



**ESC**

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**ESC GUIDELINES**



## **2019 ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD**

**The Task Force for diabetes, pre-diabetes, and cardiovascular  
diseases of the European Society of Cardiology (ESC) and the  
European Association for the Study of Diabetes (EASD)**

**Table 3** What is new in the 2019 Guidelines?

Change in recommendations	
2013	2019
<b>BP targets</b>	
BP target <140/85 mmHg for all	Individualized BP targets are recommended. SBP to 130 mmHg and, if well tolerated, <130 mmHg, but not <120 mmHg. In older people (>65 years) target SBP to a range of 130 - 139 mmHg. DBP to <80 mmHg but not <70 mmHg. On-treatment SBP to <130 mmHg should be considered for patients at high risk of cerebrovascular events or diabetic kidney disease.
<b>Lipid targets</b>	
In DM at high CV risk, an LDL-C target of <2.5 mmol/L (<100 mg/dL). In DM at very high CV risk, an LDL-C target of <1.8 mmol/L (<70 mg/dL) is recommended.	In patients with T2DM at moderate CV risk, an LDL-C target of <2.5 mmol/L (<100 mg/dL) is recommended. In patients with T2DM at high CV risk, an LDL-C target of <1.8 mmol/L (<70 mg/dL) is recommended. In patients with T2DM at very high CV risk, an LDL-C target of <1.4 mmol/L (<55 mg/dL) is recommended.
<b>Antiplatelet therapy</b>	
Aspirin for primary prevention is not recommended in DM at low CVD risk.	Aspirin (75 - 100 mg/day) for primary prevention may be considered in patients with DM at very high/high risk in the absence of clear contraindications. Aspirin for primary prevention is not recommended in patients with DM at moderate CV risk.

### Glucose-lowering treatment

Metformin should be considered as first-line therapy in patients with DM

Metformin should be considered in overweight patients with T2DM without CVD and at moderate CV risk

### Revascularization

DES rather than BMS is recommended in DM

Same techniques are recommended in patients with and without DM (see 2018 ESC/EACTS myocardial revascularization Guidelines)

PCI may be considered as an alternative to CABG in patients with DM and less complex CAD (SYNTAX score  $\leq 22$ )

One- or two-vessel CAD, no proximal LAD

CABG

PCI

One- or two-vessel CAD, proximal LAD

CABG

PCI

Three-vessel CAD, low complexity

CABG

PCI

Left main CAD, low complexity

CABG

PCI

CABG recommended in complex CAD (SYNTAX score  $> 22$ )

Three-vessel CAD, intermediate or high complexity

CABG

PCI

Left main CAD, intermediate complexity

CABG

PCI

High complexity

CABG

PCI

**Management of arrhythmias**

Attempts to diagnose structural heart disease should be considered in patients with DM1 with frequent premature ventricular contractions.

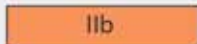
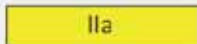
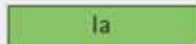
Hypoglycaemia should be avoided as it can trigger arrhythmias.

**Diagnosis and management of PAD**

Low-dose rivaroxaban 2.5 mg b.i.d. plus aspirin 100 mg o.d. may be considered in patients with DM and symptomatic LEAD.

**Management of CKD**

SGLT2 inhibitors are recommended to reduce progression of diabetic kidney disease.



ABI = ankle-brachial index; ABPM = ambulatory blood pressure monitoring; ACEi = angiotensin-converting enzyme inhibitor; b.i.d. = twice daily (bis in die); b.p.m. = beats per minute; CABG = coronary artery bypass graft; CAC = coronary artery calcium; CAD = coronary artery disease; CKD = chronic kidney disease; CRT = cardiac resynchronization therapy; CRT-D = cardiac resynchronization therapy with an implantable defibrillator; CT = computed tomography; CV = cardiovascular; CVD = cardiovascular disease; DAPT = dual antiplatelet therapy; DM = diabetes mellitus; DPP4 = dipeptidyl peptidase-4; ECG = electrocardiogram; eGFR = estimated glomerular filtration rate; GLP-1RA = glucagon-like peptide-1 receptor agonist; HF = heart failure; HFwEF = heart failure with reduced ejection fraction; ICD = implantable cardioverter defibrillator; LEAD = lower extremity artery disease; MRA = mineralocorticoid receptor agonist; o.d. = once daily (omni die); PAD = peripheral arterial disease; PCSK9 = proprotein-converterase subtilisin/kexin type 9; RAAS = renin-angiotensin-aldosterone system; SGLT2 = sodium-glucose co-transporter-2; T1DM = type 1 diabetes mellitus; T2DM = type 2 diabetes mellitus.

