Adapting Diabetes Management *during COVID-19*

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A little bit about me…

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Northumberland Hills Hospital/ IMCare/ Heart Care Canada

- Moved back to Canada from New Jersey in 2017
- Offices in Oshawa and Port Hope
- Work in Cobourg hospital (ICU/consults)
- Large diabetes practice
  - Along with cardiology, complex care, endo, neurology, and general internal medicine
- Enjoy teaching doctors, pharmacists, educators and patients

A little bit about you…

- Newly diagnosed with diabetes?
- Diabetes for 5 years?
- Diabetes for more than 5 years?
- Understand diabetes and treatment options?
- Happy with your diabetes control?
- Understand recommended monitoring and screening guidelines?

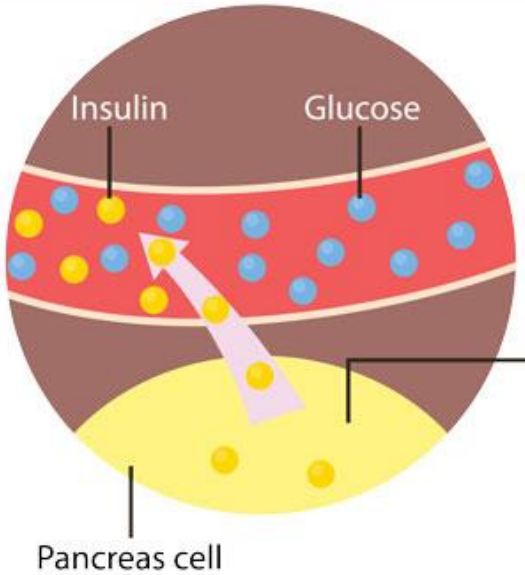
COVID-19: Coronavirus

- On March 11, 2020, the World Health Organization declared the outbreak of COVID-19, otherwise known as coronavirus, a pandemic
- By March 16, 2020, travel and business restrictions imposed by governments, including in Canada, were becoming commonplace
- In office doctor visits -> **virtual medicine**

What is Diabetes?

- Your body needs sugar for energy
- Diabetes is a disorder that disrupts the way your body uses sugar
- Once you consume food, in the GI tract (stomach, intestines, etc.) it is broken down into sugar
- The sugar gets into your cells/organs with the help of insulin, a hormone
- If there is a problem with insulin then the sugar builds up in the blood stream – arteries and veins
- Generally speaking, there are 2 kinds of diabetes
  - In type 1: the body makes LITTLE or NO insulin
  - In type 2: the cells of the body respond LESS to insulin or the body doesn't make enough or BOTH

How body controls blood sugar levels



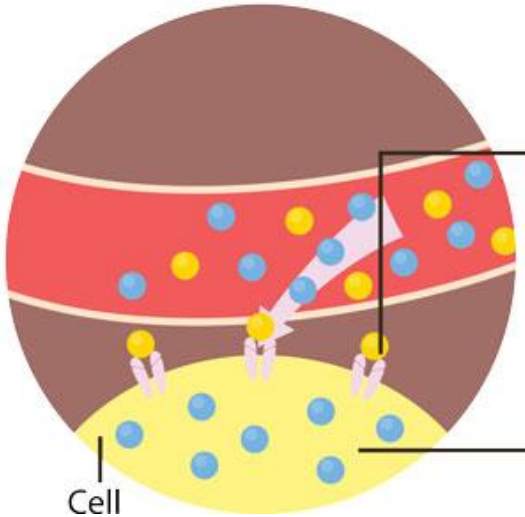
Food is converted into glucose (blood sugar)

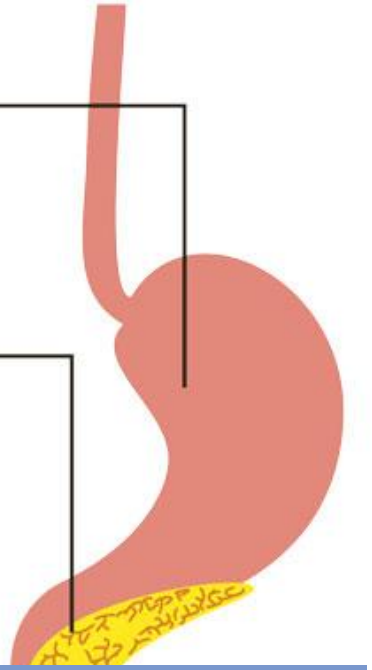
As blood sugar levels rise, the pancreas make insulin

