

DIABETES AWARENESS MONTH

FOR MORE INFORMATION, VISIT
specialfeature.diabetes.ca

DIABETES CANADA | **END DIABETES**

11 million Canadians are living with diabetes or prediabetes – chances are, the disease affects you or someone you know

People with diabetes are:

25 times more

likely to experience vision loss



12 times more

likely to be hospitalized for kidney failure needing dialysis



Vision



- Diabetes is the leading cause of blindness in Canadians under 50

- 500,000 Canadians have diabetes-related eye damage that can lead to blindness

Diabetes Canada is the registered national charitable organization that is making the invisible epidemic of diabetes visible and urgent. Diabetes Canada partners with Canadians to End Diabetes through:

- Resources for health-care professionals on best practices to care for people with diabetes
- Advocacy to governments, schools and workplaces
- Funding world-leading Canadian research to improve treatments and find a cure

[Donate at diabetes.ca/donate](http://diabetes.ca/donate)

3 times more

likely to be hospitalized for heart attack, stroke and heart failure



20 times more

likely to be hospitalized for non-traumatic toe, foot and leg amputations



Diabetes reduces lifespan by 5 to 15 years

Source: The Diabetes health toll, June 2017

DIABETES 360°: RECOMMENDATIONS TO EASE THE BURDEN OF DIABETES ON ALL CANADIANS

RESEARCH SHOWS THAT INDIVIDUALS ALONE CANNOT ADDRESS THE DIABETES EPIDEMIC. While there are many things those with or at risk of the disease can do to increase their chances of a long and healthy life, research proves that it is very difficult for them to succeed without the right environment, education and community-based support. "The fact that Canada is late to adopt a national strategy puts us in the lower third of developed countries," says Kimberley Hanson, Diabetes Canada's director of federal affairs. "We believe it's time that changes."

The numbers support that belief: the number of people diagnosed with diabetes has increased by 50 per cent over the past 10 years, and if current trends continue unchecked, will grow by another 40 per cent in the coming decade. It will cost Canada's economy \$27-billion this year – an enormous burden. Over the past year, Diabetes

“ We want as many Canadians as possible to speak out in support a national strategy because we believe it is the only way we're going to tackle a problem of this size. ”

Kimberley Hanson
Diabetes Canada's director of federal affairs



Canada brought together more than 120 stakeholders, clinicians, experts and people with diabetes who worked together to develop the Diabetes 360° recommendations. "The approach is based on a proven model that was used successfully in HIV/AIDS. It's not something that we made up and are hoping will work – we know it will work. We just have to all get behind it," Ms. Hanson adds.

Building on the best of earlier initiatives, Diabetes 360° has an even greater focus on primary prevention, which means creating an environment that prevents the development of diabetes, she says. "It also has a greater focus on delivering care via telehealth and virtual health technologies, so that even people living in remote and rural areas have access to quality care. As importantly, all of the interventions implemented will be measured in terms of how they are improving patient health."

Marilee Nowgesic, executive director of the Canadian Indigenous

Nurses Association and one of the expert participants, sees the initiative as a way to build authentic, effective relationships with cultures and communities that are at genetically higher risk. In Indigenous communities, she says, "there are many programs, but something is getting lost. This initiative creates an environment that allows Indigenous partners to participate meaningfully in recommendations that relate directly to Indigenous realities. It is a great example of developing a collective leadership approach to ultimately be effective within the respective stakeholder groups."

Food security, while a primary issue, is only one aspect of the challenges Indigenous people face, she adds. "The reality is that the items and care required are not available or cannot be afforded by most households. The absence of foot care clinics, even care for infection of insulin injection sites, **See Diabetes 360° on DC2**

DIABETES 360°

Diabetes Canada's epidemic response strategy proposes the following targets:

90%

of Canadians live in an environment that promotes wellness and prevents the development of diabetes;

90%

of Canadians know whether they're at risk for or are living with diabetes;

90%

of those with prediabetes or diabetes receive the appropriate support, or interventions, to avoid developing diabetes or its complications, so that:

90%

achieve improved health outcomes with interventions.

INSIDE

Risk factors: Diabetes and heart disease strongly linked. **DC2**

Powering through diabetes: Elite cyclists prove it can be done. **DC3**

Prevention: Youth activity program with NBA flavour. **DC4**

Research: New knowledge to reduce diabetes complications. **DC6**

Medication advances: Lowering cardiovascular risk. **DC7**



Right now, five million Canadians are living with diabetes and six million more are at risk of developing it soon.

Diabetes is an epidemic.

Diabetes 360° is a national strategy that could prevent millions of Canadians from being diagnosed with diabetes and save billions of dollars in healthcare.

Urge your MP to act now: Visit diabetes.ca/strategy

DIABETES CANADA

BEATING THE ODDS

Managing the risk of heart disease is critical for people with type 2 diabetes

DAN SAVOY COULDN'T BELIEVE WHAT THE DOCTORS IN THE EMERGENCY ROOM WERE TELLING HIM – he was having a heart attack at just 26 years old. The medical staff was also shocked, and Mr. Savoy recalls their first reaction.

"They wanted to know what drugs I was on because that's usually the cause when someone my age has a heart attack," he says. "I assured them I didn't take drugs, and later, after they conducted tests and discovered I had heart disease, they apologized."

So, he had heart disease in his twenties – that was also a jolt, but Mr. Savoy wasn't yet ready to significantly change his lifestyle. "When you're 26, you feel bulletproof. After the doctors cleared the blockage in my artery, I felt great!"

"I continued to live my life pretty much as I had done before – I still smoked and didn't change my diet much. I told myself, 'This isn't going to happen again.'"

