

Diabetes: Can it be Prevented?

Principles of diabetes prevention and its complications

By : Martin Payer – pharmacist, CDE, Diabétiques de l'Outaouais president

Conflicts of interest

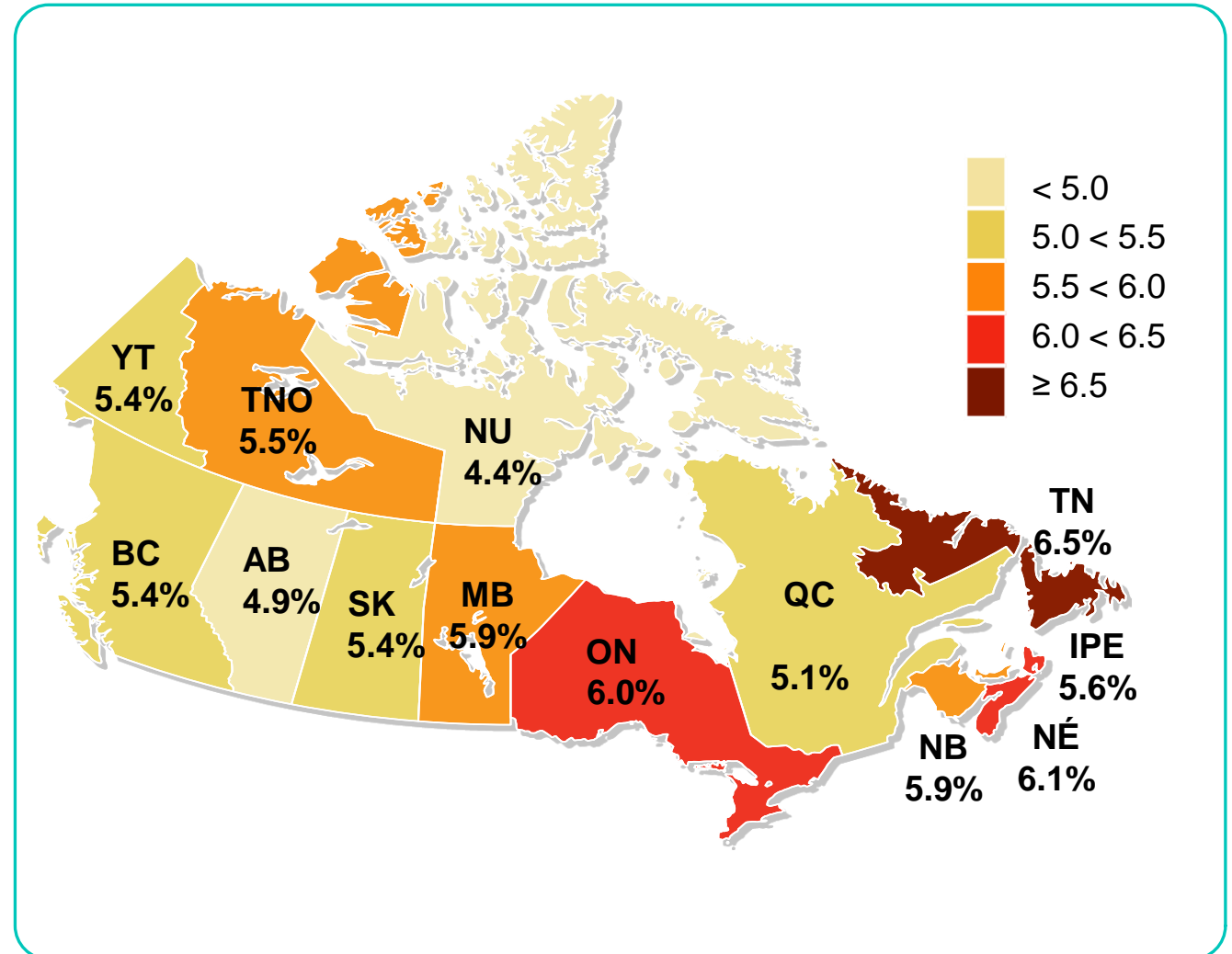
- Diabétiques de l'Outaouais President since 2015
- Pharmacist owner Pharmacies M.Payer et G. Bouallagui affiliated to Accès>Pharma
- Certified Diabetes Educator since 2010
- Certified insulin pump trainer
- Clinical teacher – Faculty of Medicine McGill University and Ottawa University
- Received honorarium for presentations and research : montméd, Abbott, Bayer, Sanofi, Dexcom