RECLASIFICACIÓN  
DEL RCV  
EN DIABÉTICOS

**Table 7** Cardiovascular risk categories in patients with diabetes<sup>a</sup>

<b>Very high risk</b>	Patients with DM <b>and</b> established CVD <b>or</b> other target organ damage <sup>b</sup> <b>or</b> three or more major risk factors <sup>c</sup> <b>or</b> early onset T1DM of long duration (>20 years)
<b>High risk</b>	Patients with DM duration ≥10 years without target organ damage plus any other additional risk factor
<b>Moderate risk</b>	Young patients (T1DM aged <35 years or T2DM aged <50 years) with DM duration <10 years, without other risk factors

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CV = cardiovascular; CVD = cardiovascular disease; DM = diabetes mellitus; T1DM = type 1 diabetes mellitus; T2DM = type 2 diabetes mellitus.

<sup>a</sup>Modified from the 2016 European Guidelines on cardiovascular disease prevention in clinical practice.<sup>27</sup>

<sup>b</sup>Proteinuria, renal impairment defined as eGFR  $\geq 30$  mL/min/1.73 m<sup>2</sup>, left ventricular hypertrophy, or retinopathy.

<sup>c</sup>Age, hypertension, dyslipidemia, smoking, obesity.

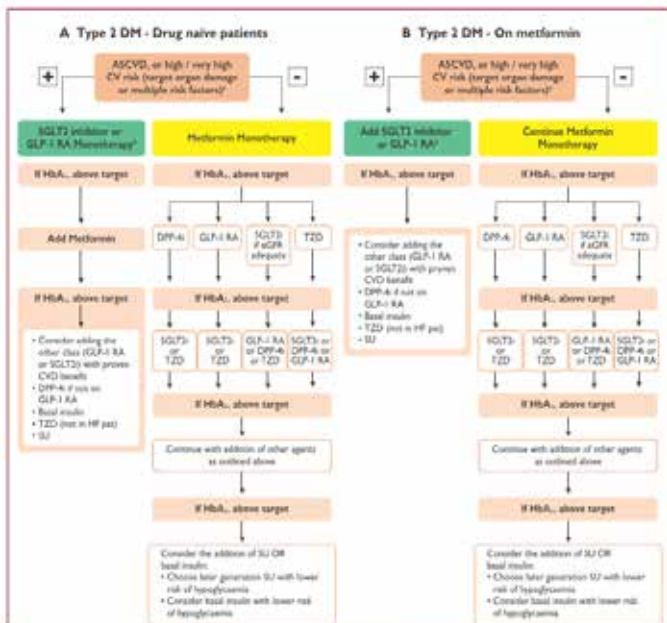
## Recommendations for the use of laboratory, electrocardiogram, and imaging testing for cardiovascular risk assessment in asymptomatic patients with diabetes