That was 24 years ago, and Mr. Savoy's assumption wasn't accurate. In the years since, he has had four more heart attacks, and he has type 2 diabetes.

A recent My Heart Matters survey found a knowledge deficit among Canadians with diabetes. Most Canadians with type 2 diabetes (93 per cent) say they are knowledgeable about their disease management, but one in two have no idea their diabetes alone significantly increases the risk of heart attack, heart failure, and stroke.*

Several risk factors are also common to type 2 diabetes and heart disease, including being overweight, inactivity, high blood pressure and smoking. Heredity may also play a role in both diseases. Heart disease and type 2 diabetes are both common in Mr. Savoy's family. All six of his siblings have heart disease, and two of them also have type 2 diabetes.

Today, Mr. Savoy, 50, is speaking about his experience to help others understand the strong links between heart disease and type 2 diabetes, and to encourage them to seek medical support to manage their risks.

"I found out I had type 2 diabetes about three years after I had my fifth heart attack. Before that diagnosis, I struggled with prediabetes for a



Dan Savoy is successfully managing his heart disease and type 2 diabetes with the help of medications and adoption of a healthier lifestyle. SUPPLIED

“**I want to encourage others to talk to their doctor about their own risks and get the help they need to stay healthy.**”

Dan Savoy
Patient managing type 2 diabetes and heart disease

few years. My blood glucose (sugar) levels were elevated for a while, and I developed type 2 diabetes, just as my doctors had warned.

"You can imagine my reaction," he says. "After having five heart attacks, being diagnosed with type 2 diabetes was the last thing I expected. Before that, I really didn't understand the connection between diabetes and heart disease."

Mr. Savoy learned that the fact that he developed diabetes elevated the risk that his heart disease would worsen and he could have another heart attack. He knew he had to take serious action, and today, he is successfully managing his health on

both fronts.

"I quit smoking. I've also made changes to my diet, and my fiancée and I stay active – including taking regular walks – and my sugar levels are now well controlled. The first year after my diabetes diagnosis, it was a struggle to get those levels in balance, but now, my endocrinologist says I'm her 'star pupil.'"

After having a quadruple bypass several years ago, he manages his health with the help of medications, including a diabetes treatment to

provide additional protection for his heart.

Mr. Savoy hopes that other people who hear his story will take steps to lower their risk of diabetes-related heart disease.

"I didn't take things seriously enough when I was young and ended up having five heart attacks and developing type 2 diabetes. I want to encourage others to talk to their doctor about their own risks and get the help they need to stay healthy."

*Source: Environics Research Group. "My Heart Matters Survey": Online survey conducted among 1,500 Canadians over 18 years of age was completed online between April 13 and May 4, 2018.

BOLD ACTION FOR AN EPIDEMIC: GREATER FOCUS ON POPULATION IMPACT

Canada's diabetes epidemic continues to grow. Since 2000, the number of Canadians with the disease has doubled – today, one in three Canadians is living with prediabetes or diabetes. At current rates, the number of people diagnosed is projected to grow by 40 per cent in the next decade.

Diabetes and its serious complications are taking an immense toll on the lives of Canadians and fuelling significant increases in health-care costs. Current projections estimate the direct costs associated with treating diabetes in Canada will exceed \$38-billion by 2028.

Diabetes Canada is meeting this challenge with a bold new approach.

"Traditionally, we have focused on interventions that reach individuals at a community level, but action at that level is no longer enough to overcome the challenge we face," says Dr. Jan Hux, Diabetes Canada president and CEO. "Faced with a diabetes epidemic that has far-reaching implications on the health of our families, communities and entire country, bold and urgent action is required," says Dr. Hux.

"We are evolving and shifting our focus to delivering greater impact at the population level. Population impact allows us to scale our efforts to the magnitude of the diabetes challenge."

Diabetes Canada will continue to pursue the priorities of its long-standing mission: prevention; better health outcomes; and ultimately the discovery of a cure to end diabetes. At the same time, it is reallocating resources to strategies that will drive broad change at the system level and produce optimal health outcomes for significant numbers of Canadians.

The population impact model includes recognition that public policies and economic and social circumstances greatly affect individuals' health. Therefore, advocating for healthy public policy is a renewed priority for Diabetes Canada as it

“**Greater awareness of how to reduce the risk of, or even prevent, type 2 diabetes, combined with better public policies, will lead to healthier families, healthier communities, a healthier workforce and a more sustainable health-care system.**”

Dr. Jan Hux
Diabetes Canada
President and CEO



seeks to prevent type 2 diabetes and prediabetes.

"Unhealthy environments are the key drivers of the type 2 diabetes epidemic, and legislation, such as the ban on marketing of unhealthy foods to kids that Diabetes Canada recently advocated for, is critical to preventing type 2 diabetes at a population level," Dr. Hux says.

Diabetes Canada will also continue to advocate for a tax on drinks with added sugar – an identified risk factor for type 2 diabetes – and for mandating product labels that better inform consumers and make the healthy choice the easy choice.

As part of its focus on prevention, Diabetes Canada provides an online Diabetes Test (diabetestest.ca), to help people find out if they are at a higher risk of having prediabetes or type 2 diabetes. To date, half a million Canadians have taken the test, and Diabetes Canada has set a goal of raising that number to one million.

"Greater awareness of how to reduce the risk of, or even prevent, type 2 diabetes, combined with better public policies, will lead to healthier families, healthier communities, a healthier workforce and a more sustainable health-care system," says Dr. Hux.

