DIABETES CANADA

2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada

Les éléments essentiels

Objectifs

- 1.- Connaitre les particularités des nouvelles lignes directrices de **Diabète Canada 2018**
- 2.- Connaitre **l'algorithme de traitement** du diabète de type 2 en 2018
- 3.- Personnaliser le traitement en **présence** ou **non** de **maladie cardiovasculaire établie** dans le diabète de type 2

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Faculty/Presenter Disclosure

- **Faculty: Dr. Jean-Marie Ekoé**

- **Relationships with commercial interests:**

  Consultant/Advisory Board Honorarium:
  Speaker's Honorarium:

  Merck, AstraZeneca, Janssen, Novo Nordisk, Eli Lilly, Sanofi, BMS, Boehringer Ingelheim,

Atténuation d'un biais potentiel

- The **evidence presented and referenced** in the program materials was selected for inclusion in the program based on **consensus of the planning committee**
- **Data** are published and recommendations are from **evidence-based guidelines** – the Diabetes Canada clinical practice guidelines
- **Presenters** have been informed that they **must declare all off-label** use to the audience during their presentation and identify when **comments are from their own personal opinion.**

Les Lignes Directrices de Diabète Canada 2018

- The 2018 guidelines were released on **April 9, 2018** and are housed on the Diabetes Canada website at **http://guidelines.diabetes.ca**

- In addition to the full guidelines, various **tools** and **resources** are present on the website and are updated regularly

- Only medications with **Health Canada Notice of Compliance** granted by September 15, 2017 were included

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IDF *DIABETES ATLAS*

Eighth edition 2017

International Diabetes Federation

Diabetes around the world

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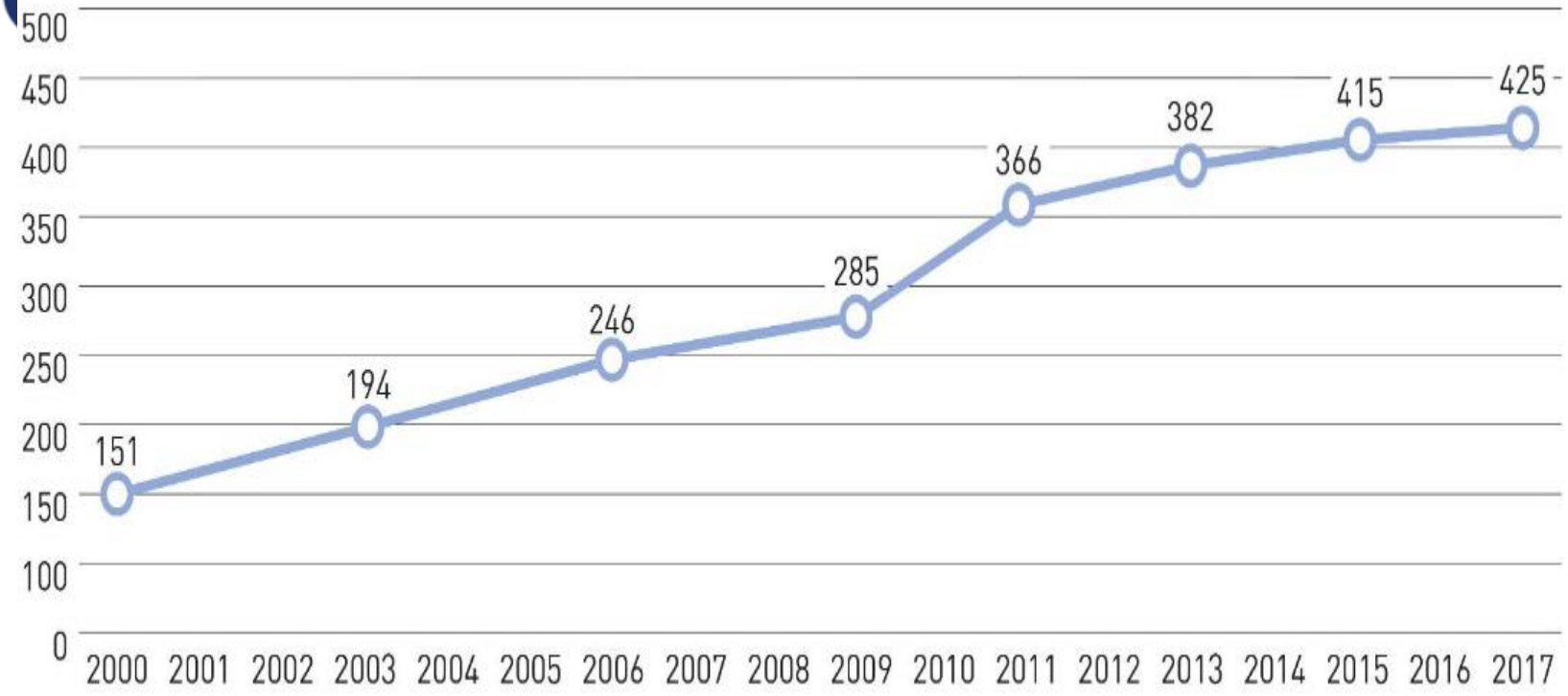
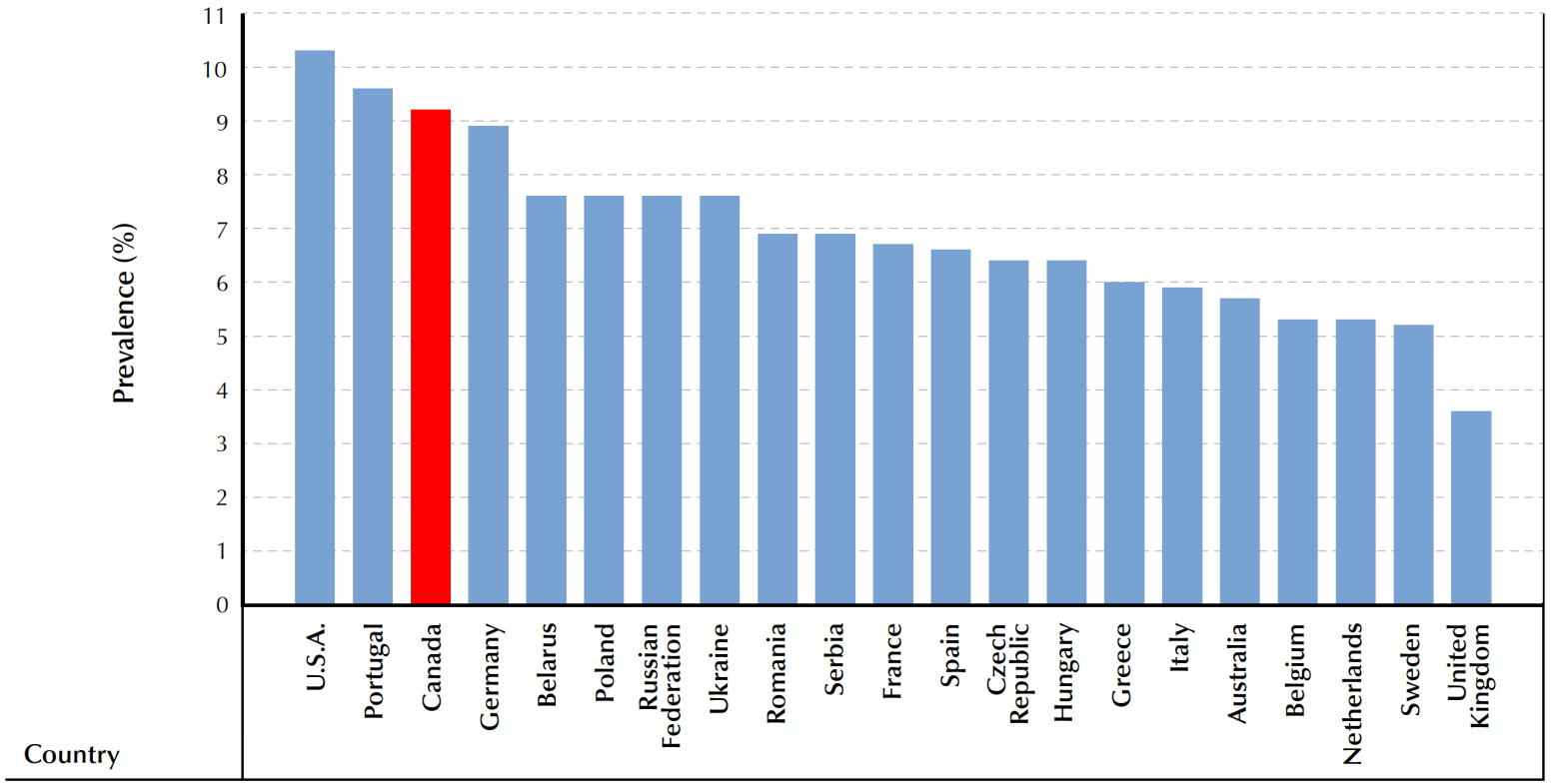
Total number of adults with diabetes (20-79 years)



Prevalence of Diabetes **among Individuals aged 20-79 years**, **Europe**, **North America**, **Oceania**, 2010



† Standardized to the global population.

Source: Public Health Agency of Canada (2011); adapted from Shaw JE, Sicree RA, Zimmet PZ. Global estimates of the prevalence of diabetes for 2010 and 2030. *Diab Res Clin Pract* 2010;87:4-14.

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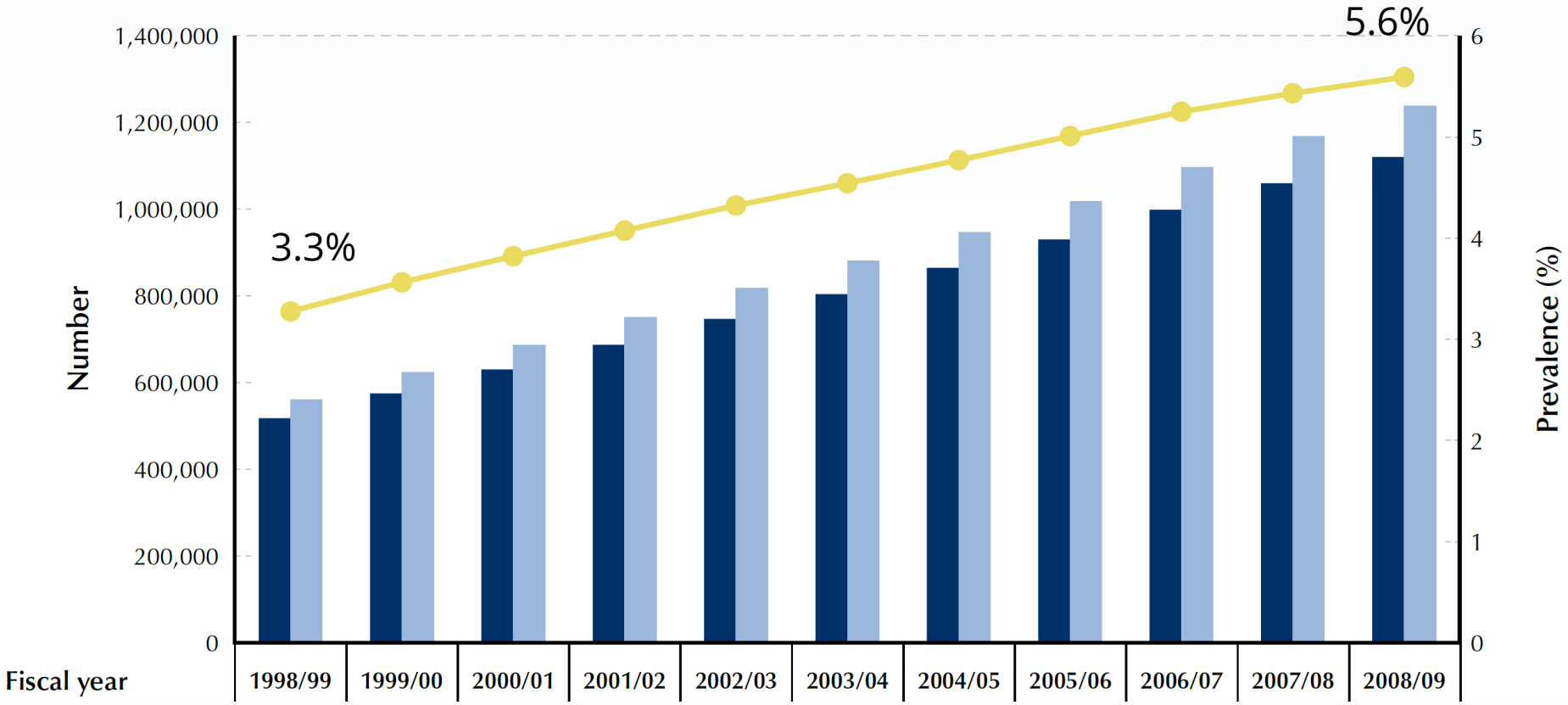
Diabetes in Canada: Prevalence of Diagnosed Diabetes 1998/99 to 2008/09

Age-standardized prevalence and number of cases of **diagnosed diabetes** among individuals **aged ≥ 1 year**, 1998/99 to 2008/09



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

Message Clé Diabète 2018

- L'importance **d'individualiser le traitement** pour la **personne atteinte de diabète** demeure à travers les lignes directrices.

