Will an insulin pump keep you from doing certain activities?

An insulin pump should not prevent you from doing anything and may give you more freedom. Pump therapy can help reduce the high and low blood glucose levels that are caused by strenuous physical activity, especially for young people. Pump users can be active in many sports, such as golf, tennis, dance, gymnastics, swimming, wrestling, baseball, basketball, football, running, and skiing. Even when you can't safely use a pump, such as in deep sea diving, there are other ways to manage your diabetes for short time periods off the pump.

Can you travel with an insulin pump?

Many of the estimated 300,000 pump users worldwide travel frequently. Most security personnel are familiar with insulin pumps and security devices in airports do not harm pumps. Current Federal Aviation Administration (FAA) guidelines for travel advise that medications and equipment such as insulin and syringes be in their original packaging with prescription information on the label. However, in practice, people who use insulin pumps regularly fly from city to city and between countries with no problems. One advantage is that pump users can fly across time zones and not worry about erratic insulin peaks.

What are other tips for living with your pump?

Wearing a pump for 24 hours a day can be challenging. Some people carry the pump in a pocket or wear it on the waist. Others use pouches attached to the calf or arm. Some women place the pump under their arms inside their bras.

Depending on what type of sleeper you are, the pump can be kept under the pillow or on the bedside table at night. The same goes for intimate times. Some people disconnect from the pump temporarily.

A good time to disconnect the pump or to plan an infusion set change is during showering or bathing.

"I have learned more in this past year (since I got my pump) than I've known all my life as a diabetic (35 years), and I am taking much better care of myself… I feel a lot better mentally and physically."

—**Kathy***, Florida

**Individual results may vary.*

How will an insulin pump affect your lifestyle?

Do insulin pumps require special care?

Normal care of your insulin pump is similar to that of any portable electronic device. Changing batteries and routine maintenance are all that's required to care for your pump.

If a pump has an electromechanical or computer problem, it will be automatically detected and an alarm will go off. If the alarm on your pump goes off, you need to respond to it immediately. Pumps will not detect a leaking infusion set, disconnected tubing, or air in the infusion set. If any of these occur, you will not receive your insulin and may not hear an alarm. This means that you must be aware of your blood glucose level and respond—figuring out the problem—when the level stays too high.

Can you afford a pump?

Insurance companies have recently begun covering insulin pumps, however, they have strict guidelines about who and what they will cover.

In order to keep insurance coverage of the insulin pump, you need to see and be evaluated by your doctor at least every three months.

"After [some initial problems], My husband decided his pump was his new best friend and now would not go back to injections. In fact, today he commented that he feels more like a person without diabetes, with being able to decide when and what he wants to eat. He's not one to accept change, so if he can do it, I think anyone can."

—**Marj***, North Carolina

Now that you are on a pump—what next?

Once you've selected the most advanced way to manage diabetes, both in terms of blood glucose control and lifestyle flexibility, you'll soon become an expert in knowing how your basal and bolus doses work.

Stay in touch with your diabetes care team. You should be sure to have tests and exams to check:

- Lipids (cholesterol) and triglycerides
- Microalbumin (kidneys)
- Eyes
- Feet (each visit)
- Blood pressure (each visit)
- Annual flu shot
- Have your hemoglobin A1C level monitored at least 3 to 4 times a year

And, keep informed about the latest recommendations and tools for managing diabetes. Until there's a cure, keeping well with diabetes is a continuous learning experience.

Have other questions?

Questions are common when you start pump therapy. Your diabetes educator, certified pump trainer, or doctor, can answer many of your questions. Information is also available on the Web sites listed on page 16. You may be able to find a pump support group in your community by checking with the diabetes education programs in your area.

**Individual results may vary.*

NovoLog® and insulin pump use

What is NovoLog insulin analog?

NovoLog is the first and only **human insulin analog** approved for use in pumps. It is called a human insulin analog because the chemical components of insulin have been slightly modified, which helps the insulin work faster. **NovoLog** is similar to the natural insulin that the body sends out after meals in people without diabetes (this is called natural or **physiologic** action). Because it doesn't last as long as regular human insulin, you may need to take an intermediate- or longer-acting insulin or use higher rates of **NovoLog** basal insulin infusion in your pump to help avoid hyperglycemia and **ketoacidosis**. This is especially true for **rapid-acting human insulin analogs**, which is especially important to know if you have been switched from multiple injection therapy or insulin with buffered regular insulin.

What are the benefits of using NovoLog in a pump?

NovoLog works faster at mealtime than buffered regular human insulin, so you can take it and then eat within 5 to 10 minutes. With regular human insulin, you have to wait 30 minutes before you eat. **NovoLog** gives you greater dosing options because you can change your insulin regimen when you change your schedule or eating habits. Studies show that NovoLog is effective and safe when used in pumps by people with type 1 or type 2 diabetes.[4,5] **NovoLog** may also be used with a variety of other insulin delivery systems that can help make dosing easier.

How does NovoLog work in pumps?