Population impact strategies will also drive resource allocation to ensure that *Diabetes Canada Clinical Practice Guidelines* are more effectively delivered to health-care professionals, so they have the knowledge to provide exceptional diabetes care. And Diabetes Canada will continue to invest in world-leading research for improving the quality of life for people with diabetes, and for ultimately discovering a cure.

"Diabetes research has an immense multiplier effect," says Dr. Hux. "By moving towards ending diabetes, we have opportunities to significantly reduce heart attacks, strokes, blindness and many other complications, improving and saving millions of lives."



Diabetes 360° recommends prevention strategies for cultures and communities at higher risk for diabetes, including Indigenous peoples. ISTOCK.COM

FROM PAGE 1 DIABETES 360°: TIME FOR A CANADIAN NATIONAL STRATEGY

means that treatable complications become the cause of amputations. It would be easy to say, 'go to the nursing station,' but sadly they don't have the supplies," says Ms. Nowgesic.

Diabetes 360° aims to support people of all cultures and incomes in getting the recommended 150 minutes of moderate to vigorous physical activity every week – something that can be very difficult for families who don't live in walkable neighbourhoods and can't afford gym memberships. Diabetes 360° initiatives will also help ensure that people with prediabetes can access the Diabetes Prevention Program, a rigorously researched program that prevented diabetes in almost 60 per cent of participants at high risk of diabetes.

For those living with the disease, Diabetes 360° will mean more consistent and seamless access to quality medical care, along with community-based support, advice and programs that can help them manage their health day-to-day. In addition, it will result in equitable

access to the medication, devices and supplies on which they rely.

"The diabetes epidemic is a runaway train right now," says Ms. Hanson. "We want as many Canadians as possible to speak out in support of a national strategy because we believe it is the only way we're going to tackle a problem of this size. The more voices that we have speaking in unison on an issue, the more it's likely to be heard by our policy-makers."

"We're asking every Canadian to consider going to diabetes.ca to quickly and easily send an email to their MP. It's a step every person can take to help ensure that the recommendations in this strategy are implemented by our government, and this epidemic is addressed."

TAKE ACTION

Help end the diabetes epidemic in Canada by contacting your MP through:
www.diabetes.ca/strategy

TEAM NOVO NORDISK –

DIABETES CANADA | END DIABETES

Cycling team inspires people with diabetes to be the 'champions they were born to be'

TEAM NOVO NORDISK IS NOVEL, THOUGH YOU WOULDN'T HEAR IT FROM THE TEAM MEMBERS THEMSELVES.

As a unit, they battle day after day through gruelling workouts to compete on the international bicycle racing scene, travelling all over the globe to give everything they've got against the best in the world.

They're international men and women. They're at the peak of their physical prowess. And, what makes them singular in their pursuit: they all suffer from type 1 diabetes.

However, in talking with the team, especially 21-year-old Canadian rider Reid McClure, "suffer," is the wrong word to use to describe his approach to his condition. If he and his teammates are "novel," they certainly aren't looking for help or holding up their diabetes as an excuse to give anything less than their best. No one is looking for sympathy.

"I think the attitude towards diabetes is changing, especially in Canada, Europe and the United States," says Mr. McClure, a rider from Calgary now based in Montreal who earned his way onto Novo Nordisk's pro cycling team through its wildly popular developmental program.

"Kids with type 1 diabetes aren't told anymore, 'You can't do this,' or, 'You can't do that.' It's all about empowerment, and what makes me most proud of our team – aside from the cycling – is that we show people with diabetes that they don't have to 'suffer.' They can absolutely live out all of their dreams."

Team Novo Nordisk is sponsored by the Danish pharmaceutical company that first produced the life-saving drug insulin discovered by Canadians Frederick Banting and Charles Best. Today, Novo Nordisk is the world's largest producer of insulin. Team Novo Nordisk merged with its predecessor, Team Type 1, an Atlanta-based cycling team in December 2012.

The dream of cyclist Phil Southerland, who had been treating his type 1 diabetes while training for a 3,000-mile race across the United States,



Canadian Reid McClure, 21, earned his way onto Team Novo Nordisk through the team's popular development program. SUPPLIED

“
Whatever your dreams are, whatever you want, don't let diabetes hold you back from them. I have type 1 diabetes. I also ride bikes for a living against the best in the world.

Reid McClure
 Canadian cyclist

the team has grown into not only a competitive, all-type 1 diabetes race crew, but also a source of inspiration for people with (and without) diabetes all over the world. Team Novo Nordisk now has more than 8 million followers on social media.

"There's nothing better than meeting somebody with type 1 who tells us they changed their life because of something they've seen you do," says Mr. Southerland, who was diagnosed with type 1 when he was seven months old and has been racing bikes competitively since he was 12.

As a senior in college, he met his first friend with diabetes, and the other young man was very impressed by all that Mr. Southerland was able to accomplish while managing his disease. Mr. Southerland says his new friend saw him as an athlete and a "rock star."

"This guy, I'll never forget it. He said, 'Oh my God, you're my hero,' and from there he got his diabetes under control. I saw first-hand how

much better his life was when he went from poorly controlled to well-controlled diabetes, and that was it – I knew I could make an impact," says Mr. Southerland, today a 36-year-old father of two who still competes at races all over the U.S.

"There's a confidence gap in the world of diabetes, and Team Novo Nordisk was created with one simple goal: to help people believe they can be the champions they were born to be."

On the road toward achieving that goal, Team Novo Nordisk isn't just a cycling team for professional riders who have been diagnosed with type 1. It goes deeper. Their mission is to inspire people living with diabetes to believe that through proper management and care, they can achieve greatness.