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2018 Clinical Practice Guidelines

Screening for Diabetes in Adults

Chapter 4

Jean-Marie Ekoe MD CSPQ PD,

Ronald Goldenberg MD FRCPC FACE,

Pamela Katz MD FRCPC

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Dépistage et Diagnostic du Diabète

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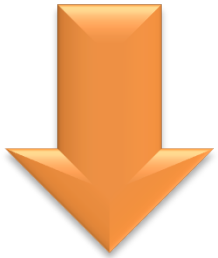
Avons-nous besoin de dépister le Diabète de Type 1 ?



NON

Il n'y a pas assez d'évidence provenant

d'interventions pour prévenir ou retarder l'apparition du Diabète de Type 1

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No Safe and Effective Strategies to Prevent Type 1 diabetes at this time

- Type 1 diabetes is a chronic autoimmune condition with destruction of pancreatic beta cells
- Ongoing or completed trials
  - ENDIT[1]: High-dose nicotinamide – Not effective
  - DPT-1[2]: Low-dose insulin in high risk relatives – Not effective overall
  - TRIGR[3]: Exclusion of cow's milk protein to infants until 6-8 months of age – Not effective
- Alternate strategy to use **immunosuppression / modulation** at the time of diagnosis but **significant side effects** and **ethical** considerations

1. Lancet 2004;363:925
2. NEJM 2002;346:1685, Diabetes Care 2005;28:1068
3. JAMA 2014;311:2279

Diagnosis of Diabetes

FPG ≥7.0 mmol/L

Fasting = no caloric intake for at least 8 hours

or

A1C ≥6.5% (in adults)

Using a standardized, validated assay in the absence of factors that affect the accuracy of the A1C and not for suspected type 1 diabetes

or

2hPG in a 75 g OGTT ≥11.1 mmol/L

or

Random PG ≥11.1 mmol/L

Random = any time of the day, without regard to the interval since the last meal

FPG, fasting plasma glucose; OGTT, oral glucose tolerane test; PG, plasma glucose

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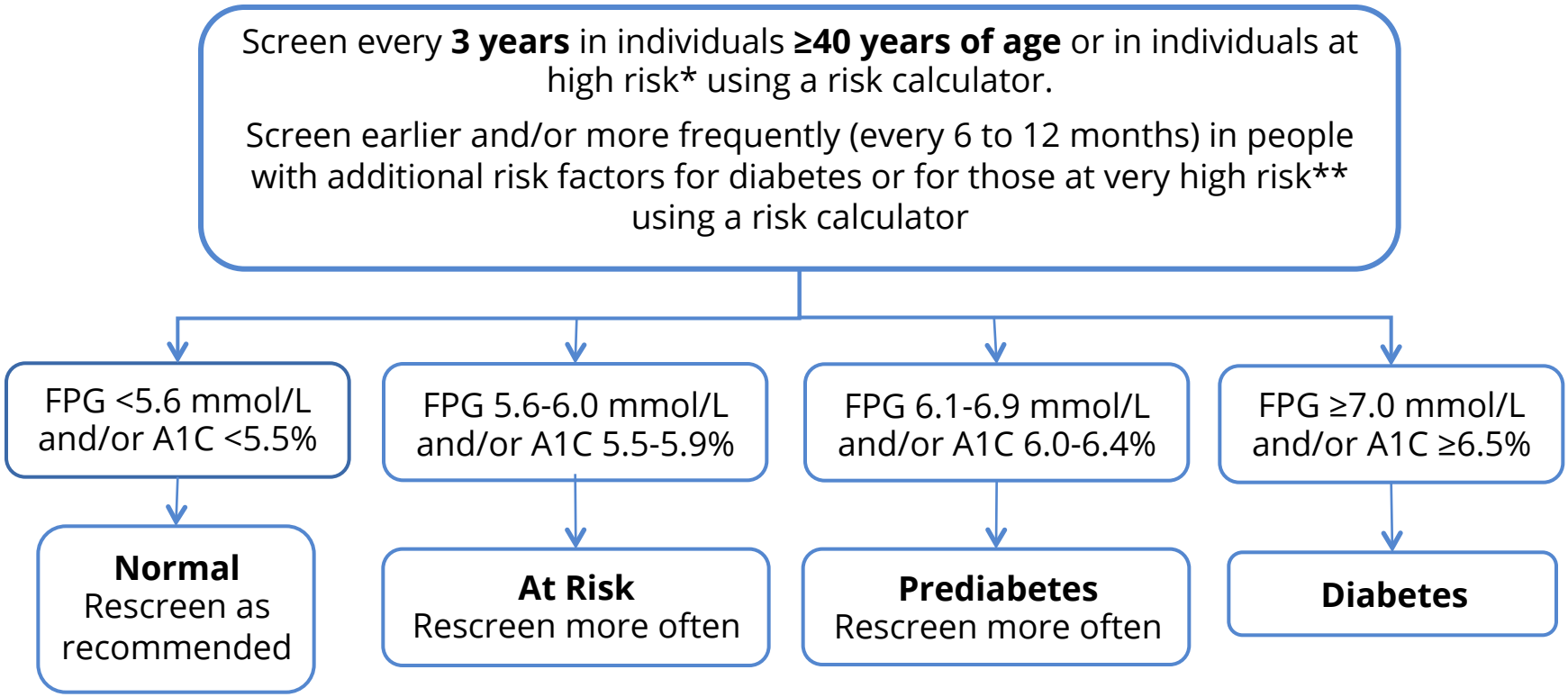
2018

Dépistage du diabète de type 2 chez les adultes



If both FPG and A1C are available, but discordant, use the test that appears furthest to the right side of the algorithm.

*Consider 75-g OGTT if 1 risk factors; ** Consider 75-g OGTT

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Diagnostic du prédiabète

Tests	Result	Prediabetes category
FPG (mmol/L)	6.1-6.9	IFG
2h PG in a 75g OGTT (mmol/L)	7.8-11.0	IGT
A1C (%)	6.0-6.4	Prediabetes

2hPG, 2-hour plasma glucose; *AlC,* glycated hemoglobin; *FPG,* fasting plasma glucose; *IFG,* impaired fasting glucose; *IGT,* impaired glucose tolerance; OGTT, oral glucose tolerance test.

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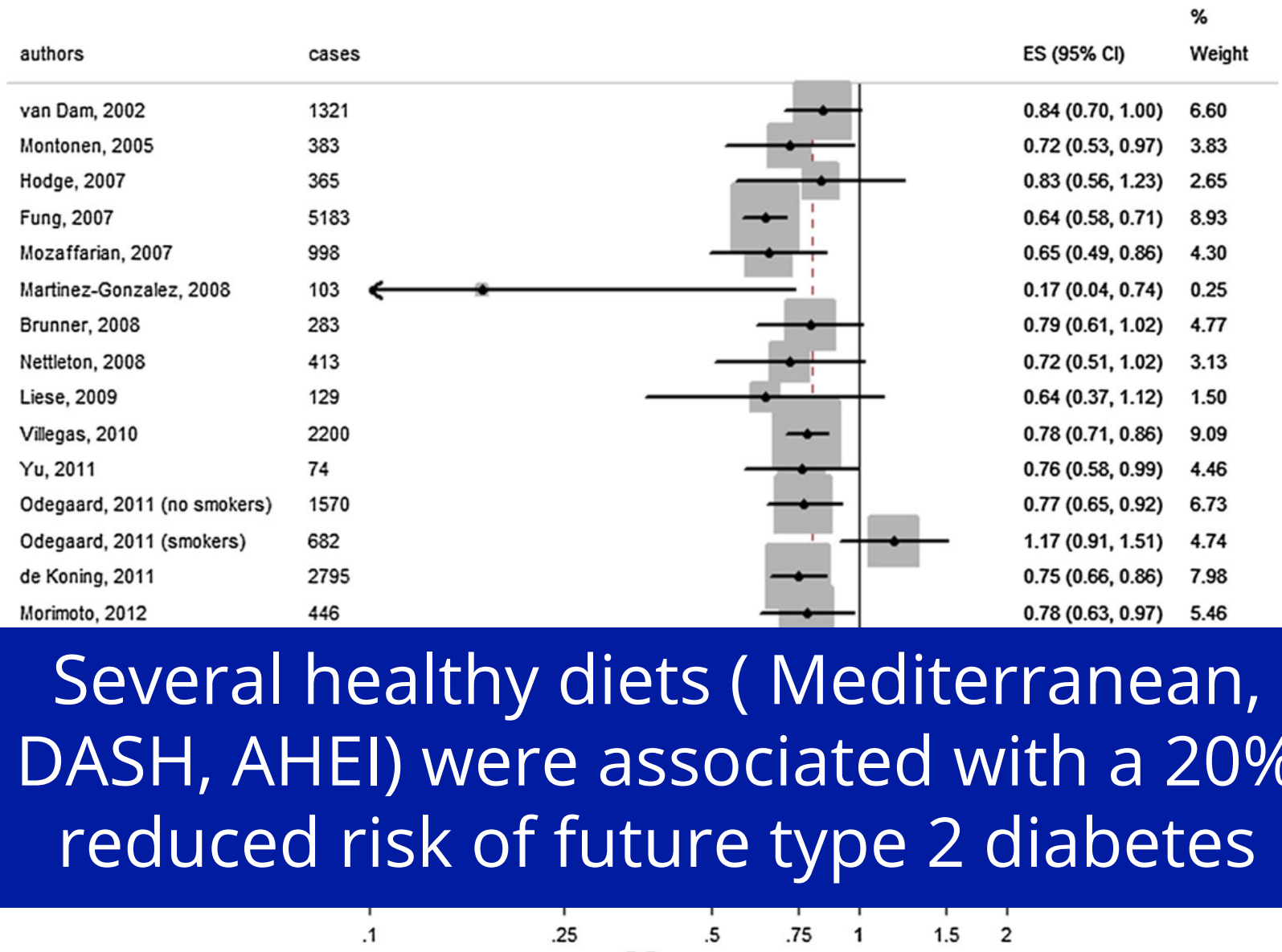
Meta-analysis of healthy dietary patterns and reduced risk of type 2 diabetes



Several healthy diets (Mediterranean, DASH, AHEI) were associated with a 20% reduced risk of future type 2 diabetes

Esposito K et al. Endocrine 2014;47:107-116.

2018

Recommendation 2

2. In individuals at risk for type 2 diabetes, dietary patterns may be used to reduce the risk of diabetes, specifically:

   - **Mediterranean-style** [Grade C, Level 3]
   - **DASH (Dietary Approaches to Stop Hypertension)** [Grade C, Level 3]
   - **AHEI (Alternate Healthy Eating Index) diet** [Grade C, Level 3]

Approche globale de la Gestion du Diabète

2018

ABCDES^3 of Diabetes Care

- ü**A** • A1C – optimal glycemic control (usually ≤7%)
- ü**B** • BP – optimal blood pressure control (<130/80)
- ü**C** • Cholesterol – LDL <2.0 mmol/L or >50% reduction
- ü**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
- ü**E** • Exercise / Healthy Eating
- ü**S** • Screening for complications
- ü**S** • Smoking cessation
- ü**S** • Self-management, stress and other barriers

