“What’s new in diabetes care?”

Connect and Learn
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Cracking Down on Wall Street’s Analysts

The Diabetes Epidemic

A killer disease—and how diet and lifestyle can help beat it
DIABETES IN CANADA

PRE-DIABETES FACTS

29% of Canadians are currently living with pre-diabetes

5.7 million or more are pre-diabetic

OVER 45 recommended age to get blood sugar levels checked

HEART DISEASE and nerve damage may begin during pre-diabetes

DIABETES FACTS

$2500 the annual out of pocket expense for a patient living with diabetes type 2

3.4 million are living with diabetes

14 billion cost of diabetes to the country

HIGH blood sugar may cause diabetes-related complications like kidney disease

Source: Diabetes Canada, as of 2015

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Diabetes Current

Interested in keeping up-to-date on the latest Diabetes Canada news, research, medical breakthroughs and more? Stay connected by subscribing to our free monthly e-newsletter, Diabetes Current.

As a world-class leader, Diabetes Canada has made innovation our hallmark. Diabetes Current will help to keep you on top of what's going on within our organization and, most importantly, the latest news regarding diabetes. In addition, you'll find interesting profiles on people living with diabetes, event listings, recipes for healthy meals and tips for healthier living.

Stay current with Diabetes Current – your virtual passport to diabetes information.
News flash: 5 types of diabetes?

5 clusters based on:

- patient characteristics
- risk of diabetic complications

Pre-Diabetes is...

Blood sugar higher than normal
- Fasting 6.1-6.9
- 2hr post meal 7.8-11

will go on to develop T2DM

Heart disease and nerve damage may begin during pre diabetes
Diabetes is when …

Fasting blood sugar is $\geq 7$

2 hr post meal/random blood sugar is $\geq 11.1$

A1C $\geq 7\%$
Diabetes is...

- Common
- Controllable
- Chronic
- Preventable

- 1 in 10 will have diabetes by 2020
- Good management depends on you!
- A life long condition
- Life style modification can reduce risk up to 60%

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Normal Blood Sugar Control

In people WITHOUT diabetes….

- Insulin is released from the pancreas at the right time and in the right amounts
- Insulin helps sugar (glucose) enter the cells to be used for ENERGY

Maintains blood sugar between 4-6 mmol/L
In people WITH diabetes…

- There is not enough insulin (keys)
- Insulin is not working properly (can’t open the door to the cell)
- Sugar stays in the bloodstream resulting in higher than normal blood sugar

NO ENERGY
DIABETES WARNING SIGNS

- Frequent urination
- Weight loss
- Lack of energy
- Excessive thirst

If you show these signs, seek MEDICAL ATTENTION now.

These signs can be mild or absent in people with type 2 diabetes.

www.worlddiabetesday.org

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RECALL: Two main types of Diabetes

- **Type 1**
  - No insulin
  - The body destroys its own cells that make insulin in the pancreas (AUTOIMMUNE)

- **Type 2**
  - Dual problem
    - Not enough insulin
    - Insulin not able to work properly (insulin resistance)
5 Diabetes clusters and associated complications

1. ‘type one’ diabetes, stop producing insulin, younger age.
2. Severe insulin-deficient *eye disease
3. Severe insulin-resistant, high BMI (obese). *kidney disease
4. Mild obesity, younger age
5. Mild age-related diabetes, mostly elderly patients.

Type 2

“It wasn’t really insulin. You don’t have diabetes yet. It was just a warning shot.”
Are you at Risk?

You should see your doctor if you:

– High risk or very high risk as per CANRISK or
– > 40 years old or
– Have any of the following risk factors

Diabetes Canada
Risk Assessment Test

- I have a parent, brother or sister with diabetes.
- I am a member of a high-risk group (Aboriginal, Hispanic, South Asian, Asian or African descent).
- I have health complications that are associated with diabetes.
Risk Assessment

❑ I had gestational diabetes (diabetes during pregnancy).

❑ I have been told I have impaired glucose tolerance or impaired fasting glucose.