It's a message that certainly rings true for Mr. McClure, a graduate of the Novo Nordisk "hero factory," which turns youngsters with promise into athletes challenging the best in the world. For Mr. McClure, who was

diagnosed with diabetes at age 3 and grew up with parents who encouraged and always supported his living a life the same as anyone else, the opportunity to ride with Team Novo Nordisk is a dream come true.

He wants to cycle against the best in the world. He also wants everyone who lives with diabetes to know this: if they manage their symptoms and monitor their blood sugar, there's nothing that they can't do.

"Diabetes no longer has to be seen as an anchor; it doesn't have to hold you back from anything, and I'm not just talking about sports," says Mr. McClure, adding that the team was instrumental in taking him from a kid with promise to someone who, one day, may just compete in the 2021 Tour de France, the 100th anniversary of the world's most famous race.

"Whatever your dreams are, whatever you want, don't let diabetes hold you back from them," he says. "I have type 1 diabetes. I also ride bikes for a living against the best in the world."

Shine a light on Diabetes

1 in 3 Canadians is affected by diabetes or prediabetes.*

Sun Life is committed to making life brighter for Canadians through the prevention of diabetes and its related complications.

TeamUpAgainstDiabetes.ca

Sun Life Financial

TEAM UP AGAINST
DIABETES

*Source: Diabetes Canada

DELIVERING RESULTS

Sun Life Financial and partners working together to fight diabetes

A basketball-inspired program to support physical activity and healthy eating among children – a partnership with health-care experts to help prevent type 2 diabetes in women after childbirth: These are just two of the partnerships created by Sun Life Financial in its commitment to fight the growing diabetes epidemic.

Since 2012, Sun Life has made prevention of diabetes and its complications an important cornerstone of its donations and sponsorships around the world. The company has committed \$22-million globally in diabetes awareness, prevention, care and research, as part of its commitment to building stronger, healthier communities.

In Canada, Sun Life is collaborating with various partners at both the national and regional levels, to help combat diabetes and prediabetes, which currently affect one in three Canadians. These partnerships are part of Sun Life's Team Up Against Diabetes platform, and they include programming focused on young people.

"We are committed to developing programs and initiatives that get kids moving and engaged in making healthy choices," says Paul Joliat, Assistant Vice-President, Philanthropy & Sponsorships, Global Marketing, at Sun Life. "One example is our Sun Life Dunk for Diabetes program, which encourages healthy habits through basketball-inspired fitness challenges, nutrition education, healthy snacks and encouragement from Toronto Raptors and NBA Legends."

Once seen only in adults, type 2 diabetes is now on the rise in children in Canada, with obesity becoming the biggest contributor to this trend. Recognizing that a healthy diet and an active lifestyle can help prevent diabetes in young people, Sun Life has teamed up with the Toronto Raptors, NBA Canada and Boys & Girls Clubs of Canada to bring Sun Life Dunk for Diabetes to life.

"Sun Life recognizes that the benefits of a healthy and active lifestyle are numerous, especially when it comes to reducing the risk of developing type 2 diabetes," says Mr. Joliat. "Even small changes to increase physical activity and making healthy choices can have a big impact."

Another example of Sun Life's support to prevent the disease is a program to help prevent type 2 diabetes in women following childbirth.



Sun Life's Dunk for Diabetes program encourages healthy habits including basketball-inspired fitness challenges. SUPPLIED

“
Even small changes to increase physical activity and making healthy choices can have a big impact.”

Paul Joliat

Assistant vice-president, philanthropy & sponsorships, global marketing, at Sun Life

Some women develop gestational diabetes during pregnancy. This form of diabetes can be managed and often goes away after birth. However, women who have had gestational diabetes are at an increased risk of developing type 2 diabetes later in life.

To support interventions that can minimize this risk, Sun Life recently launched the Sun Life Financial Program to Prevent Diabetes in Women in conjunction with Sinai Health System in the Greater Toronto Area.

"With an already stretched health-care system, hospitals and health-care facilities are looking for ways to expand the delivery of much-needed

programs and services in the fight against diabetes," says Mr. Joliat. "Sun Life values the opportunity to support this program with Sinai Health System as part of our aim to help world-class health experts remain at the forefront of battling challenging diseases like diabetes."

The Sun Life Financial Program to Prevent Diabetes in Women will aim to transform treatment for women by developing a risk calculator and risk assessment tools that will screen, monitor for and prevent the onset of type 2 diabetes post-pregnancy for a pilot group of women affected by gestational diabetes.

"It's critical for women who've

had gestational diabetes to get checked regularly after pregnancy, but unfortunately, only 20 to 40 per cent of women come back for follow up," said Dr. Denice Feig, head of the Diabetes in Pregnancy Program at Mount Sinai Hospital, part of Sinai Health System. "Gestational diabetes rates are also on the rise in Ontario, with one in 10 pregnant women over 30 now affected."

Through these and many other partnerships and programs, Sun Life is fulfilling its commitment to slowing the advance of diabetes and its related complications, and building healthier communities across Canada.

PEER NETWORK HELPS YOUNG CANADIANS WITH TYPE 1 DIABETES CONNECT TO BEAT STIGMA

Being a teenager or early 20-something can be challenging. Add on trying to fit in with peers while managing type 1 diabetes, and it can be very tough. An important Canadian study, supported by Diabetes Canada, recently showed that negative social feedback, also known as stigma, can have serious health risks.

Dr. Kaberi Dasgupta and her colleagues at the Research Institute of the McGill University Health Centre published a study earlier this year revealing that this stigma results in greater risk of complications. Of the 380 participants, 65 per cent of respondents said they experienced stigma. The impact was profound: they were three times as likely to have had a serious low blood sugar event and twice as likely to have had a high blood sugar event in the previous year.

