

Insulin

Why should I use this medication?

- If you have type 1 diabetes, you must take insulin to keep you alive.
- If you have type 2 diabetes, you should use this medication if you are having trouble keeping your blood sugar down to a normal level. Insulin is typically prescribed in cases of type-2 diabetes where the patient has blood sugars so high that pills taken by mouth will not work or if they are currently taking pills by mouth but they are not working their best.
- Using this medication will decrease your blood sugars, make you feel better, and lower your risk of complications.
- Using insulin plus or minus other medications is part of a 3 point plan in the battle against diabetes. The other two key actions are making positive lifestyle changes and managing stress.



How will it make my life better?

- In the beginning, it may feel like your life isn't getting better because you will need to check your blood sugars more often than when you are taking only pills, have to give yourself one to four injections every day and possibly coordinate your meals with your insulin.
- After a while, you will get used to injecting yourself and will figure out how to fit the insulin into your daily routine.
- Insulin will pay off in the long run since lowering blood sugar with this medication can decrease your risk of eye, kidney and/or nerve problems by approximately 25%.

How do I know it's working?

This medication will start to work right away but you will get a better sense of how well it's working overall in a week or so. With insulin, it's better to look at blood sugars over a set period of time as opposed to each individual number.

You can tell if the drug is working by:

1. Checking your blood sugar on a regular basis. If the drug is working, you should start to see the numbers come down. The amount by which insulin decreases your blood sugar will depend on the dose and your body. Each person will respond differently to insulin. Your own results depend on many things so it's not possible to say for sure how well this drug will work for you.
2. You start to feel better. Once your blood sugars come down, you'll feel less tired and not so thirsty all the time. You'll also stop going to the bathroom so often.

Your doctor or healthcare provider can tell if the drug is working by:

1. Reviewing your day to day blood sugars with you (it is very helpful if you can jot down your numbers regularly and bring them with you to the clinic).
2. Ordering a blood test called your Hemoglobin A1C. Your A1C is the best "big picture" test for your blood sugar control. It looks at your blood sugar control over the last 2 to 3 months. Insulin can lower this number more than any other medication and depending on the dose, can bring your "A1C" down to normal levels.



Dr. Mike's Key Points

- Insulin gets a bad rap. We tend to think of big needles and lots of hassle. However, many of my patients who switch over find it is actually easier. They cut down or stop all oral medications (and therefore lose any negative side effects) and they find the new "pen" system of injecting easier than they thought it would be. As well, they like the fact that they don't have to add more and more pills, (insulin is easily increased or decreased depending on your needs).

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Is there any reason why I shouldn't take this drug?

You should not use this drug if you are allergic to it. Take insulin only if it has been prescribed by a physician to treat diabetes. Before taking this medication, tell your doctor specifically if you have or have ever had:

- kidney disease or lactic acidosis
- problems with your liver
- low blood sugar (hypoglycemia)
- difficulty eating 2-3 meals per day
- thyroid problems
- problems with vision
- problems with using your hands

What about possible side effects?

The most common side effects to insulin are low blood sugar (hypoglycemia) and weight gain (more than 4 kg/9lbs). Low blood sugar may be seen in 30% or more of patients and some form of weight gain usually occurs in the majority of those who use insulin.

Both side effects are related to the dose but the frequency and severity of low blood sugar is often dependent on other factors such as age, diet, exercise, alcohol, type of insulin regimen and other drugs or medical conditions.

Talk to your doctor or pharmacist about whether you have any risk factors that may make you more sensitive to low blood sugar.

Other side effects that occur less often are: pain, swelling or itching at the injection site.

This is not a complete list of side effects. If you are concerned about these or other unusual symptoms while taking this medication, ask your doctor and/or pharmacist for more information and advice.

What if I am taking other drugs?

Although there are potential interactions with other medications, many of these may not be significant and can be managed by closer monitoring of your blood sugar and discussing any changes with your healthcare provider.

Always provide your doctor with a list of all other drugs you are taking (including over-the-counter medications and herbal/natural products) as they may interact with and may change the safety or effectiveness of either drug. Tell your doctor specifically if you are taking any of these drugs as he/she may need to make changes or check you more closely:

- Prednisone, dexamethasone, cortisone, high dose hydrochlorothiazide (>25mg), albuterol, pseudoephedrine, olanzapine, risperidone, niacin. (These drugs may increase your blood sugar and decrease the effectiveness of insulin).
- Other diabetes medications (metformin, glyburide and other sulfonylureas, rosiglitazone, pioglitazone, repaglinide, nateglinide, acarbose). These:
 - Increase your risk of low blood sugar
 - For pioglitazone and rosiglitazone, increases your risk for edema (swelling in feet and ankles)
 - For sulfonylureas, increases likelihood of weight gain
- Fenugreek, licorice, bitter melon, eucalyptus, ginseng, St. John's Wort. (These and other natural products have varying effects on blood sugar).
- Atenolol, metoprolol, propranolol and other beta-blockers. (May decrease your ability to recognize symptoms of low blood sugar).