Diabetes prevalence

- Approximately 5% in Québec
- 830 000 people with diabetes (Qc)
 - 250 000 aren't aware they're diabetic!
- Ontario, Nova Scotia and PEI have the highest prevalence

DM prevalence people over ≥ 1 year, 2008/09

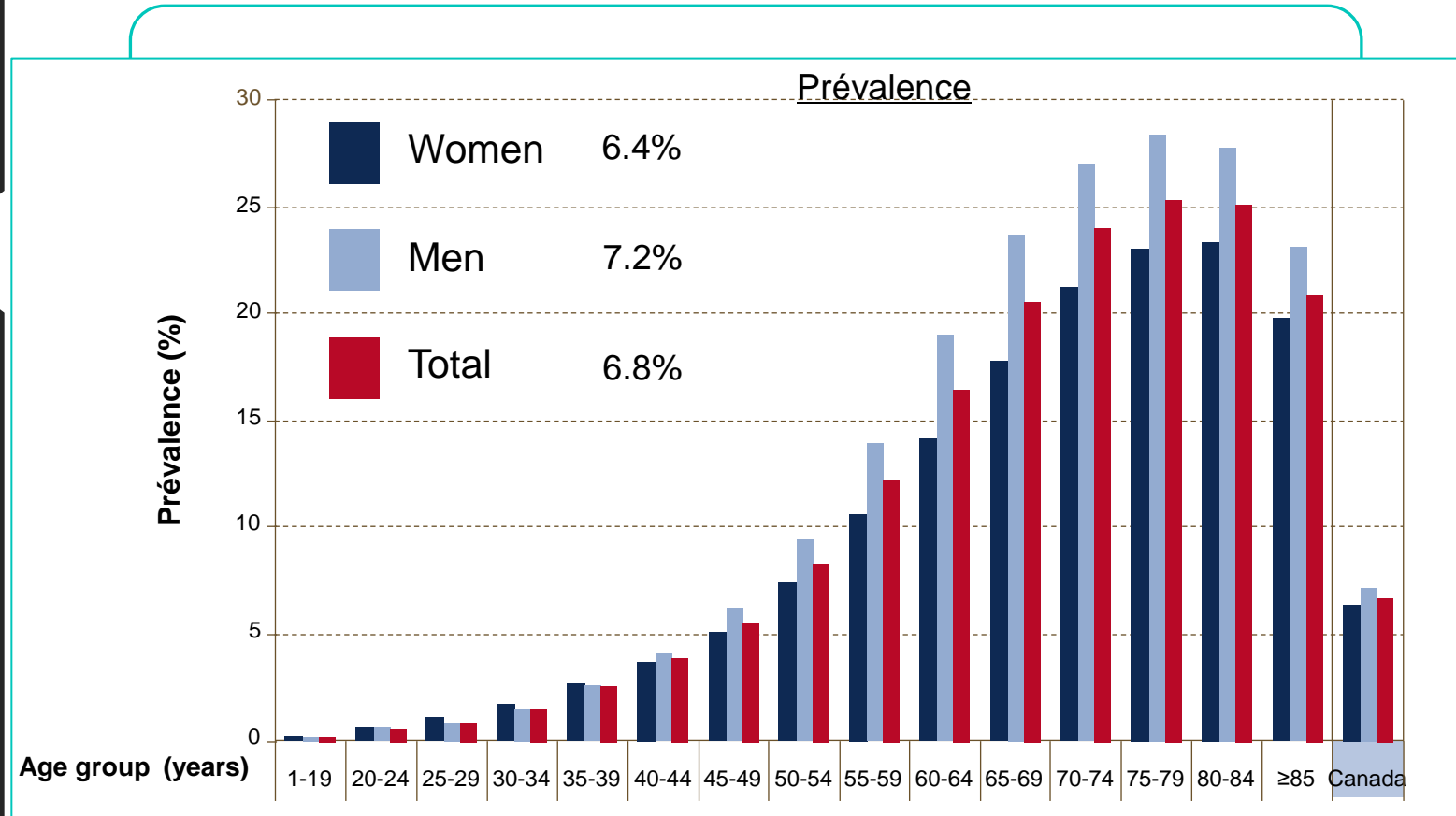