DIABETES CANADA

2018

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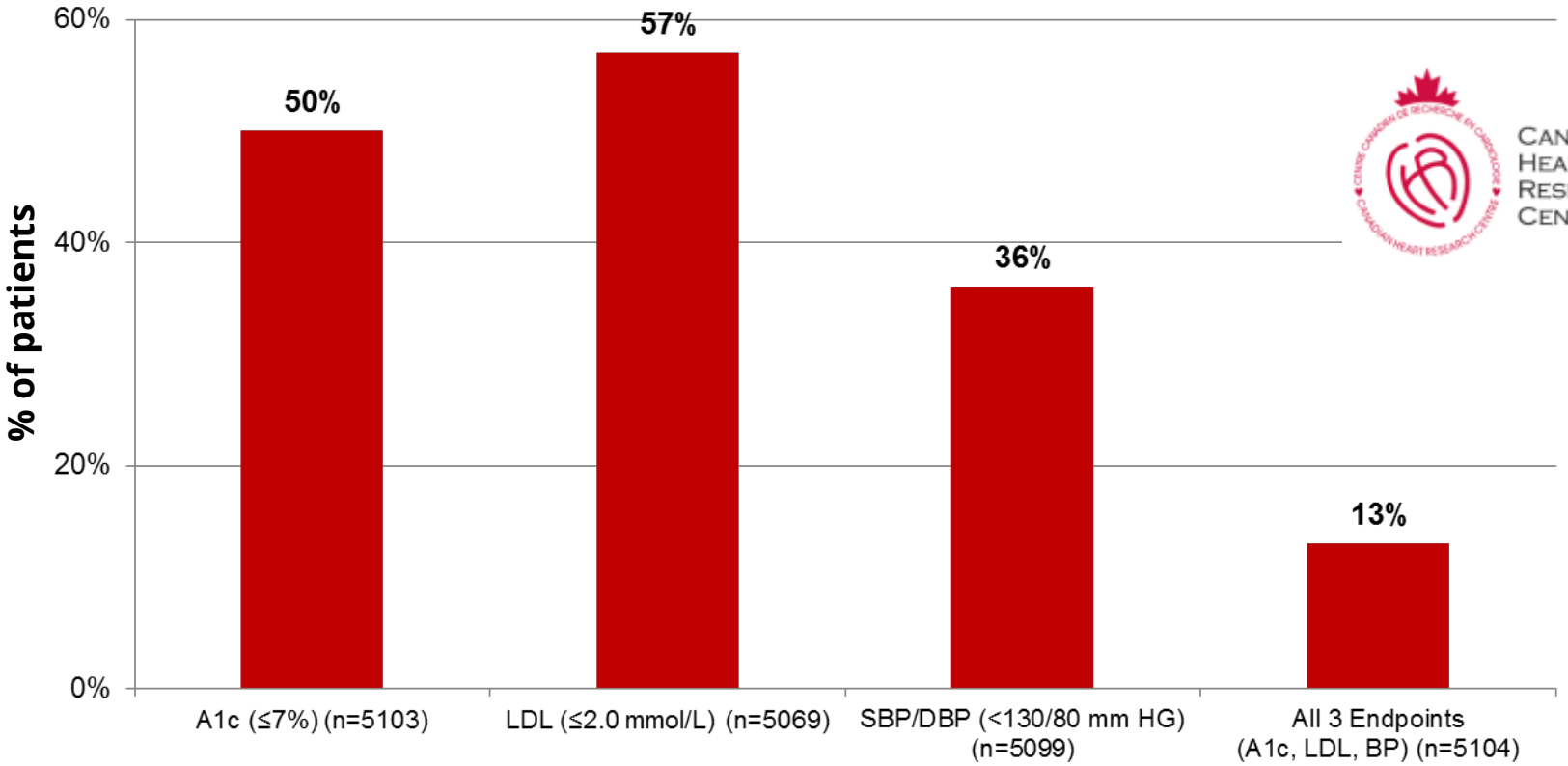
Guideline Targets Achieved

DM SCAN
Diabetes Mellitus Status in CANada
Le Diabète Mellitus Statut au CANada



CANADIAN HEART RESEARCH CENTRE

Leiter LA et al. Can J Diabetes 2013;37:82-89.

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2018 Clinical Practice Guidelines

Pharmacologic Glycemic Management of Type 2 Diabetes

Chapter 13

DIABETES CANADA

Cibles de l'A1C

2018

≤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

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Changements Importants

- Mise à jour de **l'algorithme du traitement de l'hyperglycémie** dans le diabète de type 2
- **Informations nouvelles** et **recommandations** sur
  - Les **agents** antihyperglycémiques apparus depuis 2013
  - Les études d'innocuité cardiovasculaire
- Mise à jour du **tableau** et de **l'annexe** les agents antiantihyperglycémiques et la **fonction rénale**

CV, cardiovascular

Pharmacotherapy in Type 2 Diabetes Checklist

- ü CHOOSE **initial therapy based on** glycemia
- ü START **with** metformin **+/- others**
- ü INDIVIDUALIZE **your therapy choice based on characteristics of the** person with diabetes **and the** agent
- ü REACH TARGET **within** 3-6 months **of diagnosis**

Initial choice of therapy

A1C <1.5% over target	Initiate healthy behavior interventions and **start metformin if not at target in 3 months** OR **Start metformin with healthy behavior interventions**
A1C ≥ 1.5% over target	**Start metformin** with healthy behavior interventions AND **Consider second concurrent agent**

Initial choice of therapy

Symptomatic Hyperglycemia

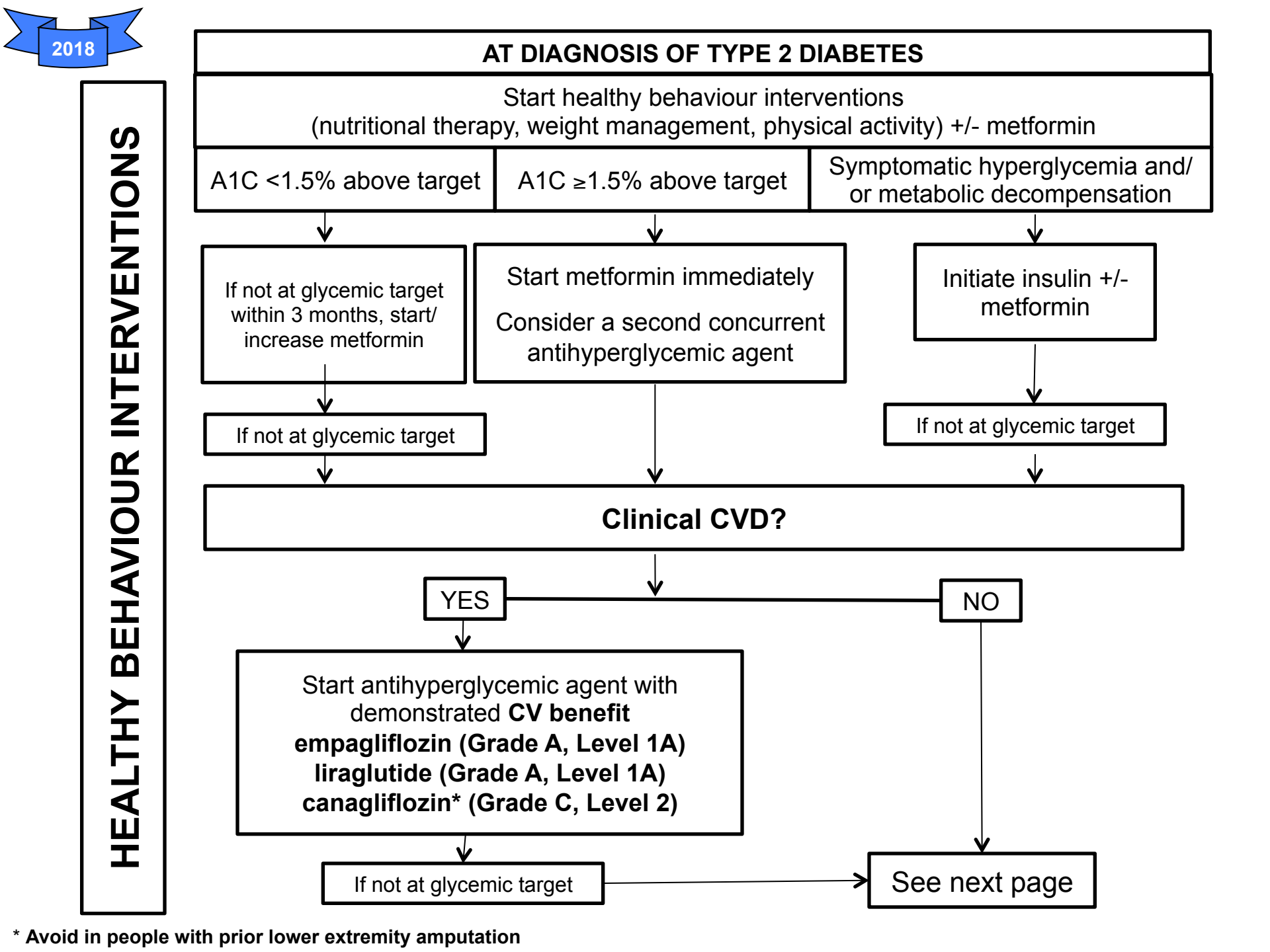
and/or

Metabolic Decompensation

- Polyuria
- Polydipsia
- Weight loss
- Volume depletion

Start INSULIN +/- metformin

ATTEINDRE LA CIBLE EN 3-6 MOIS APRÈS LE DIAGNOSTIC


2018
HEALTHY BEHAVIOUR INTERVENTIONS
AT DIAGNOSIS OF TYPE 2 DIABETES
Start healthy behaviour interventions
(nutritional therapy, weight management, physical activity) +/- metformin
A1C <1.5% above target
A1C ≥1.5% above target
Symptomatic hyperglycemia and/ or metabolic decompensation
If not at glycemic target within 3 months, start/ increase metformin
Start metformin immediately
Consider a second concurrent antihyperglycemic agent
Initiate insulin +/- metformin
If not at glycemic target
If not at glycemic target
Clinical CVD?
YES
NO
Start antihyperglycemic agent with demonstrated CV benefit
empagliflozin (Grade A, Level 1A)
liraglutide (Grade A, Level 1A)
canagliflozin* (Grade C, Level 2)
If not at glycemic target
See next page
* Avoid in people with prior lower extremity amputation

Qu’est-ce qu’une maladie cardiovasculaire clinique?

- Antécédents d’infarctus du myocarde
- Maladie coronarienne (sténose ≥ 50 % pluritronculaire ou du tronc coronaire gauche, ICP ou PAC)
- Angine instable
- Accident vasculaire cérébral
- Maladie artérielle périphérique occlusive

2018

In SGLT-2 et ArGLP-1

Inhibiteurs du SGLT-2 :

Empagliflozine ou **Jardiance**

co de 10 et 25 mg

Canagliflozine ou **Invokana**

co de 100 et 300 mg

Agonistes du récepteur du GLP-1

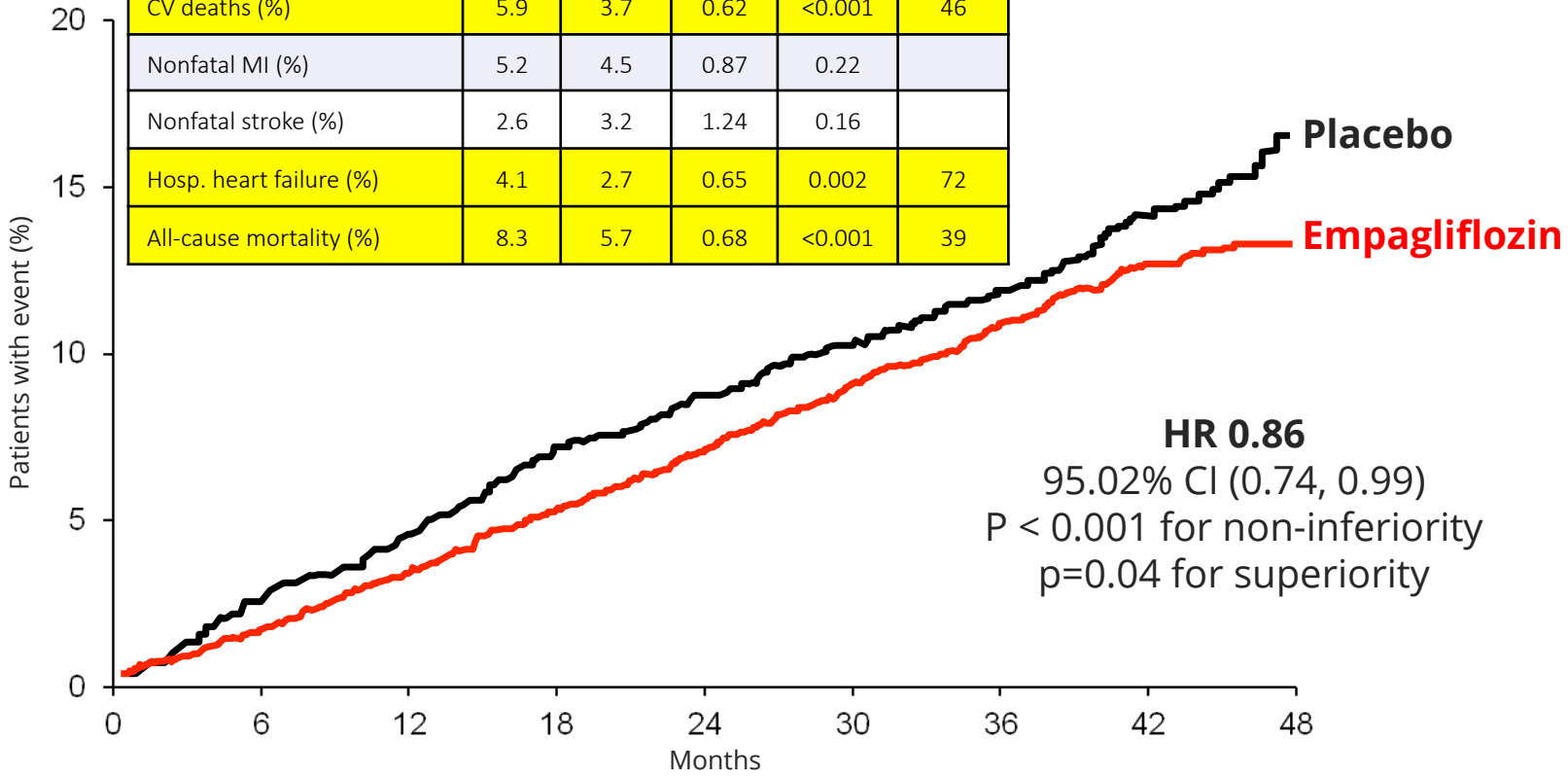
Liraglutide ou **Victoza**

injectable : 0.6 mg/1.2 mg/1.8 mg die

Empagliflozin reduced CV events

CV death, non-fatal MI, or non-fatal stroke

	PBO	EMPA	HR	P	NNT3
CV death, MI, stroke (%)	12.1	10.5	0.86	0.04	63
CV deaths (%)	5.9	3.7	0.62	<0.001	46
Nonfatal MI (%)	5.2	4.5	0.87	0.22	
Nonfatal stroke (%)	2.6	3.2	1.24	0.16	
Hosp. heart failure (%)	4.1	2.7	0.65	0.002	72
All-cause mortality (%)	8.3	5.7	0.68	<0.001	39