While both type 1 and type 2 diabetes damage the body over the long term, type 1 puts people at much higher immediate risk. Low blood sugar (triggered by too much insulin) can result in confusion, unconsciousness and even death. Over the longer term, high blood sugar (caused by too little insulin) damages blood vessels and nerves, leading to complications that include blindness and kidney failure, as well as high rates of heart disease. "The window between having controlled blood sugars that are not too high versus low sugars is very narrow," says Dr. Dasgupta. "A small change in dose can be quite dangerous."

The onset of type 1 diabetes generally happens early in life – a time when people are discovering their identity, she explains. "Fitting in is very important, so there are a lot of reasons why you might feel stigmatized by your condition."

This stigma isn't imagined. Sarah Baker, who was diagnosed at age 12, recalls a school trip to Europe where the waiter refused to serve her dessert because someone had mentioned her diabetes. Study participants said their insulin injections had been mistaken for illegal drug use.

Following up on the study, Dr. Dasgupta and her team partnered with Diabetes Canada and the Canadian Institutes for Health Research to create a Virtual Peer Network (VPN) for people with diabetes, ages 14 to 24. A private Facebook group, the VPN also connects young people

with researchers and clinicians.

Peer leaders Sarah Baker, Michael Wright, Jordan McCarron, Alexandra Kellington, Melinda Provost, Zoeie Major-Orfao and Mariam Elkeraby help participants connect and share experiences, information, tools and videos. Ms. Elkeraby, who also

writes a blog that covers subjects like reviews on diabetes technology and maintaining good blood sugar levels after eating ice cream and playing soccer, writes, "I guess there's one thing we can all agree on: diabetes is not easy! It takes effort, planning and a whole lot of

time to manage. However, with every age group, diabetes presents you with a set of unique challenges and obstacles."

Having easy access to people you can relate to and who share many of your challenges can be life-changing, she notes.



Dr. Kaberi Dasgupta (left) and colleagues at the Research Institute of the McGill University Health Centre published a study earlier in 2018 that revealed the stigma associated with having type 1 diabetes as a young person resulted in a greater risk of complications. Mariam Elkeraby (right) is one of the peer leaders in the Virtual Peer Network, helping young people with diabetes connect and share experiences and counteract feelings of being stigmatized. SUPPLIED



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* Compared to a result without colour. In a study that assessed responses of patients with diabetes to a series of BGM results with or without a colour range indicator (ColourSure[™] technology) based on a series of simulations. Study conducted in the UK with 103 patients (47 Type 1 & 56 Type 2) in Dec. 2015 and Feb. 2016. 65% of 94 insulin using patients agreed with the statement that showing a result with colour made it easier to know when to act.

† Do not make immediate treatment decisions based on the Range Indicator feature. Treatment decisions should be based on the numerical result and healthcare professional recommendation and not solely on where your result falls within your range limits.

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RESEARCH ADVANCES

World-class research on the road to a diabetes cure

Diabetes Canada instituted a new research-funding model in 2017 to deliver maximum impact for the amount of money invested. The goal is to make significant strides by 2021, the 100th anniversary of the discovery of insulin by Canadian researchers Drs. Banting and Best.

"By 2021, we want to change the world for people affected by diabetes through advances in prevention, care and treatment, and to mobilize research dollars so that we can fund the research for a cure," says Dr. Jan Hux, president and CEO of Diabetes Canada.

Diabetes Canada-funded researchers are also searching for new knowledge about diabetes complications, such as retinopathy and heart disease. Finding ways to alter disease-causing biological mechanisms could lead to new prevention strategies and treatments.

CURBING VISION LOSS FROM DIABETES

Diabetic retinopathy is the most common complication of diabetes and the leading cause of blindness in working-age individuals. It is currently estimated that 500,000 Canadians have diabetic retinopathy, and the incidence is expected to double over the next 15 years.

Diabetes Canada supports research by Dr. Przemyslaw (Mike) Sapielha, a scientist at the Université de Montréal and Canada Research Chair in Retinal Cell Biology, as he searches for greater understanding of how high blood glucose (sugar) levels contribute to vision loss in people with diabetes and ways to counteract these effects.

"We know that one of the best ways to reduce the risk of diabetic retinopathy is to have good control of your blood sugar levels," says Dr. Sapielha. "High blood glucose tends to cause a series of reactions that cause a degeneration of the blood vessels in the retina."

One of the earliest complications



Gregory Steinberg has received Diabetes Canada funding to research ways to ramp up the body's metabolism to burn fat and sugars to avoid the development of diabetes. SUPPLIED

causing vision loss is "diabetic macular edema" – swelling of the part of the retina called the macula. Later in the course of disease, blood vessels can start to die off, cutting off the flow of oxygen and nutrients to the cells of the retina that transmit pulses of light to the brain. In later stages, the retina may also try to compensate for the loss of blood vessels by creating new ones in a disorganized fashion – which may lead to further and often, more serious damage to vision.

Dr. Sapielha has also discovered cellular interactions and intracellular mechanisms that govern vessel growth and which may unlock new avenues of treatment.

"Diabetic retinopathy has been labelled almost uniquely as a microvascular disease and, traditionally, most treatments targeted retinal vessels or factors that affect vessels,"

he explains. "Our research has shed light on early changes in the retina's neurons and how these neurons ultimately produce factors that affect blood vessels and vision loss from diabetes."

Dr. Sapielha has uncovered a unique mechanism in neurons in the parts of the retina where blood vessels have died. The neurons go into a dormant state where they're not functioning, but are not dead.

"The idea is to understand what programs are being activated in those neurons to prevent them from dying, and determine if we can use therapies to 'wake them up.'"