Blood caries glucose and insulin to every cell in the body

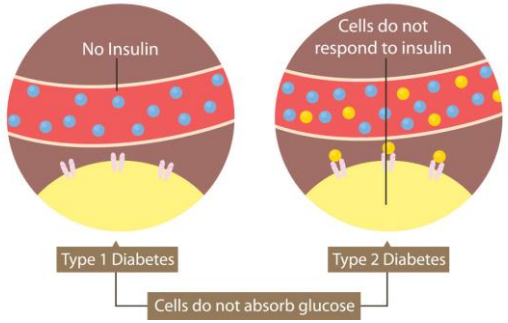
Insulin acts like a key to 'open' the cells

Cells absorb glucose from the blood





Types of Diabetes



What are the symptoms of uncontrolled blood sugars?

- For some, NONE!!!
  - Some people can live years without any symptoms
- It can start off as:
  - Increased urination (if there is more sugar in the blood -> more gets filtered by the kidney's -> urine with high sugar content causes more water to follow
  - Increased thirst – due to dehydration from the above mechanism
  - Blurry vision

Why should I care if I have no symptoms?

- If not treated, uncontrolled blood sugars can cause serious problems:
  - Heart attacks
  - Strokes
  - Kidney disease
  - Vision problems; including blindness
  - Pain or numbness in hands and feet
  - Impaired circulation leading to the need to have fingers, toes, or other body parts removed (amputation)

Impact of Diabetes in Canada

1 in 10

deaths in Canadian adults
was attributable to diabetes

3X more likely

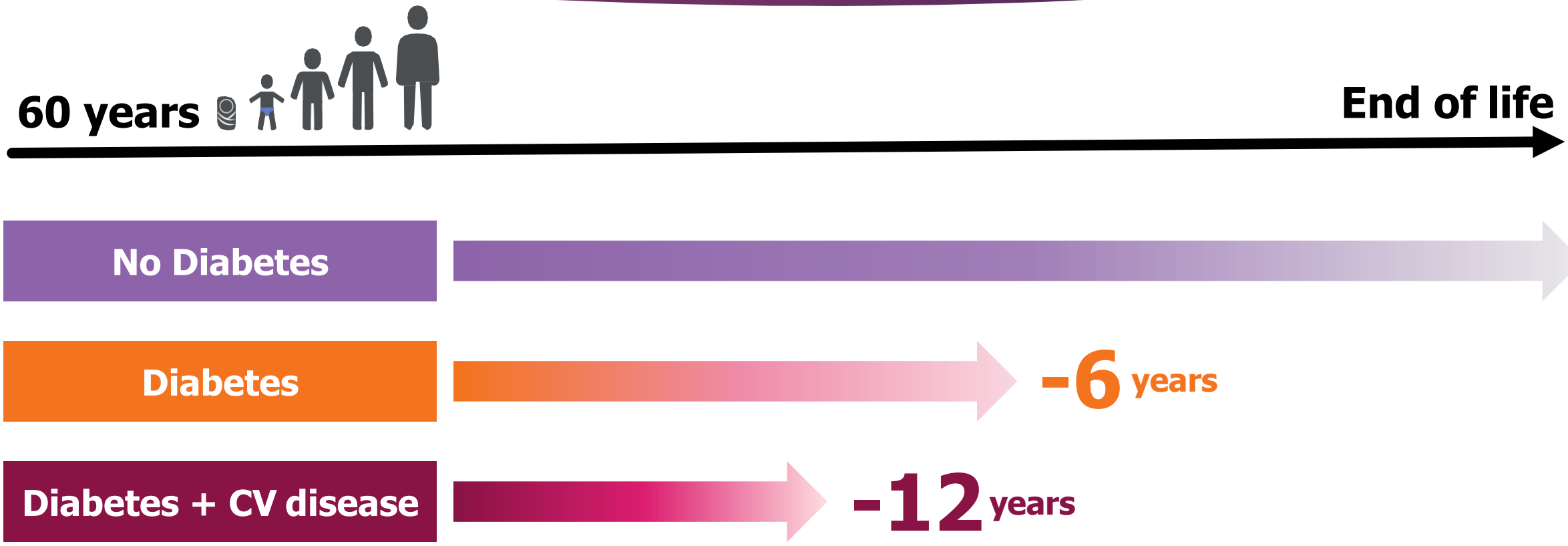
to be hospitalized
with cardiovascular disease