No. of patients

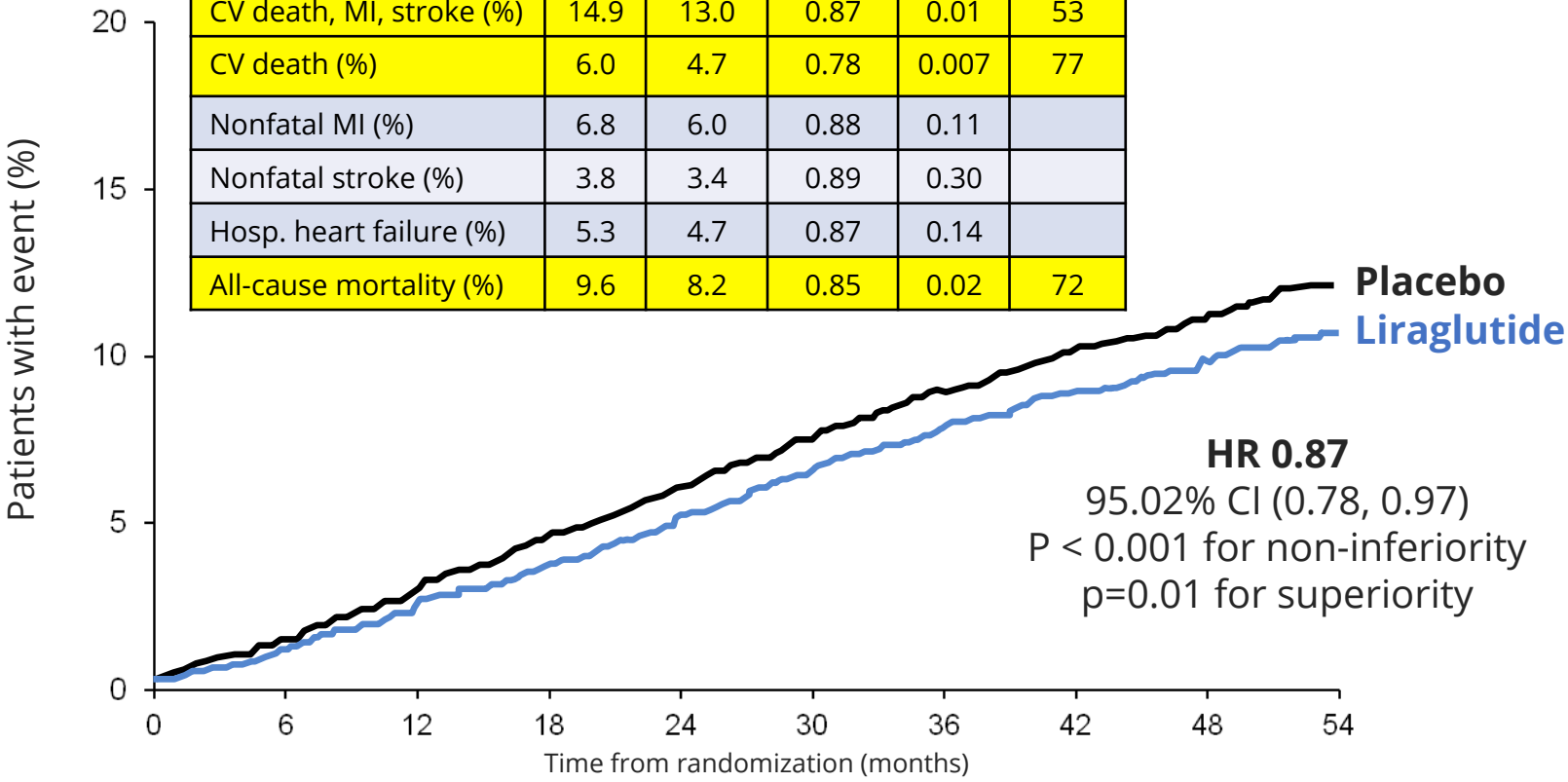
Empagliflozin	4687	4580	4455	4328	3851	2821	2359	1534	370
Placebo	2333	2256	2194	2112	1875	1380	1161	741	166

Zinman B et al. N Engl J Med 2015; DOI: 10.1056/NEJMoa1504720

Liraglutide reduced CV events

CV death, non-fatal MI, or non-fatal stroke

	PBO	LIRA	HR	P	NNT4
CV death, MI, stroke (%)	14.9	13.0	0.87	0.01	53
CV death (%)	6.0	4.7	0.78	0.007	77
Nonfatal MI (%)	6.8	6.0	0.88	0.11	
Nonfatal stroke (%)	3.8	3.4	0.89	0.30	
Hosp. heart failure (%)	5.3	4.7	0.87	0.14	
All-cause mortality (%)	9.6	8.2	0.85	0.02	72



Patients at risk

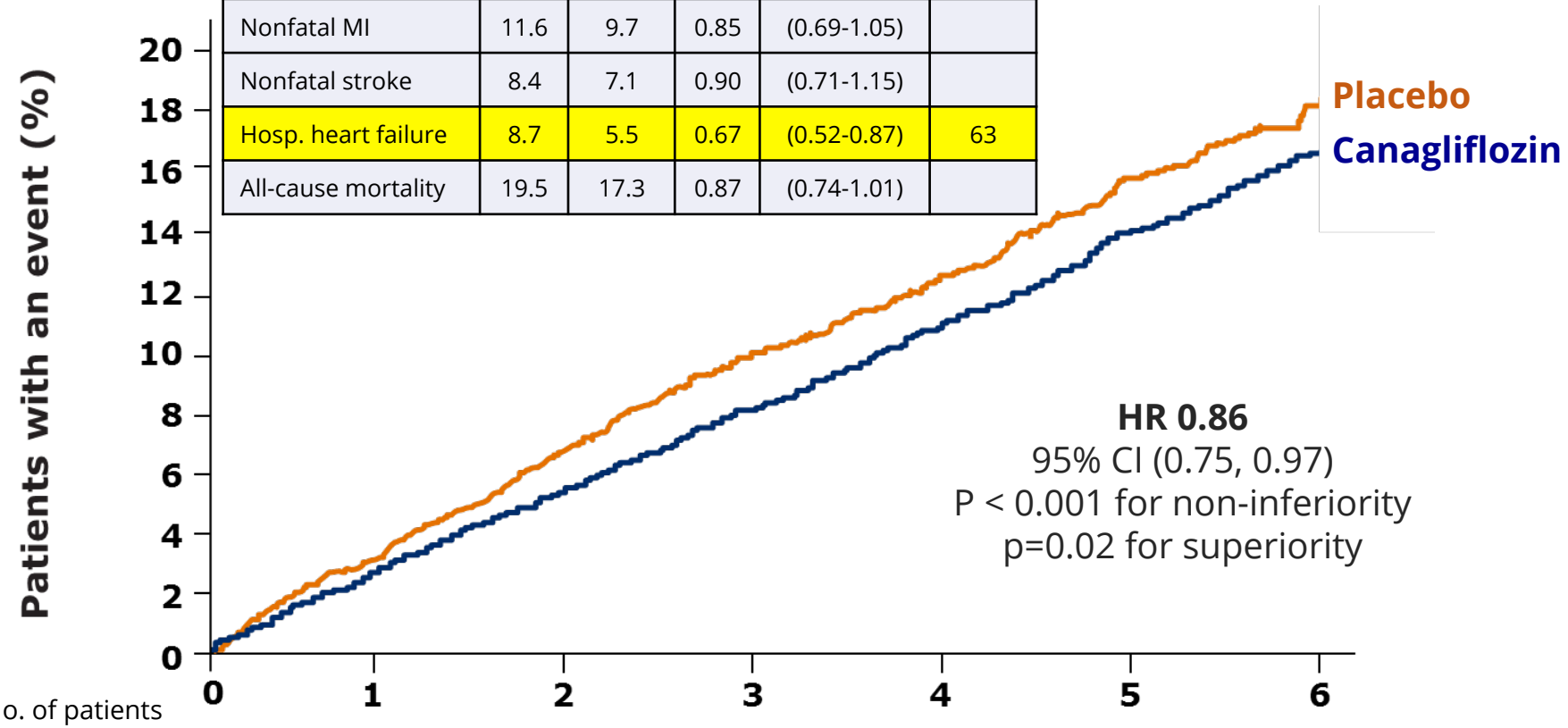
Liraglutide	4668	4593	4496	4400	4280	4172	4072	3982	1562	424
Placebo	4672	4588	4473	4352	4237	4123	4010	3914	1543	407

Marso SP et al. N Engl J Med 2016;375(4):311-22.

Canagliflozin reduced CV events

CV death, non-fatal MI, or non-fatal stroke

Outcome (per 1000 pt-y)	PBO	CANA	HR	P or 95% CI	NNT 5
CV death, MI, stroke	31.5	26.9	0.86	0.02	44
CV deaths	12.8	11.6	0.87	(0.72-1.06)	
Nonfatal MI	11.6	9.7	0.85	(0.69-1.05)	
Nonfatal stroke	8.4	7.1	0.90	(0.71-1.15)	
Hosp. heart failure	8.7	5.5	0.67	(0.52-0.87)	63
All-cause mortality	19.5	17.3	0.87	(0.74-1.01)	

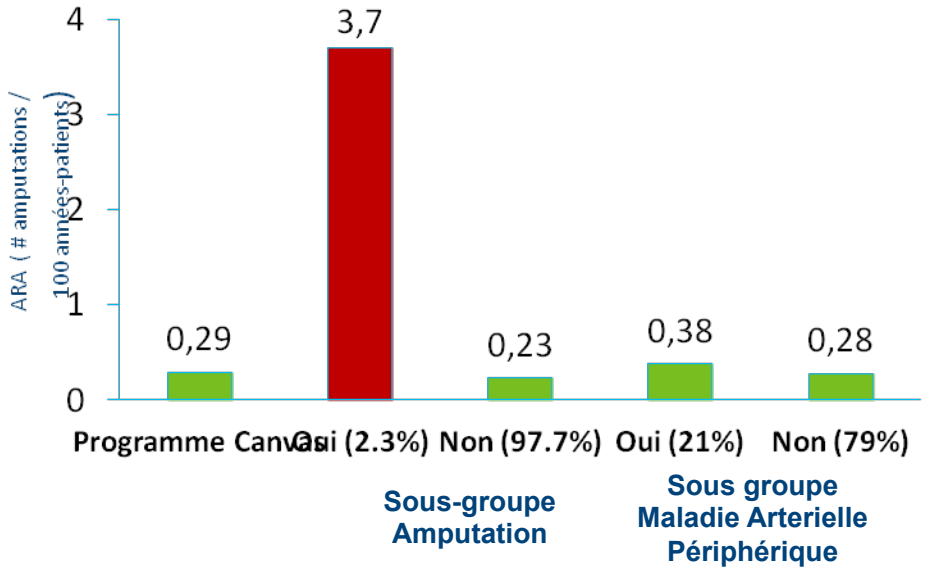


No. of patients

Canagliflozin	5795	5566	4343	2555	2460	2363	1661
Placebo	4347	4153	2942	1240	1187	1120	789

Neal B et al. N Engl J Med 2017; DOI:10.1056/NEJMoa1611925

Amputation: augmentation du risque absolu dans le Programme CANVAS et les sous-groupes à risque



ARA, augmentation du risque absolu.
Adapté Neal B *et al. N Engl J Med*. 2017 Jun 12. doi: 10.1056/NEJMoa1611925 and supplementary appendix.