Program the pump for **NovoLog** basal infusion and mealtime **NovoLog** bolus doses according to your doctor's and the manufacturer's instructions. See the Prescribing Information at the end of this brochure for detailed instructions on how to use **NovoLog** in an insulin pump.

Please see full Prescribing Information in this brochure.

Is using NovoLog® in a pump right for you?

Only your doctor can tell you if NovoLog is the right choice for you. **NovoLog** provides effective glucose control with the convenience of mealtime dosing, so it fits easily into any lifestyle. Ask your doctor for more information about **NovoLog**.

Important Safety Information: NovoLog is for use in adult patients with diabetes to control high blood glucose. **NovoLog** is different from regular human insulin. It works faster and will not work as long as regular human insulin. A **NovoLog** injection should immediately be followed by a meal. Because of the short duration of action of **NovoLog**, patients also require a basal insulin to maintain adequate glucose control. Low blood glucose is the most common side effect of insulin therapy, including **NovoLog**.

Pump or infusion set malfunctions or insulin quality can result in inadequate insulin infusion and can lead to hyperglycemia and ketosis. These problems can quickly occur due to the faster absorption and shorter duration of action of **NovoLog** compared to buffered regular insulin. It is important to quickly identify the cause of and correct these problems. Glucose monitoring is recommended for all patients with diabetes, particularly those using external pump infusion therapy.

The time course of action of insulin and insulin analogs such as **NovoLog** may vary considerably in different individuals or within the same individual. A1C did not differ between patients treated with regular human insulin and those treated with **NovoLog**. Additional basal insulin injections or pump basals may be necessary to achieve glycemic control.

"I've been pumping for more than 4 years now. Recently, my doctor suggested I try NovoLog in my pump. Comparing dosage unit for unit, I found it to be vastly more predictable, stable, and consistent than my previous pump insulin."

—**Ed***, Massachusetts

**Individual results may vary.*

Will Cross, a middle school principal from Pennsylvania, has not let type 1 diabetes stop him from pursuing rugged hiking expeditions in very challenging and dangerous conditions such as the North Pole and Greenland, including his televised **NovoLog**® ultimate Walk To Cure Diabetes to the South Pole. Here is what Will says about using **NovoLog** in the pump:

*"**NovoLog** has made a number of important changes in my diabetes management. I require less insulin on **NovoLog** than on other brands. **NovoLog** is more forgiving in that it seems to have more punch; less insulin works on more food. This allows for some welcomed flexibility in my diet, which is of particular importance when trekking in extreme environments such as the South Pole. Also, **NovoLog** develops minimal air bubbles when filling the pump."**

"I'm both a CDE and a diabetes patient, and both my pump patients and I have found that NovoLog is more potent and decreases elevated blood glucose more rapidly than previous insulins."

—**Kelly***, Michigan, CDE and Certified Pump Trainer

**Individual results may vary.*

Please see full Prescribing Information in this brochure.

What have you learned about insulin pumps and NovoLog®?

Once you've read this brochure, test yourself on insulin pumps and **NovoLog**. Check your answers on the Glossary page.

Quiz

1. Pump therapy decreases the need for blood glucose monitoring?

   ___ True ___ False

2. Which starts to work faster: regular human insulin or **NovoLog**?

   ___ Regular human insulin ___ **NovoLog**

3. After taking **NovoLog** you must wait 30 minutes before eating.

   ___ True ___ False

4. Because the chemical structure of **NovoLog** insulin have been slightly altered, it is known as an _____

   _____

5. The person using an insulin pump will never have ketones or diabetic ketoacidosis.

   ___ True ___ False

Want to learn more?

It's time to consider using an insulin pump and NovoLog®

Check out these insulin pump information websites

Animas Corporation:	www.animascorp.com
Dana Diabecare:	www.danapumps.com
Deltec:	www.delteccozmo.com/new/html
Disetronic Medical Systems, Inc.:	www.disetronic-usa.com
Medtronic MiniMed, Inc.:	www.minimed.com
Nipro Diabetes Systems, Inc.:	www.pages.zdnet.com/nipro
Novo Nordisk Pharmaceuticals, Inc.:	www.novolog.com
Insulin Pumpers Support Group:	www.insulin-pumpers.org

Be sure to ask your doctor whether pump therapy is appropriate for you.

Important information about NovoLog

NovoLog is indicated for the treatment of adult patients with diabetes mellitus for the control of high blood glucose.

For more information about NovoLog or other Novo Nordisk products, visit **www.novolog.com** or call **1-800-727-6500**.

Any change in insulin should be made cautiously and only under medical supervision. Hypoglycemia is the most common adverse event associated with insulin, including NovoLog.

References: 1. Bode BW, Steed RD, Davidson PC. Reduction in severe hypoglycemia with long-term continuous subcutaneous insulin infusion in type 1 diabetes. *Diabetes Care.* 1996;19:324-237. **2.** Pickup J, Keen H. Continuous subcutaneous insulin infusion at 25 years: Evidence base for the expanding use of insulin pump therapy in type 1 diabetes. *Diabetes Care.* 2002;25;593-598. **3.** The Diabetes Control and Complication Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *N Engl J Med.* 1993;329:977-986. **4.** Raskin P, Bode B, Marks JB, et al. Insulin aspart (IAsp) is as effective in continuous subcutaneous insulin infusion as in multiple daily injections for patients with type 2 diabetes [abstract 515P]. *Diabetes.* 2001;50(suppl 2):A128. **5.** Bode B, Weinstein R, Bell D, et al. Comparison of insulin aspart with buffered regular insulin and insulin lispro in continuous subcutaneous insulin infusion. *Diabetes Care.* 2002;25:439-444.

