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Newer Combined (ESC & EASD) 2013 guidelines for Diabetes Mellitus and Cardiovascular Disease

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Abbreviations
ABI = ankle brachial index
ACE-I = angiotensin converting enzyme inhibitor
ACS = acute coronary syndrome
ADA = American Diabetes Association
AF = atrial fibrillation
ARB = angiotensin receptor blocker
CAD = coronary artery disease
CVD = cardiovascular disease
DM = diabetes mellitus
EASD = European Association for the Study of Diabetes
ECG = electrocardiogram
ESC = European Society of Cardiology
FPG = fasting plasma glucose
IFG = impaired fasting glucose
IGT = impaired glucose tolerance
IR = insulin resistance
LVEF = left ventricular ejection fraction
MI = myocardial infarction
MRA = mineralocorticoid receptor antagonist
NYHA = New York heart Association
PAD = peripheral artery disease
T2DM = type 2 diabetes mellitus
WHO = World Health Organization

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It is estimated that 360 million people were affected by diabetes mellitus (DM) in 2011 with the great majority (namely 95%) being affected by type 2 DM (T2DM). Most importantly, approximately half of these individuals are not aware of this diagnosis. In addition, another 300 million individuals are at future risk of developing T2DM, including people with increased fasting glucose (IFG), impaired glucose tolerance (IGT), gestational DM, and euglycaemic insulin resistance (IR).

This is a summary of the European Society of Cardiology's (ESC) Guidelines on the management of diabetes mellitus (DM), pre-diabetes, and cardiovascular disease (CVD) developed in collaboration with the European Association for the Study of Diabetes (EASD). These guidelines were released in October 2013 with the aim to assist clinicians towards an evidence-based management decisions.

The classification of DM is based on recommendations from the World Health Organization (WHO), and the American Diabetes Association. The definition, classification, and diagnosis of abnormalities of glucose metabolism are provided in Figure 1.

Cardiovascular disease (CVD) is the main cause of death in diabetic individuals, since more than half of deaths in subjects with DM are attributed to CVD. These data highlight the necessity of diagnosing and accordingly treating CVD in diabetic patients. In the relevant guidelines the following algorithm outlines the principles for the diagnosis and management of CVD in DM patients with a primary diagnosis of DM or a primary diagnosis of CVD (Figure 2). The guidelines however specify that the recommended investigations should be considered according to individual needs and clinical judgment and they are meant as a general recommendation.

The treatment targets when we deal with patients with DM or IGT and CVD are summarized in figure 3.

The main points included in the relevant guidelines concerning the approach and decision making in patients with diabetes are summarized in the following subsections:

1. PREVENTION OF DIABETES IN PATIENTS WITH IMPAIRED GLUCOSE TOLERANCE (IGT)

- Lifestyle counseling, based on modest weight loss and increased physical activity, prevents or delays progression to DM in individuals with IGT, and should be offered to such persons.

Comparison of 2006 World Health Organization (WHO) and 2003/2011 and 2012 American Diabetes Association (ADA) diagnostic criteria

Diagnose/ measurement	WHO 2006 / WHO 2011	ADA
Diabetes		
HbA_{1c}	**Can be used** If measured ≥6.5% (48 mmol/mol)	**Recommended** ≥6.5% (48 mmol/mol)
	Recommended	
FPG	≥7.0 mmol/L (≥126 mg/dL)	≥7.0 mmol/L (≥126 mg/dL)
	or	**or**
2hPG	≥11.1 mmol/L (≥200 mg/dL)	≥11.1 mmol/L (≥200 mg/dL)
IGT		<7.0 mmol/L (<126 mg/dL)
FPG	<7.0 mmol/L (<126 mg/dL)	
		Not required
2hPG	≥7.8–<11.1 mmol/L (≥140–<200 mg/dL)	If measured 7.8–11.0 mmol/L (140–198 mg/dL)
IFG		
FPG	6.1-6.9 mmol/L (110–125 mg/dL)	5.6–6.9 mmol/L (100–125 mg/dL)
2hPG	**If measured** <7.8 mmol/L (<140 mg/dL)	--

2hPG = 2-hour post-load plasma glucose; ADA = American Diabetes Association; FPG = fasting plasma glucose; IGT = impaired glucose tolerance; IFG = impaired fasting glucose; WHO = World Health Organization

FIGURE 1.

