

# 2023 ESC Guidelines for the management of cardiovascular disease in patients with diabetes

Dr Y Cottin  
Dijon

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## Liens d'intérêt

- Novartis, Boehringer-Ingelheim, Bayer, BMS, Pfizer
- Astra-Zeneca, Servier, Vifor, Servier, Sanofi

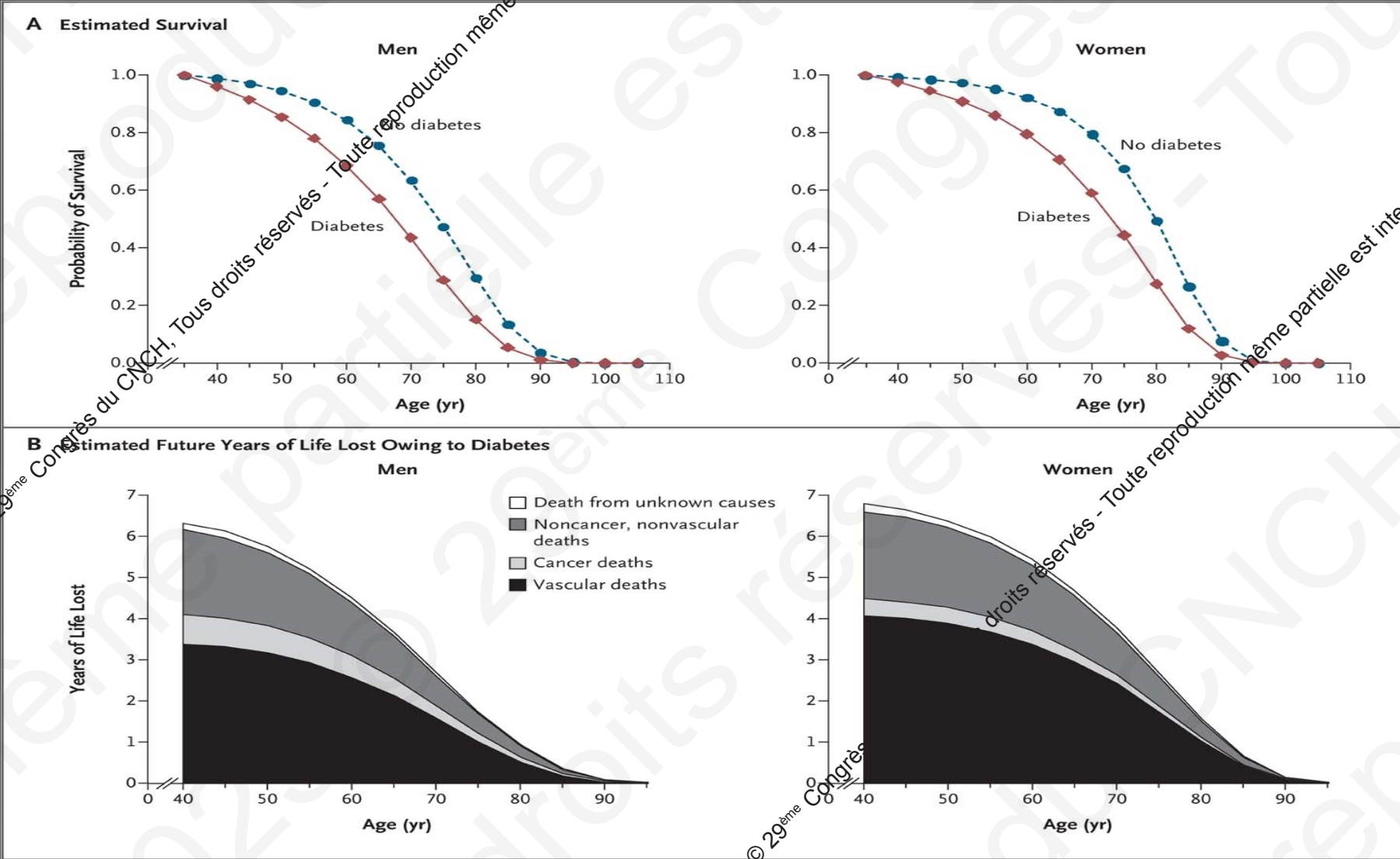
# Recommendations for diagnosing diabetes

Recommendations	Class	Level
Screening for diabetes is recommended in all individuals with CVD, using fasting glucose and/or HbA1c.	I	A
It is recommended that the diagnosis of diabetes is based on HbA1c and/or fasting plasma glucose, or on an OGTT if still in doubt.	I	B

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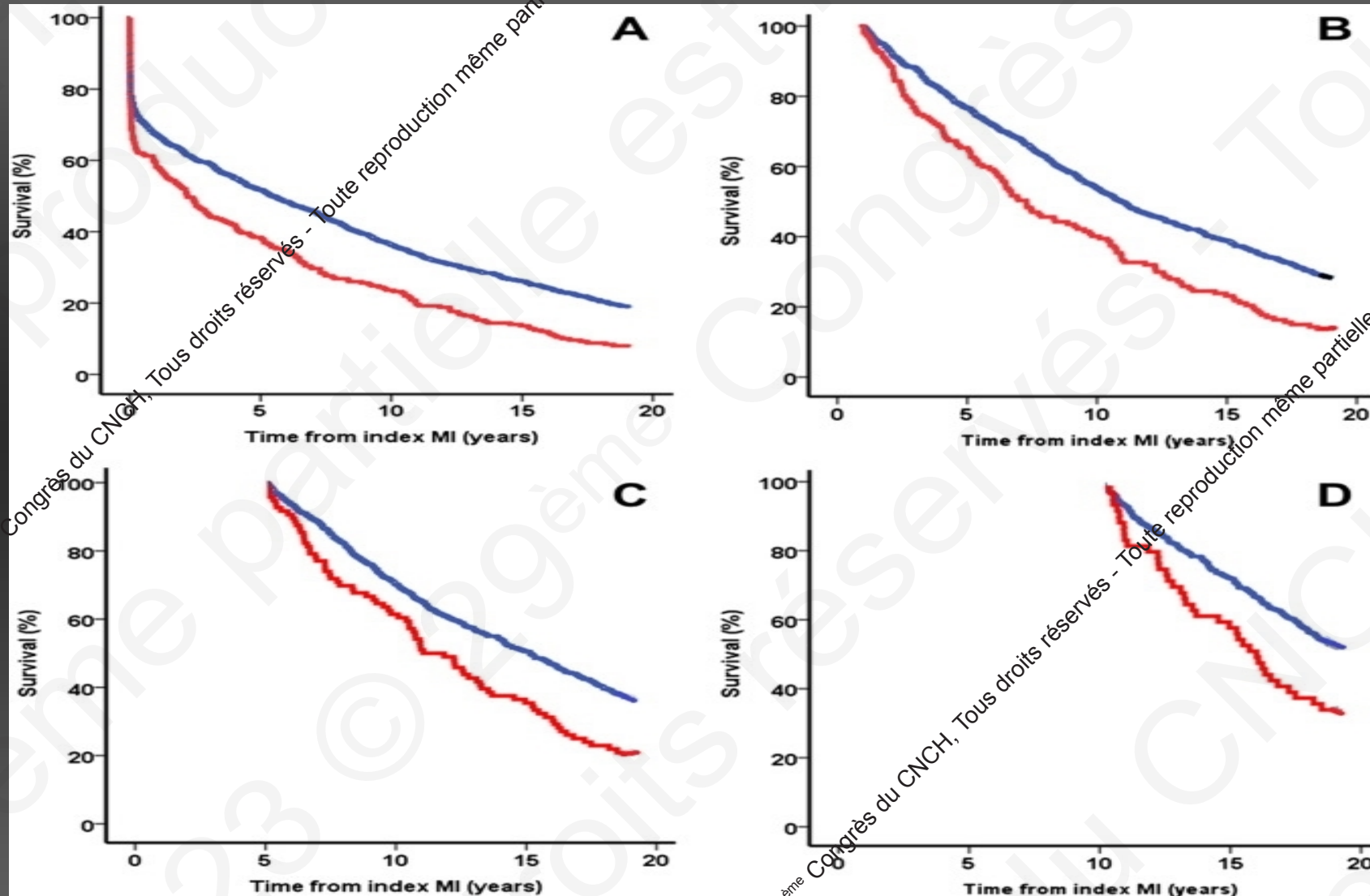
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# Diabetes Mellitus, Fasting Glucose, and Risk of Cause-Specific Death

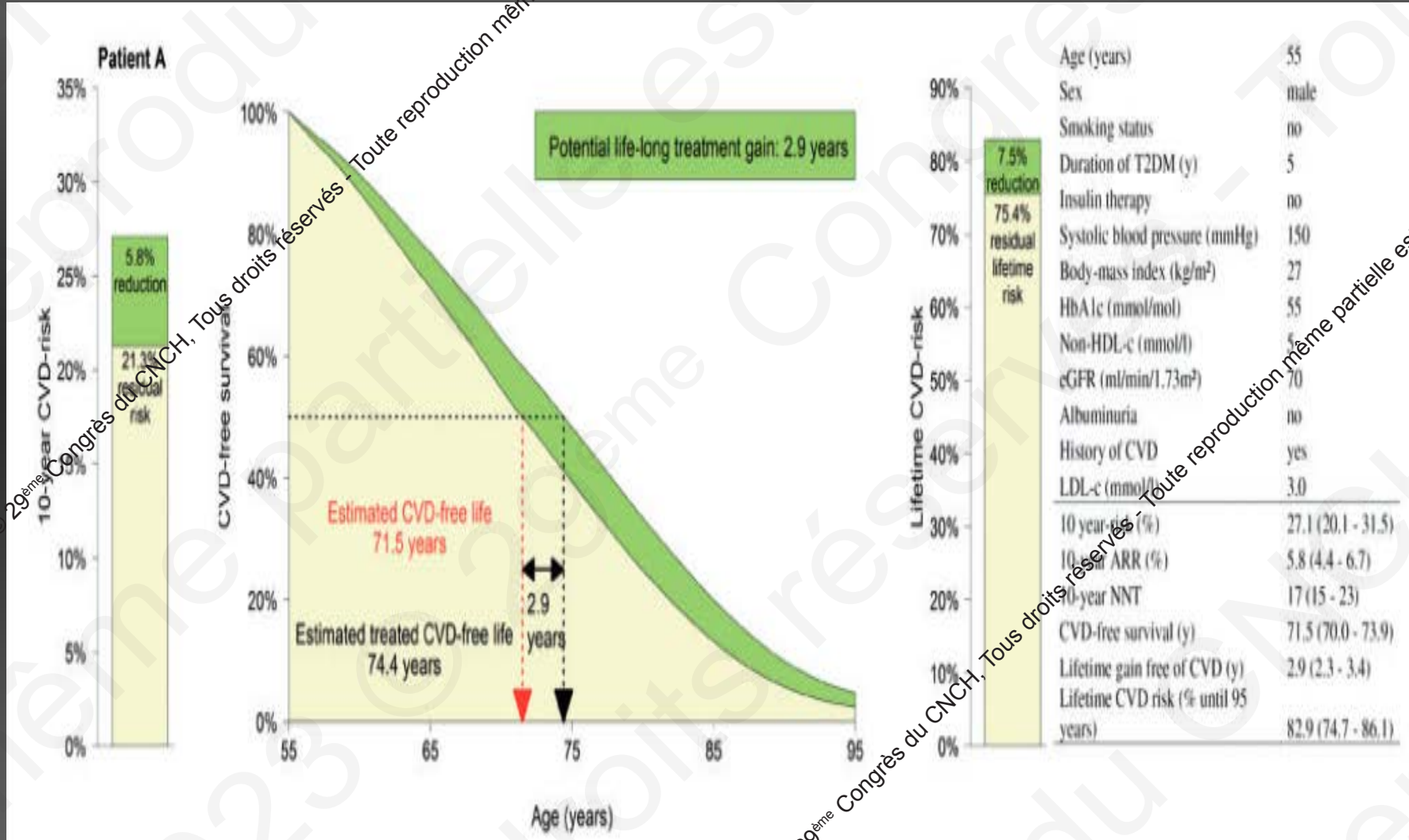


The Emerging Risk Factors Collaboration. N Engl J Med 2011; 364:829-841.