12X more likely

to be hospitalized
with end-stage renal disease

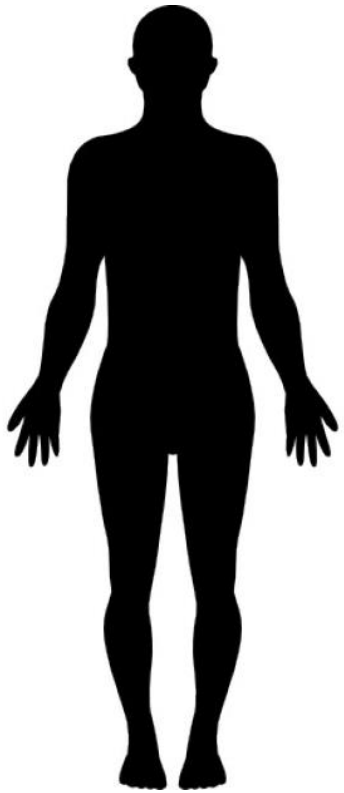
http://www.diabetes.ca/how-you-can-help/advocate/why-federal-leadership-is-essential/diabetes-statistics-in-canada

Life Expectancy is Reduced By 12 Years in People With Diabetes and Previous CVD



Emerging Risk Factors Collaboration. JAMA. 2015 Jul 7;314(1):52-60; Loukine L et al. Popul Health Metr. 2012 Apr 24;10(1):7.

