Cardiovascular risk reduction in patients with diabetes: targets and treatments

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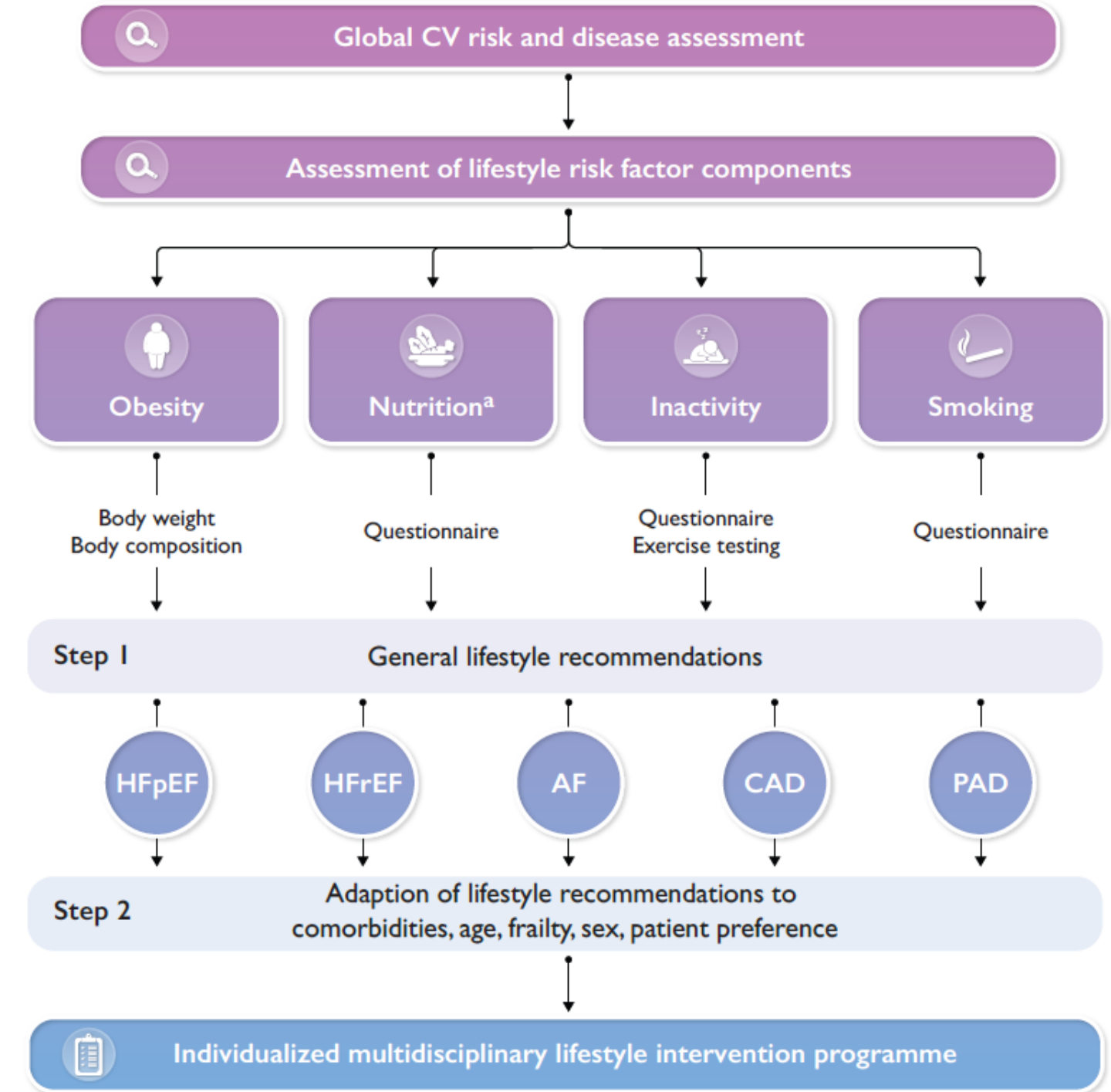
Global CV risk and disease assessment
Assessment of lifestyle risk factor components
Obesity
Nutrition[a]
Inactivity
Smoking
Body weight
Body composition
Questionnaire
Questionnaire
Exercise testing
Questionnaire
Step 1
General lifestyle recommendations
HFpEF
HFrEF
AF
CAD
PAD
Step 2
Adaption of lifestyle recommendations to
comorbidities, age, frailty, sex, patient preference
Individualized multidisciplinary lifestyle intervention programme

Lifestyle and diabetes

- **prevention**
- **managing** T2DM

- **Advice** should be addressed by a

  multifactorial approach

  patient-centred

  health status and health literacy

Look AHEAD; **5145** T2DM patients, 59% female, mean age 58 years, mean body mass index [BMI] 36 kg/m2),
lifestyle intervention : nutritional counselling, meal replacement, and exercise

