

Lantus & Levemir:

New insulins available at last!

Although insulin was discovered and made available for the treatment of diabetes in the 1920s, it wasn't until 1946 that we learned how to modify it and the first "long acting" insulins came on the market. These were precipitates of insulin, most commonly using zinc, which slowed down the insulin's absorption. Up until now, a whole sixty years on, most of us were still reliant on this same substance.

But now we have progress at last!

We have since learnt that those zinc-based insulins (known as NPH, Lente, Protaphane) have some drawbacks. Did you know that the rate of absorption commonly varies day to day by 20 to 30%? Unless you religiously invert the vial or pen more than 20 times before every injection, the concentration of what you are injecting changes between injections because the powdery bit isn't totally dissolved in the liquid. By the end of the vial you may have a higher concentration of the powdery part, and the insulin might be 'stronger'. Absorption rates vary between injection sites too: cloudy long-acting insulins have been found to be twice as rapid in the abdomen (tummy) as the thigh.

The biggest issue for many people is how the insulin's action itself is variable: it starts working 30 - 60 minutes after injection, then 'peaks' quite dramatically between 2 and 6 hours after injection, then fades away again until it stops working around 12 hours after it was injected. The peaks can be quite difficult to manage - often causing hypos and rebounds, most problematically during the night.

As Cat wrote on *Reality Check's* discussion forum recently, "On protopain (sic), I hypoed every night at 1-3am and I would always be in the teens at 7am."

Abs shared a slightly different experience: "I was quite happy with Protaphane ... for many many years (33rd anniversary of getting D today). It worked better when after reading about it here, I split the evening dose Of course, going onto Lantus not quite 2 yrs ago made things even better still."

For many people, standard long-acting insulins present a lot of variables on top of all the variables that life throws at us anyway!

Two new long-acting insulins, Lantus and Levemir, have now become available that are quite dramatically different from those known to us before.

Lantus and Levemir provide a proper "basal" i.e. background, constant (peakless, or nearly peakless) supply of insulin, which is much closer to what a fully functioning pancreas does!

This is also one of the great advantages of "the insulin pump": a small continuous supply of insulin throughout the day and night to keep you going between meals if and when your short-acting insulin runs out. Hence Lantus' colloquial name when it first came out: The Poor wo/man's Pump.

The Diabetes Control and Complications Trial (DCCT) of 1,441 people with Type 1 Diabetes over a mean of 6.5 years proved that intensive therapy for Type 1 Diabetes and a lower HbA1c reduces complications. Yet, the study also showed that a lower HbA1c *increases* the risk of severe hypos. Most of us are instructed to aim for HbA1cs around 7.5% where risks of complications and severe hypos are both at their lowest. Of much interest to the docs (and us!) is that these new 'flat profile' insulins might, just like insulin pumps, allow this compromise to be achieved lower at an HbA1c of around 6.8%.

Fact sheet



Lantus by Sanofi-Aventis

Lantus does not require shaking as its very different chemical composition means it is clear. This does mean it can be easily confused with short-acting insulins if you are used to your long-acting being a cloudy white colour. Another thing to note is due to its acidity it can't be mixed in a vial or syringe with other insulins so you won't see 30/70 premixed insulins with Lantus, and you can't do your own pre-mixing in a syringe either.

Pain in the injection site has been reported in 2.7% of cases as opposed to 0.7% with regular NPH. Some people on *Reality Check* are finding ways to prevent the stinging, such as using the longer 12mm needles.

Levemir by Novo Nordisk

Levemir is Novo Nordisk's answer to Lantus. It has a different chemical composition to Lantus which can affect the dosage.

A fatty acid is mixed with insulin which is able to bind to the fatty acid's serum proteins. This new compound is held in a suspension with zinc and phenol. Immediately upon injection 98% of the insulin remains bound to fatty acids and it is released after it has travelled into the blood stream rather than straight under the skin thus reducing variability between injection sites. It is also a clear solution so no mixing is required which also reduces the variability.

Studies have shown reduction in both fasting blood glucose levels and overnight hypos (77% on NPH to 60% on Levemir).

Levemir, like all Novo insulins, is available in disposable pens which might be convenient (or bad for the environment – depending on your point of view).

Availability of Lantus & Levemir

As of October 1, 2006, Lantus and Levemir are available to Australians in the same way that other insulins are – with a normal prescription from your doctor, and subsidised by the Pharmaceutical Benefits Scheme (PBS) so you pay \$29 or \$4.70 (concession).

There are a couple of restrictions:

- Levemir is only available to people with Type 1 diabetes.
- Neither insulin has been trialled on young children or pregnant women (nor has insulin been though) and therefore not approved for use. Endos who specialise in pregnancy are the people to chat to if you are pregnant (or planning) and want to use these new insulins.

But I heard Lantus was really expensive?

Lantus was first made available in Germany (the home of its manufacturer) where it immediately took over 30% of the market for long-acting insulin. A new production facility had to be built to cope with the demand!

Lantus came to Australia in 2003 but was available only on 'private prescription' which meant many people paid \$130 for 5x3mLs (one-fifth of the quantity you get on a normal PBS prescription – owch!). Levemir was also first released on 'private prescription', in September 2005.

It is terrific that these new insulins, that can better help people with Type 1 diabetes with their tough job to mimic a functioning pancreas, are now subsidised by the PBS and affordable.

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