Chronic Complications of Diabetes Mellitus



Macrovascular Complications

- Myocardial Infarction
- Stroke
- Peripheral Artery Disease

Microvascular Complications

- Retinopathy
- Nephropathy
- Neuropathy

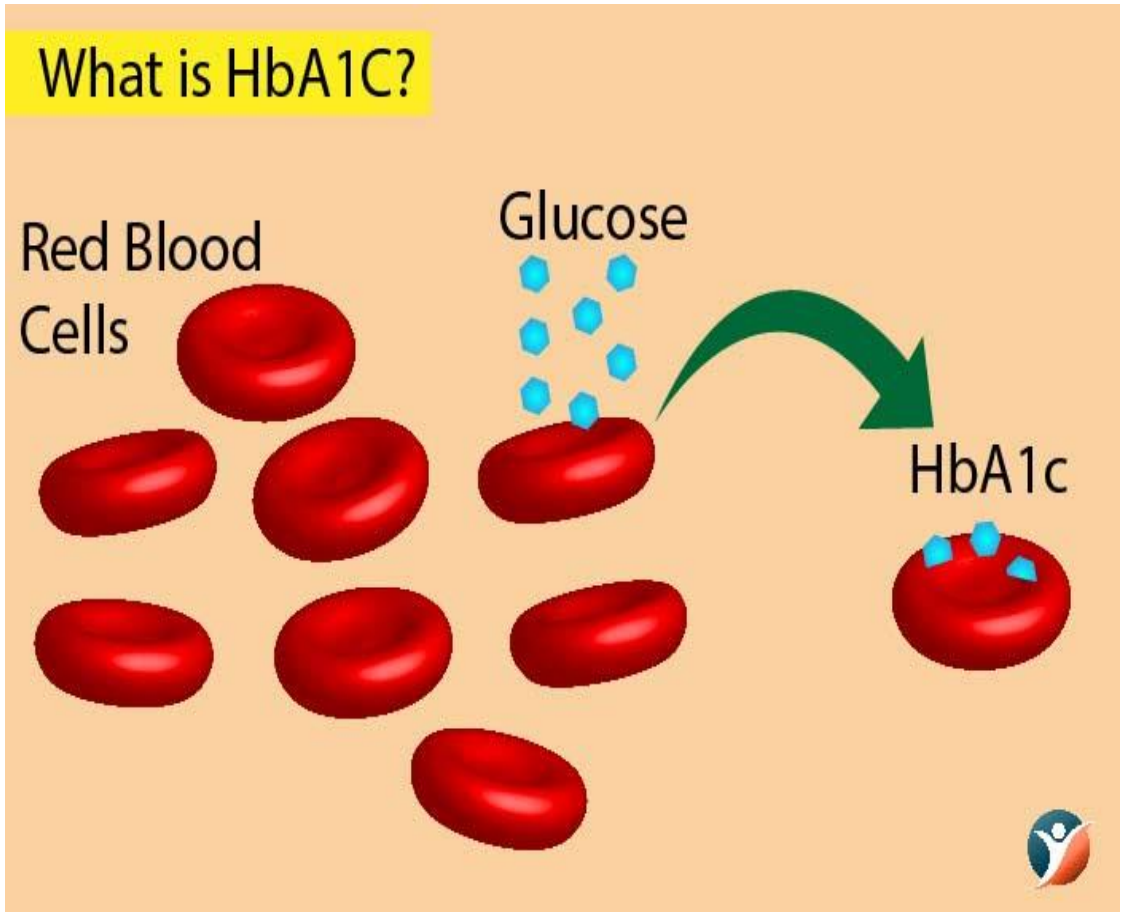
- **Heart Failure**

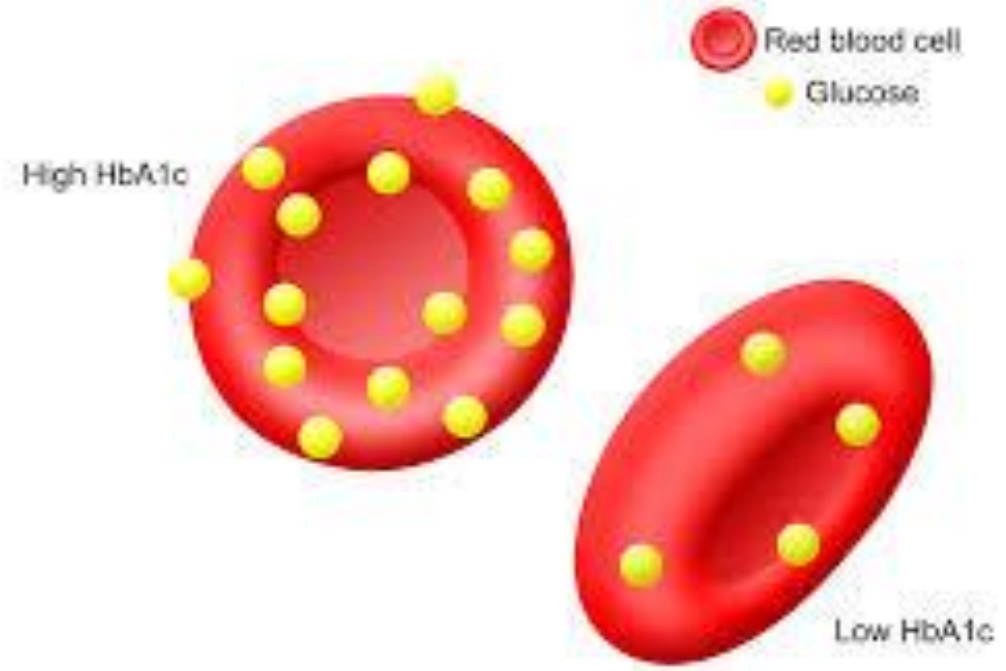
Fowler MJ. Clin Diabetes. 2011;29(3):116-22; Stratton IM et al. BMJ. 2000 Aug 12;321(7258):405-12.

