

SPONSOR CONTENT

Type 1 diabetes

For kids, research and new treatment options bring less discomfort and better outcomes

In many ways, Avery Rice is like any other 11-year-old boy. The Guelph, Ontario, native has a wide variety of interests – he loves to swim competitively, sing, dance, act and spend time with friends – and names cereal and popcorn as two of his favourite foods. However, the precocious, outgoing child faces a challenge most of his peers are unfamiliar with – Avery has type 1 diabetes (T1D).

Diagnosed at age seven, Avery maintains a rigorous diabetes management plan to keep his blood glucose levels in a healthy range. In his first year after diagnosis, that plan involved using a glucose meter to prick his finger for blood six to 10 times a day to test his blood glucose, and receiving insulin doses four to five times a day using a syringe.

Avery eventually started using an insulin pen, and then, in October 2012, just over a year after his diagnosis, his parents enrolled him in a JDRF Canadian Clinical Trial Network (JDRF CCTN) study called Timing of Initiation of Continuous Glucose Monitoring in Established Pediatric Diabetes Trial (CGM TIME Trial).

"We liked the idea of less finger pokes for Avery and having the CGM device continually show us how food, stress and other factors affected his blood sugar throughout the day," says Melinda Rice, Avery's mother.

Led by Dr. Margaret Lawson of the Children's Hospital of Eastern Ontario, the CGM TIME Trial aims to show whether it is more beneficial for children to start using an insulin pump and CGM simultaneously, or to delay CGM use and introduce the device only after pump technology has been established.

Avery and all other participants were provided with Medtronic's Veo insulin pump and CGM system, which Dr. Lawson says is the most advanced type of pump technology.

Dave Prowten, Canada's president and CEO of JDRF, an organization dedicated to T1D research funding and advocacy, says technology such as a CGM is revolutionizing how the disease can be managed. "CGM means testing happens every five minutes, which works out to 288 times a day, so testing is much more frequent than is possible with meter blood glucose testing. You get alerts and can manage your blood sugar effectively."



"What's amazing is that CGM with Medtronic's low glucose suspend feature allows a person with type 1 diabetes to achieve remarkably good A1Cs without a risk of severe hypoglycemia."

Dr. Margaret Lawson leads the CGM TIME Trial at Children's Hospital of Eastern Ontario

Melinda noticed a positive impact on her son's health and mood almost immediately after he started using an insulin pump and CGM. "I was thrilled and thought to myself, 'I have my happy boy back.'"

"My diabetes is much easier to control," says Avery of using a pump and CGM. "I have to do less finger pokes, which is great because I hate needles."

The brave, well-spoken boy is also a JDRF youth ambassador, a role Avery has embraced because "I get to tell people what it's like to live with type 1 diabetes, which helps fundraise for JDRF." He will be one of 40 children participating in Kids Awareness Day on Parliament Hill on November 25.

The study also looks at the impact CGM has on a participant's A1C test results. It is standard practice for a person with diabetes to have their A1C, a measure of the body's blood glucose levels, tested every three months.

"What's amazing is that CGM with Medtronic's low glucose suspend

feature allows a person with type 1 diabetes to achieve remarkably good A1Cs without a risk of severe hypoglycemia," says Dr. Lawson. "That's what's going to protect them over the long term from diabetes complications."

SUPPLIED



CGM has made a vast improvement not only for Avery, but in his parents' lives, too. "Before using CGM, my husband and I would wake up every night at midnight and 3 a.m. to check that Avery's blood sugar hadn't gone too low because that can cause a hypoglycemic seizure, which is very dangerous," says Melinda. "Now, we only get up if the CGM's built-in alarm alerts us to a problem. So, an added bonus is the entire family sleeps better at night."

Both mother and son are hopeful a cure will be found in Avery's lifetime. Meanwhile, the Rice family will continue to use pump technology and CGM together to ensure Avery manages his diabetes as best as possible.

normal blood-glucose control by transplanting pancreatic islet cells into people living with T1D.

Yet two major obstacles prevent the therapy's widespread application: a lack of available islets for transplantation and the need for transplant recipients to take immunosuppressive drugs to prevent the immune system from attacking the transplanted cells.

Encapsulated cell therapies can overcome both obstacles. The stem cell-derived cells are designed to replace a person's lost insulin-producing ability while being protected from the ongoing T1D autoimmune attack.

"Our search for the cure has accelerated at an impressive pace," says Mr. Prowten, adding that he sees the JDRF Encapsulated Cell Therapy Research Program as a crucial link in the commitment to advance more effective treatment and disease-management options.

