



## News Blog

# Diabetics insulin-free after stem-cell transplants

By Jordan Lite on April 14, 2009

Patients recently diagnosed with type 1 diabetes who received transplants of their own immune stem cells were able to go without insulin injections for nearly five years after the procedure, scientists report today.

In type 1 diabetes, the immune system attacks islet cells in the pancreas that the body depends on to make insulin, a hormone that converts glucose into energy. Treatment typically includes injections or infusions of insulin. Now, research in the new *Journal of the American Medical Association* shows that the transplant technique — autologous nonmyeloablative hematopoietic stem cell transplantation, in which a patient is infused with immune system stem cells from his or her own blood — enabled 20 of 23 recipients to thrive without insulin injections for up to 58 months. Twelve were able to stay off insulin continuously, while the rest had to periodically receive treatment.

The scientists, from Northwestern University Feinberg School of Medicine and the School of Medicine of Ribeirao Preto in Sao Paulo, Brazil, reported in 2007 that the transplant patients

were able to stay insulin-free for as long as a year and a half. At that time, critics wondered if the effect was genuine or reflected a kind of "honeymoon period" following the procedure.

The new research measured levels of C-peptides, a protein made by the same islet cells that manufacture insulin and that's considered a marker of the hormone. Two to three years after the transplants, patients had markedly higher C-peptide levels, suggesting that the transplant had effectively "re-set" their immune systems not to attack their islet cells, study co-author [Richard Burt](#), chief of the division of immunotherapy at Northwestern, tells *ScientificAmerican.com*. Their ability to stay off insulin, he says, is "clearly an effect of the cells recovering and producing insulin, not just some honeymoon period or diet or [exercise](#)."

The procedure would likely work only within three months of patients being diagnosed with type 1 diabetes, before their immune systems have destroyed all of their insulin-producing islet cells, Burt says. The next step is proving that the technique — which Burt says could cost up to \$90,000 — works in a randomized controlled trial.

Because patients were transplanted with their own cells, they didn't have to take anti-rejection drugs that other transplant recipients are prescribed to prevent them from reacting new cells. Side effects of the transplant included temporary hair loss, nausea, fever and sterility in some of the patients who had already gone through puberty. (Patients ages 13-31 and mostly male underwent transplants.) Younger patients who undergo the transplants in the future might be told to bank their sperm as a precaution, Burt says.

Scientists are also studying whether [islet-cell transplants](#) would effectively treat diabetes. [That procedure](#) would involve infusing a patient with a deceased donor's islet cells. Because those cells would come from another person, islet cell transplantation would require recipients to take anti-rejection drugs.

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