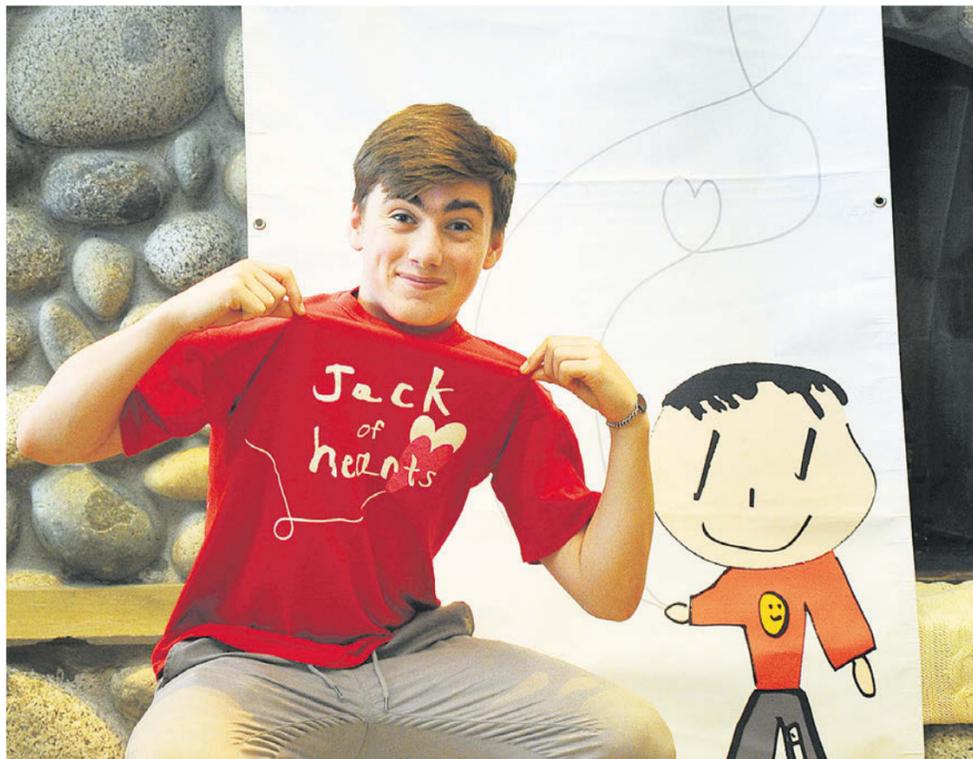


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Type 1 diabetes



Jack Stuart started his walk team "Team Jack of Hearts" eight years ago. With the largest walk team in Western Canada, he has raised \$250,000 toward type 1 diabetes research so far. SUPPLIED

The dream of a life without needles and finger pricking

Fifteen-year-old Jack Stuart attends Grade 10 at Handsworth Secondary in North Vancouver. He's not so different from his classmates – he likes to ski, play sports and is on the basketball team – yet there is always something on his mind.

"Every other kid is just thinking about his plans for the day – I have to think about diabetes," says Jack, who was diagnosed with type 1 diabetes (T1D) when he was five years old.

Jack manages his diabetes by regularly checking his blood glucose levels and injecting insulin. And even though he's been doing that for most of his life, it doesn't get any easier. "It's a struggle that I go through every day and it gets harder as I grow," he explains. "Maybe that's because when I

"I was so young when I was diagnosed, so I can't really remember life without needles, without being pricked every day. A cure would be a dream come true – it would be amazing."

Jack Stuart is a fifteen-year-old student living with with type 1 diabetes

was little, a lot of the responsibilities were on my parents and now they've shifted to me."

Yet with age also came the understanding that the insulin shots are crucial to Jack's well-being – T1D is an autoimmune disease in which the body's immune system attacks and destroys the insulin-producing cells of the pancreas. If the disease isn't managed properly, patients run the risk of blindness, kidney failure and even limb amputation.

"Everyone on the basketball team knows I have diabetes, they admire that I don't let that hold me back," says Jack. "They support me 100 per cent."

While Jack's friends know that he has to manage his diabetes, he's found that there is still a misconception about

the disease. "A lot of people don't know the difference between type 1 and type 2," he explains. "I would like to get that out there that there's a huge difference. Type 2 diabetes is curable – type 1 is not... yet."

Jack believes that JDRF, an organization dedicated to T1D research funding and advocacy, is close to finding a cure.

Dave Prowten, Canada's president and CEO of JDRF, also believes the search for the cure has accelerated at an impressive pace. He explains that decades of research efforts have led to an understanding of T1D that is prompting a number of potentially life-changing therapies.

"I think it's going to take several years. But as the immune system gets more and more understood, I think it will be possible to figure it out," he says. "We have some amazing people in Canada doing best-in-class work. We just want to get to the finish line as quickly as possible."

That is good news for Jack. "I was so young when I was diagnosed, so I can't really remember life without needles, without being pricked every day," he says, adding that a cure "would be a dream come true – it would be amazing."

In addition to funding the most promising research, JDRF helps newly diagnosed kids, teenagers and adults manage their diabetes, says Jack. "JDRF is very family-oriented, they've really been there for us and they support every family [affected by T1D]."

Through his work as a youth ambassador for JDRF, Jack has been involved in raising awareness about T1D at the government level. In addition to going to Ottawa, he was the only Canadian delegate to attend a conference in Washington, D.C., presenting the topic in front of Congress. And he came away inspired.