# An evaluation of 20 year survival in patients with diabetes mellitus and acute myocardial infarction

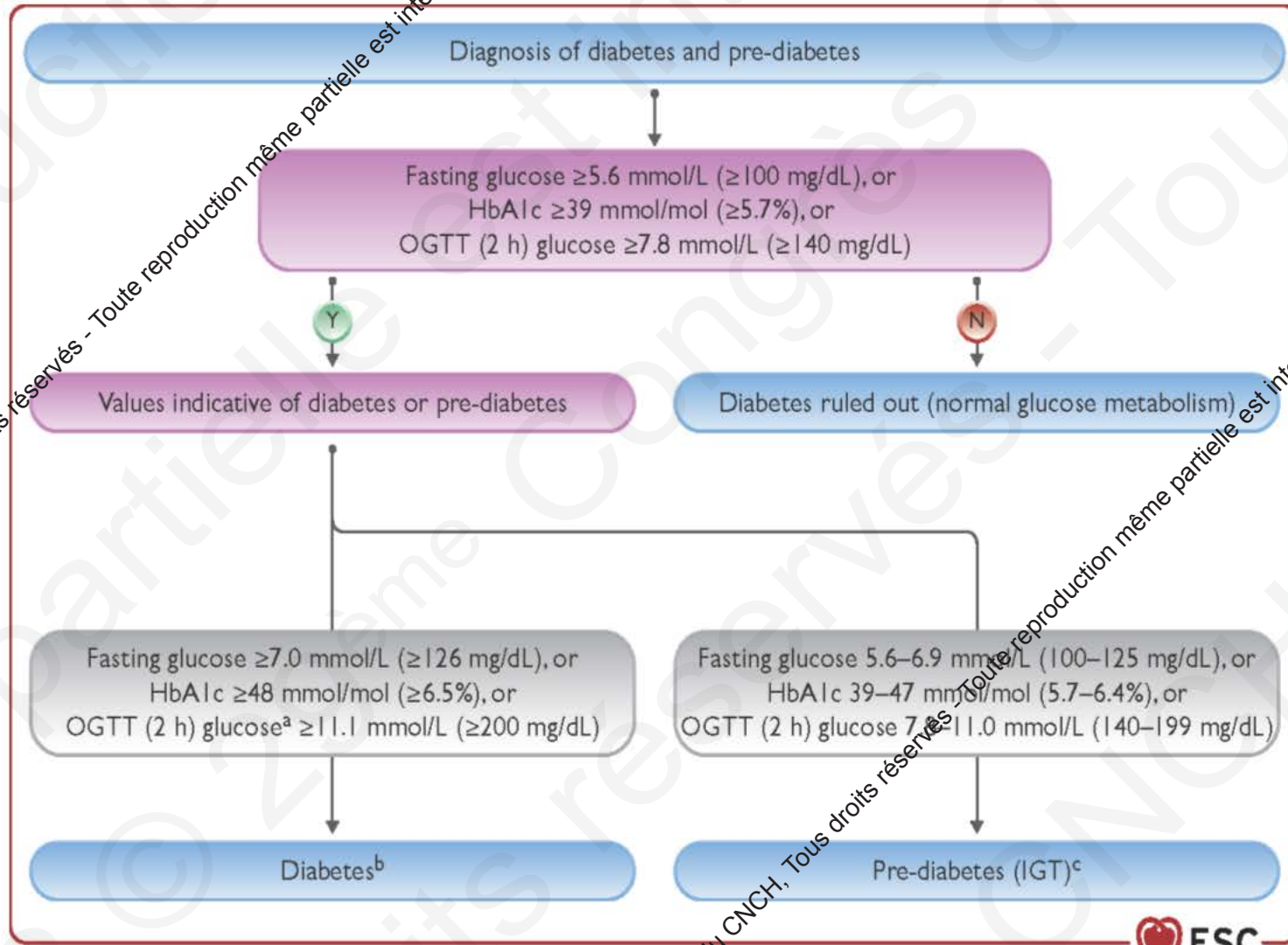


# Prediction of individual life-years gained without cardiovascular events from lipid, blood pressure, glucose, and aspirin treatment based on data of more than 500 000 patients with Type 2 diabetes mellitus



## Figure 2

### Diagnosis of diabetes and pre-diabetes



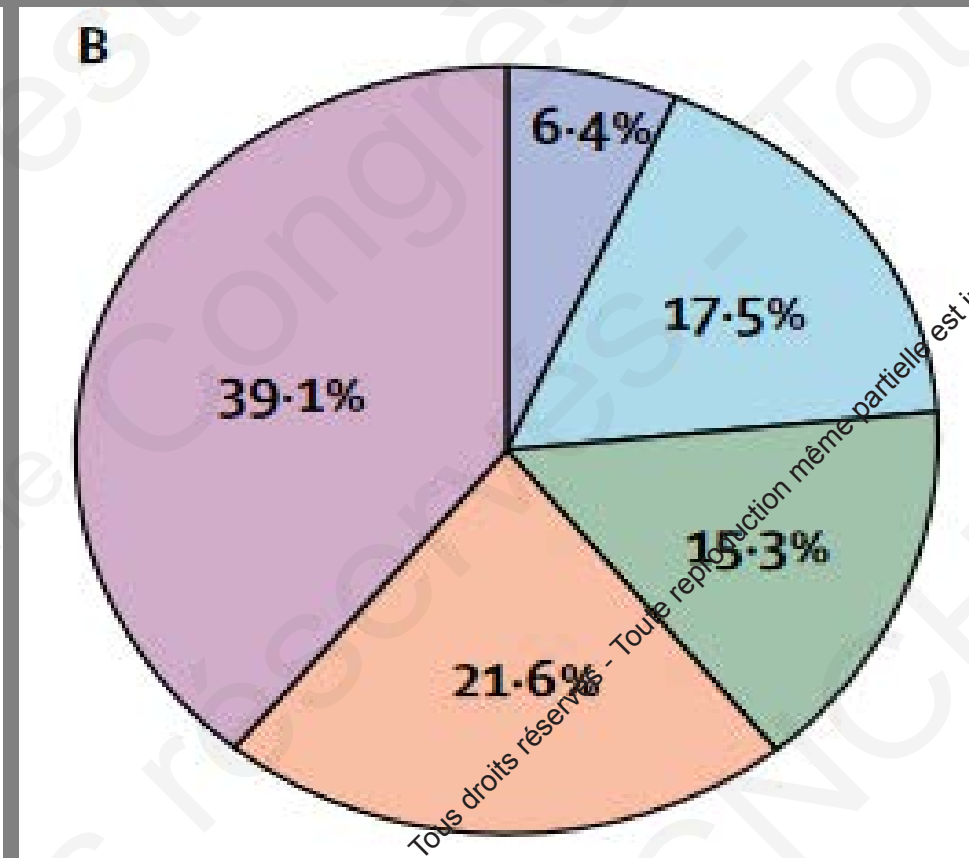
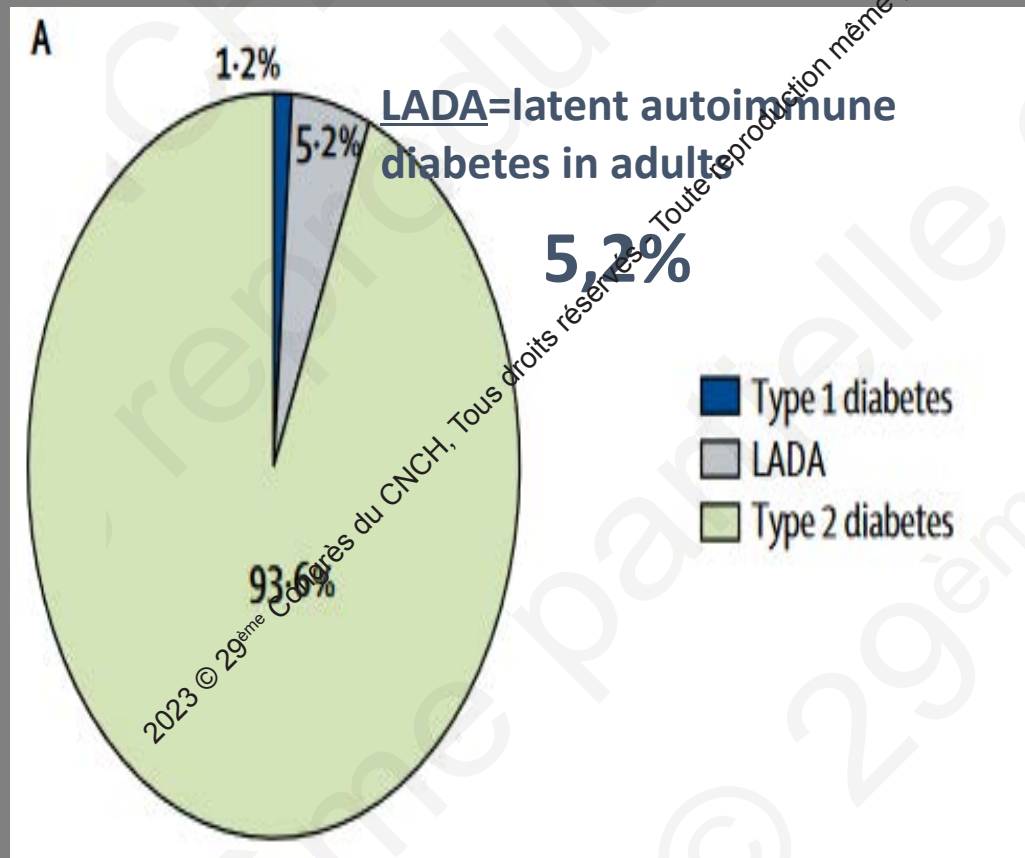
# Biochemical diagnostic criteria for diabetes and pre-diabetes according to the WHO and the ADA



Glycaemic marker	WHO criteria (2011, 2019)	ADA criteria (2021)
	<b>Diabetes</b>	
FPG	≥7.0 mmol/L (≥126 mg/dL)	
2hPG (OGTT)	≥11.1 mmol/L (≥200 mg/dL)	
HbA1c	≥6.5% (≥48 mmol/mol)	
RPG	≥11.1 mmol/L (≥200 mg/dL)	
<b>Pre-diabetes</b>		
FPG	6.1–6.9 mmol/L (110–125 mg/dL)	5.6–6.9 mmol/L (100–125 mg/dL)
2hPG (OGTT)	7.8–11.0 mmol/L (140–199 mg/dL)	
HbA1c	6.0–6.4% (42–47 mmol/mol)	5.7–6.4% (39–47 mmol/mol)



# Novel subgroups of adult-onset diabetes and their association with outcomes: a data-driven cluster analysis of six variables



- Cluster 1 (SAID)
- Cluster 2 (SIDD)
- Cluster 3 (SIRD)
- Cluster 4 (MOD)
- Cluster 5 (MARD)

SAID=severe autoimmune diabeteses.  
SIDD=severe insulin-deficient diabeteses.  
SIRD=severe insulin-resistant diabeteses.  
MOD=mild obesity-related diabeteses.  
MARD=mild age-related diabeteses

# Cardiovascular risk categories in type 2 diabetes

## Very high CV risk

Patients with T2DM with:

- Clinically established ASCVD or
- Severe TOD or
- 10-year CVD risk  $\geq 20\%$  using SCORE2-Diabetes

TOD : Target Organ Damage

## High CV risk

Patients with T2DM not fulfilling the very high risk criteria and a:

- 10-year CVD risk 10 to  $< 20\%$  using SCORE2-Diabetes

## Moderate CV risk

Patients with T2DM not fulfilling the very high risk criteria and a:

- 10-year CVD risk 5 to  $< 10\%$  using SCORE2-Diabetes

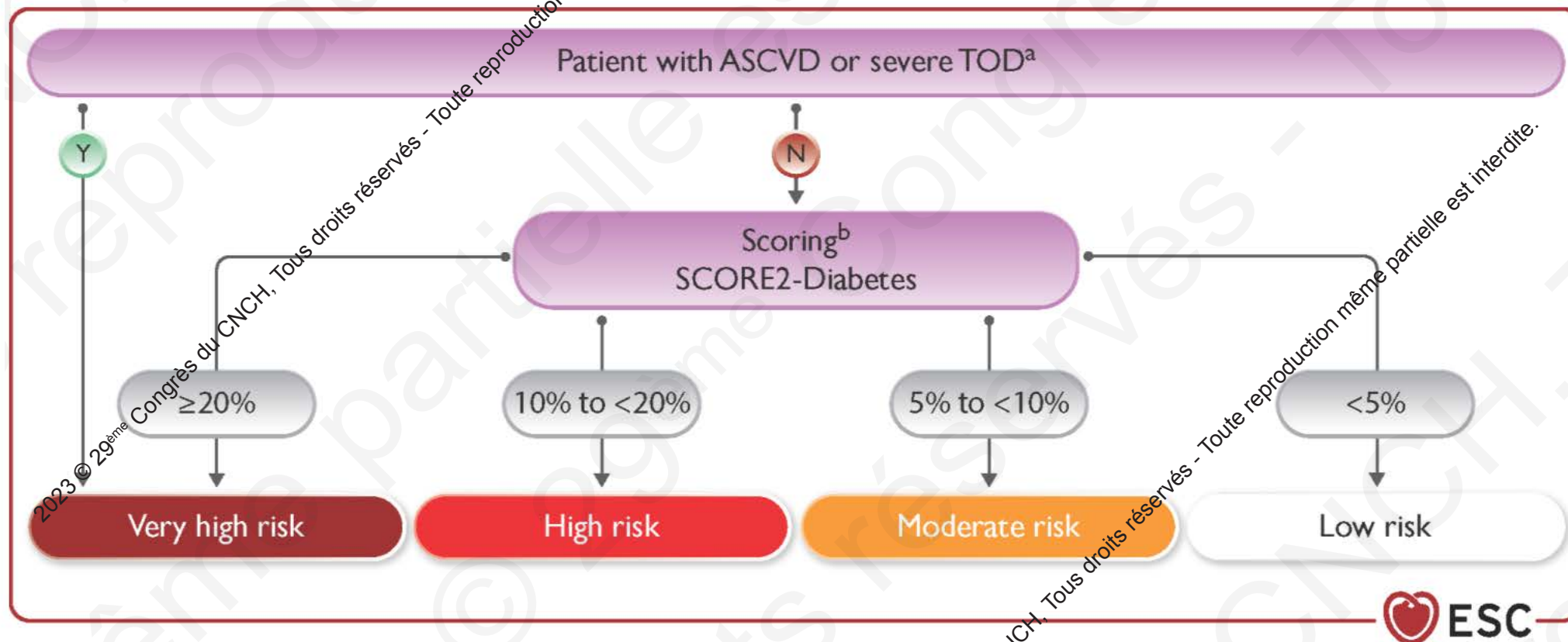
## Low CV risk

Patients with T2DM not fulfilling the very high risk criteria and a:

- 10-year CVD risk  $< 5\%$  using SCORE2-Diabetes

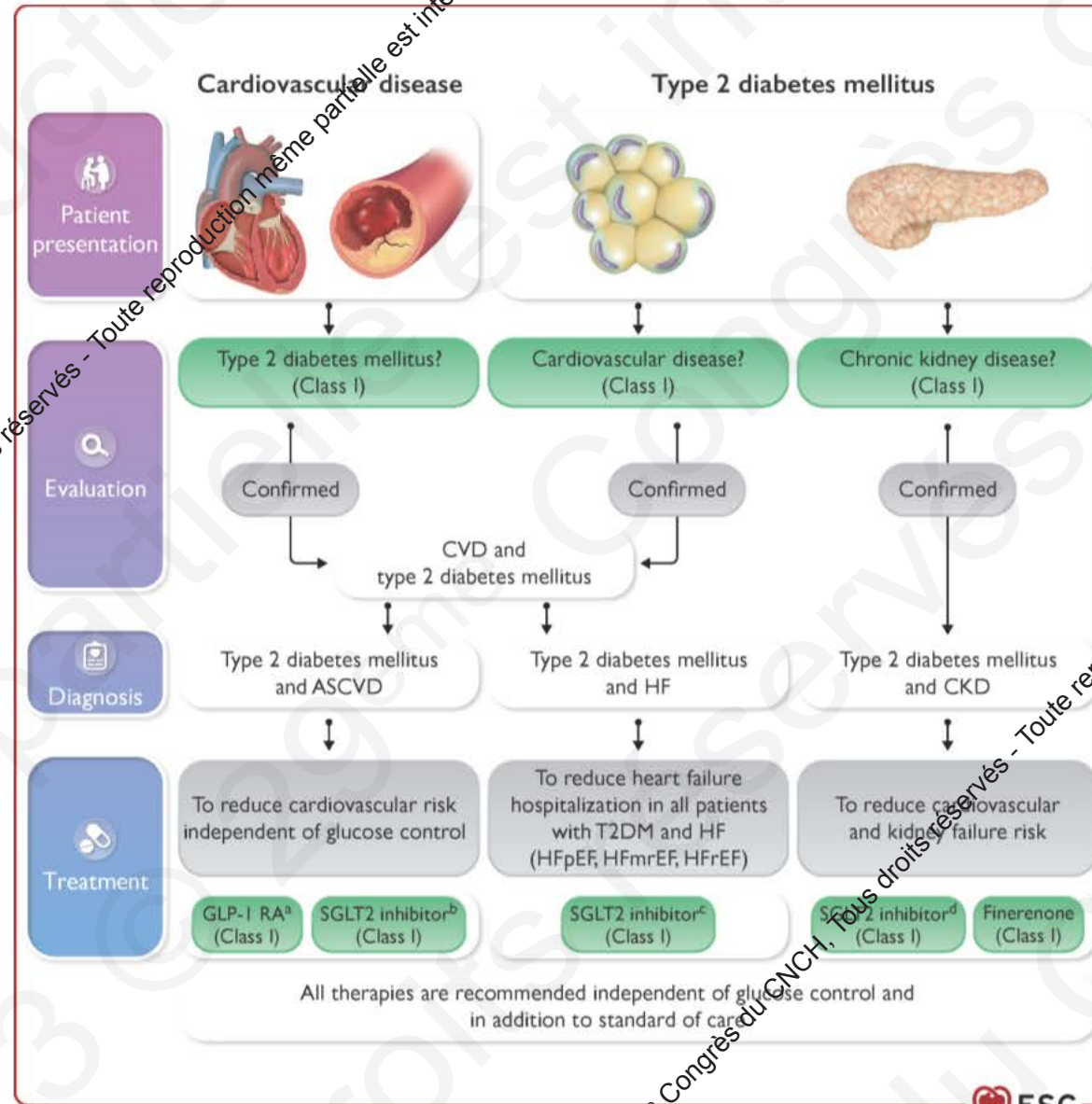
## Figure 3

### Cardiovascular risk categories in patients with type 2 diabetes



# Figure 1

## Management of cardiovascular disease in patients with type 2 diabetes: clinical approach and key recommendations



## New recommendations (5)

Recommendations	Class	Level
<b><i>Lipids and diabetes (continued)</i></b>		
If a statin-based regimen is not tolerated at any dosage (even after re-challenge), ezetimibe should be considered.	IIa	C
High-dose icosapent ethyl (2 g b.i.d.) may be considered in combination with a statin in patients with hypertriglyceridaemia.	IIb	B
<b><i>antithrombotic therapy in patients with diabetes</i></b>		
Clopidogrel 75 mg o.d. following appropriate loading (e.g. 600 mg or at least 5 days already on maintenance therapy) is recommended <u>in addition to ASA for 6 months</u> following coronary stenting in patients with CCS, irrespective of stent type, unless a shorter duration is indicated due to the risk or occurrence of life-threatening bleeding.	I	A
In patients with diabetes and ACS treated with DAPT who are undergoing CABG and do not require long-term OAC therapy, resuming a P2Y <sub>12</sub> receptor inhibitor as soon as deemed safe after surgery and continuing it up to 12 months is recommended.	I	C

## New recommendations (7)

Recommendations	Class	Level
<b><i>multifactorial approach in patients with diabetes</i></b>		
Identifying and treating risk factors and comorbidities early is recommended.	I	A
Multidisciplinary behavioural approaches that combine the knowledge and skills of different caregivers are recommended.	I	C
Principles of motivational interviewing should be considered to induce behavioural changes.	IIa	C
Telehealth may be considered to improve risk profile.	IIb	B
<b><i>Management of coronary artery disease in patients with diabetes</i></b>		
Myocardial revascularization in CCS is recommended when angina persists despite treatment with anti-anginal drugs or in patients with a documented large area of ischaemia (>10% LV).	I	A
Complete revascularization is recommended in patients with STEMI without cardiogenic shock and with multi-vessel CAD.	I	A

## New recommendations (9)

Recommendations	Class	Level
<b><i>Heart failure and diabetes</i></b>		
<b><i>Evaluation for heart failure in diabetes</i></b>		
If HF is suspected, it is recommended to measure BNP/NT-proBNP.	I	B
Systematic survey for HF symptoms and/or signs of HF is recommended at each clinical encounter in all patients with diabetes.	I	C
<b><i>Diagnostic tests in all patients with suspected heart failure</i></b>		
12-lead ECG is recommended.	I	C
Transthoracic echocardiography is recommended.	I	C
Chest radiography (X-ray) is recommended.	I	C
Routine blood tests for comorbidities are recommended, including full blood count, urea, creatinine and electrolytes, thyroid function, lipids, and iron status (ferritin and TSAT).	I	C

## New recommendations (13)

Recommendations	Class	Level
<b><i>Chronic kidney disease and diabetes</i></b>		
Intensive LDL-C lowering with statins or a statin/ezetimibe combination is recommended.	I	A
A SGLT2 inhibitor (canagliflozin, empagliflozin, or dapagliflozin) is recommended in patients with T2DM and CKD with an eGFR $\geq 20$ mL/min/1.73 m <sup>2</sup> to reduce the risk of CVD and kidney failure.	I	A
Finerenone is recommended in addition to an ACE-I or ARB in patients with T2DM and eGFR $> 60$ mL/min/1.73 m <sup>2</sup> with a UACR $\geq 30$ mg/mmol ( $\geq 300$ mg/g), or eGFR 25–60 mL/min/1.73 m <sup>2</sup> and UACR $\geq 3$ mg/mmol ( $\geq 30$ mg/g) to reduce CV events and kidney failure.	I	A
Low-dose ASA (75–100 mg o.d.) is recommended in patients with CKD and ASCVD.	I	A



## Revised recommendations (2)

2019	Class	Level	2023	Class	Level
<b>ASCVD risk reduction by glucose-lowering medications in diabetes</b>					
Empagliflozin, canagliflozin, or dapagliflozin are recommended in patients with T2DM and CVD, or at very high/high CV risk to reduce CV events.	I	A	SGLT2 inhibitors with proven CV benefit are recommended in patients with T2DM and ASCVD to reduce CV events, <u>independent of baseline or target HbA1c and independent of concomitant glucose-lowering medication.</u>	I	A
			In patients with T2DM without ASCVD or severe TOD but with a <u>calculated 10-year CVD risk <math>\geq 10\%</math></u> , treatment with a SGLT2 inhibitor or GLP-1 RA may be considered to reduce CV risk.	IIb	C