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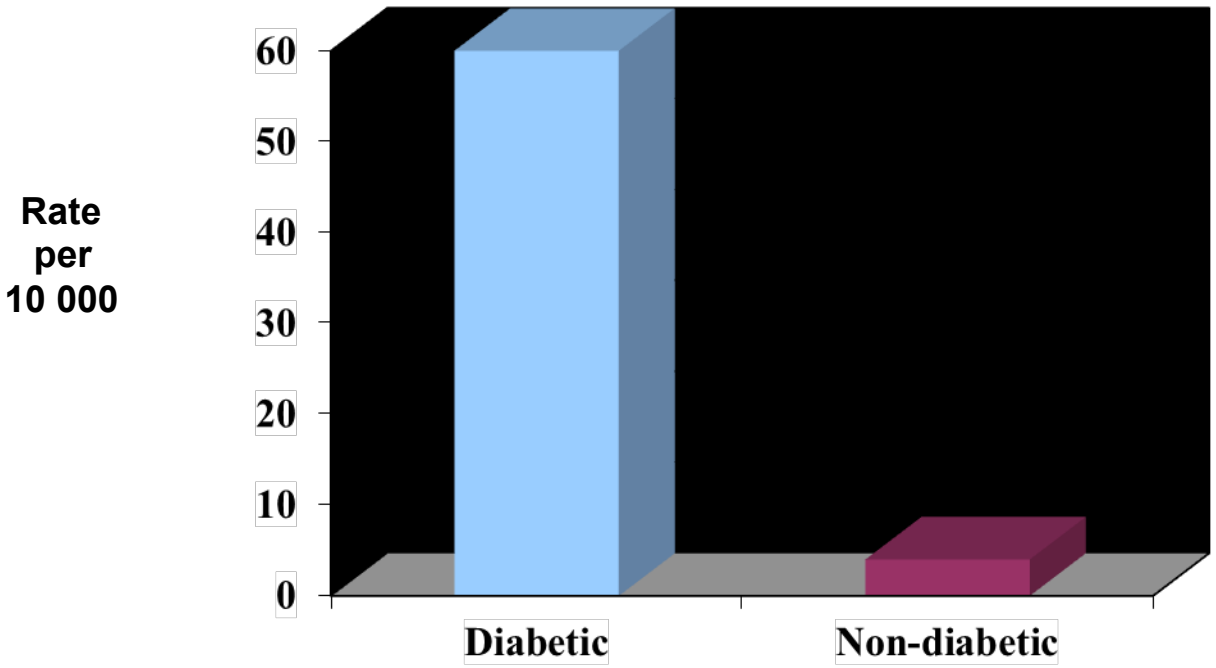
People with diabetes at high risk for amputation



- Vast majority of **all non-traumatic amputations** occur in people with diabetes
- 84 % of amputations among people with diabetes are preceded by a **foot ulcer** (Ref: Pecoraro, 1990)
- Those patients with **an amputation are at high risk of a second amputation within 2-3 years (Ref: Most, 1983).**

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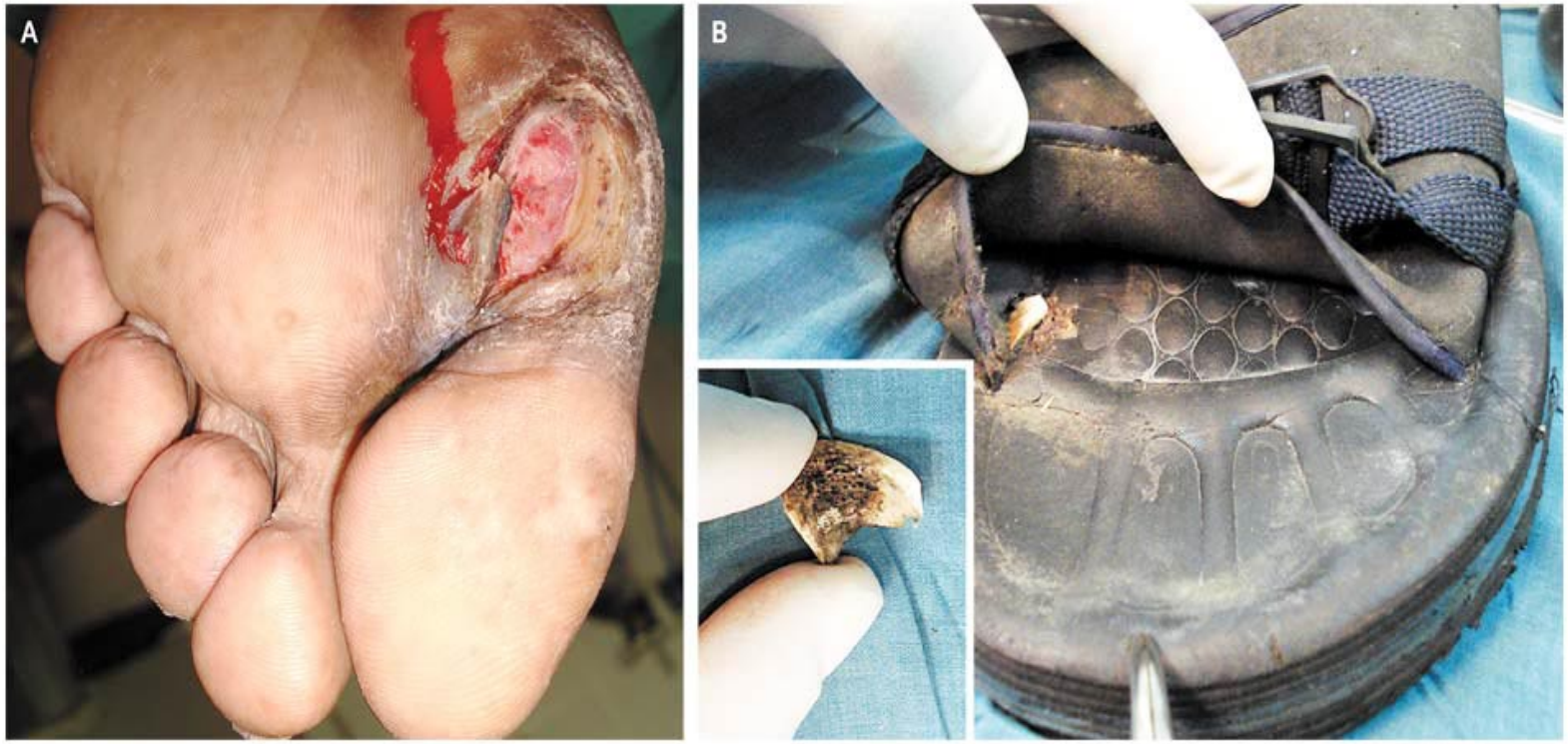
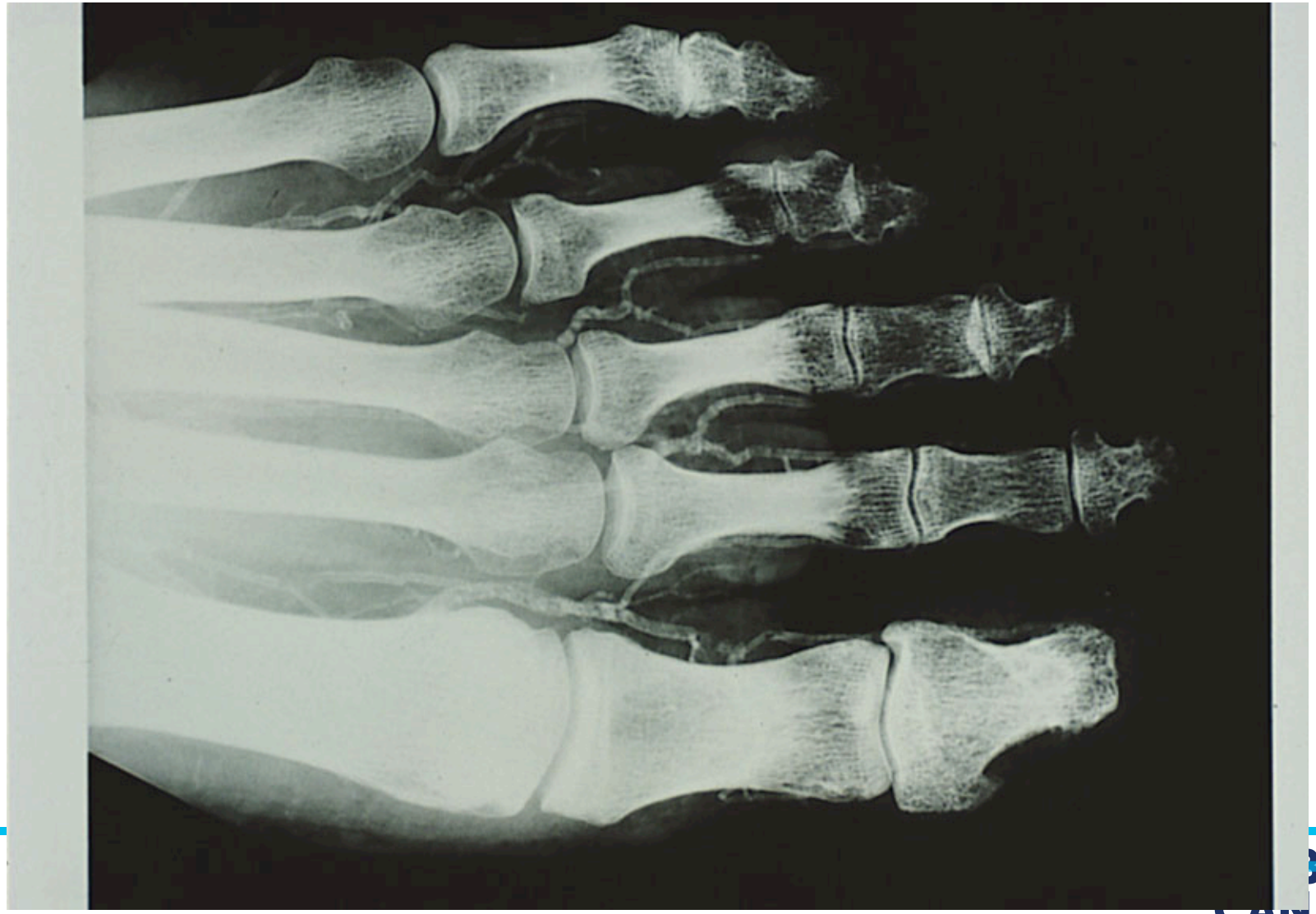
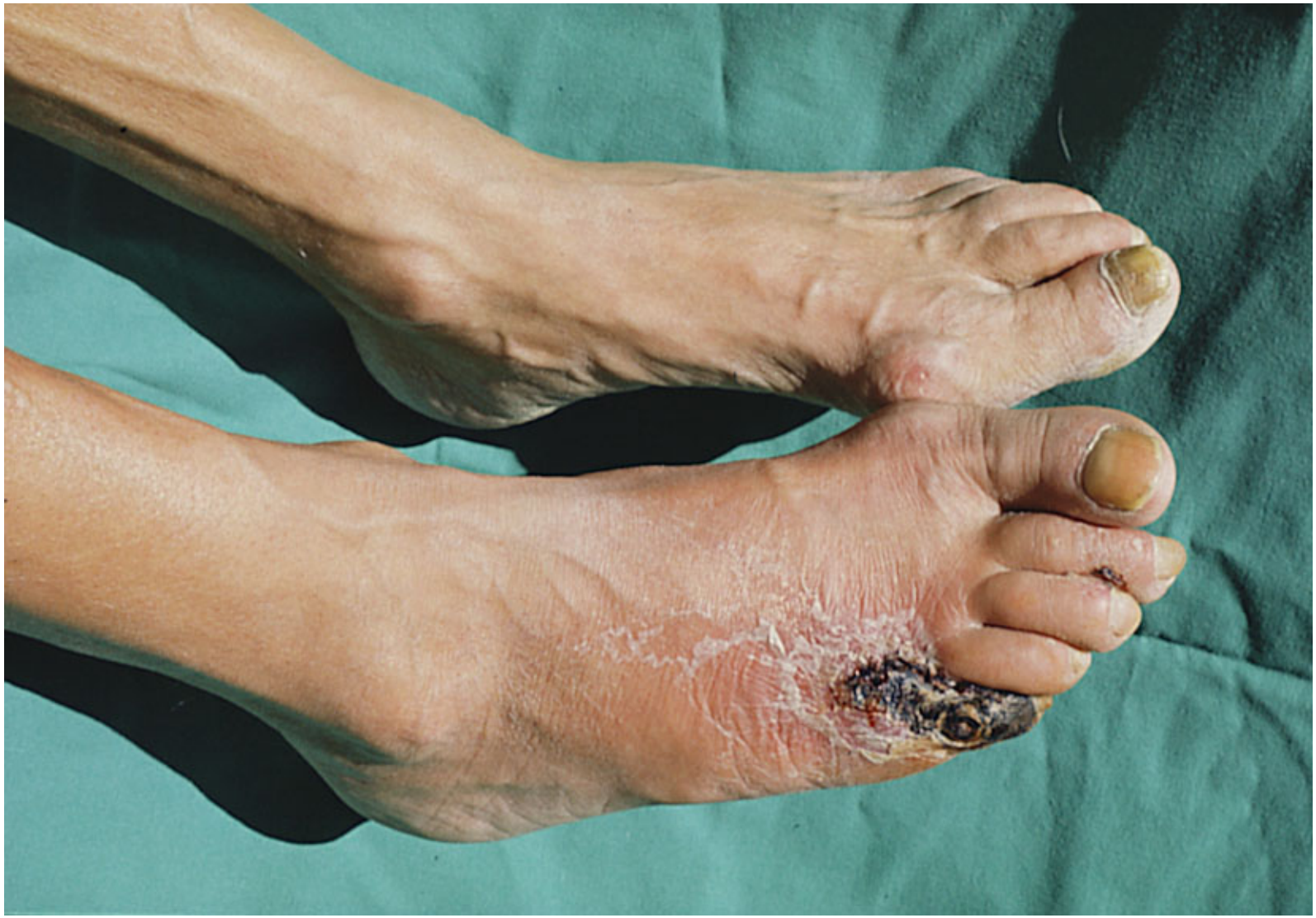
61-year-old man with a 15-year history of diabetes and resulting foot neuropathy presented with an ulcer of 3 months' duration overlying the first metatarsal head (Panel A)



Teelucksingh S and Naraynsingh V. N Engl J Med 2010;362:e26





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Maux Perforants Plantaires: les faits

Morbidité :

* 8-22% réamputation ipsilatérale/an
* 26-44% réamputation controlatérale/an

Mortalité

* 30-40% à 1 an
* 35-65% à 3 ans
* 39-80% à 5 ans

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Canagliflozine et Amputations

1.- Pas de causalité prouvée

2.- Histoire naturelle d'une maladie vasculaire périphérique plus sévère (selection bias) ?

