

Special

TYPE 1 DIABETES

Improving the odds for expectant mothers

Study targets pregnancy complications related to diabetes

Starting a family is the dream of many Canadians, and countless medical advances have improved the chances for healthy pregnancies. Yet risks remain, and among those who are more likely to face challenges are expectant mothers with type 1 diabetes (T1D), an autoimmune disease that makes individuals insulin-dependent for life.

Since she was diagnosed at age seven, Stephany Stephenson had to manage her diabetes with insulin injections. Now, at 40, she is looking forward to having a baby with her partner. Yet they've learned that pregnancy can be one of the biggest accelerators of diabetic complications, such as kidney failure, blindness and amputation. What's more, babies of diabetic mothers are also at risk – they are prone to having problems after birth, including breathing difficulties and low blood sugar.

"Managing T1D is already a daily challenge, and preparing for a pregnancy and carrying a child can bring added stress," says Dave Prowten, Canada's president and CEO of JDRF, an organization dedicated to T1D research funding and advocacy.

Even before conception – and throughout the pregnancy – women with T1D are advised to keep their blood glucose level as stable as possible to improve their chances, says Stephenson, a difficult task at a time when a woman's body is undergoing many changes.

When she learned about a JDRF Canadian Clinical Trial Network (JDRF CCTN) study called Continuous Glucose Monitoring in Women with Type 1 Diabetes in Pregnancy Trial (CONCEPTT) that aims to give pregnant women with T1D the tools to better monitor and control their blood glucose levels, Stephenson eagerly signed up.

"CONCEPTT is about healthy moms and healthy babies. Both can experience potentially serious complications during pregnancy and childbirth if the mother's diabetes is not managed with utmost care," says Prowten, adding that the study will determine whether new technology can reduce risks and



Stephany Stephenson and her partner have long been planning to have a baby. Stephenson, who has type 1 diabetes, says a continuous glucose monitoring device helps her maintain stable blood glucose levels. SUPPLIED

"During pregnancy, you have to keep your blood glucose really tight, and that's challenging."

Stephany Stephenson was diagnosed with type 1 diabetes at age 7

complications associated with T1D pregnancies.

CONCEPTT evaluates the benefit of adding a real-time continuous glucose monitoring (CGM) sensor to the standard therapy that typically relies on self-monitoring of blood glucose, the use of insulin and diet.

What prompted Stephenson to participate is the potential of CGM to reduce the margin of error. "During pregnancy, you have to keep your blood glucose really tight, and that's challenging," she explains. "With regular monitoring, you'd literally have to test your blood glucose every hour."

While Stephenson says she wouldn't mind the high frequency of standard testing – after all, she knows how important it is for her own and the baby's well-being – she feels continuous monitoring gives her something more: a certain peace of mind.

Stephenson says before getting the CGM device, she felt she was "catching up all the time." With the CGM sensor – which is placed on a person's body and continuously relays blood glucose readings – she knows what her glucose levels are and whether they are trending up or down.

"The monitor shows if your glucose level is going higher or lower, and you know at what point you need to adjust your insulin," she says. "Before you go to bed, for example, you have the opportunity to check and know that you won't have a reaction in the middle of the night. I find that completely reassuring."

Stephenson says that maintaining blood glucose control is "much more manageable with CGM," where a sensor communicates wirelessly with an external device that administers insulin. Yet it is only part of her pregnancy regime.

She regularly consults with her endocrinologist, OB/GYN doctors specializing in high-risk pregnancies, and a diabetes nurse, and also has access to a nutritionist. Before her pregnancy, she underwent stress tests and had her eyes checked.

While she appreciates the support, Stephenson says she has another reason for participating. If CONCEPTT proves that continuous glucose monitoring

can result in fewer pregnancy complications – as she believes it will – the outcome could help expectant mothers with T1D gain access to the device.

"The cost of the sensors is very high, and they're often not covered by insurance. Hopefully their use could be supported by the government in the future," she explains, adding that she believes preventative measures like CGM can save health-care dollars in the long run.

"If we can determine that new technology can enable women with T1D to have safer and healthier pregnancies, that would be a significant outcome," says Prowten, adding that trials such as CONCEPTT help to position Canada as an international hub for diabetes science and innovation.

For Stephenson, taking part in CONCEPTT makes the pregnancy she and her partner have long been planning a little bit less stressful.

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. 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.

In 2009, a partnership with the Government of Canada was formed where funding for JDRF CCTN came from a commitment of \$20-million by FedDev Ontario, with an additional \$13.9-million contribution from JDRF. The \$33.9-million investment has helped accelerate the testing of new technologies and treatments for Canadians and individuals around the world living with T1D and its complications.

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 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.

ONLINE?

For more information, visit jdrf.ca.

RESEARCH

Evaluating continuous glucose monitoring in T1D pregnancies

It has long been known that complications in diabetic pregnancies can be reduced with improved control of blood glucose levels. And new technology – such as continuous glucose monitoring (CGM) devices, which test blood glucose levels every five minutes and display them on the woman's pump or hand-held device – can help achieve those levels. But is there a direct link between CGM and healthier outcomes for pregnant women with type 1 diabetes (T1D)?

The findings of the JDRF Canadian Clinical Trial Network (JDRF CCTN) Continuous Glucose Monitoring in Women with Type 1 Diabetes in Pregnancy Trial (CONCEPTT) will provide answers to that question.

"Women with T1D continue to have adverse pregnancy outcomes, even when they strive to achieve excellent blood glucose levels. Attending pre-pregnancy and pregnancy clinics provides

"We hypothesize that real-time continuous glucose monitoring will assist women with T1D improve their glycemic control before and during pregnancy, and improve maternal and fetal outcomes."

Dr. Denice Feig is head of the diabetes and endocrinology in pregnancy program at Mount Sinai Hospital

benefits, but more needs to be done," says Dr. Denice Feig, head of the diabetes and endocrinology in pregnancy program at Mount Sinai Hospital, Toronto, and principal investigator for CONCEPTT.

Poor glucose control during pregnancy can result in a number of serious complications, says Dr. Feig, and pregnant women with T1D have a higher incidence of elevated blood pressure and preterm births, while their babies are at increased risk of congenital malformations and neonatal care unit admissions. Since the babies are significantly larger than average, delivery complications are also more common.

The primary goal of CONCEPTT is to help women with T1D, who are planning to get pregnant or are early in their pregnancy, achieve near normal blood glucose levels and avoid blood glucose levels that are too low (hypoglycemia) in order to reduce adverse outcomes.

CONCEPTT is a large-scale, international trial testing the use of continuous glucose monitoring technology in T1D pregnancies. "We hypothesize that real-time continuous glucose monitoring will assist women with T1D improve their glycemic control before and during pregnancy, and improve maternal and fetal outcomes," says Dr. Feig.

The CONCEPTT study is currently active in two Canadian provinces, Ontario and Alberta, with additional collaborating sites in the U.S., the U.K., Spain and Italy. The results from the study are expected to influence standards of obstetric care for women with T1D worldwide.

JDRF and the JDRF CCTN focus on accelerating research leading to better management and an eventual cure for T1D. JDRF CCTN studies cover a wide range of therapeutic areas, and provide opportunities for children, adolescents and adults with T1D to participate in clinical trials.

Gym is my favourite time of the day

Type 1 diabetes.

I almost passed out.

You don't know the half of it.

Visit [f](https://www.facebook.com/JDRFCanada) /JDRFCanada to hear what you're missing.

JDRF IMPROVING LIVES. CURING TYPE 1 DIABETES.

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.