## Revised recommendations (3)

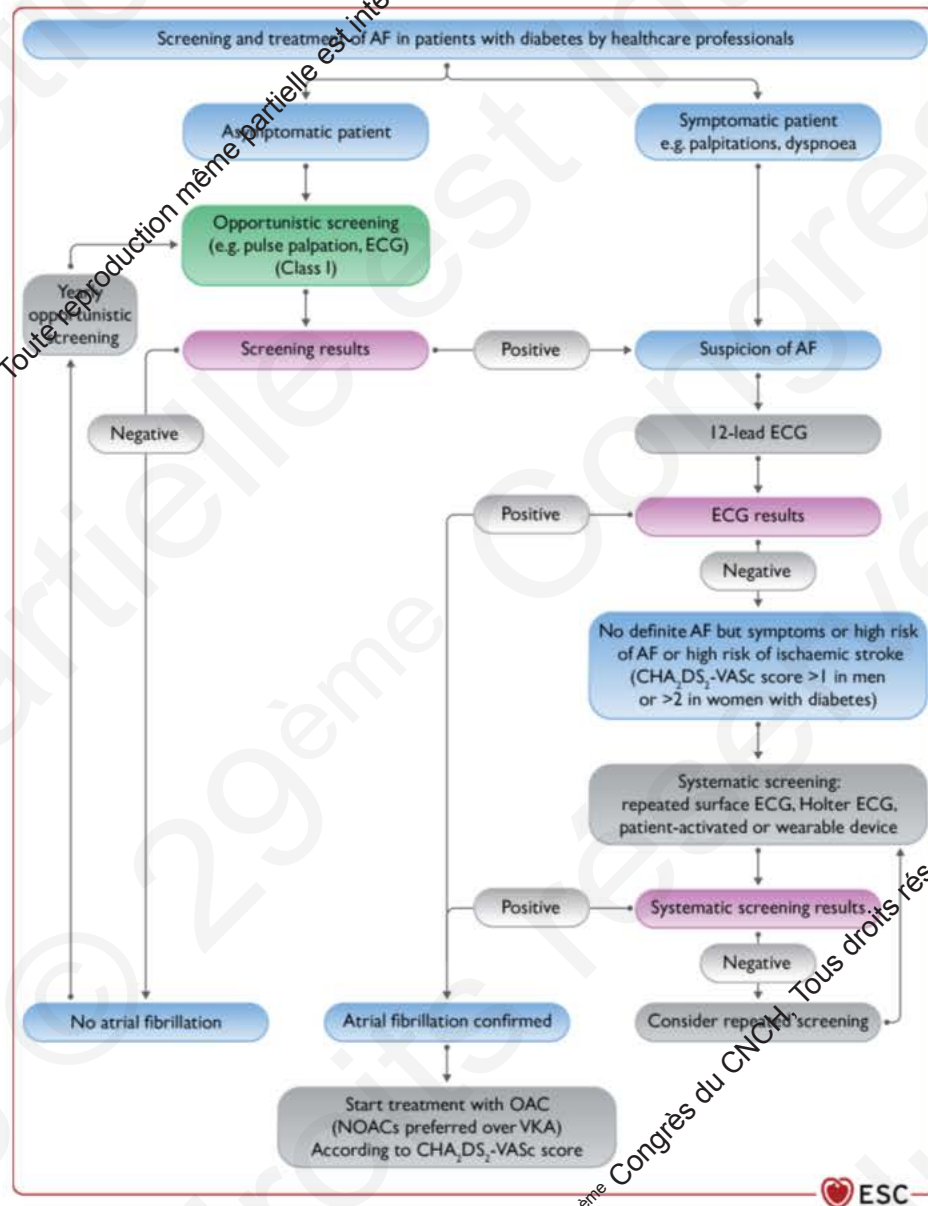
2019	Class	Level	2023	Class	Level
<b>ASCVD risk reduction by glucose-lowering medications in diabetes (continued)</b>					
Liraglutide, semaglutide, or dulaglutide are recommended in patients with T2DM and CVD, or at very high/high CV risk to reduce CV events.	I	A	GLP-1 RAs with proven CV benefit are recommended in patients with T2DM and ASCVD to reduce CV events, <u>independent of baseline or target HbA1c and independent of concomitant glucose-lowering medication.</u>	I	A
			In patients with T2DM without ASCVD or severe TOD but with a <u>calculated 10-year CVD risk <math>\geq 10\%</math></u> , treatment with a SGLT2 inhibitor or GLP-1 RA may be considered to reduce CV risk.	IIb	C

## Revised recommendations (8)

2019	Class	Level	2023	Class	Level
<b><i>Atrial fibrillation and diabetes</i></b>					
Screening for AF by pulse palpation should be considered in patients aged >65 years with diabetes and confirmed by ECG, if any suspicion of AF, as AF in patients with diabetes increases morbidity and mortality.	<b>IIa</b>	<b>C</b>	Opportunistic screening for AF by pulse taking or ECG is recommended in patients $\geq 65$ years of age.	<b>I</b>	<b>B</b>

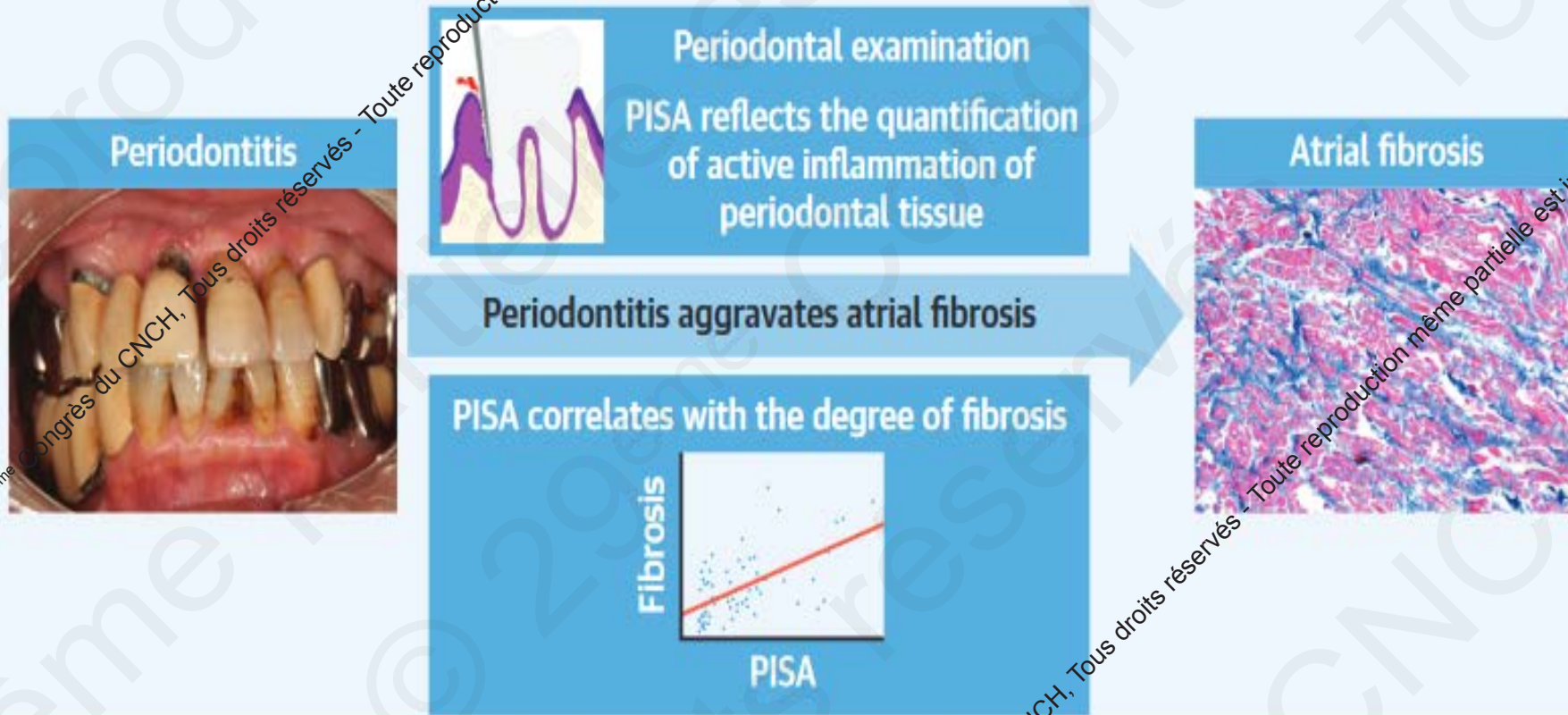
# Figure 17

## Screening for atrial fibrillation in patients with diabetes



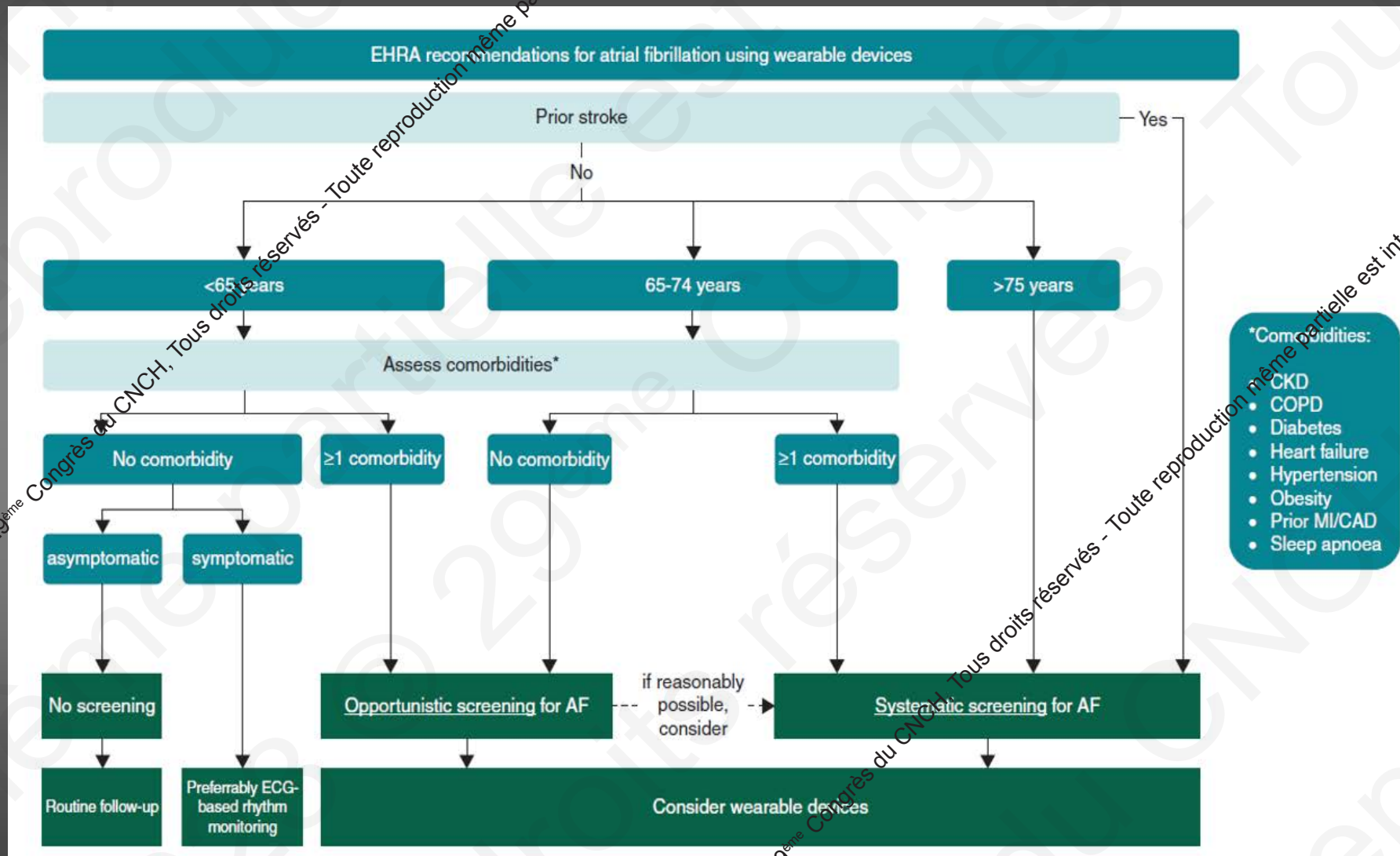
# CENTRAL ILLUSTRATION Periodontitis Is Associated With Atrial Fibriosis

## Histological Evaluation of 76 Left Atrial Appendages



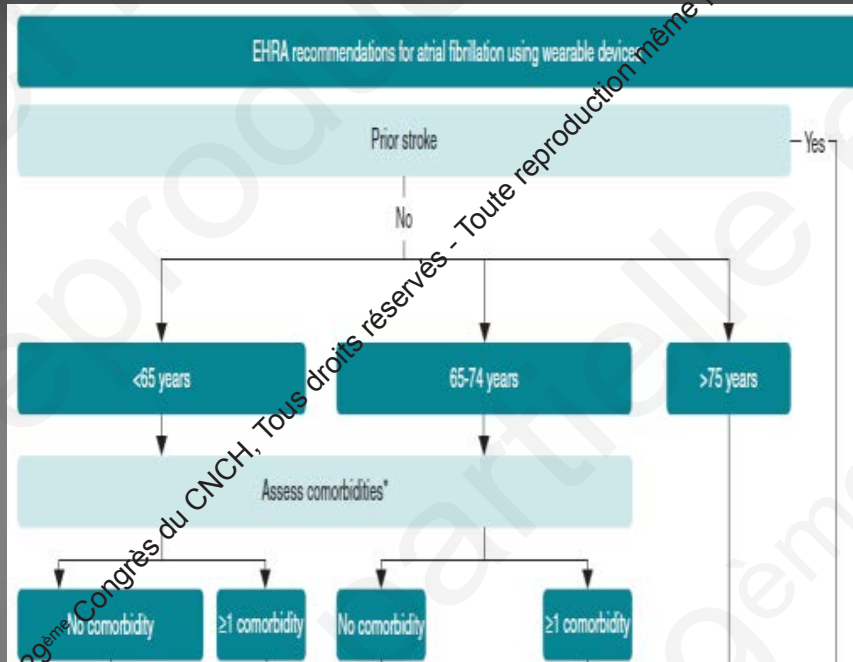
- CLINICAL PERSPECTIVES**
- Periodontitis can be a modifiable risk factor for AF
  - Dental specialists should participate in comprehensive AF management