"I've met many people living with T1D, including some very young children, and found we all have the same story," he says. "I don't think diabetes is holding any of us back – we are just like any other children growing up even if we face this daily challenge."

While Jack doesn't have any defined plans for his future, he believes JDRF will be a part of it. "I want to continue to help out with kids with diabetes as a JDRF ambassador," he says.

This content was produced by Randall Anthony Communications, in partnership with The Globe and Mail's advertising department. The Globe's editorial department was not involved in its creation.

EDUCATION

PEAK performance

The well-being of people living with type 1 diabetes (T1D) largely depends on their ability to successfully manage the disease. A recent survey of T1D patients, caregivers and health-care professionals found that exercise and food are among the top five challenges they face.

About 36 per cent of people with T1D view exercise as a challenge on which they would like to have more information. JDRF, the largest charitable funder and advocate for T1D research with the mission to find a cure for diabetes and its complications, has launched a multi-year education initiative to address that need.

The new JDRF outreach initiative titled "T1D Performance in Exercise and Knowledge (PEAK)" will increase education on the management of physical activity for individuals with T1D and is supported by a three-year, \$5-million grant from Novo Nordisk, a global health-care company with more than 90 years of innovation and leadership in diabetes care.

A portion of the grant will also be attributed to research and development expanding on JDRF's previous partnerships.

During the program's first and second years, a panel of leading T1D experts will develop a curriculum that will be used to educate health-care providers at pilot events. The third year of the program will focus on patient education at events hosted by international JDRF chapters.

The education curriculum will touch on the environmental, dietary and physiological elements that impact physical activity with T1D.



For more information, please visit jdrf.ca.

Online? Visit jdrf.ca for more information.

RESEARCH

Co-ordinated approaches on track to finding a cure

Researchers have good news for the roughly 300,000 people in Canada who live with type 1 diabetes (T1D). They say a cure may soon be found for the non-preventable autoimmune disease, which inhibits the body's immune system by attacking and destroying the insulin-producing cells of the pancreas.

Officials engaged in the race say they hope to achieve success via a number of co-ordinated approaches. Those include efforts to ease the burden on people living with T1D through the development of technology that either improves their ability to monitor blood sugar levels or temporarily releases them from the need to inject insulin.

"It looks like in the next five to 10 years we will have some choices," said Dr. Bob Goldstein, chief scientific officer with JDRF Canada.

In recent years, attention has focused on the work of Dr. James Shapiro, the holder of a Canadian Research Chair in Transplant Surgery and Regenerative Medicine at the University of Alberta's Faculty of Medicine and Dentistry.

Dr. Shapiro and his laboratory team have developed a procedure for transplanting pancreatic islets, the insulin-producing cells of the pancreas, in people whose own islets have been destroyed by the autoimmune process that characterizes T1D.

Within the last 15 years, 516 islet transplants have been carried out in over 250 T1D patients at the University of Alberta. These have generally been effective in enabling patients to come off insulin for periods of time, he says. "I wouldn't call this a cure from T1D, but it is a highly effective treatment."

A key flaw, he explains, is scarcity of organ donors. Critics point out that islet recipients need to take chronic immunosuppressive drugs in order to avoid destruction of the transplant by their immune system. These drugs can produce unpleasant side-effects.

Researchers at the University of Alberta are hoping that the solution lies in the creation of insulin-secreting embryonic stem cells that respond to fluctuating blood glucose levels and can be transplanted into T1D patients.

"If we can create an unlimited supply of those, it should solve the supply problem," says Dr. Goldstein.

In keeping with that goal, Dr. Shapiro and his team are collaborating in clinical trial tests with ViaCyte Inc., a privately held regenerative company based in San Diego, Calif.

Backed by both the Alberta government through Alberta Innovates – Health Solutions and the JDRF Canadian Clinical Trials Network, the trial focuses on testing insulin-secreting stem cells as well as an encapsulation device that aims to overcome the



Dr. James Shapiro and his team have developed a procedure for transplanting pancreatic islets, the insulin-producing cells of the pancreas, into people living with T1D. SUPPLIED

abnormal immune response without the use of anti-rejection drugs.

The encapsulation device (developed by ViaCyte) is placed under the skin and works like a tea bag that

provides a protective environment for insulin while allowing it to pass through.

After recently launching the first Canadian clinical trial in Edmonton,

Dr. Shapiro is now looking for patients in the Edmonton area to participate in the trial.

At the same time, researchers at the University of Montreal are working on the development of an external artificial pancreas. The device is comprised of an automated system that simulates a functional pancreas: glucose sensors continuously measure blood glucose levels and pumps respond to imbalances by delivering insulin.

"The device aims to tell you what your blood sugar level is continuously throughout the day," says Dr. Goldstein. "A key benefit is that you don't have to use a finger prick to measure blood sugar levels. If it succeeds, patients wouldn't have to get up at night to take blood samples."

The research is led by Dr. Rémi Rabasa-Lhoret at the IRCM (Institut de recherches cliniques de Montréal), and it is estimated that the technology should be available commercially within the next five to seven years.

Finding a cure to a complicated disease like T1D involves figuring out not only how to manage blood glucose levels, but also how to address the immune system. But researchers say the goal is within reach. "It may not be completely straight-forward to get there," says Dr. Shapiro. "But I'm confident that we already have the ingredients for a true, robust cure."

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T1D does not stop Kenadie from her superhero adventures. JDRF is right by her side.



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