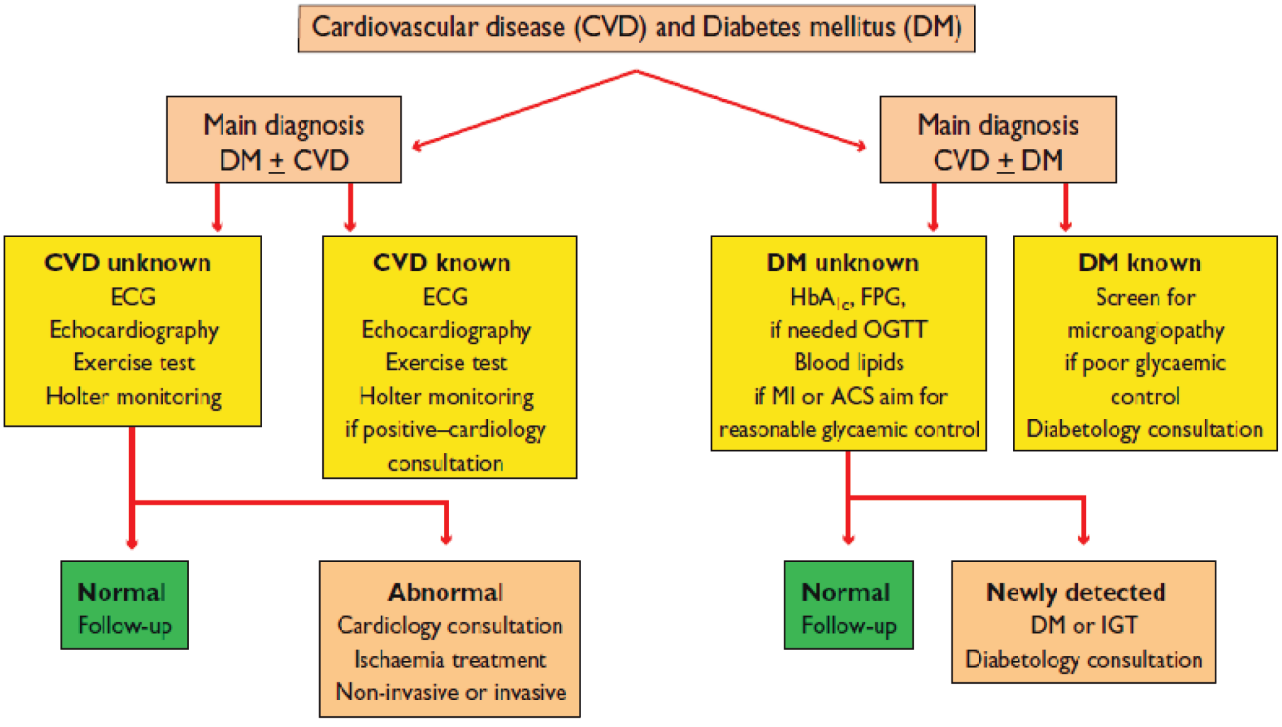

FIGURE 2.

Blood pressure (mmHg) In case of nephropathy	<140/85 Systolic <130
Glycaemic control HbA_{1c} %[a] (mmol/mol[b])	Generally <7.0 (53 mmol/mol) On an individual basis <6.5–6.9% (48–52 mmol/mol)
Lipid profile mmol/l (mg/dL) LDL-cholesterol	Very high risk patients <1.8 mmol/L (<70 mg/dL) or reduced by at least 50% High risk patients <2.5 mmol/L (<100 mg/dL)
Platelet stabilization	Patients with CVD and DM ASA 75–160 mg/day
Smoking	Cessation obligatory; passive smoking - none
Physical activity	Moderate to vigorous ≥150 min/week
Weight	Aim for weight stabilization in the overweight or obese DM patients based on calorie balance, and weight reduction in subjects with IGT to prevent development of T2DM
Dietary habits Fat intake (% of dietary energy) Total Saturated Monounsaturated fatty acids Dietary fibre intake	 <35% <10% >10% >40 g/day (or 20 g/1000 Kcal/day)

CVD = cardiovascular disease; DM = diabetes mellitus; HbA_{1c} = glycated haemoglobin A_{1c}; IGT = impaired glucose tolerance; LDL = low density lipoprotein; T2DM = type 2 diabetes mellitus.
[a] = Diabetes Control and Complication Trial standard.
[b] = IFFC

FIGURE 3.

2. IDENTIFYING PATIENTS WITH DIABETES AND THOSE AT RISK FOR DEVELOPING DM

- Primary screening for potential T2DM in the general population is recommended to start with a non-invasive DM risk score (e.g. the Finnish Diabetes Risk Score or FINDRISC; www.diabetes.fi/english) to identify individuals at high risk of T2DM in whom hemoglobin (Hb) A1c and fasting plasma glucose (FPG) should be determined.
- In CVD patients no diabetes risk score is needed, but an oral glucose tolerance test (OGTT) is indicated if HbA1c and/or FPG are normal, since people who belong to these groups may often have DM disclosed only by an elevated two-hour post load glucose (2hPG).