"We think this opens up possible new treatments to kickstart these dormant neurons to function again, thus restoring vision for people who may have been without sight for a long time," says Dr. Sapielha.

METABOLISM, OBESITY AND DIABETES

The growing number of Canadians who are overweight or obese is an important factor contributing to the rising incidence of type 2 diabetes, and one research goal is to identify at the molecular and cellular level ways to prevent this from happening. The aim is to answer the question, "How can we prevent type 2 diabetes in people who are overweight or obese?"

Diabetes Canada-funded researcher Dr. Gregory Steinberg is addressing this question by investigating the complex metabolic processes operating in the obesity-diabetes link, as well as the links of both diseases to cardiovascular disease (CVD).

"Obesity, type 2 diabetes and CVD are interrelated metabolic diseases," says Dr. Steinberg. "We are working

on ways to ramp up the body's metabolism to burn fat and sugars to avoid the development of diabetes and CVD."

Dr. Steinberg is a professor of medicine at Hamilton's McMaster University and Canada Research Chair in Metabolic Diseases. He is also the co-director of McMaster's new Centre for Metabolism, Obesity and Diabetes Research.

Normally, fat is stored in fat cells in the body, Dr. Steinberg explains. With obesity, a person may start to store fat in other tissues, such as the liver, which leads to inflammation and resistance to insulin, the key hormone that keeps blood glucose levels low. Thus accumulation of lipids (fatty acids and cholesterol) in the liver can cause blood sugar levels to rise, causing diabetes.

"It becomes like a snowball rolling downhill – the accumulation of lipids in the liver can happen quickly with weight gain, triggering a vicious cycle of insulin resistance, high blood glucose and a greater risk of having a heart attack or stroke."

"The goal is to find new ways to prevent and treat diabetes by increasing energy metabolism and fat burning, potentially by targeting inflammation and hormonal factors."

Increasing energy metabolism with therapies would help people who are overweight or obese overcome the challenges of maintaining weight loss through diet and exercise – presenting new hope for people at risk for type 2 diabetes.

"We know that modest weight loss can prevent type 2 diabetes from developing in many people," says Dr. Steinberg. "But keeping weight off is difficult, because people's metabolism slows down. Finding new ways of keeping the metabolic furnace running could have a tremendous impact on the diabetes epidemic."

NEW CLINICAL GUIDELINES DRIVE BETTER HEALTH OUTCOMES, EMPOWER CARE PARTNERSHIPS

Like others with the disease, Ram Krishna admits that diabetes is challenging to manage – but he adds that learning from others has made an immense difference. "Attitude is key – looking at solutions rather than the problems."

His thinking has been influenced by many people, he says, including his endocrinologist, other health-care providers and patient groups. By being conscious about what he calls the "four pillars" (meal planning, monitoring, medication and

activity), he has maintained healthy blood sugar levels, vastly reducing his risk of future complications. As a Canadian of South Asian descent, Mr. Krishna is in a high-risk genetic group. (Two of the four brothers in his family have diabetes.) A volun-

teer with Diabetes Canada, he also connects with others in the South Asian community who are living with diabetes.

For the *Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada (Guidelines)*, released in April of this year, Krishna was a patient contributor. "We worked with family physicians, endocrinologists, nurse practitioners, pharmacists and cardiologists – and all of the other specialties with which diabetes is associated," he says.

A key aim is empowering people with diabetes to become educated partners in their own care. This is why each of the 38 chapters in the 2018 edition has easy-to-read key messages written specifically for people living with diabetes. "The *Guidelines* are designed to be patient friendly," says Krishna.

The *Guidelines* provide multiple points of access for all Canadians, says Dr. Robyn Houlden, chair of the *Diabetes Canada Guidelines*. "Our webpage is a rich repository of information for both health-care providers and for people living with diabetes. It includes information sheets and instructional videos related to all aspects of care, and has specific information for various groups of patients, including children and adolescents, pregnant women, older people and Indigenous people."

The 2018 edition includes a new focus on ethnocultural diversity and its importance in diabetes care, says Dr. Houlden. "There is encouragement to take culture, faith traditions, values and beliefs into consideration in diabetes education, and to deliver it in a specific population's preferred language, ideally within their own community, including their community leaders."

This edition also includes greater involvement from Indigenous authors and organizations, as well as health-care providers who work with Indigenous populations. "The *Guidelines* reference the recommendations of the Truth and Reconciliation Commission and recognize the legacy of colonization and residential schools, which contributes to the high rates of diabetes in these populations," says Dr. Houlden.

Other new elements include a focus on the importance of individualizing glycemic targets, pregnancy preparation for women with diabetes, and drugs that are heart-protective while lowering blood sugar.

"Knowledge is power," Dr. Houlden says. "The more you understand about how to live well with diabetes, the more successful you can be in managing it."



Ram Krishna was a patient contributor to the 2018 *Guidelines* and helped to make them "patient friendly." SUPPLIED

The Boehringer Ingelheim-Lilly Canada Diabetes Alliance applauds Diabetes Canada for all the work they do to support people living with diabetes. Diabetes Canada is the first medical association in the world to update their clinical guidelines to reflect the importance of cardiovascular risk in type 2 diabetes.



Canada has the second highest rate of type 2 diabetes in the developed world.

Currently over 3.5 million Canadians are living with diabetes. And yet, half are unaware that their diabetes alone significantly increases their risk of heart disease.

Approximately one in two people with type 2 diabetes will die of heart disease. Prioritizing cardiovascular protection in managing and treating type 2 diabetes will help Canadians with diabetes live longer, healthier lives.