This is not a complete list of drug interactions. Ask your doctor or pharmacist to review your list of medications.

Dr. Mike's Key Points

- People think they have done "badly" when they require insulin. This is simply not true. Studies show that the natural history of diabetes points to the fact that most people with diabetes will require insulin at some point.
- There is still a learning curve and it is essential that you don't rush into insulin therapy. Talk to your doctor, nurse, pharmacist and your local diabetes education centre. Talk to other people who use insulin. Use the resources at the Canadian Diabetes Association. Put it all together and give it a shot!

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Dr. Christine’s Pharmacist Tips:

- It is very important to eat 2-3 balanced meals each day while using this medication. If you don’t eat, you may have a greater chance of having low blood sugars. If you find it difficult to maintain a steady intake of food, talk to your doctor or pharmacist as there are other types of insulin that may be better suited for your lifestyle.
- Know your insulin.

There are many different types of insulin. While all are designed to help keep your blood sugar levels within a normal range, some are short acting while others are designed for medium or long-term action. Some have distinct “peaks” (high amount of insulin in the blood) while others are released into the body continuously over a longer period of time.



Type of insulin	Comments
<p>Very fast acting</p> <ul style="list-style-type: none"> • Insulin Lispro (Humalog) • Insulin Aspart (NovoRapid) 	<ul style="list-style-type: none"> • Very fast onset and short duration of action – can inject right when you start eating • Works well to keep your blood sugars down after eating • Good choice if you need more flexibility with the timing of injections with respect to meals • May have lower chances for low blood sugar if used properly in certain situations • Often used in insulin pumps for people with Type 1 diabetes • When it’s used with an NPH or Lente insulin, the NPH or Lente should usually be given twice a day versus once a day
<p>Short acting</p> <ul style="list-style-type: none"> • Regular Insulin (Novolin ge Toronto or Humulin) 	<ul style="list-style-type: none"> • Most common form of short acting insulin used • Works well to keep your blood sugars down after eating • Must inject about 30 minutes before you eat for it to work its best
<p>Intermediate (Medium) acting</p> <ul style="list-style-type: none"> • Insulin NPH (Novolin/Humulin) • Insulin Lente (Novolin/Humulin) 	<ul style="list-style-type: none"> • Most common form of longer acting insulin used • Important insulin to keep your blood sugar down throughout the day and night • It takes time for it to start working so it will not work right away to bring down a high blood sugar • Usually given once or twice a day, especially if using lispro or aspart
<p>Long acting</p> <ul style="list-style-type: none"> • Ultralente (Humulin) • Insulin Glargine (Lantus) 	<ul style="list-style-type: none"> • Ultralente is not used very often but may be beneficial in some people • Glargine has promise for a longer acting insulin that may give better control of blood sugars throughout the day and night • It takes time for it to start working so it will not bring down a high blood sugar right away

Dr. Mike’s Key Points

- Many, but not all, patients will start with a night time injection and continue taking their metformin. Then as they get more comfortable, they will add insulin to their daily regime and stop the metformin.

Insulin

Dr. Christine's Pharmacist Tips *continued*

- When injecting insulin, keep this information in mind:
 - Rotate within the same area (stomach, thigh or arm) when you are injecting your insulin.
 - Although you can inject in different areas (stomach, thigh or arm), it is important to keep the same area for each dose. For example, morning dose in the stomach and evening dose in the thighs.
 - When mixing insulin in a syringe, always draw up the short-acting insulin first.
- If you do develop symptoms of low blood sugar (shaking hands, fast heartbeat, sweating, confusion, dizziness, feeling hungry, feeling tired and drowsy) then take any of the following:
 - 3 glucose tablets, 6 life-savers, 3 teaspoons or packets of tablet sugar in water, 3/4 cup juice
 - Recheck your blood sugar again in 15 minutes, if it is still under 4mmol/l then repeat the above.
 - Once the blood sugar is normalized (and not too high), you should have a small snack or a meal if it is around that time. This will help prevent another low blood sugar episode.
- This medication may not work as well if you are sick or you may have a greater chance for low blood sugar if you have diarrhea, vomiting or can't eat because of illness. It is best to check your blood sugars more frequently when you are sick. Call your doctor or pharmacist if you have any questions.
- If you have not seen an improvement in your blood sugars after 2 weeks of being at your current dose, then you should go see your doctor. He/she may need to make changes.



Dr. Mike's Key Points

- While the A1C is still the best picture of your overall blood sugar control, taking your blood sugar reading from a fingertip becomes ***much*** more important when you use insulin. We usually do this 4 times a day (before each meal and bedtime). This is especially important at the beginning or with dosing changes. When your dose is stable you can take the occasional one at different times to make sure you are keeping on track.
- Hypoglycemia (low blood sugar) happens more frequently with insulin, so educate yourself and make sure you carry around a sugar product as recommended by Dr. Christine.