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
Routine assessment of microalbuminuria is indicated to identify patients at risk of developing renal dysfunction or at high risk of future CVD. <sup>27,28</sup>	I	B
A resting ECG is indicated in patients with DM diagnosed with hypertension or with suspected CVD. <sup>38,39</sup>	I	C
Assessment of carotid and/or femoral plaque burden with arterial ultrasonography should be considered as a risk modifier in asymptomatic patients with DM. <sup>40-42</sup>	IIa	B
CAC score with CT may be considered as a risk modifier in the CV risk assessment of asymptomatic patients with DM at moderate risk. <sup>6,43</sup>	IIb	B
CTCA or functional imaging (radiotracer myocardial perfusion imaging, stress cardiac magnetic resonance imaging, or exercise or pharmacological stress echocardiography) may be considered in asymptomatic patients with DM for screening of CAD. <sup>47,48,55,67-70</sup>	IIb	B
ABI may be considered as a risk modifier in CV risk assessment. <sup>78</sup>	IIb	B
Detection of atherosclerotic plaque of carotid or femoral arteries by CT, or magnetic resonance imaging, may be considered as a risk modifier in patients with DM at moderate or high risk CV. <sup>6,75,77</sup>	IIb	B
Carotid ultrasound intima-media thickness screening for CV risk assessment is not recommended. <sup>42,71,78</sup>	III	A
Routine assessment of circulating biomarkers is not recommended for CV risk stratification. <sup>27,31,35-37</sup>	III	B
Risk scores developed for the general population are not recommended for CV risk assessment in patients with DM.	III	C

ABI = ankle-brachial index; CAC = coronary artery calcium; CAD = coronary artery disease; CT = computed tomography; CTCA = computed tomography coronary angiography; CV = cardiovascular; CVD = cardiovascular disease; DM = diabetes mellitus; ECG = electrocardiogram.

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## Recommendations for glucose-lowering treatment for patients with diabetes

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
<b>SGLT2 inhibitors</b>		
Empagliflozin, canagliflozin, or dapagliflozin are recommended in patients with T2DM and CVD, or at very high/high CV risk, <sup>6</sup> to reduce CV events. <sup>346,308,309,311</sup>	I	A
Empagliflozin is recommended in patients with T2DM and CVD to reduce the risk of death. <sup>308</sup>	I	B
<b>GLP1-RA<sup>s</sup></b>		
Liraglutide, semaglutide, or dulaglutide are recommended in patients with T2DM and CVD, or at very high/high CV risk, <sup>6</sup> to reduce CV events. <sup>174,177-180,302-303</sup>	I	A
Liraglutide is recommended in patients with T2DM and CVD, or at very high/high CV risk, <sup>6</sup> to reduce the risk of death. <sup>174</sup>	I	B
<b>Biguanides</b>		
Metformin should be considered in overweight patients with T2DM without CVD and at moderate CV risk. <sup>146,149</sup>	IIa	C
<b>Insulin</b>		
Insulin-based glycaemic control should be considered in patients with ACS with significant hyperglycaemia ( $\geq 10$ mmol/L or $>180$ mg/dL), with the target adapted according to comorbidities. <sup>248-252</sup>	IIa	C
<b>Thiazolidinediones</b>		
Thiazolidinediones are not recommended in patients with HF.	III	A
<b>DPP4 inhibitors</b>		
Saxagliptin is not recommended in patients with T2DM and a high risk of HF. <sup>291</sup>	III	B

ACS = acute coronary syndrome; CV = cardiovascular; CVD = cardiovascular disease; DM = diabetes mellitus; DPP4 = dipeptidyl peptidase-4; GLP1-RA = glucagon-like peptide-1 receptor agonist; HF = heart failure; SGLT2 = sodium-glucose co-transporter 2; T2DM = type 2 diabetes mellitus.

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## Recommendations for the management of dyslipidaemia with lipid-lowering drugs