If you have type 2 diabetes, speak with your doctor about steps you can take to help manage your risk of heart disease.

"It's a challenge for even the most research-savvy people to keep up with the evidence about the pros and cons of different tests and treatments," says Dr. Noah Ivers, a family doctor at Women's College Hospital and co-chair of the *Guidelines* Dissemination and Implementation Committee.

"This is especially true today, when you simply can't trust much of what you read online or see on TV."

He stresses that the *Guidelines* involve thousands and thousands of hours during which well-trained professionals systematically comb through the research evidence.

"We've worked hard to turn this evidence into specific recommendations, with clear and meaningful take-home points," he notes. "And we've worked hard to update our website – guidelines.diabetes.ca – with tools to make it easier to put the recommendations into practice. We know that guidelines don't self-implement."

"People with diabetes should feel empowered to ask for more," says Dr. Ivers. "They should ask their health professionals if there is more that can be done to prevent future complications, to keep them safe from adverse effects of treatment, or if resources are available to help them better take care of themselves."

The goal of the *Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada* is closing the current health-care gap.

[Guidelines.diabetes.ca](http://guidelines.diabetes.ca) is the place for current diabetes-related research. As the source for the best-in-class treatment recommendations, the information provided can help improve outcomes for people living with diabetes, cutting the risk of complications – such as stroke, heart attack and amputation – in half.

CARDIOVASCULAR HEALTH

Managing the diabetes-related risks of heart disease and stroke

DIABETES CANADA | END DIABETES

If you have type 2 diabetes, you are more likely to develop heart disease, and you have a greater chance of having a heart attack or a stroke.

High blood glucose (sugar) levels can damage your blood vessels in various ways: “microvascular” or damage to smaller vessels can lead to vision loss or kidney disease, while “macrovascular” complications occur when the larger blood vessels in the heart or brain are affected – thus elevating the heart disease and stroke risks.

The connection between diabetes and heart disease and stroke has been established for several decades, providing health-care professionals with extensive evidence about how to reduce the risks for patients with diabetes.

“People with type 2 diabetes should be aware that they are at significantly increased risk for cardiovascular disease (CVD) and should have all of their risk factors assessed by their physician and managed accordingly,” says Dr. Milan Gupta, associate clinical professor, Department of Medicine, McMaster University in Hamilton, Ontario, and medical director of the Canadian Collaborative Research Network in Brampton, Ontario.

“This includes keeping your blood pressure and cholesterol at healthy levels, avoiding smoking and maintaining a healthy body weight, and working with your health-care team to ensure your A1C is as close to target as possible.”

A1C is a blood test that measures your level of diabetes control over the previous three months. Every patient diagnosed with diabetes has an individualized target, but most are advised to aim for an A1C of less than seven per cent. Achieving the A1C target is very important, given the damage caused to blood vessels by uncontrolled, elevated blood sugars.

Diabetes medications are also available to further help patients control their blood sugar levels. According to Dr. Gupta, the drugs that

“
We have new classes of drugs for diabetes control that can lower the risk of a heart attack or stroke in patients with diabetes who have cardiovascular disease. We advise people in this category to discuss the options with their health-care team.

Dr. Milan Gupta
 Associate clinical professor,
 Department of Medicine,
 McMaster University



have been used for many years to control blood sugar have limitations in terms of protecting against heart attacks and stroke.

“The historical medications used for diabetes management are very effective for lowering blood glucose and are generally shown to help prevent microvascular disease,” he says. “However, these drugs have not shown the macrovascular benefits we would like to see.”

However, some of these limitations have been overcome with the recent introduction of new types of diabetes medications, says Dr. Gupta. “We have new classes of drugs for diabetes control that can lower the risk of a heart attack or stroke in patients with diabetes who have cardiovascular disease. We advise

people in this category to discuss the options with their health-care team.”

The two categories of heart-beneficial drugs are GLP-1 receptor agonists and SGLT2 inhibitors.

These new drugs have significantly changed the treatment landscape for people who have type 2 diabetes and CVD, Dr. Gupta says, and could help reduce rates of disability and death.

“Cardiovascular disease is the leading cause of death in patients with diabetes and although we have made inroads in reducing mortality due to CVD in patients with diabetes, there is still a long way to go,” he says.

“These new classes of drugs represent a major step forward in further lowering that risk, such that they

have been practice-changing. The *Diabetes Canada Clinical Practice Guidelines* and other guidelines around the world now recommend these medications for diabetes patients who meet the criteria.

“We are quite hopeful that adoption of this new evidence in treating people with diabetes, specifically those with CVD, will prolong survival.”

For more information on diabetes and lowering your risk of heart disease and stroke, visit Diabetes Canada www.diabetes.ca and Heart and Stroke Canada www.heartandstroke.ca.



The A1C blood test shows individuals with diabetes how well they're controlling blood sugar levels – good control helps reduce risk of heart disease and stroke. ISTOCK.COM

AFTER SEVERE LOW BLOOD SUGAR ATTACK, FORMER BODYBUILDING CHAMPION HELPING RAISE AWARENESS

Doug Burns made a pivotal decision as he entered his teen years; he would not be limited by his health challenges. At age 13, he was inspired by images of Samson in a picture Bible and a fitness athlete in a magazine, and vowed to build strength and power through weightlifting and other fitness endeavours. He had been struggling to manage type 1 diabetes and asthma; he was seriously underweight and constantly bullied for being the smallest boy in his class and “a bag of bones,” as he puts it.

“That Samson picture really pierced me,” he recalls. “I was experiencing hardships every day from being picked on and I told myself, ‘This is the solution I need.’”

