



Insulin delivery options

So once you've been inducted into the insulin-appreciation society, the all-important question is which method of delivery? In order to keep you up-to-date, Reality Check has taken a look at the available options, and some others that are in the pipe works.

Syringes

Most people take their insulin by injection with either an insulin pen or the traditional syringe.

Using traditional syringes and vials of insulin was the only method available until the 1980s. The main advantages of sticking with syringes is that very little can go wrong - you can see the insulin you are drawing up and delivering, so you are unlikely to inject Protaphane when you meant to inject Humalog and you can verify that you delivered the full dose visually. The syringes are extremely unlikely to malfunction or be damaged by being dropped or hit. In addition, you can 'mix' insulins in a syringe (just don't change the order of the mix) that may mean fewer jabs. Note: New Lantus insulin can **not** be mixed with anything else.

The downsides of syringes are that it can take longer to draw up the dose and the needle is very visible - which can be scary for people with needle-phobia.

Pens

Insulin pens are recommended as a 'more discreet' way to carry and inject insulin. They are devices that look like a cartridge pen, with a needle on the end. Users turn a dial, insert the needle under the skin and

then press a plunger that delivers the 'dialled-up' dose of insulin. Being able to 'dial-up' a dose is quicker than drawing up a syringe, if you are self-conscious or needle-phobic they look a bit less intimidating than a syringe and you only have to carry one item around (so long as you only need one type of insulin at a time) rather than the syringe and vial.

Some companies have brought out more sophisticated versions of the pen, for example, the Innovo (pictured below) which remembers the amount and time of your last dose.

"Being a fraidy cat when it comes to needles I find the pens great. If I go out for dinner it is easy to slip into your pocket. I think it is fantastic" - Neal, Humapen road test, on www.realitycheck.org.au

The downside is that they can malfunction, they are slightly more expensive than using syringes (but ask your diabetes educator for a freebie if possible) and they can actually be bulkier than a syringe and vial.



Baz tells us *"They (pens) are much handier than syringes, but the things just won't work all of the time. Have been using Humapens for a while and in the past twelve months have had about 4 or 5 failures..."*

Insulin pumps

Insulin pumps deliver insulin constantly (basal rate) and on demand to cover food or correct a high sugar (bolus) through narrow flexible tubing that ends in a cannula just under the skin. The pump is about the size of a deck of cards and resembles a pager; it is

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clipped onto a belt, waistband or other handy bit of clothing.

The main advantages are that it delivers a constant (basal) dose of insulin throughout the day, the rate of delivery can be set to compensate for your needs, e.g. a lower rate to avoid 1am hypos and a higher rate to overcome the dawn phenomena. Only rapid acting insulin is used so it overcomes the peaks and troughs of the long acting insulins. As it constantly delivers a basal rate of insulin, flexibility in meal times, skipping meals, sleeping-in etc can be achieved without sacrificing control. *"Since being on the pump my BSLs have been the best ever for the past 50 years."* Sue, RC Forum.

The downsides are the cost, but a recent announcement from the federal government has improved this tremendously. The pump itself is covered by private health insurance (through basic hospital cover it is considered a 'prosthetic device' and paid for in full by the insurance company). If you don't have private health cover it would cost approximately \$8,000. Many people sign up for health insurance in order to get a pump - there is generally a 12 month waiting period. The consumables required to run the pump, as at 1 September 2004, are subsidised under the federal government's National Diabetes Services Scheme (NDSS) - prior to that development they cost approximately \$200 a month. As the pump delivers a constant stream of quick acting insulin, if the pump malfunctions or you pull out the infusion site or run out of insulin, you will very quickly run out of insulin completely and the risk of developing ketoacidosis is high. To avoid this you must be prepared to monitor your BSL frequently (about 6 times a day) and carry insulin with you, so that you can inject some insulin if your pump stops delivering insulin.

Greg sums it up on the PumpOz website *"If considering a pump, be serious about it. It requires more testing. You must learn to carry adequate supplies to do a quick infuse in the field and as now there is no long-term insulin aboard if you*

have a tube failure or an infusion set tear out, without proper remedy. BSLs will climb quickly and almost uncontrollably."



Also potential pumpers need to be aware that changing over to a pump involves a lot of work as it is quite different to injections and despite the many happy pumpers who wax lyrical about its advantages - it is still a long way from a cure and requires a lot of work and a fairly serious commitment. Being attached to a pump constantly - having this *"weird shite hanging out of you"* as one of our forum correspondents so eloquently stated is a real downside. You have to carry this thing around with you, sleep with it and be prepared to answer those *"what's that?"*, *"is that a pager?"* questions.

Carolyn sums up how many pumpers feel about the pros and cons of pumping *"Since getting the pump my control has been so much better, my BSLs are consistent and I love the freedom. Yes, the cost is a big deal but the freedom and control it gives more than makes up for it"*.

Insulin pumps currently available in Australia are:

Animas

www.animascorp.com

Customer Service: 02 9436 0444

Deltec Cozmo

www.deltecco.com

Customer Service: 02 9417 7955

Disetronic

www.disetronic.com

Customer Service: 1800 802 309

Medtronic Minimed

www.minimed.com

Customer Service: 1800 668 670

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Coming 'soon' to a pharmacy near you:

Inhalable insulin

The drug companies are working furiously to provide a practical method of providing insulin as a powder to be inhaled through the mouth, passing into the lungs and then into the bloodstream.

At this stage, a satisfactory method to control the dosage has not been developed, and there have been insufficient clinical trials to assess the long-term effect on the lungs. In addition the current device is about the size of a flashlight and 'phallic looking' (another comment from our discussion forum) not very discreet.

Insulin patch

Apparently the insulin patch is being worked on, which would deliver a continuous low dose of insulin, whilst to deliver a bolus before a meal, users could pull off a tab on the patch to release extra insulin. The main problem is that the insulin has trouble penetrating the skin (that'd be why we use needles!) and I would imagine it would be difficult to achieve adequate control of dosage.



Implantable pumps

These are being developed by pump companies. Implantable pumps are surgically implanted and deliver a basal dose of insulin and a remote control gets the pump to bolus for meals (wouldn't like to mix up the TV and pump remote!). The advantage of this method is that the insulin can go directly to the liver (just like insulin from the pancreas) so enhancing its effectiveness. The most exciting potential development in pumping is the 'artificial pancreas'. This would combine continuous

blood glucose monitoring with insulin delivery - to automatically control blood glucose levels. Companies such as Minimed proclaim that they are well on the way to perfecting this technology.

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