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
<b>Targets</b>		
In patients with T2DM at moderate CV risk, <sup>e</sup> an LDL-C target of <2.5 mmol/L (<100 mg/dL) is recommended. <sup>210-212</sup>	I	A
In patients with T2DM at high CV risk, <sup>e</sup> an LDL-C target of <1.8 mmol/L (<70 mg/dL) or an LDL-C reduction of at least 50% is recommended. <sup>4,210-212</sup>	I	A
In patients with T2DM at very high CV risk, <sup>e</sup> an LDL-C target of <1.4 mmol/L (<55 mg/dL) or an LDL-C reduction of at least 50% is recommended. <sup>4,200,201,210</sup>	I	B
In patients with T2DM, a secondary goal of a non-HDL-C target of <2.2 mmol/L (<85 mg/dL) in very high CV-risk patients, and <2.6 mmol/L (<100 mg/dL) in high CV-risk patients, is recommended. <sup>4,211,214</sup>	I	B
<b>Treatment</b>		
Statins are recommended as the first-choice lipid-lowering treatment in patients with DM and high LDL-C levels: administration of statins is defined based on the CV risk profile of the patient <sup>f</sup> and the recommended LDL-C (or non-HDL-C) target levels. <sup>187</sup>	I	A
If the target LDL-C is not reached, combination therapy with ezetimibe is recommended. <sup>200,201</sup>	I	B
In patients at very high CV risk, with persistent high LDL-C despite treatment with a maximum tolerated statin dose, in combination with ezetimibe, or in patients with statin intolerance, a PCSK9 inhibitor is recommended. <sup>201, 204</sup>	I	A
Lifestyle intervention (with a focus on weight reduction, and decreased consumption of fast-absorbed carbohydrates and alcohol) and fibrates should be considered in patients with low HDL-C and high triglyceride levels. <sup>191,207</sup>	IIa	B
Intensification of statin therapy should be considered before the introduction of combination therapy.	IIa	C
Statins should be considered in patients with T1DM at high CV risk, <sup>e</sup> irrespective of the baseline LDL-C level. <sup>187,202</sup>	IIa	A
Statins may be considered in asymptomatic patients with T1DM beyond the age of 30 years.	IIb	C

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## Recommendations for the management of blood pressure in patients with diabetes and pre-diabetes

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
<b>Treatment targets</b>		
Antihypertensive drug treatment is recommended for people with DM when office BP is >140/90 mmHg. <sup>133,178-180</sup>	I	A
It is recommended that patients with hypertension and DM are treated in an individualized manner. The BP goal is to target SBP to 130 mmHg and <130 mmHg if tolerated, but not <120 mmHg. In older people (aged >65 years), the SBP goal is to a range of 130-139 mmHg. <sup>155,138,140,181-183</sup>	I	A
It is recommended that target DBP is targeted to <80 mmHg, but not <70 mmHg. <sup>140</sup>	I	C
An on-treatment SBP of <130 mmHg may be considered in patients at particularly high risk of a cerebrovascular event, such as those with a history of stroke. <sup>134-137,173</sup>	IIb	C
<b>Treatment and evaluation</b>		
Lifestyle changes [weight loss if overweight, physical activity, alcohol restriction, sodium restriction, and increased consumption of fruits (e.g. 2-3 servings), vegetables (e.g. 2-3 servings), and low-fat dairy products] are recommended in patients with DM and pre-DM with hypertension. <sup>161-163,168</sup>	I	A
A RAAS blocker (ACEI or ARB) is recommended in the treatment of hypertension in patient with DM, particularly in the presence of microalbuminuria, albuminuria, proteinuria, or LV hypertrophy. <sup>167-170</sup>	I	A
It is recommended that treatment is initiated with a combination of a RAAS blocker with a calcium channel blocker or thiazide/thiazide-like diuretic. <sup>167-171</sup>	I	A
In patients with IFG or IGT, RAAS blockers should be preferred to beta-blockers or diuretics to reduce the risk of new-onset DM. <sup>172-175</sup>	IIa	A
The effects of GLP1-RA and SGLT2 inhibitors on BP should be considered.	IIa	C
Home BP self-monitoring should be considered in patients with DM on antihypertensive treatments to check that their	IIa	C

# Terapia antitrombótica

## Recommendations for the use of antiplatelet therapy in primary prevention in patients with diabetes

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
In patients with DM at high/very high risk, <sup>c</sup> aspirin (75 - 100 mg/day) may be considered in primary prevention in the absence of clear contraindications. <sup>231</sup>	IIb	A
In patients with DM at moderate CV risk, <sup>c</sup> aspirin for primary prevention is not recommended.	III	B
<b>Gastric protection</b>		
When low-dose aspirin is used, proton pump inhibitors should be considered to prevent gastrointestinal bleeding. <sup>232,235</sup>	IIa	A

CV = cardiovascular, DM = diabetes mellitus.