Public Health Agency of Canada. *Diabetes in Canada: Facts and figures from a public health perspective*. Ottawa, 2011.

Diabetes prevalence

- Increases with age
- Highest prevalence between 75-79 years old
- Large increase >40 years old

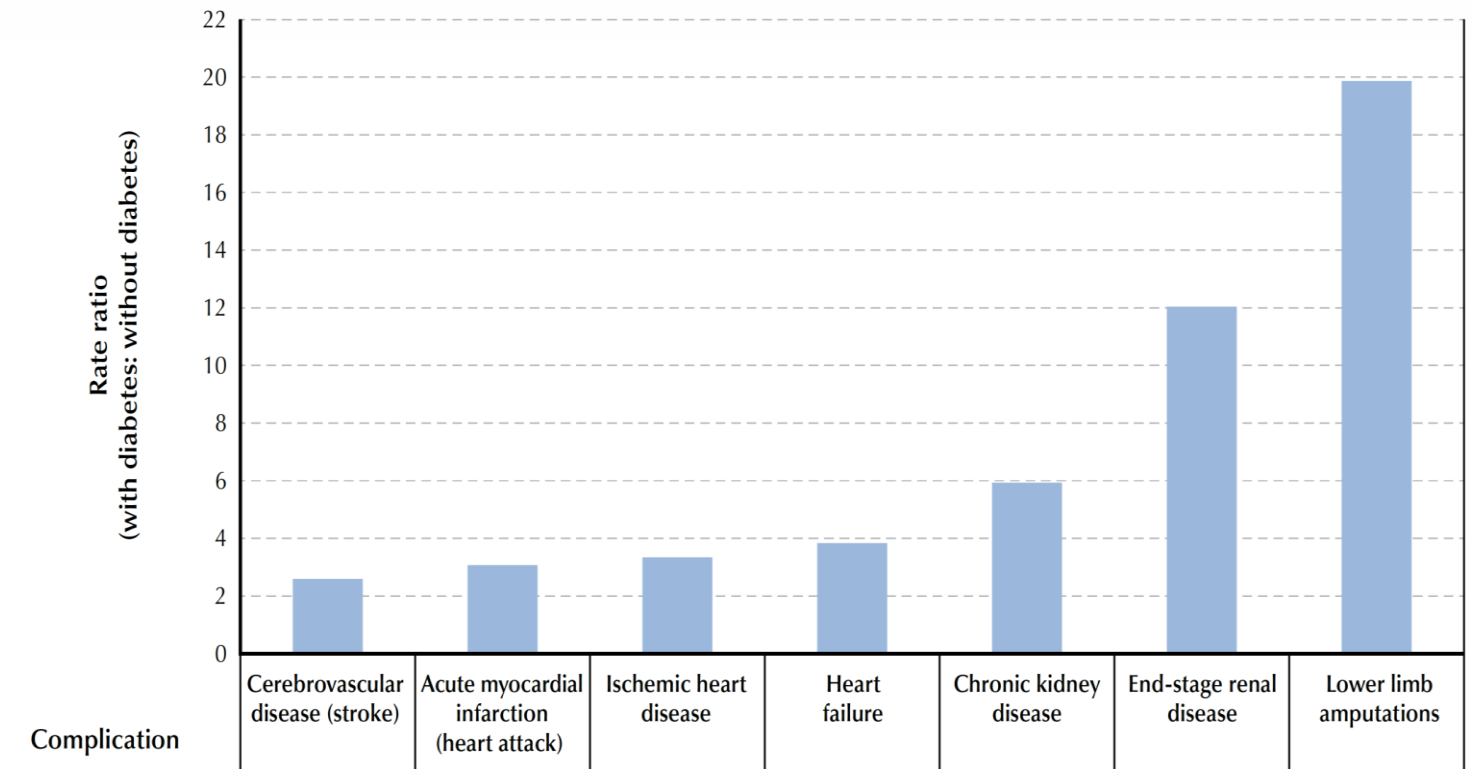
DM prevalence in people ≥ 1 year (age and sex), 2008/09