Chronically uncontrolled sugars lead to…

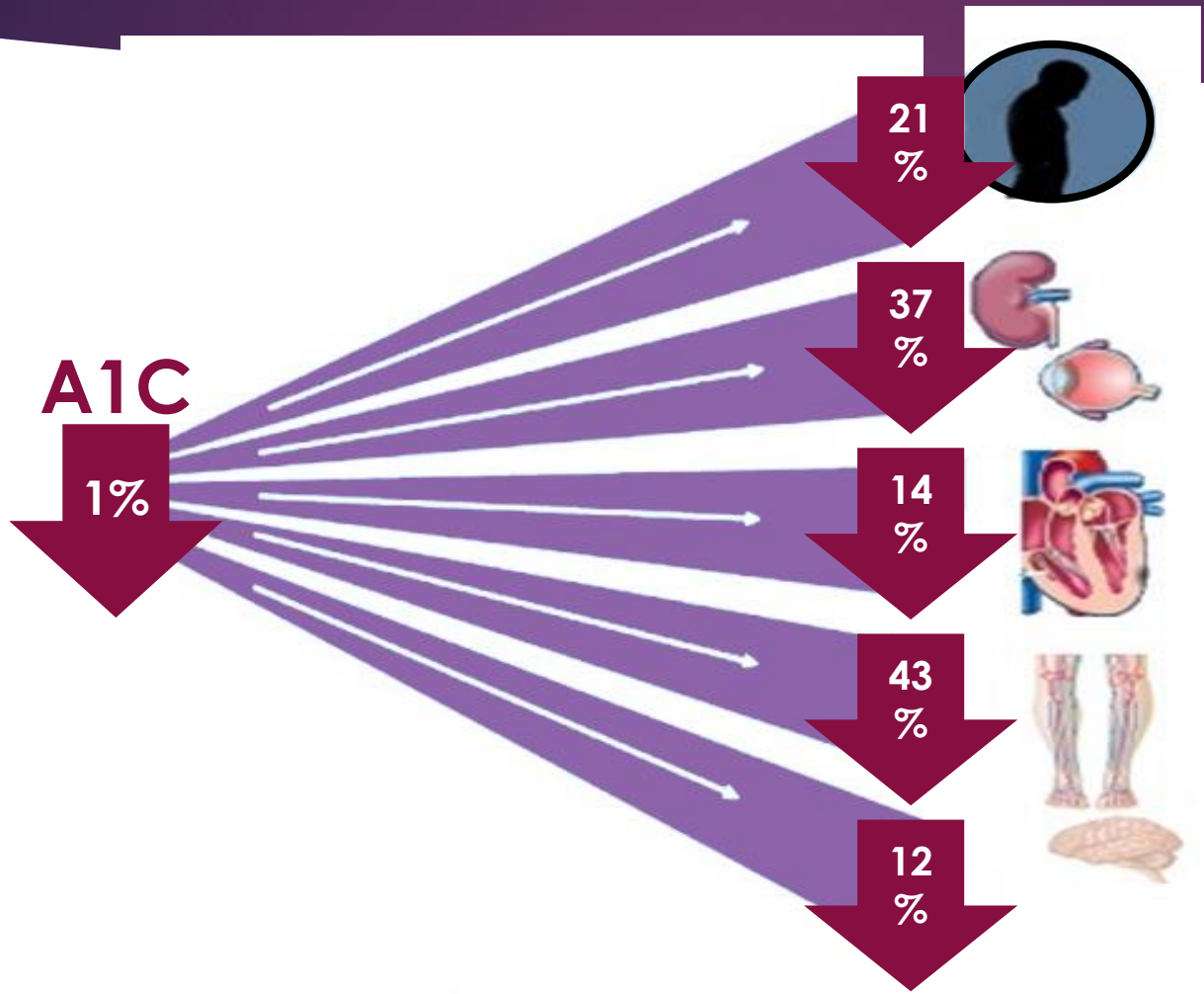
- Chronic kidney disease (CKD)
  - CKD is estimated to affect approximately 50% of people living with type 2 diabetes world-wide
- 50% of all new dialysis cases in Canada are due to diabetes
- The average survival for a diabetic patient on dialysis over age 65 is only about 2.5 years
- Diabetic retinopathy is the most common cause of incident blindness (legal) in people of working age

How do I know if my blood sugars are controlled?





Improving your sugar control reduces your risk of…



Deaths related to diabetes*

Microvascular complications e.g. kidney disease and blindness*

Heart attack*

Amputation or fatal peripheral blood disease*

Stroke†

*, P<0.0001; †, P=0.035.
Adapted from Stratton IM et al. BMJ. 2000 Aug 12;321(7258):405-12.

A1C Targets

≤6.5	Adults with type 2 diabetes to reduce the risk of CKD and retinopathy **if at low risk of hypoglycemia**
≤7.0	**MOST ADULTS WITH TYPE 1 OR TYPE 2 DIABETES**
7.1 ↓ **8.5**	**7.1-8.0%**: Functionally dependent* **7.1-8.5%:** • Recurrent severe hypoglycemia and/or hypoglycemia unawareness • Limited life expectancy • Frail elderly and/or with dementia**
Avoid higher A1C to minimize risk of symptomatic hyperglycemia and acute and chronic complications	
End of life	A1C measurement not recommended. Avoid symptomatic hyperglycemia and any hypoglycemia.