<sup>a</sup>Class of recommendation.

<sup>b</sup>Level of evidence.

<sup>c</sup>See Table 7.

<sup>d</sup>Gastrointestinal bleeding, peptic ulceration within the previous 6 months, active hepatic disease, or history of aspirin allergy.

e LSC, 2018

## Recommendations for the management of arrhythmias in patients with diabetes

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
Oral anticoagulation with a NOAC, which is preferred over a VKA, is recommended in patients with DM aged >65 years with AF and a CHA <sub>2</sub> DS <sub>2</sub> -VASc score >2, if not contraindicated. <sup>503</sup>	I	A
i. ICD therapy is recommended in DM patients with symptomatic HF (New York Heart Association class II or III) and LVEF <35% after 3 months of optimal medical therapy, who are expected to survive for at least 1 year with good functional status.	I	A
ii. ICD therapy is recommended in DM patients with documented ventricular fibrillation or haemodynamically unstable VT in the absence of reversible causes, or within 48 hours of MI. <sup>504</sup>	I	A
Beta-blockers are recommended for patients with DM with HF and after acute MI with LVEF <40% to prevent sudden cardiac death. <sup>512</sup>	I	A

## Recommendations for lifestyle modifications in patients with diabetes and pre-diabetes

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
Smoking cessation advised by structured advice is:		

**Table 9** Summary of treatment targets for the management of patients with diabetes

Risk factor	Target
BP <sup>c</sup>	<ul style="list-style-type: none"> <li>Target SBP 130 mmHg for most adults, &lt;130 mmHg if tolerated, but not &lt;120 mmHg</li> <li>Less-stringent targets, SBP 130 - 139 in older patients (aged &gt;65 years)</li> </ul>
Glycaemic control: HbA1c	<ul style="list-style-type: none"> <li>HbA1c target for most adults is &lt;7.0% (&lt;53 mmol/mol)</li> <li>More-stringent HbA1c goals of &lt;6.5% (48 mmol/mol) may be suggested on a personalized basis if this can be achieved without significant hypoglycaemia or other adverse effects of treatment</li> <li>Less-stringent HbA1c goals of &lt;8% (64 mmol/mol) or &lt;9% (75 mmol/mol) may be adequate for elderly patients (see section 6.2.1)</li> </ul>
Lipid profile: LDL-C	<ul style="list-style-type: none"> <li>In patients with DM at very high CV risk,<sup>d</sup> target LDL-C to &lt;1.4 mmol/L (&lt;55 mg/dL)</li> <li>In patients with DM at high risk,<sup>d</sup> target LDL-C to &lt;1.8 mmol/L (&lt;70 mg/dL)</li> <li>In patients with DM at moderate CV risk,<sup>d</sup> aim for an LDL-C target of &lt;2.5 mmol/L (&lt;100 mg/dL)</li> </ul>
Platelet inhibition	In DM patients at high/very high CV risk
Smoking	Cessation obligatory
Physical activity	Moderate-to-vigorous, ≥150 min/week, combined aerobic and resistance training
Weight	Aim for weight stabilization in overweight or obese patients with DM, based on calorie balance, and weight reduction in subjects with IGT, to prevent the development of DM.
Dietary habits	Reduction of caloric intake is recommended in obese patients with T2DM to lower body weight; there is no ideal percentage of calories from carbohydrate, protein, and fat for all people with DM.

BP = blood pressure; CV = cardiovascular; DM = diabetes mellitus; HbA1c = haemoglobin A1c; IGT = impaired glucose tolerance; LDL-C = low-density lipoprotein cholesterol; SBP = systolic blood pressure; T2DM = type 2 diabetes mellitus.

<sup>a</sup>See Table 7.

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# Conclusiones

- **Cambio de paradigma** en el uso de los nuevo  
farmacos hipoglucemiantes
- Nueva **clasificación del RCV**
- Nuevos objetivos de **PA y Dislipemia**
- Modificaciones en la recomendaciones de la  
**terapia antitrombótica**
- Aproximación **multifactorial** sobre el RCV