Public Health Agency of Canada. *Diabetes in Canada: Facts and figures from a public health perspective*. Ottawa, 2011.

- Diabetics are more likely to be hospitalized for multiple reasons
- Diabetes = 1st cause of blindness in <65yo
- 40% renal insufficiency
- 50% non-traumatic amputations

Figure 2-2. Prevalence rate ratios[†] of complications among hospitalized individuals[‡] aged 20 years and older, by diabetes status, Canada, 2008/09



[†] Rate ratios based on rates age-standardized to the 1991 Canadian population.

[‡] A person with diabetes hospitalized with more than one complication was counted once in each category, except for cases of acute myocardial infarction, where regardless of multiple counts in the acute myocardial infarction category, the individual was counted only once under the broader ischemic heart disease category.

Types of diabetes

Type	Definition
Type 1 (DI)	Caused by destruction of beta cells found in the pancreas. NO insulin, usually diagnosed in children
Type 2 (DII)	Caused by resistance to insulin and a decreased production of insulin on different levels .
Gestationnal Diabetes	Intolerance to glucose during pregnancy
Other types	Medical causes and other rare genetic diseases

Diabetes diagnostic

**DIABETES
CANADA**

Fasting blood glucose $\geq 7.0\text{mmol/L}$

OR

A1C $\geq 6.5\%$

OR

2hr at 75g OGTT $\geq 11.1\text{mmol/L}$

OR

Blood sugar $\geq 11.1\text{mmol/L}$

Pre-diabetic

- Predisposition to developing diabetes
- Is meant as a warning to instore changes to prevent diabetes
- High probability of developing T2D

Test	Result	Category
Fasting glucose (mmol/L)	6.1 - 6.9	Impaired fasting glucose (IFG)
2-hr to 75-g OGTT (mmol/L)	7.8 – 11.0	Impaired glucose tolerance (IGT)
Glycated hemoglobin (A1C) (%)	6.0 - 6.4	Pre-diabetes

Risk of developing diabetes

A1C (%)	Diabetes incidence in 5 years
5.0-5.5	<5 to 9%
5.5-6.0	9 to 25%
6.0-6.5	25 to 50%

**All this info is nice but can we
predict who will be affected by
diabetes?**

Risk factors (T2D)

- 1st degree family diabetic (T2D)
- High risk population (Aboriginal, Asian, African, Hispanic)
- Pre-diabétique
- History of gestationnal diabetes
- Presence of complications (macrovascular or microvascular)**
- Concurrent diseases (MS, Sleep apnea, psychiatric disorders, HIV)
- Certains medication (steroids, antipsychotics, antiretroviral)

CANRISK Survey

- Quick survey that helps determine someone's risk of developing diabetes
- Based on different risk factors

RISK QUESTIONNAIRE

CANRISK

→ Are you at risk?

The following questions will help you to find out if you are at higher risk of having pre-diabetes or type 2 diabetes. Pre-diabetes is a condition where a person's blood sugar levels are higher than normal, but not high enough to be diagnosed as diabetes. You can have pre-diabetes or undiagnosed type 2 diabetes without having any obvious warning signs or symptoms. Knowing your risk can help you make healthy choices now that will reduce your risk or even prevent you from developing diabetes. Please answer the questions as honestly and completely as you can. If you wish, a friend or family member can help you to complete this form. The answers to these questions are completely confidential. Answer all questions. Enter your scores for each question in the box on the right-hand side and then add them up to calculate your total risk score.

