Islet transplants are the closest doctors have come to a temporary cure for type 1 diabetes. But is it for you? Here, the experts talk about this cutting-edge treatment.

Imagine a life without injections, finger pricks or the need for a pump! For people with type 1, it’s always been a pipedream. Now, the Australian Islet Transplantation Program (ITP) offers hope. Healthy, insulin-producing islet cells from a deceased donor that are infused into a patient with type 1 can restore the body’s ability to produce insulin. For those people who’ve undergone the procedure, becoming insulin independent can seem like a miracle.

But, it’s not a cure – not yet. Patients must take immunosuppressant drugs and put up with potential side effects. And, as the islets lose their ability to function over time, the transplant isn’t permanent. However, the Juvenile Diabetes Research Foundation (JDRF), which manages the $30 million federally-funded program, and doctors at clinics in Sydney, Melbourne and Adelaide are working to improve the prospects of the transplants.

“Worldwide, the insulin-free period is getting longer. In the past, transplants functioned for up to three years. Now, with better immunosuppression, we’re hoping this will extend to between five and 10 years,” says Dr Dorota Pawlak, JDRF’s head of research development.
What’s involved?

A person is usually referred to the ITP by their endocrinologist, then assessed over the phone. If suitable, tests are and counselling are required, then it’s onto the transplant list to wait for an available donor. The program is funded by the Department of Health and Ageing, so there’s no cost to the patient.

The procedure is performed under local anaesthetic. It involves the islets from the donor pancreas being injected into the main vein of the patient’s liver.

“There’s too much of a risk of inflammation in the pancreas, so we use the liver, which is very good at delivering a new blood supply to the islets. And, regardless of where they are, they respond to the change in blood sugar. It’s amazing,” says Dr Pawlak.

However, it’s generally not until the second transplant, which may be months later, that people become insulin independent.

“It’s thrilling to see a person who has been on insulin for 42 years now no longer need it,” says kidney specialist Dr David Goodman from Melbourne’s St Vincent’s Hospital.

Not eligible:

If you have good diabetes control. “Currently, this is not a treatment for the well-controlled diabetic who’s injecting once a day and feeling terrific, exercising and working full time,” says Dr Goodman.

May be eligible:

If your diabetes is all over the place. “The people we take are those who have hypos so often that their whole life is about getting through the day, hoping that they’re not going to wake up in an ambulance,” says Dr Goodman.

Donors needed

A lack of organ donors is a problem. Over 50 pancreases become available each year, but they are not all suitable. Although only a small share of those with type 1 are eligible for the procedure, with around 130,000 Australians living with the disease, the demand for donor pancreases will always outstrip the supply.

Eventually, it’s hoped the procedure will work as effectively with just one transplant, and other therapies may lessen the demand on donors in the future, too. Islets grown via embryonic stem cells and xenotransplantation, where pig islet cells are implanted into humans, are two possibilities.

“The advantage of the procedure is that islets can be transplanted into the person, regardless of the source, so we’re working on the sources to become more abundant in the future,” says Dr Pawlak.

The pros and the cons

What does a successful islet transplant mean for a person?

Benefits

- No need for insulin injections.
- A significant improvement in glucose control.
- A big improvement in hypo unawareness (the inability to recognise the symptoms of disabling low blood sugars).
- Reduction in the risk of diabetes complications.

Drawbacks

- It’s a lengthy process and the assessment tests can be gruelling.
- There can be side effects from the immunosuppressant drugs.
- People generally require two operations to achieve insulin independence.
- It’s temporary – most patients will be back on insulin eventually.

Want to help?

“I’ve been on insulin since I was two years old – I didn’t know it any other way,” says dietitian Sue, 49. “But, my hypo unawareness was getting to be scary, and I was doing at least a dozen blood tests a day to try to stave off the hypos, so my fingers really told the tale.”

Islet transplant was the next step. Sue was tested for everything at the clinic at St Vincent’s Hospital in Melbourne.

“My kidneys, liver, heart, lungs, bone density – everything was investigated to make sure I was suitable to go onto the program. I had to fit all the tests in around work, so it took 18 months. And, even if you’re not valid for the program at the end of it, it doesn’t cost you a cent, so at least you get a very good picture of what your health is like.”