Mr. Burns's determination at a young age helped him take control of his diabetes and paved the way for incredible fitness success in adulthood. He went on to win six power-lifting championships and set state, regional and United States records in that sport. He then shifted his focus to bodybuilding, winning several titles including Mr. USA and Mr. Universe.

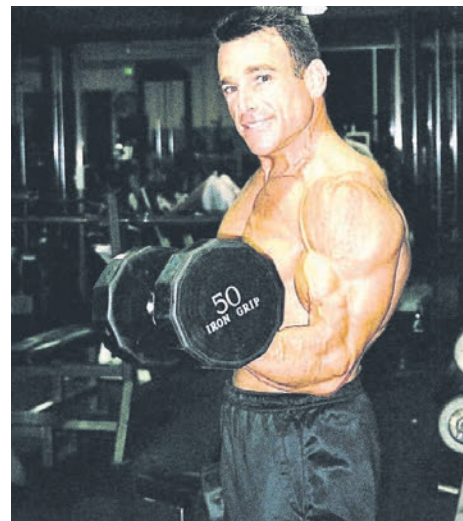
Mr. Burns's stature as Mr. Universe, however, couldn't prepare or completely protect him from the devastating impacts of a severe and life-changing hypoglycemia attack in 2007.

Hypoglycemia occurs when the blood sugar levels of a person with diabetes drop below their healthy target range. Various factors can cause the condition, including more physical activity than usual, eating less or later than you should, or taking too much medication. Symptoms, such as light-headedness, sweating, nausea, weakness and a sped-up heart rate can hit without warning. If not dealt with immediately, the result can be serious confusion and disorientation, loss of consciousness and, in extreme cases, death.

When Mr. Burns had his serious attack of hypoglycemia, he was in a public place – at a movie theatre – and it came upon him without warning.

“I didn't know it then, but later learned that people with type 1 diabetes can develop ‘hypoglycemia unawareness.’ When your blood sugar begins to decline, your body releases chemicals, creating physical warning signs that you're in trouble. But over time, you become less sensitive to these signals.

“I didn't realize what was happening. Some in the theatre thought I was drunk. The police were called



Doug Burns worked for years to build strength and fitness to help him manage his type 1 diabetes, but that didn't prepare or completely protect him from the impacts of a severe hypoglycemia attack. SUPPLIED

“
...often, busy physicians don't have the time to do in-depth interviews with their patients to learn about problems they're having.

Doug Burns
 Former Mr. USA and
 Mr. Universe

and even though I was wearing a MedicAlert bracelet, they tried to restrain me and a brawl ensued.”

Mr. Burns ended up being sprayed with mace, arrested and charged with resisting arrest and assault.

The publicity about his case led to a stream of support from others with diabetes who had experienced severe hypoglycemia attacks. People came forward to vouch for him and, ultimately, the charges were dropped.

The incident left Mr. Burns with damage to his hand and arm that meant he had to give up competing as an athlete. But ever since, this resident of Northern California has pursued other fitness activities and has built a career as an international consultant and entrepreneur.

And a big part of his life today is speaking at conferences and events for youth with diabetes, to share his experience with hypoglycemia and to call for more recognition and management of this challenging aspect of diabetes.

“I received emails and phone calls from people throughout the world, including from young people who had hypoglycemia attacks in school and everybody thought they were on drugs,” Mr. Burns says. “After learning of my experience and that of friends in the type 1 community, it was great to hear that some of these younger people were now letting others know about their own struggles. They realize they aren't the only ones.”

Mr. Burns says more awareness is

needed about hypoglycemia among the health-care community, patients with type 1 or type 2 diabetes, and their circles of friends and family members.

“Young people in particular may be reluctant to discuss these issues with their health-care professionals, and often, busy physicians don't have the time to do in-depth interviews with their patients to learn about problems they're having.

“By talking about these and other events, I'm hoping to underscore the dire need for the health-care profession to consider the seriousness of hypoglycemia within the diabetes community, and to urge people with diabetes to confide in others and seek help when needed.”



ONE IS TOO MANY

When it comes to the number of Canadian lives taken by heart disease due to type 2 diabetes, even one is too many.

It's long been known that diabetes can lead to health problems including blindness, foot ulcers and amputations, but new research from My Heart Matters shows most Canadians don't know about the link between type 2 diabetes and heart disease. Canadian singer, songwriter, TV personality and author Jann Arden knows this all too well. Both Jann's father and grandmother died from heart disease, not realizing at the time their type 2 diabetes was a key factor. In fact, one in two Canadians with type 2 diabetes, like Jann's father and grandmother, die from a heart attack, heart failure, or stroke.

"Most people don't know type 2 diabetes and heart disease are connected," says Jann. "It's something neither my dad or grandmother realized, and it ended up killing them both. People with type 2 diabetes need to know there are medications that – along with diet and exercise – can lower the risk of dying from problems related to the heart. It's important to talk with your doctor about steps you can take to help manage your risk."

"It's important to talk with your doctor about steps you can take to help manage your risk."

- There is a worrisome knowledge deficit among Canadians with diabetes. Most Canadians with type 2 diabetes (**93 per cent**) feel they are knowledgeable about their disease management, but one in two have no idea their diabetes alone significantly increases the risk of heart attack, heart failure and stroke.
- Studies show that people with diabetes may develop heart disease **10 to 15 years** earlier than people without diabetes, but only **54 per cent** of Canadians with type 2 diabetes know.
- People with diabetes are over three times more likely to be hospitalized for heart health problems than people without diabetes, which can also lead to an early death.

If you have type 2 diabetes, speak with your doctor about steps you can take to help manage your risk of heart disease. Visit www.myheartmatters.ca to learn more

myHEART
matters