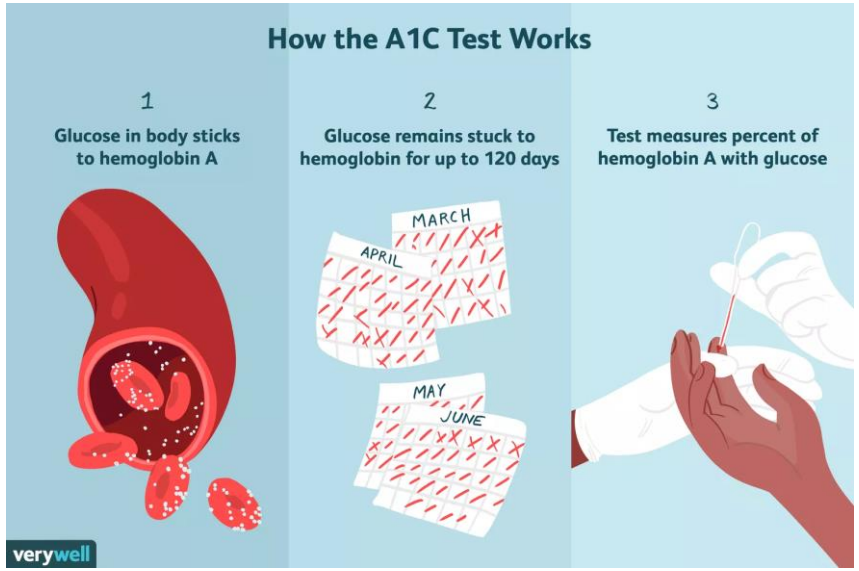
* Based on class of antihyperglycemic medication(s) utilized and person's characteristics
** see Diabetes in Older People chapter

ABCDES^3 of Diabetes Care

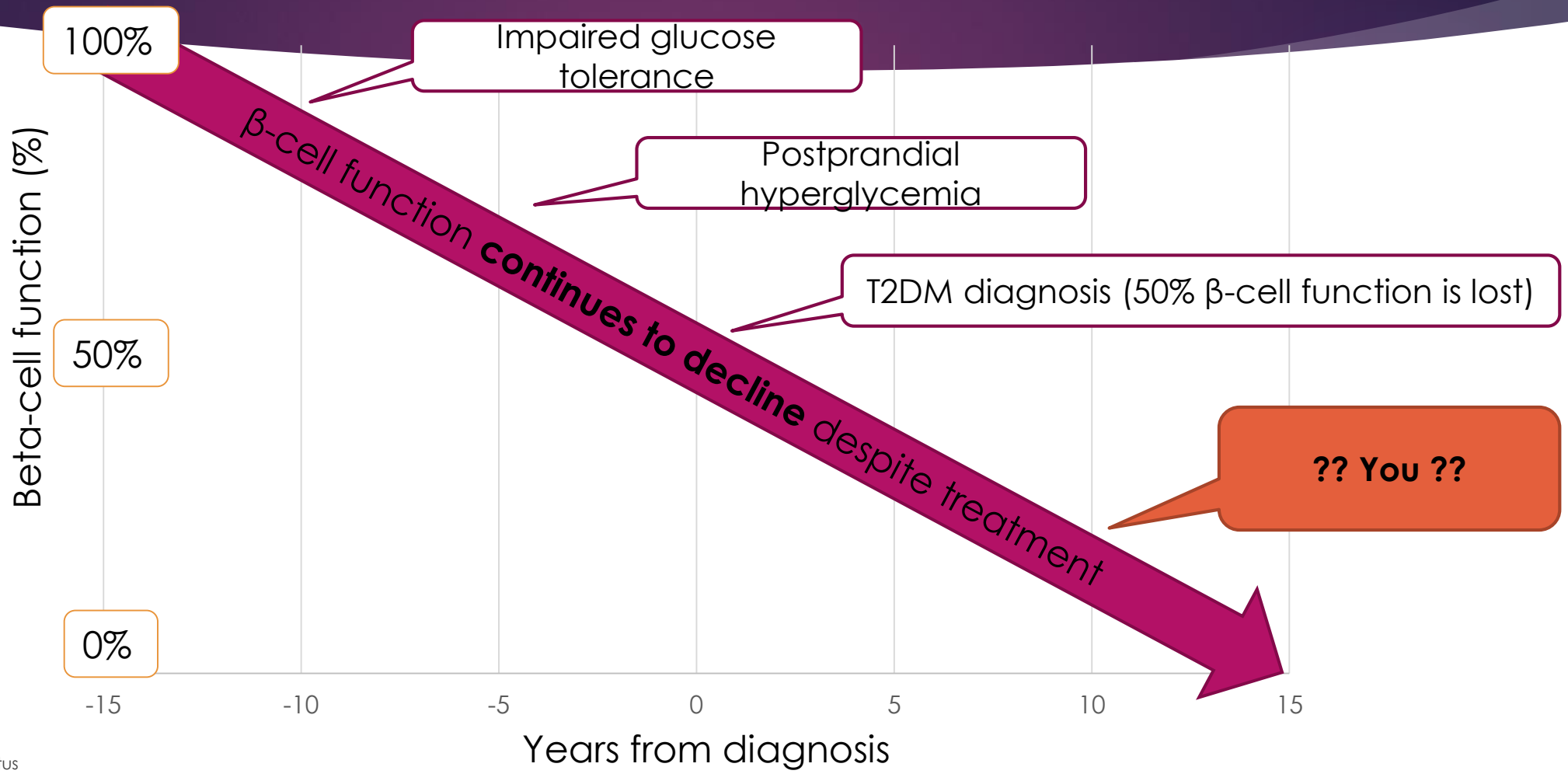
- ✓ **A** • A1C – optimal glycemic control (usually ≤7%)
- ✓ **B** • BP – optimal blood pressure control (<130/80 mmHg)
- ✓ **C** • Cholesterol – LDL <2.0 mmol/L or >50% reduction
- ✓ **D** • Drugs to protect the heart
  - A – ACEi or ARB | S – Statin | A – ASA if indicated | SGLT2i/GLP-1 RA with demonstrated CV benefit if type 2 DM with CVD and A1C not at target
- ✓ **E** • Exercise / Healthy Eating
- ✓ **S** • Screening for complications
- ✓ **S** • Smoking cessation
- ✓ **S** • Self-management, stress and other barriers