This questionnaire is intended for adults aged 40 to 74 years.

→ **AS YOU GET OLDER, YOUR RISK OF DEVELOPING DIABETES GOES UP.**

1. **Select your age group:**
- 40-44 years 0 points
 - 45-54 years 7 points
 - 55-64 years 13 points
 - 65-74 years 15 points

2. **Are you male or female?**
- Male 6 points
 - Female 0 points

→ **BODY SHAPE AND SIZE CAN AFFECT YOUR RISK OF DIABETES.**

3. **How tall are you and how much do you weigh?**
On the left-hand side of the BMI chart below, circle your height, then on the bottom of the chart circle your weight. Find the square on the chart where your height crosses with your weight, and note which shaded area you fall into. For example, if you were 5 feet 2 inches (or 157.5cm) and 163 pounds (or 74kg) you would fall in the LIGHT GREY area.

- Select your BMI group from the following choices:
- White (BMI less than 25) 0 points
 - Light grey (BMI 25 to 29) 4 points
 - Dark grey (BMI 30 to 34) 9 points
 - Black (BMI 35 and over) 14 points

height	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355	360	365	370	375	380	385	390	395	400	405	410	415	420	425	430	435	440	445	450	455	460	465	470	475	480	485	490	495	500	505	510	515	520	525	530	535	540	545	550	555	560	565	570	575	580	585	590	595	600	605	610	615	620	625	630	635	640	645	650	655	660	665	670	675	680	685	690	695	700	705	710	715	720	725	730	735	740	745	750	755	760	765	770	775	780	785	790	795	800	805	810	815	820	825	830	835	840	845	850	855	860	865	870	875	880	885	890	895	900	905	910	915	920	925	930	935	940	945	950	955	960	965	970	975	980	985	990	995	1000																																																																																																																																																																																																																																																																																			
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4. **Using a tape measure, place it around your waist at the level of your belly button.**

Measure after breathing in (do not hold your breath) and same your results on the first circle.

Then check the box that contains your measurement. (Note: this is not the same as the "waist size" on your pants).

- ↑ **MEN – Waist circumference:** _____ inches OR _____ cm
- Less than 94 cm or 37 inches 0 points
 - Between 94-102 cm or 37-40 inches 4 points
 - Over 102 cm or 40 inches 6 points

- ↓ **WOMEN – Waist circumference:** _____ inches OR _____ cm
- Less than 80 cm or 31.5 inches 0 points
 - Between 80-88 cm or 31.5-35 inches 4 points
 - Over 88 cm or 35 inches 6 points

Diabetes complications

Macrovascular

- Cardiovascular disease (HF, HBP, peripheral disease)