Sue remembers the procedure as being quite easy, with a good recovery, even though the immunosuppressant drugs made her nauseous at first, and knocked her energy levels around a bit.

“They’ve gone a long way with the drugs these days. I did get a bit anaemic, but that’s been my only side effect. The drugs are much better than they were. You have to be on them indefinitely, but it’s a hell of a lot better than taking insulin!”

About 5-6 weeks after Sue’s second islet transplant, she became completely insulin independent, which was surreal, she remembers.

“I used to have an insulin pump and work out the carbs when I sat down to a meal, then I had to think, ‘Oh, is my body going to work it out as well as I used to?’” she laughs.

“It’s quite strange adjusting to not needing insulin anymore. It has been a complete turnaround, but life is a lot easier.”

Sue is still involved with the clinic at St Vincent’s Hospital.

“They’re doing further research work on me to see how my body’s responding to things and how they can make the operation last longer. So I’m imagining it’ll probably be 10-12 years before the islets start to wear off. It’s not a permanent solution at this point in time, but a lot of the research is looking at how to make it permanent.”

It’s quite strange adjusting to not needing insulin anymore.

Words Rachel Smith
Teacher Marg Harrigan has had type 1 for more than 35 years. Over the decades, her condition deteriorated until her life was ruled by her hypo unawareness. Unable to mind her grandchildren, or to teach, Marg relied heavily on her husband, Kerry, and the ever-present glucagon – an emergency injection to correct crashing BGLs.

“My post-transplant life has changed in so many ways. I can now say that I have a life,” says 59-year-old Marg, who’s now back teaching. “It’s been amazing.”

These diary extracts follow her islet transplants at Adelaide’s Queen Elizabeth hospital and Royal Adelaide Hospital.

- **20 June 2008**
  I’ve recently gone on the pump, which has given me better control than the five daily injections I was having, but my diabetes is so brittle that my pump isn’t doing all it should. I’m now on the list for an islet transplant.

- **4 January 2009**
  Still waiting for the transplant. The protocol has been approved and signed off. I had a call from the coordinator just before Christmas. She said they were hoping it would happen in the next couple of weeks.

- **17 January 2010**
  It’s happened! I was admitted to Queen Elizabeth Hospital at 6am for the first islet transplant. I’m back on the pump, which is delivering a minimum basal rate to nurture the islets (my doctors don’t want them to be stressed or overworked in the early days). My sugar readings are better than they’ve been in over 30 years. The days following the operation were heavy going. I’m taking a mountain of pills daily.

- **4 February 2010**
  Just back from an appointment at the Royal Adelaide clinic. My pump is starting to back off and let the islets do a little more work. I am so excited because I’m allowed to drive again.

- **20 February 2010**
  I came off the pump today, replaced by just one injection of Lantus a day. It feels a bit funny, and scary. The islets are doing their job. I love the freedom – no more hypos and huge swings in sugar levels.

- **20 May 2010**
  The transplant team are very excited and call me their success story. It’s all so life-changing. I’ve regained my hypo awareness and can feel a hypo coming on when I get to around 3mmol/L, so there’s lots of time to react and still be thinking logically. I’m giving a speech at the Organ Donors Thanksgiving in June. I’m nervous but excited to think I can publicly thank the incredible families who donate their loved ones’ organs at such a low time in their lives.

- **30 June 2010**
  Received the call for the second transplant on Sunday at our grandson’s birthday party. I’m home again now and feeling great. The new islets haven’t kicked in yet but should soon.

- **20 August 2010**
  I’m now on four units of Lantus a day, and cutting down every week. The islets are working beautifully. I love it! I attend the clinic at Royal Adelaide Hospital once every 3-4 weeks.

- **26 August 2010**
  I came off insulin today after 35 years. It’s an unbelievable feeling. It’s early days yet, but so far, so good.

For more info…
If you think you may be a suitable candidate, visit http://itp.jdrf.org.au and run through the list of criteria with your diabetes specialist. If you fit the bill, contact JDRF via email on itp@jdrf.org.au, or call 1300 363 126 for a referral to a clinical centre.