# How to use digital devices to detect and manage arrhythmias: an EHRA practical guide



# Methods

## Classification in 6 groups population



Group 1: history of stroke

Group 2: > 75 years

Group 3: 65-74 years

3a- with and

3b- without comorbidities

### Comorbidities:

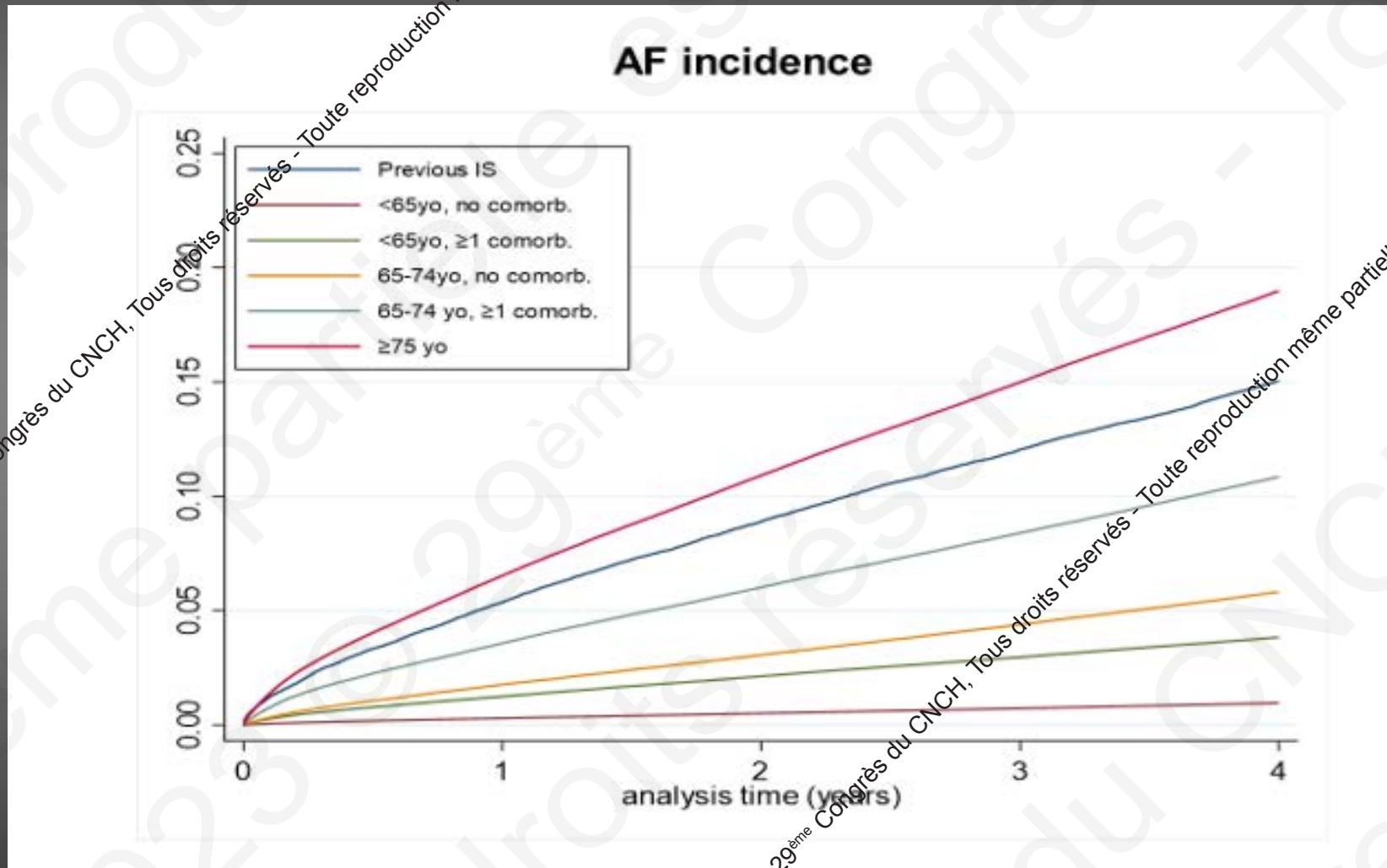
- Chronic kidney disease
- COPD
- Diabetes mellitus
- Heart failure
- Hypertension
- Obesity
- Coronary artery disease
- Sleep apnoea syndrome

Group 4: < 65 years

4a- with and

4b- without comorbidities

# A nationwide study of Incident atrial fibrillation risk and atrial fibrillation-related complications: implications for AF screening strategies





# Results

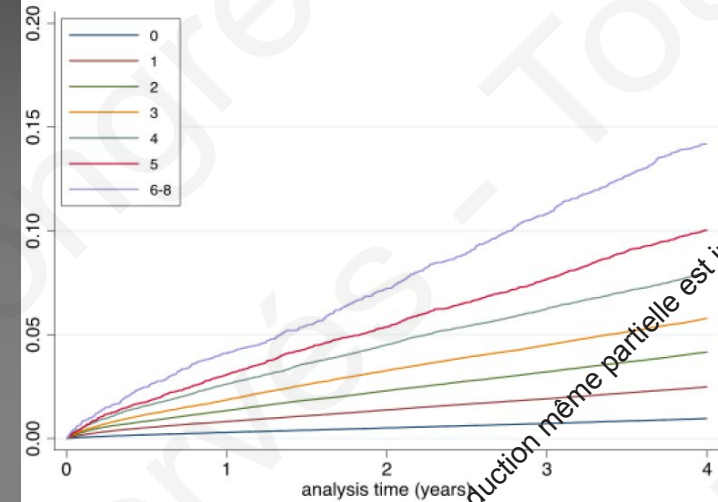
Impact of the number of comorbidities on the annual incidence of AF in groups 3 and 4

## Comorbidities:

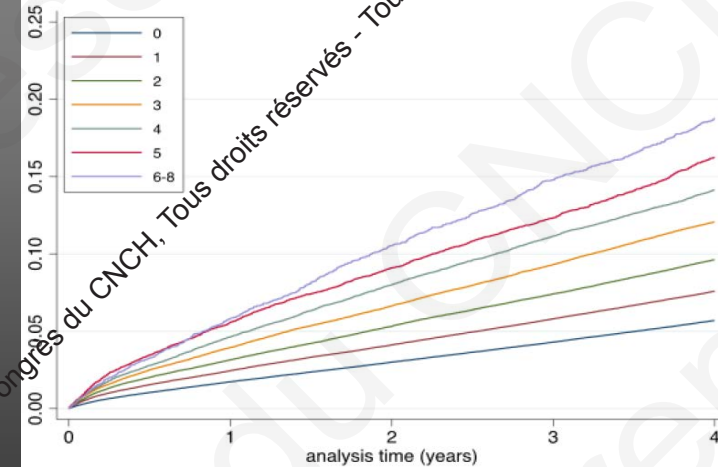
- Chronic kidney disease
- COPD
- Diabetes mellitus
- Heart failure
- Hypertension
- Obesity
- Coronary artery disease
- Sleep apnoea syndrome

Number of comorbidities:	< 65 years	65-74 years
<b>Yearly incidence of new-onset AF (%):</b>		
0	0.35 (0.35-0.35)	2.01 (1.99-2.03)
1	0.84 (0.83-0.85)	2.74 (2.71-2.77)
2	1.42 (1.39-1.44)	3.58 (3.53-3.63)
3	2.00 (1.96-2.04)	4.56 (4.48-4.64)
4	2.68 (2.60-2.76)	<u>5.61 (5.47-5.75)</u>
5	3.68 (3.52-3.84)	7.12 (6.86-7.38)
6	<u>5.01 (4.65-5.39)</u>	8.68 (8.16-9.23)
7	6.55 (5.72-7.51)	10.07 (8.91-11.37)
8	9.08 (5.79-14.24)	11.47 (7.86-16.72)
All patients	0.56 (0.55-0.56)	2.66 (2.65-2.68)