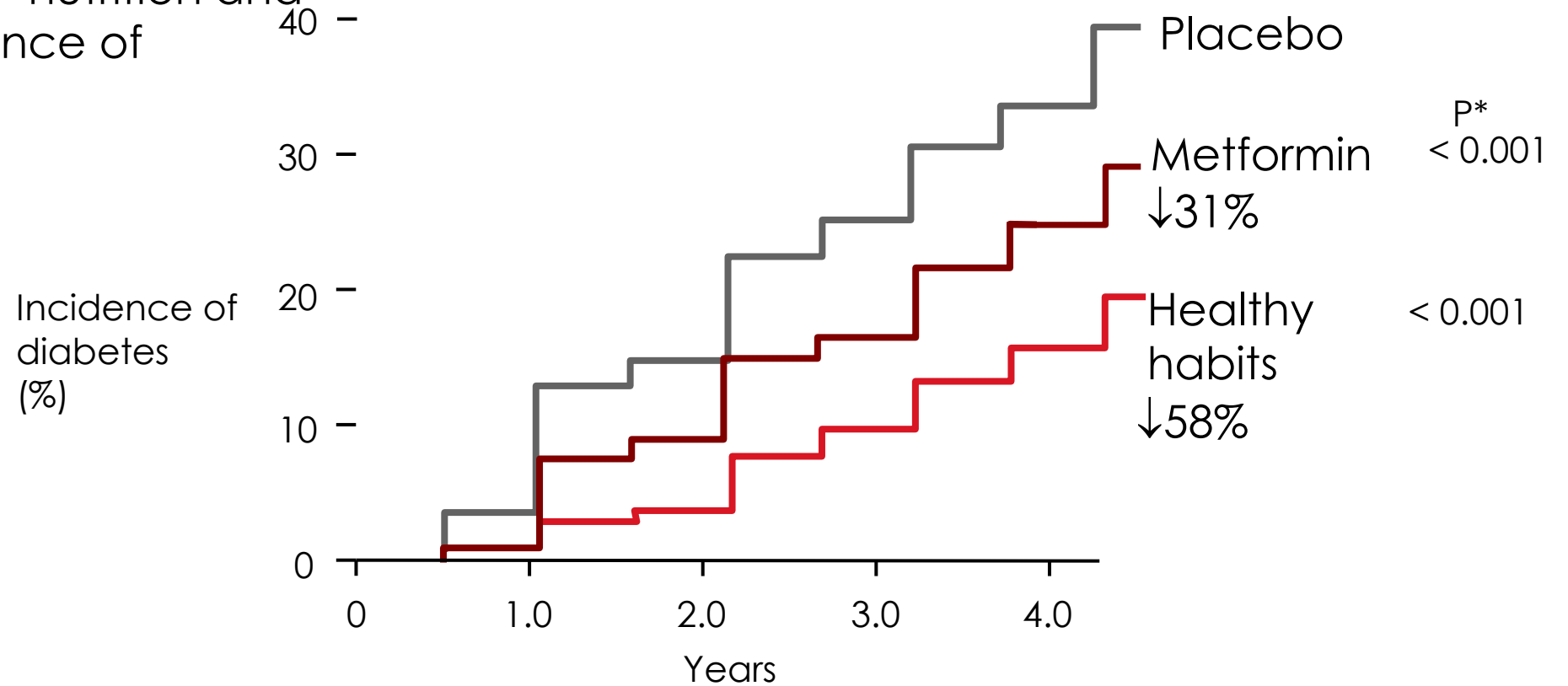
Microvascular

- Retinopathy
- Nephropathy
- Neuropathy

Ok, but can we prevent diabetes?

Prevention

- Benefits of exercise + nutrition and metformin on incidence of diabetes
- N = 3234



Modifications to health habits

- We can't change everything at once !!!
- One step or one aspect at a time
- Having help from a friend or loved one increase the chance of success
- Satisfaction of small wins
 - Long term objectives
- Action plan – written !



Modifications to health habits

EXERCISE

NUTRITION

WEIGHT

TOBACCO
USE

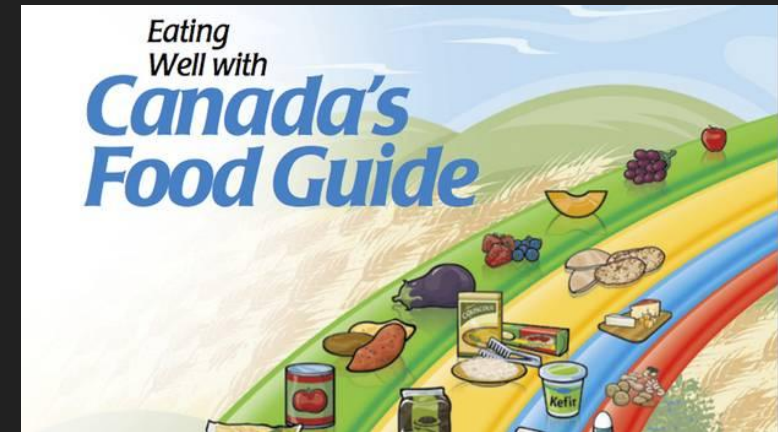
Exercise

- We're not talking about, all of a sudden, becoming a marathon runner or gym buff!
- 150 min of exercise of medium intensity (aerobic) per week (<2 consecutive days without exercise) and 2 sessions of resistance exercises
 - Aerobic : brisk walk, bike, jogging (min 10 mins)
 - Resistance: weights, resistance bands
 - Combinaison: yoga
- Being inactive is much more harmful than the risks associated to exercising!
- There are many benefits of exercise (cardiovascular health, energy, happiness, etc.)



