

Type 2s: Time For Insulin?

By Gary Scheiner MS, CDE

Insulin has the most wonderful reputation among people with Type-2 diabetes. Many view it the same way as moving to a nursing home (or Florida retirement community)... just one short step away from the grave.

But nothing could be further from the truth. If anything, taking insulin keeps you as far away from the mortician as possible. Despite recent advances in medical therapy, insulin remains the most potent and effective treatment for elevated blood glucose. It is a more natural substance than pills (chemically similar to the insulin produced by the body), and lacks many of the potential side-effects inherent to oral medications.

Today, there are more than 15 million people with Type-2 diabetes in the United States, and more than 3 million take insulin. But many more people should probably be taking insulin. Here is why:

Nature of the DiaBeast

Type-2 diabetes is a *progressive* condition. It gets worse over time. It usually starts out as a state of mild insulin resistance: the insulin produced by the pancreas is not properly utilized by the body's cells. This result is a gradual increase in the blood sugar level, which promotes increased insulin production by the pancreas. Eventually, the pancreas is unable to make enough insulin to overcome the insulin resistance, and glucose levels rise high enough to require medical treatment.

All this time, the pancreas is working harder and harder to secrete as much insulin as possible. Just like a machine that is strained and overworked, the insulin-producing cells eventually burn out and cease to function. This is why the treatment for type-2 diabetes tends to become more

aggressive over time. Initially, many people with Type-2 diabetes can control their blood sugar through exercise (which improves insulin sensitivity) and a healthy diet with limited carbohydrates. Once this fails to achieve desired blood sugar levels, oral medications are often added. Some medications reduce the amount of sugar produced by the body; some improve sensitivity to insulin; and some stimulate the pancreas to produce as much insulin as possible. Eventually, the oral medications (combined with diet and exercise) are unable to the job, and insulin is added to the treatment.

Oral medications really do have their limits. Unlike insulin, which lowers blood sugar **DIRECTLY** by causing the body's cells to absorb insulin from the bloodstream, oral medications work **INDIRECTLY**. They only work when the pancreas is able to produce sufficient amounts of insulin. Once the pancreas is unable to keep up with the workload, no amount of medication is going to solve the problem. And it really can be a problem. Elevated blood sugar levels cause short-term problems (tiredness, infection/impaired healing, diminished mental and physical abilities, mood changes) as well as long-term complications (blindness, kidney failure, nerve disorders, heart disease).

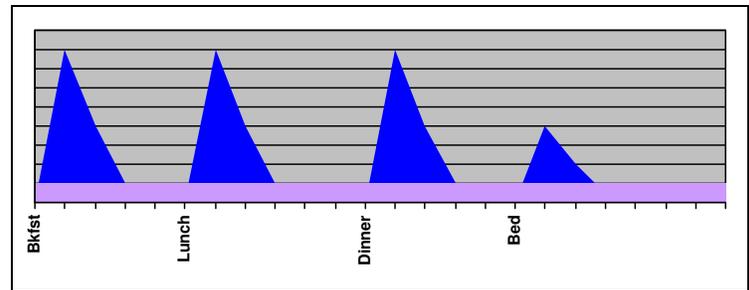
Insulin to the Rescue

Taking insulin is easier and safer than ever before. Insulin syringes have short, super-thin needles that you can barely feel. Insulin can also be administered with an insulin pen: simply dial up and inject. Don't forget... insulin is given into **FAT**. Not muscle, not blood vessels, not into any kind of sensitive tissue. Fat has no nerve endings, so the injection procedure is virtually pain-free.

In recent years, new insulin formulations have come to the forefront. “Basal” insulin, which works slowly and gradually over an extended period of time (like a time-release capsule), may be enough to get your diabetes in control. Glargine (brand name Lantus) and detemir (brand name Levemir) are two such insulins. They are usually taken once or twice daily, and do a good job of controlling blood sugar levels overnight and between meals. Having insulin working all the time helps to “rest” the pancreas so that it can generate extra insulin at mealtimes. And because basal insulin does not have a pronounced peak, it rarely causes hypoglycemia (low blood sugar). In many cases, basal insulin is all that is needed to control the blood sugar throughout the day and night.

In some instances, even with the addition of basal insulin, the pancreas is unable to make enough insulin at mealtimes. This results in large blood sugar “spikes” after meals and snacks. Post-meal spikes have been shown to damage blood vessels and contribute to many of the complications of diabetes. To prevent the spikes, a number of strategies can be used.

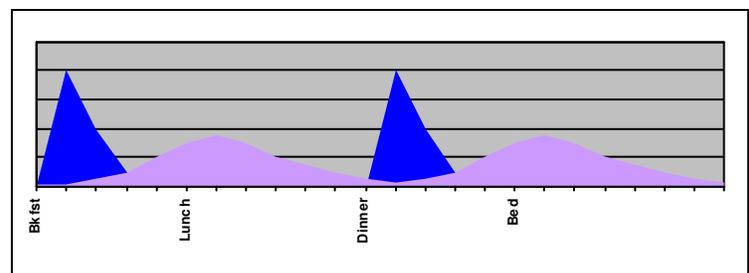
Perhaps the most effective solution is to take rapid-acting insulin at each meal, in addition to the usual injections of basal insulin. This is called an MDI (multiple daily injection) program. Rapid insulin, including lispro (brand name Humalog), aspart (brand name Novolog) and glulisine (brand name Apidra) is usually taken at the onset of each meal or snack. Rapid insulin starts working in approximately 15 minutes, peaks (works hardest) in about an hour, and lasts for around 4 hours. The dose can be adjusted based on the amount of carbohydrate in the meal or snack. Rapid insulin, just like basal insulin, can be taken via pen or syringe.



Insulin activity from MDI program

Another effective option would be to use an insulin PUMP. Insulin pumps are beeper-sized and battery-operated. They deliver tiny pulses of rapid acting insulin throughout the day and night, which effectively serves as the “basal” insulin. The user programs a larger dose, called a “bolus” dose, to be delivered at meal and snack times. The insulin is delivered from the pump into a small plastic tube that sits just below the skin.

In order to cut down on the number of injections required with MDI or the complexity of using an insulin pump, some people opt to use PREMIXED insulin. Premixed insulin usually consists intermediate insulin known as NPH (a cloudy mixture which peaks 4-10 hours after it is taken) combined with rapid insulin. Taken at breakfast and dinner, premixed insulin provides some basal insulin throughout the day and night (albeit with pronounced peaks and valleys), and rapid insulin to offset breakfast and dinner.



Insulin activity from twice daily premixed insulin

Some physicians also recommend a combination of insulin and oral medications. For example, basal insulin is often combined with medications called MEGLITINIDES (brand names Prandin and Starlix) or DPP-4 INHIBITORS (brand name Januvia). These medications help the pancreas to secrete extra insulin specifically at mealtimes.

Granted, insulin is not ideal for everyone with Type-2 diabetes. It requires some dexterity to administer the injections. If the doses are incorrect, it can cause hypoglycemia (low blood sugar). And if not balanced with sufficient exercise and a healthy diet, insulin tends to cause weight gain.

But don't lose sight of the fact that diabetes is a disease that requires aggressive treatment. If your blood glucose level is frequently above target or your HbA1c is above 7%, talk to your doctor about intensifying your therapy. Starting insulin, or taking your insulin program to a higher level, may give you just the results you're looking for.

Editor's note: Gary Scheiner is a Certified Diabetes Educator with a private practice specializing in intensive diabetes management. He and his team offer consultations and self-management education via phone and the internet. For questions or more information, you may contact him at gary@integrateddiabetes.com, or call 877-735-3648.