Age 18-64: AF incidence by number of comorbidities

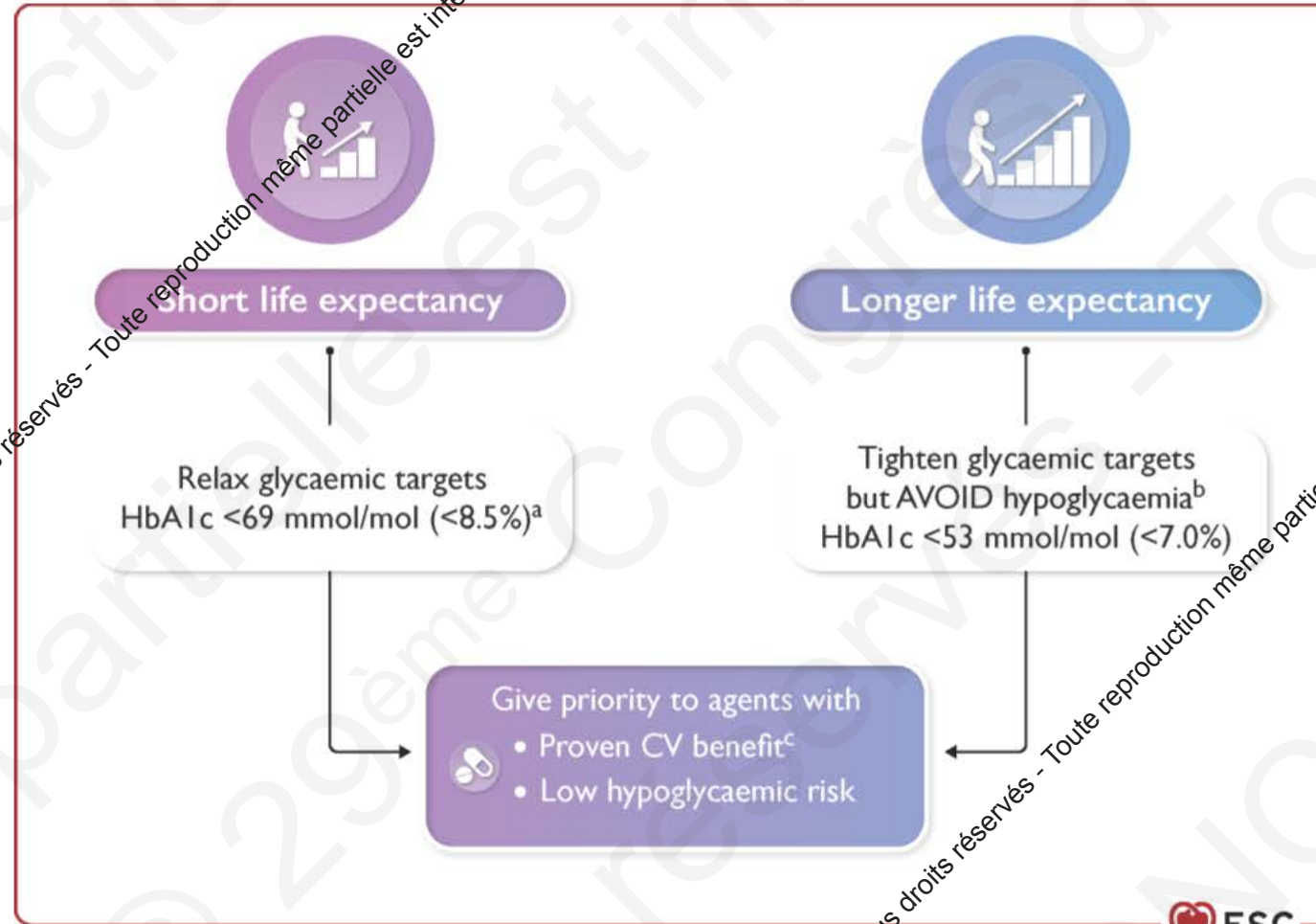


Age 65-74: AF incidence by number of comorbidities



## Figure 4

### Simple guide to glycaemic targets in patients with type 2 diabetes and cardiovascular disease



# Recommendations for glycaemic targets in patients with diabetes

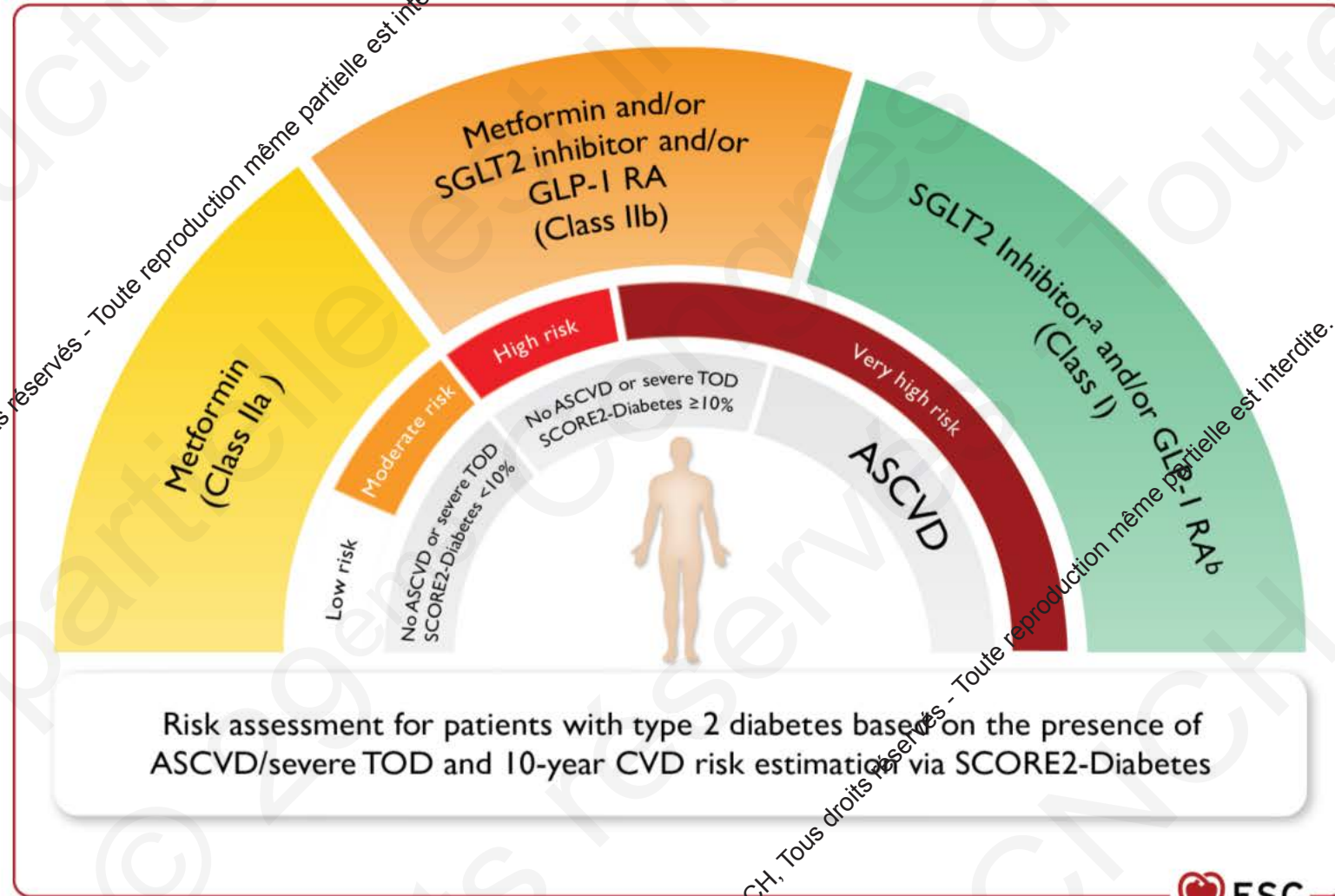


Recommendations	Class	Level
It is recommended to apply tight glycaemic control (HbA1c <7%) to reduce microvascular complications.	I	A
It is recommended to avoid hypoglycaemia, particularly in patients with CVD.	I	B
It is recommended to individualize HbA1c targets according to comorbidities, diabetes duration, and life expectancy.	I	C
Tight glycaemic control should be considered for reducing CAD in the long term preferably using agents with proven CV benefit.	Ia	B

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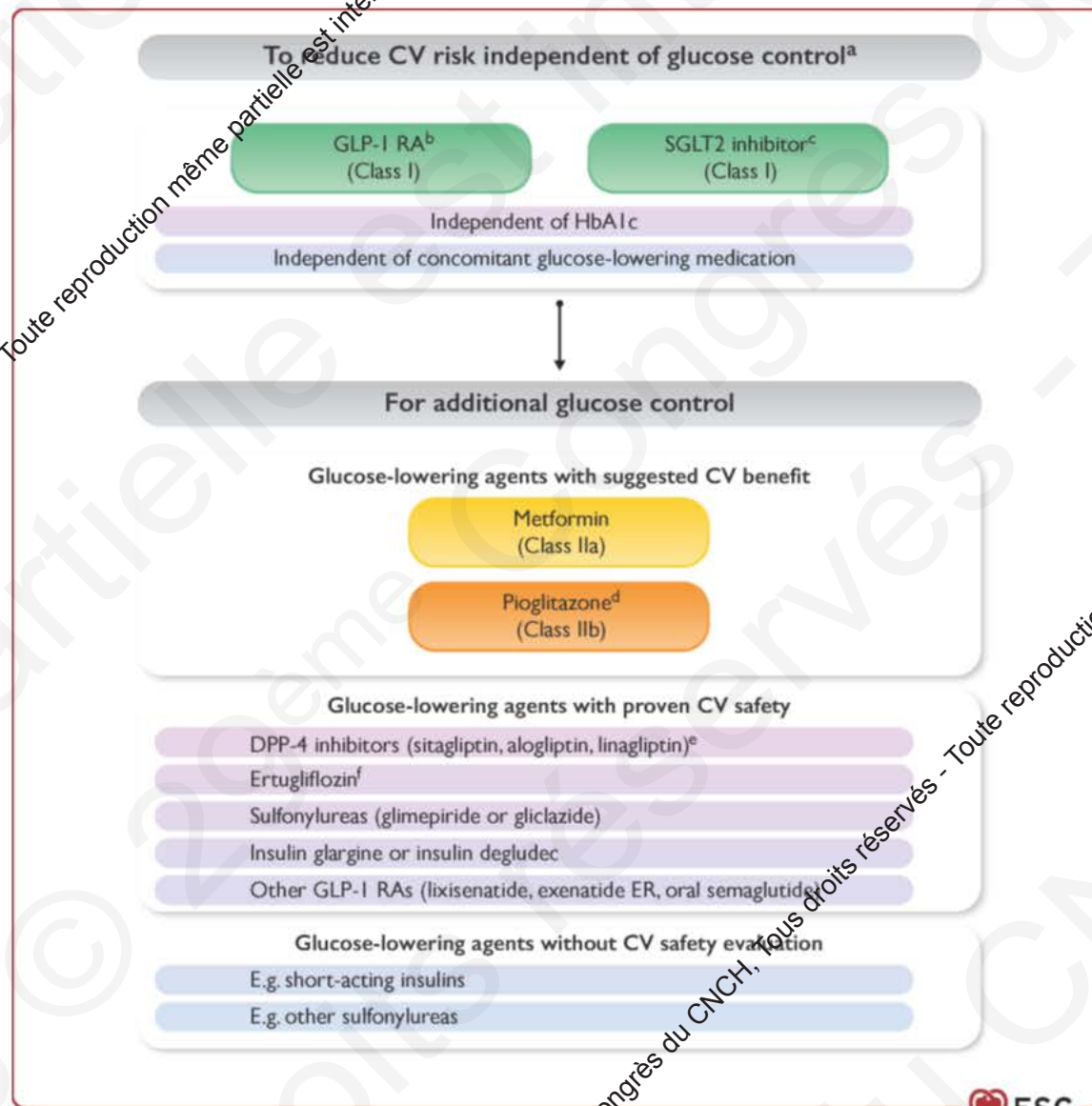
## Figure 7

Glucose-lowering treatment for patients with type 2 diabetes to reduce cardiovascular risk based on the presence of ASCVD/severe target-organ damage and 10-year cardiovascular disease risk estimation via SCORE2-Diabetes



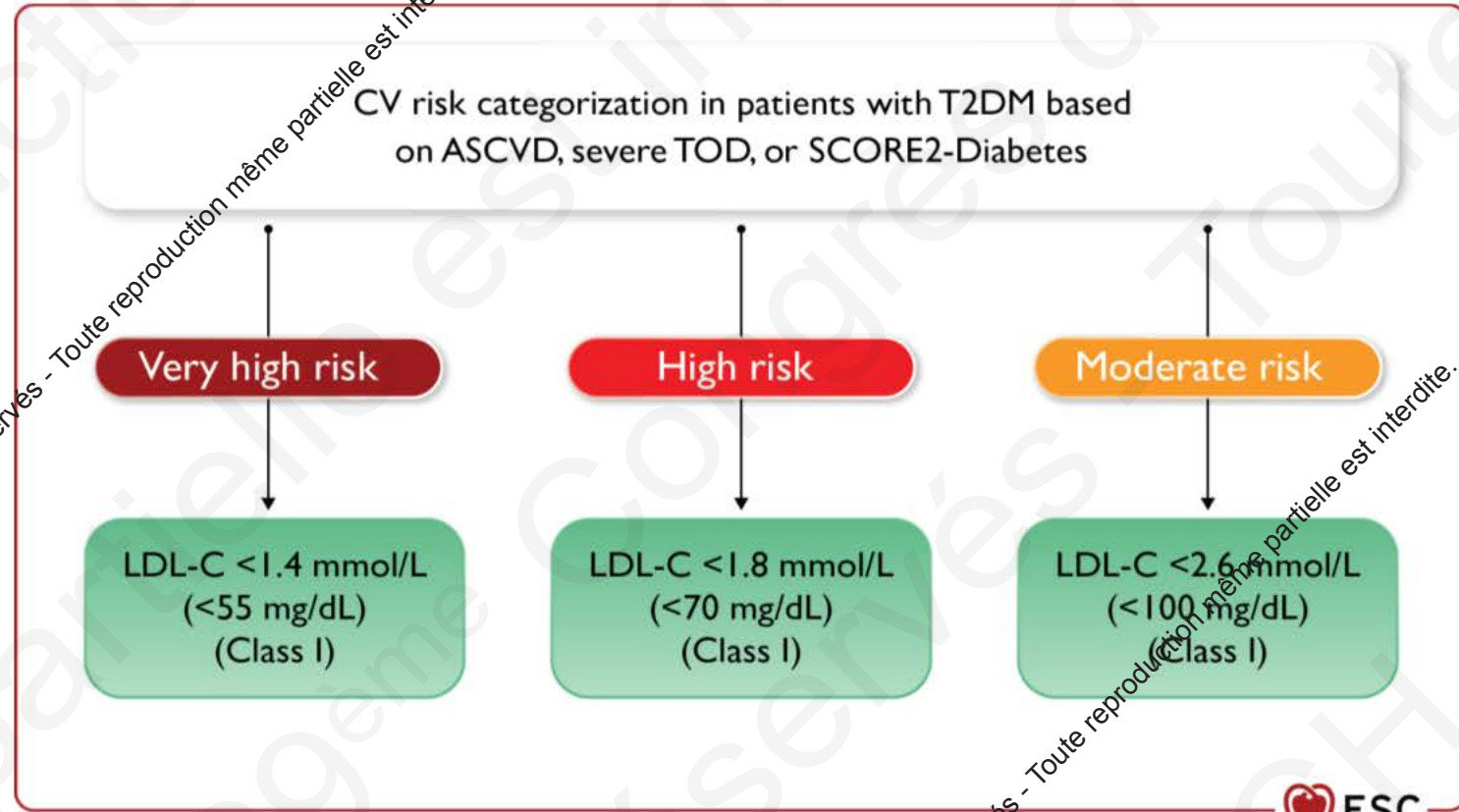
## Figure 8

# Glucose-lowering treatment for patients with type 2 diabetes and atherosclerotic cardiovascular disease to reduce cardiovascular risk



## Figure 10

**Recommended low-density lipoprotein-cholesterol targets by cardiovascular risk categories in patients with type 2 diabetes**