Nutrition and Weight

- Here as well we suggest small changes– you don't have to suddenly become vegetarian !
- Decreases HbA1C by 1.0-2.0 %
- Caloric decrease will encourage weight loss
 - 5 to 10% of body weight
- Portion control !!!
- Meals at regular intervals
- There are no magical diets...it needs to be individualized
 - Nutritionist



Nutrition – a few tips

- Labels !!!!!
- Fibre
 - Decreases gastric emptying, decreases glycemc variation, decreases cholesterol
- Minimize food with a high glycemc index
- Sugar oh sugar
 - Sweeteners
 - Portion control
- Fat
 - Omega3
- Alcohol

Nutrition Facts	
Serving Size 1 cup (252g)	
Amount Per Serving	
Calories 355	Calories from Fat 103
% Daily Value*	
Total Fat 11g	18%
Saturated Fat 2g	8%
Trans Fat	
Cholesterol 5mg	2%
Sodium 239mg	10%
Total Carbohydrate 50g	17%
Dietary Fiber 0g	0%
Sugars 50g	
Protein 13g	
Vitamin A 25%	Vitamin C 50%
Calcium 20%	Iron 25%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.	
NutritionData.com	



Smoking cessation

- Is a risk factor for pretty much every known disease...
- Benefits to heart health, lungs, emotional, etc.
- NOT EASY but there are different strategies to help
- Go see your favorite pharmacist !