3.- Hypoperfusion périphérique plus endommageable chez des sujets à haut risque cardiovasculaire ?

4.- Modification du rapport érythroplasmatique ?

5.- Bad luck ?

6.- Opinion FDA (USA) vs EMA (Europe)

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Grading Criteria Applied ?

	Empa	Lira	Cana
CV death, MI, Stro.	**+++**	**++**	**+++**
CV Deaths	+++	++	-
Hosp. Heart Failure	++++	-	++++
Amputations vs Pla more	equal	equal	

2018

Clinical CVD?

NO

Add additional antihyperglycemic agent best suited to the individual based on the following

CLINICAL CONSIDERATIONS	CHOICE OF AGENT
Avoidance of **hypoglycemia** and/or **weight gain** with **adequate glycemic efficacy**	**DPP-4 inhibitor, GLP-1 receptor agonist or SGLT2 inhibitor**
Other considerations: Reduced **eGFR** and/or **albuminuria** Clinical **CVD** or CV **risk factors** Degree of **hyperglycemia** Other comorbidities (**CHF, hepatic disease**) Planning **pregnancy** **Cost/coverage** **Patient preference**	see **Renal Impairment** Appendix See Table Below

Key Messages

- In people **without clinical CVD in whom A1C target is not achieved** with current therapy, if affordability and access are not barriers, people with type 2 diabetes and their providers who are concerned about **hypoglycemia** and **weight gain** may prefer an **incretin agent (DPP-4 inhibitor or GLP-1 receptor agonist) and/or an SGLT2 inhibitor** to other agents as they improve glycemic control with **a low risk** of **hypoglycemia** and **weight gain**

CVD, cardiovascular disease

Add additional antihyperglycemic agent best suited to the individual by prioritizing patient characteristics (*agents listed in alphabetical order by CV outcome data*):

Class	Effect on CVD Outcomes	Hypo-glycemia	Weight	Relative A1C Lowering when added to metformin	Other therapeutic considerations	Cost
GLP-1R agonists	lira: Superiority in T2DM with clinical CVD exenatide LAR & lixi: Neutral	Rare	↓↓	↓↓ to ↓↓↓	GI side-effects, Gallstone disease Contraindicated with personal / family history of medullary thyroid cancer or MEN 2 Requires subcutaneous injection	$$$$
SGLT2 inhibitors	Cana & empa: Superiority in T2DM patients with clinical CVD	Rare	↓↓	↓↓ to ↓↓↓	Genital infections, UTI, hypotension, dose-related changes in LDL-C. Caution with renal dysfunction, loop diuretics, in the elderly. Dapagliflozin not to be used if bladder cancer. Rare diabetic ketoacidosis (may occur with no hyperglycemia). Increased risk of fractures and amputations with canagliflozin. Reduced progression of nephropathy & CHF hospitalizations with empagliflozin and canagliflozin in those with clinical CVD	$$$
DPP-4 Inhibitors	alo, saxa, sita: Neutral	Rare	Neutral	↓↓	Caution with saxagliptin in heart failure Rare joint pain	$$$
Insulin	glar: Neutral degludec: noninferior to glar	Yes	↑↑	↓↓↓↓	No dose ceiling, flexible regimens Requires subcutaneous injection	$- $$$$
Thiazolidinediones	Neutral	Rare	↑↑	↓↓	CHF, edema, fractures, rare bladder cancer (pioglitazone), cardiovascular controversy (rosiglitazone), 6-12 weeks for maximal effect	$$
α-glucosidase inhibitor (acarbose)		Rare	Neutral	↓	GI side-effects common Requires 3 times daily dosing	$$
Insulin secretagogue: Meglitinide Sulfonylurea		Yes Yes	↑ ↑	↓↓ ↓↓	More rapid BG-lowering response Reduced postprandial glycemia with meglitinides but usually requires 3 to 4 times daily dosing. Gliclazide and glimepiride associated with less hypoglycemia than glyburide. Poor durability	 $$ $
Weight loss agent (orlistat)		None	↓	↓	GI side effects Requires 3 times daily dosing	$$$

2018

Add additional antihyperglycemic agent best suited to the individual by prioritizing patient characteristics (*agents listed in alphabetical order by CV outcome data*):						
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DPP-4 Inhibitors	alo, saxa, sita: Neutral	Rare	Neutral	↓↓	Caution with saxagliptin in heart failure Rare joint pain	$$$
Insulin	glar: Neutral degludec: noninferior to glar	Yes	↑↑	↓↓↓↓	No dose ceiling, flexible regimens Requires subcutaneous injection	$-$$$$
Thiazolidinediones	Neutral	Rare	↑↑	↓↓	CHF, edema, fractures, rare bladder cancer (pioglitazone), cardiovascular controversy (rosiglitazone), 6-12 weeks for maximal effect	$$
α-glucosidase inhibitor (acarbose)		Rare	Neutral	↓	GI side-effects common Requires 3 times daily dosing	$$
Insulin secretagogue: **Meglitinide**		Yes	↑	↓↓	More rapid BG-lowering response Reduced postprandial glycemia with meglitinides but usually requires 3 to 4 times daily dosing.	$$
Sulfonylurea		Yes	↑	↓↓	Gliclazide and glimepiride associated with less hypoglycemia than glyburide. Poor durability	$
Weight loss agent (orlistat)		None	↓	↓	GI side effects Requires 3 times daily dosing	$$$

↓

If not at glycemic targets

↓

Add another antihyperglycemic agent from a different class and/or add/intensify insulin regimen
Make timely adjustments to attain target A1C within 3-6 months

DIABETES CANADA

Antihyperglycemic therapy in patients with diabetes with Heart Failure

DIABETES CANADA

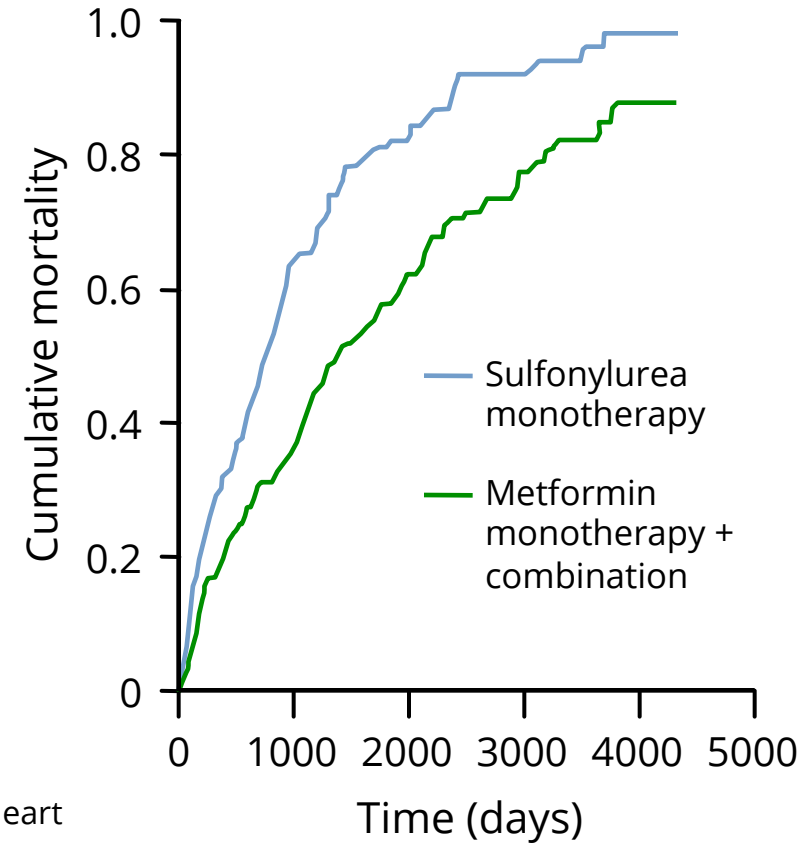
Metformin Use in Heart Failure Patients

Tayside, Scotland
(population 400,000)

n=422 with CHF and diabetes

Antihyperglycemic therapy:

- Metformin alone n=68
- SU alone n=217
- Combination n=137



ACEi, angiotensin converting enzyme inhibitor; *CHF*, congestive heart failure; *MI*, myocardial infarction; *SU*, sulfonylurea

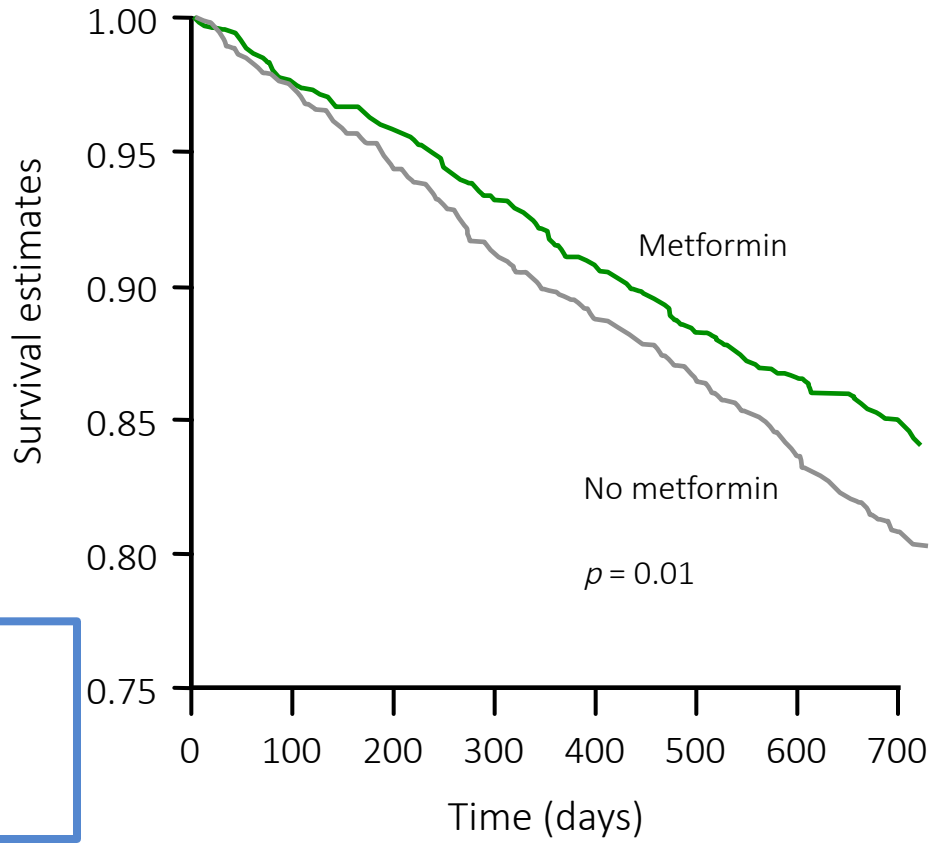
Evans JM, et al. Am J Cardiol 2010;106:1006-10.

DIABETES CANADA

Metformin Use in Heart Failure Patients

Veterans Affairs

- 6,185 with CHF & DM
- Oral antihyperglycemic:
  - With metformin (n=1,561)
  - Without metformin
- Statistically adjusted for co-variables



Death:	0.76 (0.63-0.92) $p < 0.01$
CHF hospitalization:	0.93 (0.74-1.18) $p = 0.56$
Total hospitalization:	0.94 (0.83-1.07) $p = 0.35$

Aguilar D, et al. Circ Heart Fail 2011;4:53-8.