3. MICROVASCULAR COMPLICATIONS

- Screening for the presence of retinopathy should be considered on an annual basis in patients with T2DM.
- An HbA1c <7% and a blood pressure <140/85 mmHg are recommended for primary prevention of retinopathy related to DM.
- Multifactorial therapy is recommended when retinopathy is progressing rapidly.

4. CARDIOVASCULAR RISK ASSESSMENT IN PATIENTS WITH DYSGLYCAEMIA

- Patients with DM and at least one other cardiovascular risk factor or target organ damage should be considered as at very high risk and all other patients with DM as being at high risk.
- Estimate the urinary albumin excretion rate when performing risk stratification in patients with DM.

5. RECOMMENDATIONS ON LIFE STYLE MODIFICATIONS IN DIABETES

- Smoking cessation guided by structured advice is recommended in all subjects with DM.
- Total fat intake should be <35%, saturated fat <10%, and monounsaturated fatty acids >10% of total energy.
- Dietary fibre intake should be >40 g/day (or 20 g/1000 Kcal/day) in the prevention of T2DM and control of DM.
- Any diet with reduced energy intake can be recommended to lower excessive body weight in DM.
- Vitamin or micronutrient supplementation to reduce the risk of CVD in DM is not recommended.
- Moderate to vigorous physical activity of ≥150 min/week is recommended for the prevention and control of T2DM, and prevention of CVD in DM.
- Aerobic exercise and resistance training are recommended in the prevention and control of T2DM, but best when combined.

6. RECOMMENDATIONS FOR PATIENTS WITH DM AND CVD

- For patients with DM and stable coronary artery disease (CAD), and angiotensin converting enzyme inhibitor (ACE-I) or angiotensin receptor blocker (ARB) are indicated to reduce the risk for cardiovascular events.
- Statin therapy is recommended in patients with DM and CAD to reduce the risk for cardiovascular events.
- ACE-I (or an ARB if ACE-I not tolerated), and a beta-blocker are recommended in patients with systolic heart failure and T2DM to reduce mortality and hospitalizations.
- A mineralocorticoid receptor antagonist (MRA) is recommended for all patients with persisting symptoms (NYHA class II–IV) and a left ventricular ejection fraction (LVEF) ≤35% despite treatment with an ACE-I (or an ARB if an ACE-I is not tolerated) and a beta-blocker, to reduce the risk of heart failure hospitalization and premature death.
- Thiazolidinediones should not be used in patients with

heart failure and T2DM since water retention may worsen or provoke heart failure.

- Oral anticoagulation with vitamin K antagonists or a new oral anticoagulant is recommended in DM patients with atrial fibrillation (AF) if not contraindicated.
- Screening for AF should be considered since it is common in patients with DM and increases morbidity and mortality.
- It is recommended that patients with DM have annual screening to detect peripheral artery disease (PAD) and measurement of the ankle brachial index (ABI) to detect lower extremity artery disease.
- It is recommended that patients with PAD and DM have LDL-cholesterol (LDL-C) lowered to <1.8 mmol/L (<70 mg/dL), that they stop smoking, and have their blood pressure controlled to <140/85 mmHg.

Finally, multidisciplinary teams and nurse-led programs should be considered to support lifestyle change and self-management.

REFERENCES

1. Authors/Task Force Members, Rydın L, Grant PJ, Anker SD, et al. ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD: the Task Force on diabetes, pre-diabetes, and cardiovascular diseases of the European Society of Cardiology (ESC) and developed in collaboration with the European Association for the Study of Diabetes (EASD). *Eur Heart J* 2013 34:3035-87.
2. WHO Consultation. Definition and diagnosis of diabetes and intermediate hyperglycaemia. 2006 (http://www.who.int/diabetes/publications/Definition and diagnosis of diabetes_new.pdf) (22 August 2013).
3. World Health Organization (WHO), Abbreviated report of a WHO consultation. Use of glycated hemoglobin (HbA1c) in the diagnosis if diabetes mellitus. 2011 (http://www.who.int/diabetes/publications/diagnosis_diabetes2011/en/index.html) (22 August 2013).
4. Diagnosis and classification of diabetes mellitus. *Diabetes Care* 2012;35 Suppl 1: S64–71.