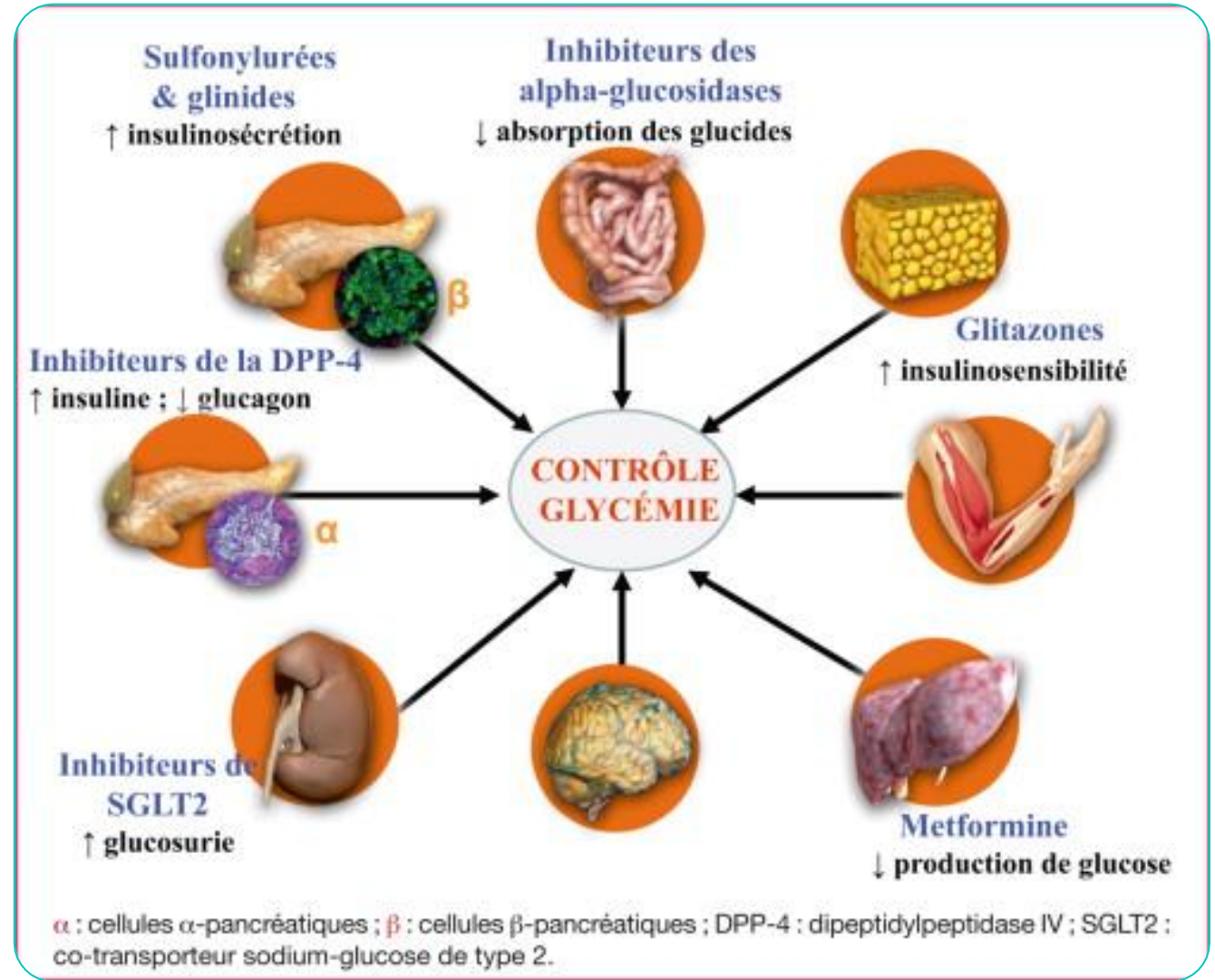


Targets for diabetics

- A1C $\leq 7\%$ ** + fasting blood sugar between 4 and 7 mmol/L + post-prandial glycemia between 5 and 10 mmol/L
- Decreases chances of complications (micro et macrovascular)
 - ↓76% retinopathy
 - ↓34% albuminuria
 - ↓50% neuropathy
 - ↓57% infarction, stroke, death

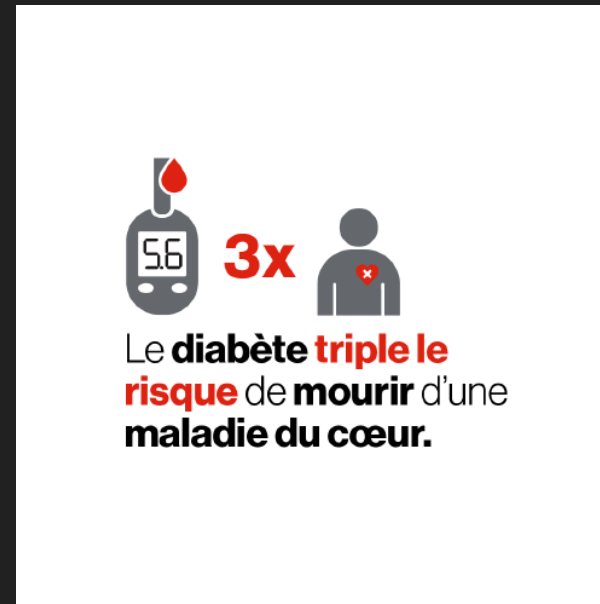
Drugs

- Many different treatments available depending on the severity and risk factors
 - Metformin
 - Secretagogues (gliclazide, glyburide) and DPP4 inh (Januvia, Nesina, Onglyza, etc)
 - SGLT2 inh (Jardiance, Invokana, Forxiga)
 - GLP-1 analogs (Victoza, Ozempic, Trulicity)
 - Insulin !
 - Fast acting
 - Long acting
 - Ultra long acting



Vascular protection

- Major complication of diabetes = Vascular protection (infarctus, stroke)
- Some medications offer protection and decrease risks of cardiovascular problems
 - Inh SGLT2
 - GLP-1 analogs
 - Statins
 - ACEi/ARB
 - AAS***



Key Messages

- PREVENTION !!!
- What is your risk of developing diabetes?
- High prevalence – this century's epidemic
- Healthy habits
- Take care of yourselves; diabetes is a disease that increases the risk of many complications

Thanks !!! Questions ?