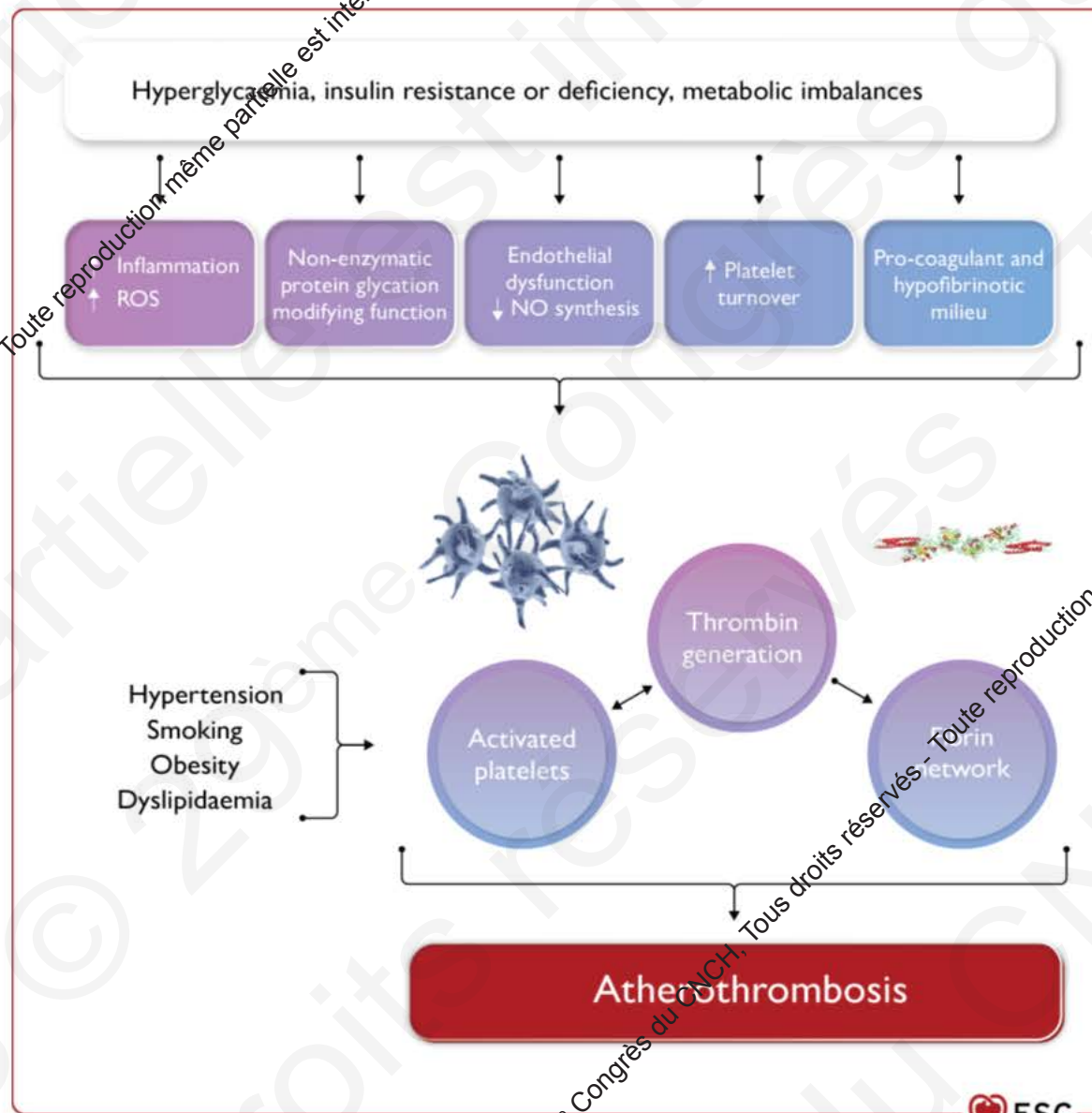


# Recommendations for the management of dyslipidaemia in patients with diabetes (2)

Recommendations	Class	Level
<b><i>Lipid-lowering treatment</i></b>		
Statins are recommended as the first-choice LDL-C-lowering treatment in patients with diabetes and above-target LDL-C levels. Administration of statins is defined based on the CV risk profile of the patients and the recommended LDL-C (or non-HDL-C) target levels.	I	A
A PCSK9 inhibitor is recommended in patients at very high CV risk, with persistently high LDL-C levels above target despite treatment with a maximum tolerated statin dose, in combination with ezetimibe, or in patients with statin intolerance.	I	A
If the target LDL-C is not reached with statins, combination therapy with ezetimibe is recommended.	I	B

# Figure 11

## Mechanisms contributing to altered platelet activation and atherothrombosis in patients with diabetes



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# Recommendations for patients with diabetes without a history of symptomatic atherosclerotic cardiovascular disease or revascularization



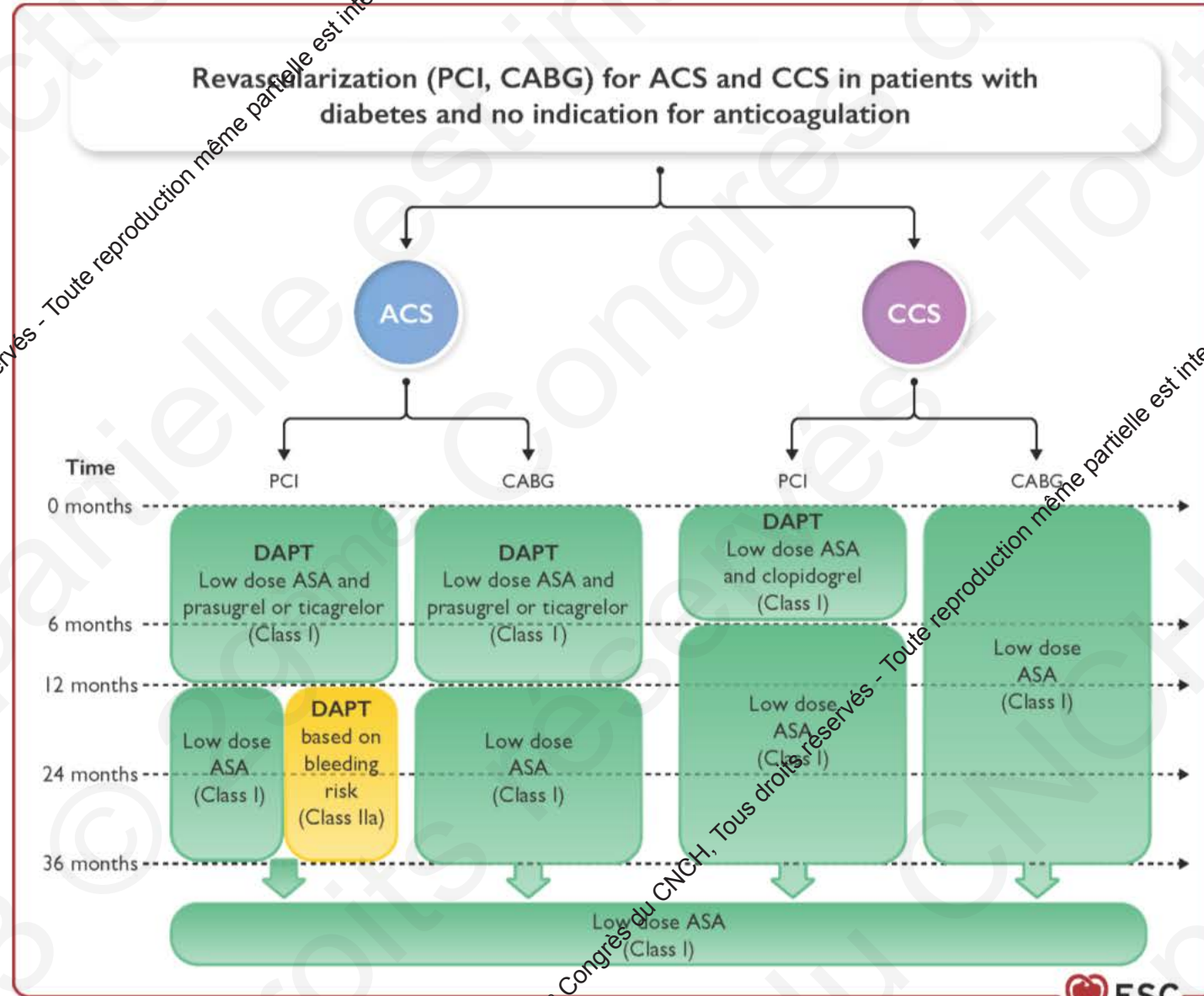
Recommendation	Class	Level
In adults with T2DM without a history of symptomatic ASCVD or revascularization, ASA (75–100 mg o.d.) may be considered to prevent the first severe vascular event, in the absence of clear contraindications.	<b>IIb</b>	<b>A</b>

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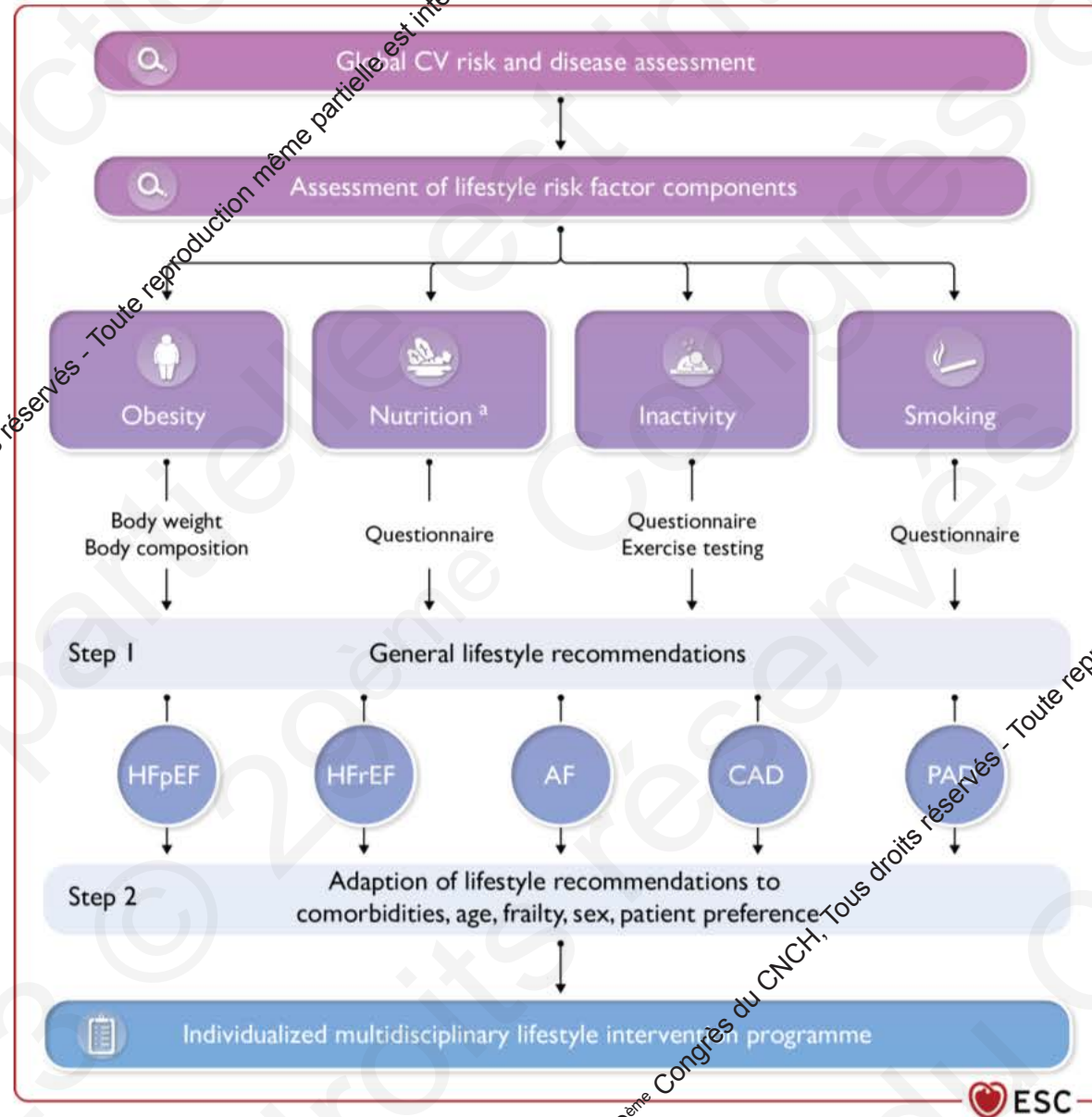
## Figure 12

Recommendations for antiplatelet therapy in patients with diabetes with acute or chronic coronary syndrome undergoing percutaneous coronary intervention or coronary artery bypass grafting without indications for long-term oral anticoagulation