ACEi, angiotensin converting enzyme inhibitor; *CHF*, congestive heart failure; *MI*, myocardial infarction; *SU*, sulfonylurea

DIABETES CANADA

Use metformin in heart failure patients when eGFR >30 mL/min/ 1.73 m^2

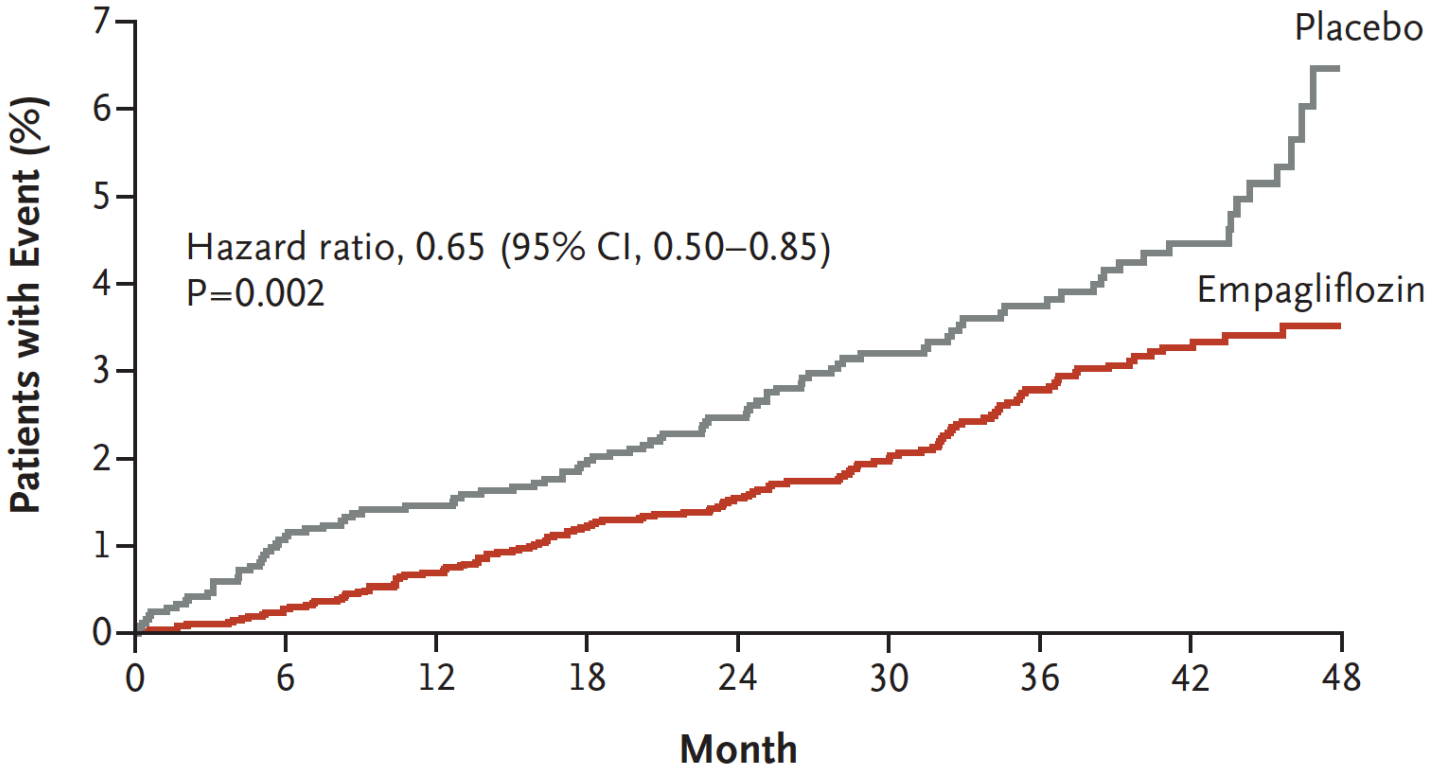
Hospitalization for Heart Failure: DPP-4 inhibitors

	Study Drug n/N (%)	Placebo n/N (%)	Hazard Ratio	95% CI	P Value
EXAMINE[1] (alogliptin vs. placebo)	106/2701 (3.9%)	89/2679 (3.3%)	1.19	0.90, 1.58	0.220
SAVOR-TIMI 53[2] (saxagliptin vs. placebo)	289/8280 (3.5%)	228/8212 (2.8%)	1.27	1.07, 1.51	0.007
TECOS[3] (sitagliptin vs. placebo)	228/7332 (3.1%)	229/7339 (3.1%)	1.00	0.83, 1.20	0.983

CI = confidence interval

1 White WB *et al. N Engl J Med*. 2013;369:1327-35; 2 Scirica BM *et al. N Engl J Med*. 2013;369:1317-26 3 Green JB *et al. N Engl J Med*. 2015 doi: 10.1056/NEJMoa1501352

Empagliflozin reduced hospitalization for heart failure



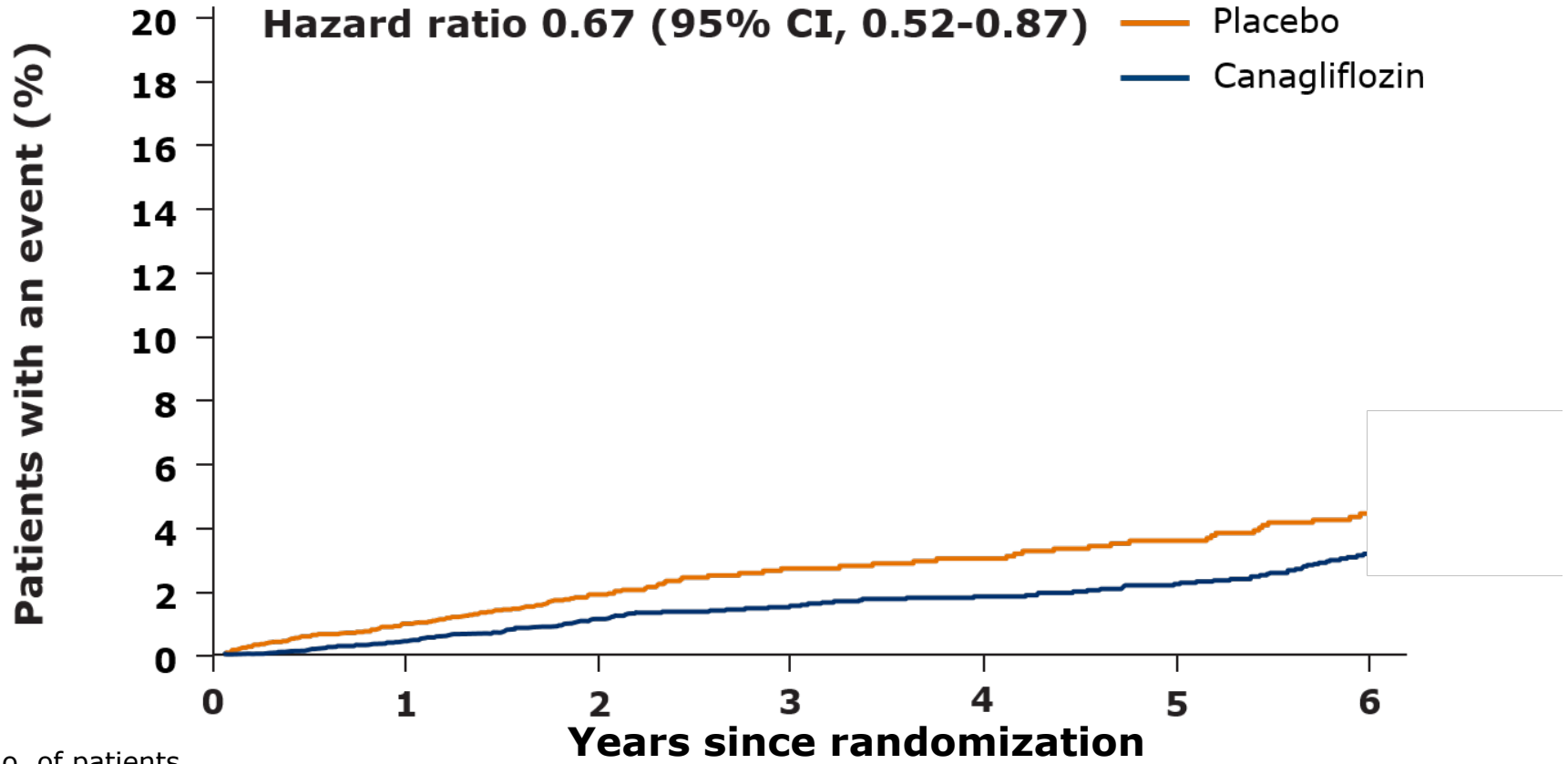
No. at Risk									
Empagliflozin	4687	4614	4523	4427	3988	2950	2487	1634	395
Placebo	2333	2271	2226	2173	1932	1424	1202	775	168

Zinman B, *N Engl J Med* Sep 17, 2015.

Cumulative incidence function. HR, hazard ratio

DIABETES CANADA

Canagliflozin reduced hospitalization for heart failure



No. of patients							
Placebo	4347	4198	3011	1274	1236	1180	829
Canagliflozin	5795	5653	4437	2643	2572	2498	1782

.Neal B et al. N Engl J Med 2017; 377(7):644-657

DIABETES CANADA

2018 Clinical Practice Guidelines

Chronic Kidney Disease in Diabetes

Chapter 29

Philip McFarlane MD FRCPC
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Richard E. Gilbert MBBS PhD FACP FRACP FRCPC
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DIABETES CANADA

2018

Key Changes

- Reinforcement of
  - **screening algorithm** for CKD in diabetes
  - **multifaceted cardiovascular risk** reduction in people with diabetes and CKD
  - **sick day medication list**
  - **avoidance of combination** of agents that block the renin angiotensin aldosterone system (RAAS) – i.e., **ACE inhibitors** and **ARBs**

ACE, angiotensin converting enzyme; *ARB*, angiotensin receptor blocker; *CKD*, chronic kidney disease

DIABETES CANADA

CKD in Diabetes =

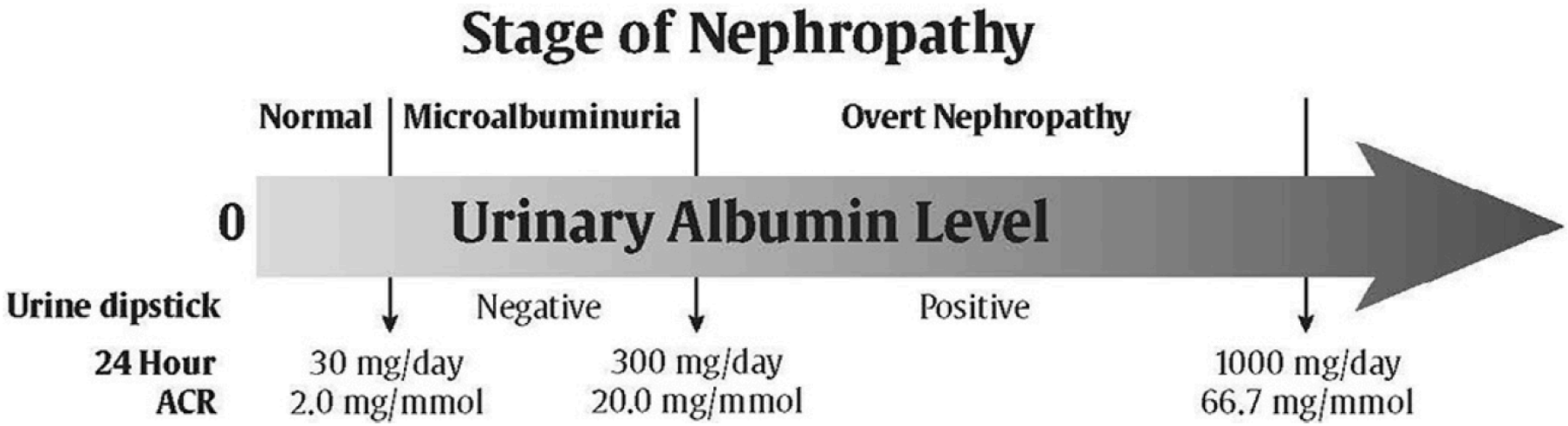
ACR ≥2.0 mg/mmol

and / or

eGFR <60 mL/min/ 1.73 m^2

ACR, albumin to creatinine ratio; *CKD*, chronic kidney disease; *eGFR*, estimated glomerular filtration rate

DIABETES CANADA


Stage of Nephropathy
Normal
Microalbuminuria
Overt Nephropathy
0
Urinary Albumin Level
Urine dipstick
Negative
Positive
24 Hour
ACR
30 mg/day
2.0 mg/mmol
300 mg/day
20.0 mg/mmol
1000 mg/day
66.7 mg/mmol

2018

Recommendation 1

1. Individuals with diabetes and heart failure should receive the **same heart failure therapies** as those identified in the evidence-based ***Canadian Cardiovascular Society Heart Failure*** recommendations (http://www.onlinecjc.ca/article/S0828-282X(12)01379-7/pdf) [Grade D, Consensus]

2018

Recommendation 2

2. Unless contraindicated, **metformin may be used** in people with type 2 diabetes and heart failure [Grade C, Level 3]. Metformin **should be temporarily withheld** if renal function **acutely worsens**, and should be **discontinued if renal function significantly and chronically worsens [Grade D, Consensus]**

Recommendations 3-4

3. For people with NYHA class I-IV, exposure to **TZDs should be avoided** [Grade A, Level 1]

4. **Beta blockers** should be prescribed when **indicated for heart failure with reduced ejection fraction**, as they provide similar benefits in people with or without diabetes [Grade B, Level 2]

2018

Recommendation 5

5. In adults with type 2 diabetes with **clinical CVD** in whom glycemic targets are not achieved with existing antihyperglycemic medication(s) **and** with **an eGFR >30 mL/min/1.73 m^2**, an **SGLT2 inhibitor with demonstrated heart failure hospitalization reduction** may be added to **reduce the risk of heart failure hospitalization** [Grade B, Level 2 for empagliflozin; Grade C, Level 2 for canagliflozin]