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ABOUT JDRF

As the largest global charitable funder and advocate for type 1 diabetes (T1D) research, it is JDRF's mission to find a cure for diabetes and its complications through the support of research.

Driven by dedicated grassroots volunteers, JDRF is passionate about the commitment to improving the lives of people affected by T1D by accelerating progress on the most promising opportunities for curing, better treating and preventing the disease. JDRF continuously strives to help people at all ages and all stages of T1D live better, longer, healthier lives.

Since its founding in 1970 (1974 in Canada), JDRF has awarded more than \$1.8-billion globally to T1D research. When JDRF decides to invest in health research, it does so based on the merits of research, the quality of the science and the potential of the results to improve the lives and health of people with T1D. JDRF research efforts have helped to significantly improve the care of people living with this disease and have expanded the critical scientific understanding of T1D.

Canada has long played a leadership role in type 1 diabetes research, from the world-changing discovery of insulin by Sir Frederick Banting and Dr. Charles Best, to the recent breakthrough in islet transplantation (known as the Edmonton Protocol). It was for this reason that JDRF was very pleased to form a unique partnership with the Government of Canada in 2009 when Gary Goodyear, Minister of State (Federal Economic Development Agency for Southern Ontario), decided to invest \$20-million in the Canadian Clinical Trial Network (CCTN). JDRF Canada provided \$13.9-million of its own funding for CCTN, which enabled the creation of a unique network and research infrastructure that has accelerated the testing of new technologies and treatments for nearly 1,000 Canadians living with T1D and its complications, and created over 200 highly skilled, knowledge-based jobs across nine peer-reviewed clinical trials plus one technology project.

JDRF CCTN continues to be a groundbreaking effort to accelerate solutions for the management, care and cure of T1D. JDRF CCTN is currently running several high-profile clinical trials, in association with leading diabetes researchers at partner universities and medical centres in Southern Ontario and newly expanded to Western Canada.

Through local chapters, international affiliates, volunteers, staff and corporate partnerships in over 100 locations worldwide, JDRF offers a diverse support network, outreach programs, advocacy initiatives and innovative fundraising programs.

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Online? Visit jdrf.ca for more information.

ADVANCES

New therapy offers hope for ending insulin dependence

The daily routine of people living with type 1 diabetes (T1D) is heavily influenced by the necessity of keeping their blood glucose levels within normal range. From the diagnosis of T1D – a non-preventable autoimmune disease in which the body's immune system attacks and destroys the insulin-producing cells of the pancreas – they are dependent on insulin for life.

Yet a new breakthrough – encapsulated cell therapy – offers hope to fundamentally transform the management of T1D by restoring a person's independence from insulin injections.

It is part of JDRF's mission to find a cure for T1D, says Dave Prowten, Canada's president and CEO of JDRF. "We are working hard to fund the most promising research to ensure future generations don't have to face the burden of T1D and the obstacles

associated throughout their lives," he adds.

Decades of research have led to an understanding of T1D that has prompted a number of potentially life-changing therapies – such as new smart insulins, stem cell therapies, diabetes vaccines, drugs that help regrow the body's insulin-producing beta cells and an artificial pancreas – with a few already moving from laboratories into clinics.

Today, JDRF celebrates an important milestone as the first person with T1D has been implanted with an experimental encapsulated cell replacement therapy called VC-01TM.

The trial, headed by JDRF-funded partner ViaCyte, will evaluate the safety and efficacy of the VC-01 product candidate, a potential replacement source of insulin-producing cells.

JDRF's research has already confirmed that it is possible to achieve

normal blood-glucose control by transplanting pancreatic islet cells into people living with T1D.

Yet two major obstacles prevent the therapy's widespread application: a lack of available islets for transplantation and the need for transplant recipients to take immunosuppressive drugs to prevent the immune system from attacking the transplanted cells.

Encapsulated cell therapies can overcome both obstacles. The stem cell-derived cells are designed to replace a person's lost insulin-producing ability while being protected from the ongoing T1D autoimmune attack.

"Our search for the cure has accelerated at an impressive pace," says Mr. Prowten, adding that he sees the JDRF Encapsulated Cell Therapy Research Program as a crucial link in the commitment to advance more effective treatment and disease-management options.

Gym is my favourite time of the day

Type 1 diabetes.

I almost passed out.

You don't know the half of it.

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JDRF IMPROVING LIVES. CURING TYPE 1 DIABETES.