Please see full Prescribing Information in this brochure.

Glossary

Basal insulin: the insulin that provides the body with a steady, low level of insulin throughout the day and night; may be given by intermediate- or long-acting insulin injections or continuous release of faster-acting insulin in a pump

Bolus insulin: the faster-acting (either regular or rapid-acting) insulin that provides the boost of insulin needed to stop the rise in blood glucose levels that occurs after meals; may be given as a before-meal injection or a before-meal dose via an insulin pump

Buffered regular human insulin: the form of regular human insulin that is used in pumps

Cannula: a soft plastic tube

Glucose: also known as blood sugar; produced when the digestive system breaks down food; provides fuel for the body

Human insulin analog: a type of insulin in which the chemical structure of the insulin molecule has been changed in some way

Hyperglycemia: abnormally high levels of glucose in the blood

Hypoglycemia: abnormally low levels of glucose in the blood

Infusion line: a sterile tube used to deliver a medication or other substance into the body

Insulin: a hormone that helps the body use glucose; produced by the pancreas

Ketoacidosis: a serious condition caused by too little insulin; caused by high levels of glucose and ketones in urine

Ketones: waste created when fat cells are burned for energy. In large amounts, ketones alter the blood chemistry and can lead to diabetic ketoacidosis

Physiologic: similar to the way the human body works naturally

Rapid-acting human insulin analog: an insulin that works faster and for a shorter period of time compared with regular human insulin; created by changing the chemical structure of the insulin molecule

Regular human insulin: a fast-acting insulin that may be taken before meals; meals may be eaten 30 minutes after insulin injection

Quiz Answers

1. False. Testing is done more often to safely adjust dosage.
2. **NovoLog®**. **NovoLog** starts to work faster, giving you more dosing options.
3. False. **NovoLog** works fast, so you should eat a meal within 5 to 10 minutes after injection or bolus dose from a pump.
4. Human insulin analog, because the chemical components of insulin have been modified to help the insulin work faster.
5. False. There may be greater risk because high blood glucose and ketones can develop rapidly if the insulin infusion stops (as in clogged cannula, leaking, or empty syringe).

Please detach rebate form at perforation.

up to $25.00 back

NovoLog® Rebate Certificate

up to $25.00 back

Now, pump users can get up to $25.00 Back on Rapid-Acting NovoLog

It's easy! Just complete the simple instructions on the other side of this form.

After filling your prescription for **NovoLog**, complete the information section on the reverse side and mail it along with your pharmacy receipt to Novo Nordisk Pharmaceuticals, Inc. at the address shown. **When you do, we'll send you a check for up to $25.00 back!**

Offers are not valid under Medicaid, Medicare, TriCare or certain other similar federal or state programs, or where prohibited by law. Offer void in MA, MI, MN, and RI. Under certain state laws, or your insurance company contract, you may need to disclose your acceptance of offers to your third-party payor (insurer). This rebate must be accompanied by a proof of purchase (pharmacy receipt). This certificate may not be reproduced and must accompany this request. Proof of purchase will not be returned. Eligibility is restricted to individuals; no clubs, groups, or organizations. Offer good only in the USA. Void where taxed or restricted. Please allow 6 to 8 weeks for delivery. Limit one rebate per customer. Expiration date 12/31/03.

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By voluntarily submitting this form, I understand that the information I am providing may be used for business purposes, including providing me with additional support literature and special offers from Novo Nordisk Pharmaceuticals, Inc.

Please detach rebate form at perforation.

up to $25.00 back

NovoLog® Rebate Certificate

up to $25.00 back

Here's all you have to do:

1. Discuss NovoLog with your doctor or diabetes-care team. A prescription is required.
2. Purchase NovoLog at your pharmacy.
3. Complete and mail this rebate form, with your pharmacy receipt, to:

   Novo Nordisk Pharmaceuticals, Inc.
   650 Dresher Road
   Horsham, PA 19044

Simply complete the information below and follow the easy instructions to get up to $25.00 back.

Name _____

Address _____

_____

City _____

State _____ Zip _____

E-mail address _____

Gender ☐ Male ☐ Female

Date of Birth (MM/DD/YY) _____

Physician name _____

You will receive a check for up to $25.00*.

*The amount of the check will depend on the amount you paid for NovoLog. If you have an insurance plan, the check will equal the total amount of your co-payment, up to $25.00. If you do not have an insurance plan, you will receive a check for $25.00.

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NovoLog®
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Notes

NovoLog®

Insulin aspart (rDNA origin) injection

For more information please visit:
www.novolog.com
or call
1-800-727-6500

Please see full Prescribing Information attached to this brochure.

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