CVD, cardiovascular disease

DIABETES CANADA

2018

Recommendation 7

7. In adults with type 2 diabetes with **clinical CVD** in whom glycemic targets are not achieved with existing antihyperglycemic medication(s) and with **eGFR >30** mL/min/1.73m^2, **an antihyperglycemic agent with demonstrated CV outcome benefit should be added** to reduce the risk of:
   a) **major CV events** [Grade A, Level 1A for **empagliflozin**; Grade A, Level 1A for **liraglutide**; Grade C, Level 2 for **canagliflozin**]
   b) **heart failure hospitalization** [Grade B, Level 2 for **empagliflozin**; Grade C, Level 2 for **canagliflozin**],
   c) **progression of nephropathy** [Grade B, Level 2 for **empagliflozin**; Grade C, Level 3 for **canagliflozin**]

CV, cardiovascular; *CVD*, cardiovascular disease; *eGFR*, estimated glomerular filtration rate

DIABETES CANADA

2018

Recommendation 8

8. In adults with type 2 diabetes **without clinical CVD** in whom glycemic targets are not achieved with existing antihyperglycemic medication(s), incretin agents (**DPP-4 inhibitors** or **GLP-1 receptor agonists**) and/or **SGLT2 inhibitors** should be considered as add-on medication over insulin secretagogues, insulin and TZDs to improve glycemic control, **if lower risk of hypoglycemia and/or weight gain are priorities** [Grade A, Level 1A]

Diabetes in Heart Failure Checklist

- ü Treat heart failure in people with diabetes the **SAME** as you would a person without diabetes
- ü **METFORMIN** recommended if eGFR >30 mL/min/ 1.73 m^2
- ü If eGFR <60 mL/min, use **Renin Angiotensin Aldosterone** system or **sacubitril/valsartan** blockade carefully
- ü Do **NOT** use **thiazolidinediones**
- ü **Avoid saxagliptin** in patients with heart failure and diabetes

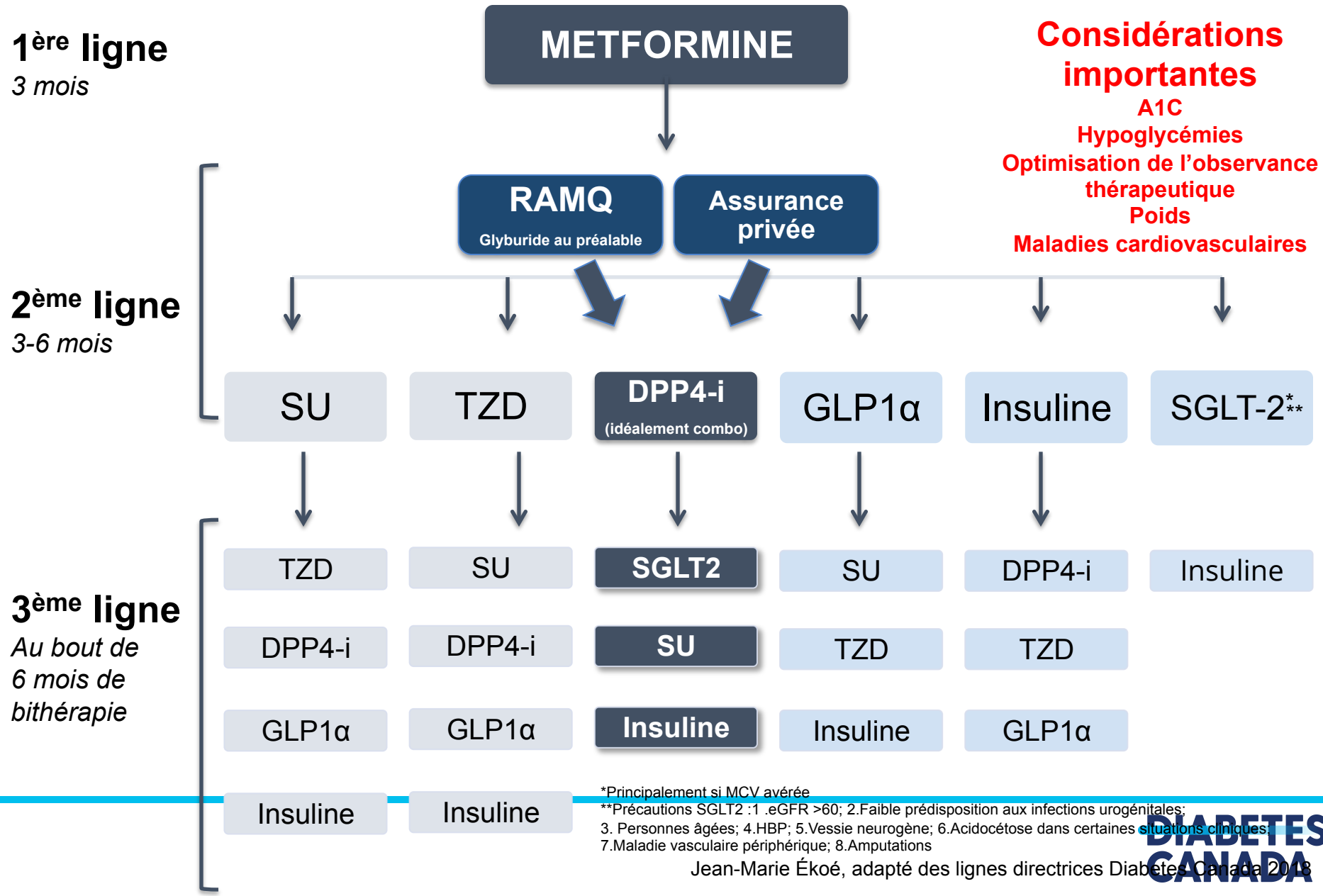
DIABETES CANADA

Diabetes → Increased Risk of Heart Failure Independent of Ischemia

- **Diabetic cardiomyopathy**
- **2 to 4-fold** increase incidence of heart failure in diabetes
- Asymptomatic abnormalities of ventricular systolic and diastolic function, independent of ischemic heart disease or systemic hypertension
- Independent risk factors for heart failure
  - **Elevated A1C**
  - **Albuminuria**

  Underlying ischemic heart disease should be ruled out.

Algorithme traitement révisé 2018: DM2



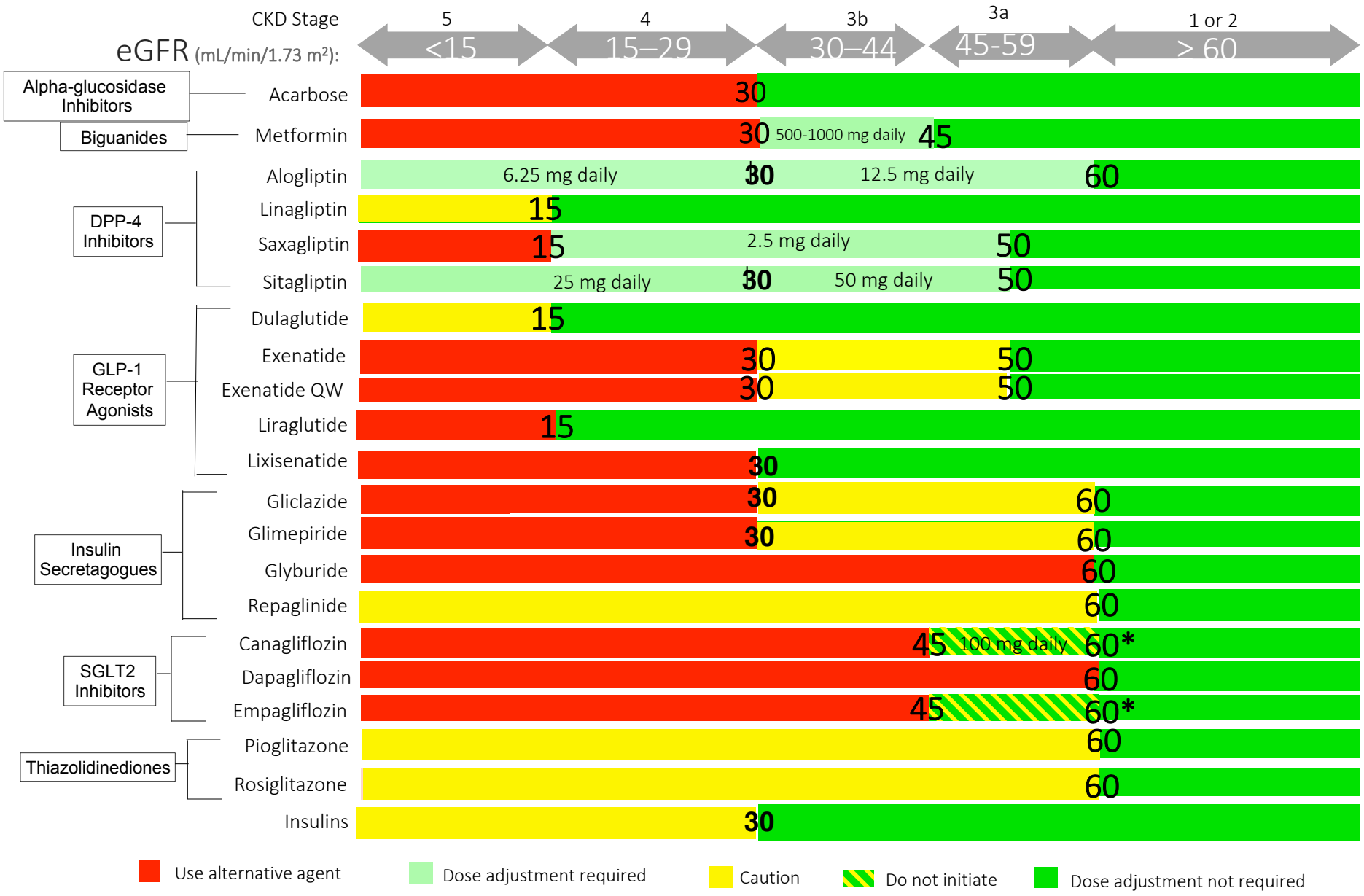
*Principalement si MCV avérée

**Précautions SGLT2 :1 .eGFR >60; 2.Faible prédisposition aux infections urogénitales; 3. Personnes âgées; 4.HBP; 5.Vessie neurogène; 6.Acidocétose dans certaines situations cliniques; 7.Maladie vasculaire périphérique; 8.Amputations

Jean-Marie Ékoé, adapté des lignes directrices Diabetes Canada 2018

DIABETES CANADA

Antihyperglycemic Agents and Renal Function



*May be considered when indicated for CV and renal protection with eGFR< 60 but >30 ml/min/1.73²

Counsel all Patients About

Sick Day Medication List

Visit guidelines.diabetes.ca for patient handout

Instructions for Healthcare Professionals:
If patients become ill and are unable to maintain adequate fluid intake, or have an acute decline in renal function (e.g. due to gastrointestinal upset or dehydration), they should be instructed to hold medications which will:

A) Increase risk for a decline in kidney function:
- Angiotensin-converting enzyme inhibitor
- Angiotensin receptor blockers
- Direct renin inhibitors
- Non-steroidal anti-inflammatory drugs
- Diuretics
- SGLT2 inhibitors

B) Have reduced clearance and increase risk for adverse effects:
- Metformin
- Sulfonylureas (gliclazide, glimepiride, glyburide)

S sulfonylureas
A ACE-inhibitors
D diuretics, direct renin inhibitors

M metformin
A angiotensin receptor blockers
N non-steroidal anti-inflammatory
S SGLT2 inhibitors

Please complete the following card and give it to your patient.

Patients should be instructed that increased frequency of self blood glucose monitoring will be required and adjustments to their doses of insulin or oral antihyperglycemic agents may be necessary.

Instructions for Patients
When you are ill, particularly if you become dehydrated (e.g. vomiting or diarrhea), some medicines could cause your kidney function to worsen or result in side effects.

If you become sick and are unable to drink enough fluid to keep hydrated, you should **STOP** the following medications:

- Blood pressure pills
- Water pills
- Metformin
- Diabetes pills
- Pain medications
- Non-steroidal anti-inflammatory drugs (see below)

_____

_____

_____

_____

_____

Please be careful not to take non-steroidal anti-inflammatory drugs (which are commonly found in pain medications (e.g. Advil) and cold remedies).

Please check with your pharmacist before using over-the-counter medications and discuss all changes in medication with your healthcare professional.

Please increase the number of times you check your blood glucose levels. If they run too high or too low, contact your healthcare professional.

If you have any problems, you can call:

_____

Conclusions : nouvelles lignes directrices 2018

1.- Emphase sur la **personnalisation** du traitement

2.- Algorithme thérapeutique favorisant une prise en charge globale visant une **protection cardiovasculaire et rénale optimales**

3.- Algorithme favorisant une **réduction de l'A1c** avec le **moins d'hypoglycémies** possibles et de **prise poids**

4.- Beaucoup **d'outils** pour aider la gestion au quotidien du diabète

DIABETES CANADA