How can do I get diagnosed?

- Blood tests (including FBS and Hba1c) can easily tell your nurse or doctor what your sugar levels are/have been



Type 2 diabetes is progressive, requiring continuous treatment optimization



T2DM, type 2 diabetes mellitus

1. Lebovitz H. Insulin secretagogues: old and new. *Diabetes Reviews*. 1999;7(3):139–153; 2. UK Prospective Diabetes Study Group. UK Prospective Diabetes Study 16: overview of 6 years' therapy of type II diabetes: a progressive dis
1995;44(11):1249–1258; 3. Leibowitz G, et al. β-Cell failure in type 2 diabetes. *J Diabetes Investig*. 2011;2(2):82–91.

How can we treat diabetes?

- There are a wide variety of medication classes that your doctor can choose for you:
  A. Pills that help your bodies insulin do it's job better
  B. Pills that make your pancreas release more insulin
  C. Pills that make your kidneys remove more sugar through urine
  D. Injectable medications that are non-insulin and help your bodies insulin do it's job better
  E. Injectable insulin

Important Information to collect

- **UP TO DATE list of meds**
  - This can be ***emailed*** or ***faxed*** or a list can be made and ***kept handy in back pocket*** for doctor appointments
    - ***Blister pack lists***
- **Regular follow ups**
  - Family docs and NPs usually like to see or speak with you **once a year**
  - Specialists may schedule to see you **more** or **less**, depending on your conditions control

Important Information to collect

- **Regular blood work**
  - Book in advance!! Ensure this is done at least 48 hours before
  - Fasting vs. random
  - REQ: email, mail, or fax to lab
- **Vitals**
  - Arm BP machines vs. wrist
  - HRs

Important Information to collect

- Blood sugars **before meals** and **bed-time**
  - Using a traditional glucometer vs. CGM or FGM

- Phone apps that sync with your cellphone and glucometer
  - One Touch Reveal, Contour Diabetes App, Dexcom Clarity, Freestyle Libre
- Upload data
  - Online LibreView System, etc

AGP Report

26 April 2021 - 9 May 2021 (14 Days)

LibreView

GLUCOSE STATISTICS AND TARGETS

26 April 2021 - 9 May 2021	**14 Days**
% Time Sensor is Active	**61%**

Ranges And Targets For	Type 1 or Type 2 Diabetes
Glucose Ranges	**Targets** % of Readings (Time/Day)
Target Range 3.9-10.0 mmol/L	Greater than 70% (16h 48min)
Below 3.9 mmol/L	Less than 4% (58min)
Below 3.0 mmol/L	Less than 1% (14min)
Above 10.0 mmol/L	Less than 25% (6h)
Above 13.9 mmol/L	Less than 5% (1h 12min)

Each 5% increase in time in range (3.9-10.0 mmol/L) is clinically beneficial.