❑ I have high blood pressure.
Risk Assessment

- I gave birth to a baby that weighed over 4 kg (9 lbs) at birth.
- I have high cholesterol or other fats in my blood.
- I am overweight (especially if I carry most of my weight around my middle).
I have been diagnosed with any of the following conditions:

- Polycystic ovary syndrome
- Acanthosis nigricans (darkened patches of skin)
- Schizophrenia
- Obstructive sleep apnea
- Bipolar disease, depression
- HIV infection
Risk Assessment

- I take certain medications including:
  - Steroids
  - Anti-psychotics

If you check any of the boxes above, you should be tested for diabetes earlier /or more often.
Increasing rise in Obesity

Estimated 80-90% of people with type 2 diabetes are overweight (BMI > 25) or obese (BMI > 30)
Are you an apple or a pear?
Waist to Hip Ratio (WHR)

\[ \text{WHR} = \frac{\text{waist}}{\text{hip}} \]

- For men: > 1.0
- For women: > 0.85

Diabetes, High blood pressure, Cardiovascular disease
Managing Diabetes

- **Healthy Eating**
- **Physical Activity**
- **Diabetes Management**
- **Prescription Medication**
- **Weight Management**
- **Education and Resources**
Fasting 4-7
2 hr post meal < 10

Diabetes contributes to

- 30% of strokes
- Leading cause of blindness
- 40% of heart attacks
- 50% of kidney failure requiring dialysis
- 70% of all non-traumatic leg and foot amputations

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Treatment for type 2 diabetes
SGLT2 inhibitors

Sodium
GLucose co-
Transporter 2
~180g glucose
Filtered per day

Marx et al. Eur Heart J 2016; 37:3192-3200
Mechanism of Action

Hyperglycaemia

Glomeruli

Increased glucose filtration

Proximal tubule

SGLT2 inhibitor

Increased glucose reabsorption

Distal tubule

Increased urinary glucose excretion

SGTL1

UNIKLINIK RWTH AACHEN
SGLT2 inhibitors

- Dapagliflozin (Forxiga™)
- Canagliflozin (Invokana™)
- Empagliflozin (Jardiance®)
Research shows that Empagliflozin:

- Kidney disease by 39%
- Heart failure hospitalization by 35%
- CV death by 38%
- Death by 32%
- Blood Pressure

Research shows Canagliflozin

- Reduction hospitalization for heart failure
- Reduction in worsening of protein in the urine (27%)
- Increased risk for amputation, toe level (2-fold)
  - Men, prior history of amputation, PVD, neuropathy

Neal et al, NEJM 2017, 377;7
Urinary tract infection
*36.4% ♀
10.% ♂

Increased desire to urinate ~ 1 extra per day

23% increased risk of low-trauma with canagliflozin

*Genital infections
Higher risk in women and men who are uncircumcised
10% ♀
5% ♂
What is new in diabetes technology?
Freestyle libre

- flash glucose monitoring system that uses sensors
- No lancets/finger pricks!
- Small sensor automatically measures and continuously stores readings
- Painless, one-second scan
Freestyle Libre Sensor

- water resistant
- Lasts 14 days
- Discreet, 35 x 5 mm
Freestyle Libre

1. current glucose reading with every scan
2. arrow showing direction of blood sugar is heading
3. last 8 hours of data
Freestyle Libre: when you should check with a finger prick

- A finger prick test using a blood glucose meter is required in the following situations:
  - During times of rapidly changing blood sugar levels when interstitial fluid glucose levels may not accurately reflect blood glucose levels
  - If hypoglycemia or impending hypoglycemia is reported by the sensor
  - When symptoms do not match FreeStyle Libre readings

- NOTE: The physiological delay in interstitial fluid glucose with respect to changes in blood glucose is about 5-10 minutes which is unlikely to impact routine day-to-day treatment decisions.
- The average lag time of the freestyle libre is approximately 5 minutes
Cost Freestyle Libre

- Starter kit $227
- Reader $49
- Sensor $89

Not covered by Ontario drug benefits or Trillium
The Good News about Diabetes

You can stay healthy by…

✓ Keeping your blood sugars near normal as possible
✓ learning self-care skills
✓ getting support from family, friends and your Diabetes Care team
✓ taking diabetes medications as needed
✓ Know if you are at risk for diabetes, and learn strategies to help prevent type 2 diabetes
Your diabetes care team may include:

- A Dentist
- Family and friends
- Social worker/Mental health specialist
- Physical activity specialist
- Other people you know who have diabetes

Your doctor

Your nurse

Your diabetes educator

Your dietitian

Your pharmacist

Your diabetes educator

Your diabetes educator

Naturopathic care provider

A Foot care specialist

Heart doctor

Kidney doctor

Eye doctor

Diabetes doctor