**Figure 13**

**Assessment of lifestyle risk-factor components and stepwise lifestyle recommendations in patients with diabetes**



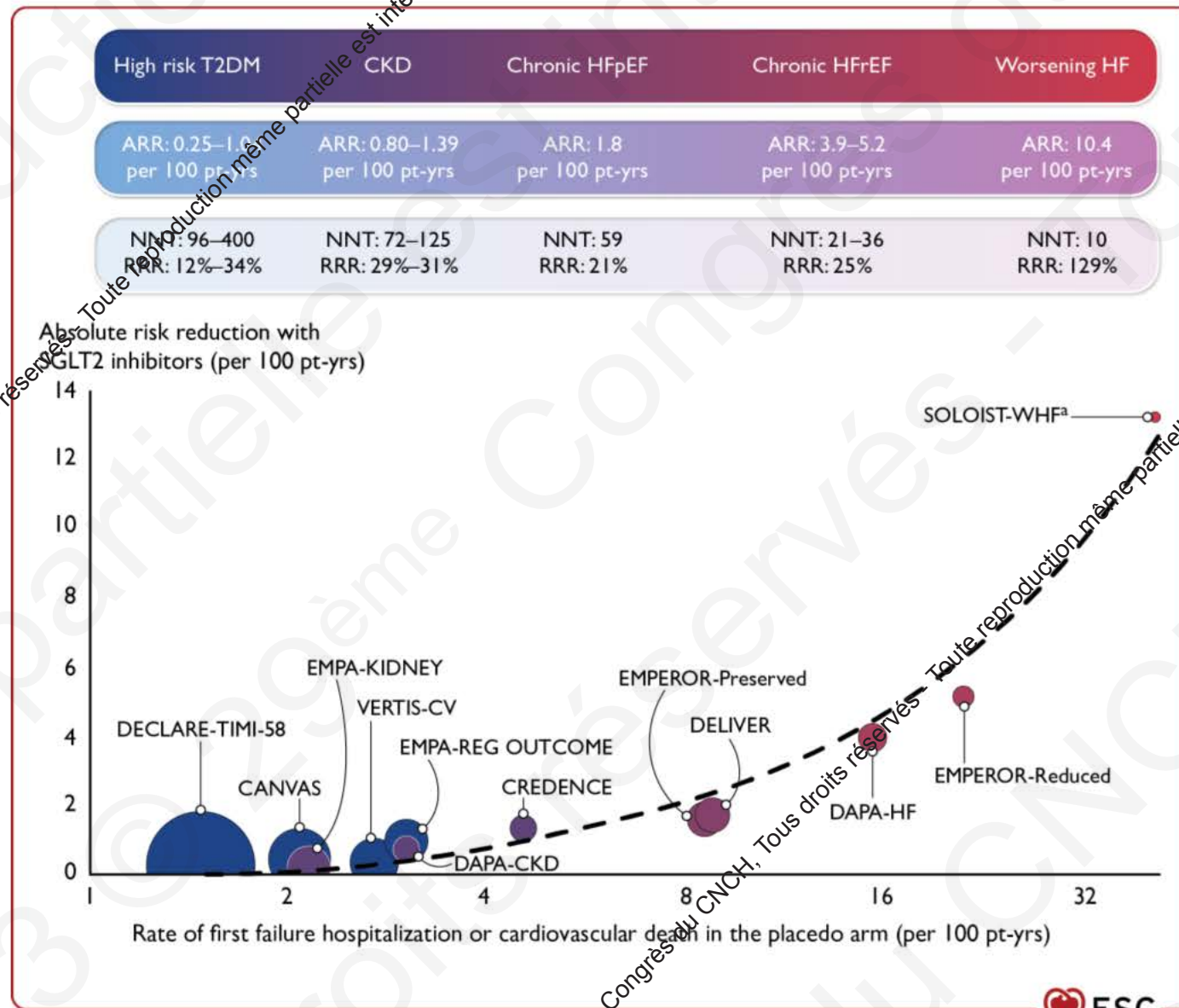
# Recommendations for revascularization in patients with diabetes



Recommendations	Class	Level
It is recommended that similar revascularization techniques are implemented (e.g. the use of DES and the radial approach for PCI, and the use of the left internal mammary artery as the graft for CABG) in patients with and without diabetes.	I	A
Myocardial revascularization in CCS is recommended when angina persists despite treatment with anti-anginal drugs or in patients with a documented large area of ischaemia (>10% LV).	I	A
Complete revascularization is recommended in patients with STEMI without cardiogenic shock and with multi-vessel CAD.	I	A
Complete revascularization should be considered in patients with NSTEMI-ACS without cardiogenic shock and with multi-vessel CAD.	IIa	C
Routine immediate revascularization of non-culprit lesions in patients with MI and multi-vessel disease presenting with cardiogenic shock is not recommended.	III	B

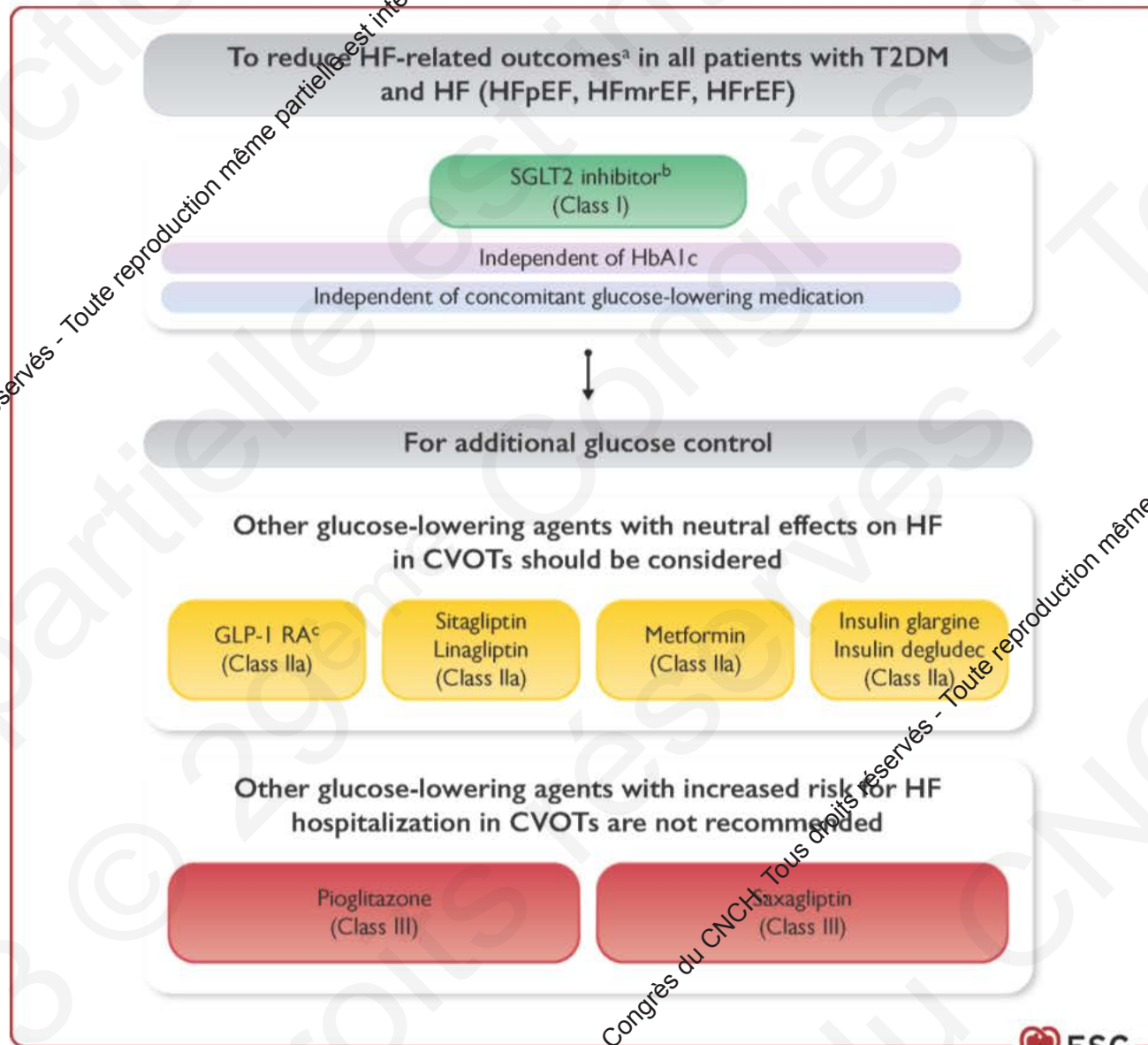
**Figure 15**

**Absolute risk reduction with sodium–glucose co-transporter-2 inhibitors in relation to patient risk based on rate of heart failure-related endpoints in the placebo arm of the respective trials**



## Figure 16

### Glucose-lowering treatment of patients with heart failure and type 2 diabetes

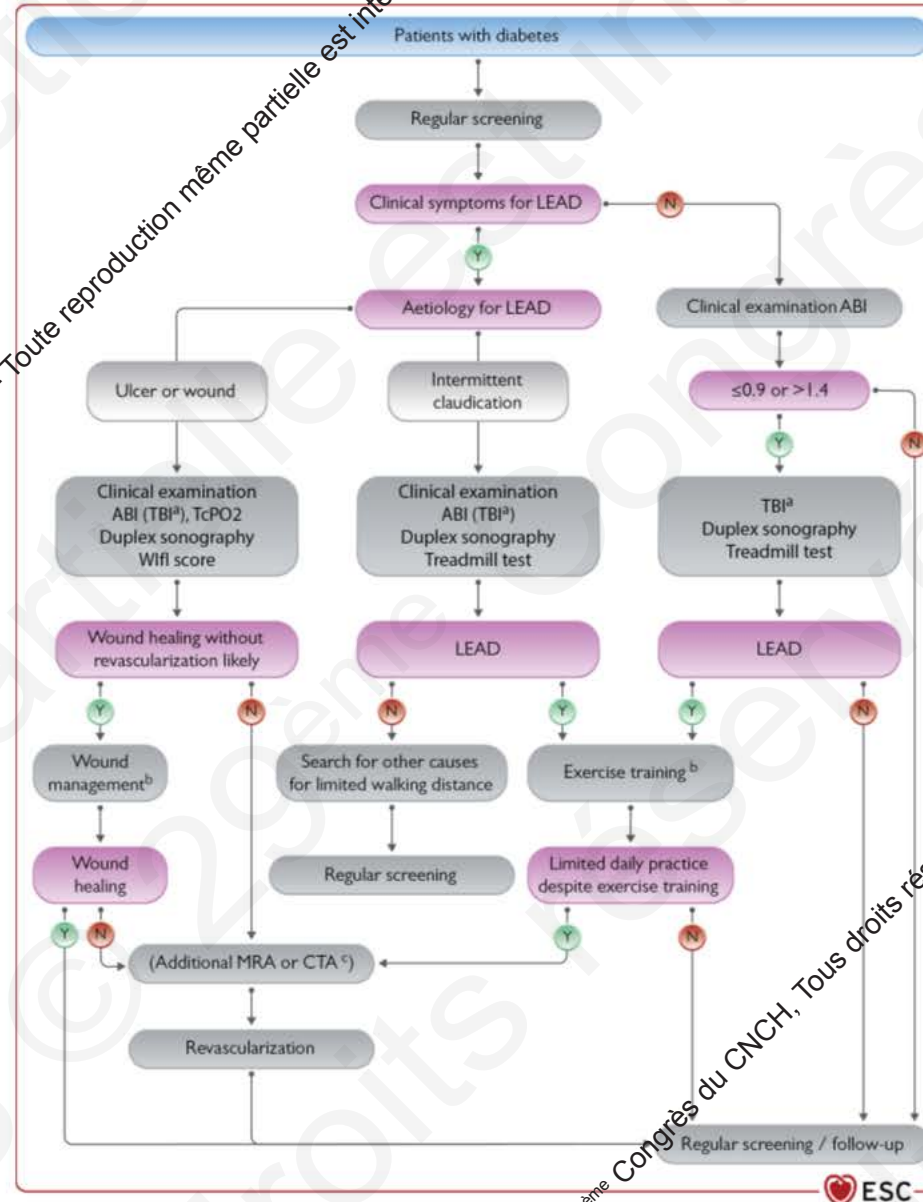


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## Figure 20

### Screening for and managing lower-extremity artery disease in patients with diabetes



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Vente caritative aux enchères et dîner de gala

# Le Cœur des Femmes

Organisé par Femmes & Vins de Bourgogne  
Au profit de deux associations de soutien aux femmes

Château du Clos de Vougeot  
Le 14 Décembre 2023

En présence de Alexandra Lamy,  
Mélanie Doutey et Michaël Llodra

Renseignements & inscriptions

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