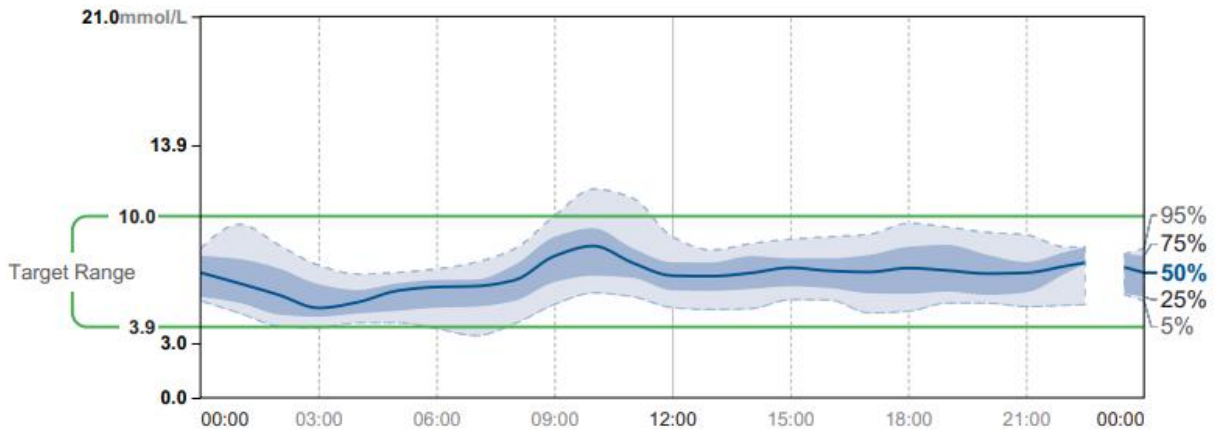
Average Glucose	**6.6** mmol/L
Glucose Management Indicator (GMI)	**6.2% or 44 mmol/mol**
Glucose Variability	**23.4%**

Defined as percent coefficient of variation (%CV); target ≤36%

TIME IN RANGES

AMBULATORY GLUCOSE PROFILE (AGP)

AGP is a summary of glucose values from the report period, with median (50%) and other percentiles shown as if occurring in a single day.



Tips and Tricks

- Gather the contact information for your doctors, clinic, pharmacy and your insurance
- Write down the names and doses of your medications
- Have enough medication for one-two weeks in case you cannot get to the pharmacy to refill your prescriptions
- Ensure you have enough device supplies as well (i.e. pump supplies, pen supplies, monitor supplies, etc.)
- Ensure all your medications have refills available, so you do not have to leave the house if you become ill
- Have extra supplies like rubbing alcohol, hand sanitizers and soap to wash your hands
- Keep simple sugars (i.e. glucose tablets) on-hand in case you need to treat low blood sugar which may occur more frequently with illness due to changes to eating patterns
- Have glucagon available in case of a significant low blood sugar (if taking insulin or medications that can cause low blood sugar)
- Have ketone strips available in case of illness (if you have type 1 diabetes)

COVID 19 Vaccines for Diabetics

- **Which vaccine is safe for people living with diabetes?**
  - There is no single vaccine that is better than others for people with diabetes
  - Diabetes Canada encourages adults living with type 1 or type 2 diabetes to receive the COVID-19 vaccine when it is accessible
  - The benefits of being vaccinated outweigh potential risks that could be associated with these vaccines, as well as the risks of contracting COVID-19
  - All the vaccines approved for use in Canada dramatically reduce the risk of hospitalization, severe illness, and death due to COVID
  - People living with both type 1 and type 2 diabetes were included in the vaccine clinical trials, with no increase in adverse events reported in these participants

COVID 19 and Diabetes

- **I have diabetes and I think I may be infected. What do I do?**
  - COVID-19 can cause more severe symptoms and complications in some people living with diabetes, as well as in older people, and those with other chronic health conditions
  - Monitor sugars more often
  - Speak with you doctor or NP
  - Staying hydrated and having unsweetened drinks on hand; and practicing eating smaller portions but more often

Recommendations for Sick Day Medication Counseling

DIABETES CANADA 2018

- **S** Sulfonylureas
- **A** Angiotensin Converting Enzyme Inhibitors
- **D** Diuretics, Direct Renin Inhibitors
- **M** Metformin
- **A** Angiotensin Receptor Blockers
- **N** Non-steroidal Anti-inflammatory
- **S** SGLT2 Inhibitors

Adapted from Diabetes Canada Clinical Practice Guidelines Expert Committee. Can J Diabetes. 2018 Apr;42 (Suppl 1):S88-103.

Is prevention of type 2 diabetes possible?

- YES IT IS!!!!!!!!
  - To reduce your chances of developing type 2 diabetes the number one thing you can do is controlling your weight and exercising
- Even after developing type 2 diabetes, losing weight and exercise can improve your blood sugars and reduce the amount, and even sometimes the need for medications

Thank you!!