- 8.6% weight loss
- significant reduction in HbA1c and BP

- **after 5 years :**

  Effects on weight and risk-factor control diminished in those with low adherence to the lifestyle program

After 10 years :

CV events were not different to usual care

Microvascular disease complications : **reduced**

- **After 16.7 years**:

  participants who lost ≥10% of weight at 1 year of intervention : **a 21% reduced risk of mortality**

- The decline in **body fat mass** : **lower risk of HFrEF HFpEF**
- decline in **waist circumference** :**lower risk of HFpEF**
- **Baseline cardio-pulmonary** fitness was associated with **reduced risks of mortality and CV events** during **follow-up of 9.2 years**

5.1.1. Weight reduction

Recommendation Table 3 — Recommendations for reducing weight in patients with type 2 diabetes with or without cardiovascular disease

Recommendations	Class[a]	Level[b]
It is recommended that individuals living with overweight or obesity aim to reduce weight and increase physical exercise to improve metabolic control and overall CVD risk profile.[56,79]	I	A
Glucose-lowering medications with effects on weight loss (e.g. GLP-1 RAs) should be considered in patients with overweight or obesity to reduce weight.[67]	IIa	B
Bariatric surgery should be considered for high and very high risk patients with BMI ≥35 kg/m^2 (≥Class II[c]) when repetitive and structured efforts of lifestyle changes combined with weight-reducing medications do not result in maintained weight loss.[73–77]	IIa	B

Increasing physical activity and exercise

- **Regular moderate to vigorous PA** : favourable effects on **metabolic control and CV risk factors** in T2DM

- **combination of endurance and resistance exercise**

- compared with low total PA, high total PA:

  lower CV mortality risk

  reduction in all-cause mortality

Structured exercise intervention : T2DM with established CVD

- **Interval endurance** exercise training : (interval walking, alternating between moderate to vigorous intensities)

has **superior effects**

moderate-intensity continuous walking

regarding body weight, waist circumference, and glucose control

Before starting a structured exercise programe in patients with **T2DM and established CVD**

- a ***maximal exercise stress test***
- assessment of ***aerobic and anaerobic thresholds*** by spiroergometry:
- to provide an individualized endurance exercise prescription including *exercise intensity*.

- Optimal intensity:

percentage of cardiorespiratory fitness ***(% peak oxygen consumption)***

percentage of maximum (peak) heart rate ***(% HRmax***)

perceived exertion rate according to the ***Borg scale***

Exercise prescription is recommended to be adapted to T2DM-associated comorbidities, e.g. CAD, HF, AF, diabetic peripheral neuropathy, or retinopathy, as well as age and frailty

Resistance exercise is recommended :

- **at least twice weekly**
- (*intensity of 60–80% of the individual's one-repetition maximum).*

- For *older or deconditioned adults:*

less volume and lower intensities

particularly during the ***initiation phase of 3–6 weeks***

- Interventions are based on ***encouraging an increase in any PA***

as even ***small amounts*** even

an extra 1000 ***steps of walking per day***

good starting point for many patients

a ***gradual increase***

PA accumulated
even <10 min
favorable outcomes, including reduced mortality

- **Interventions :**

  increase PA level

  reduce sedentary behaviour

  ***behaviour theory-based interventions*:**

  goal-setting

  reevaluation of goals

  self-monitoring

  feedback

  wearable activity tracker

  PA that people enjoy

  feasible and sustainable

Recommendation Table 5 — Recommendations for physical activity/exercise in patients with type 2 diabetes with or without cardiovascular disease

Recommendation	Class[a]	Level[b]
It is recommended to increase any physical activity (e.g. 10 min daily walking) in all patients with T2DM with and without CVD. Optimal is a weekly activity of 150 min of moderate intensity or 75 min of vigorous endurance intensity.[97,98]	I	A
It is recommended to adapt exercise interventions to T2DM-associated comorbidities, e.g. frailty, neuropathy, or retinopathy.[108,115]	I	B
It is recommended to introduce structured exercise training in patients with T2DM and established CVD, e.g. CAD, HFpEF, HFmrEF, HFrEF, or AF to improve metabolic control, exercise capacity and quality of life, and to reduce CV events.[108,115,116]	I	B
It is recommended to perform resistance exercise in addition to endurance exercise at least twice a week.[115,117]	I	B
The use of behavioural theory-based interventions, such as goal-setting, re-evaluation of goals, self-monitoring, and feedback, should be considered to promote physical activity behaviour.[112,113]	IIa	B
It should be considered to perform a maximally tolerated exercise stress test in patients with T2DM and established CVD before starting a structured exercise programme.	IIa	C
It may be considered to use wearable activity trackers to increase physical activity behaviour.[114]	IIb	B

Change in diet or nutrition

- A Mediterranean-style eating pattern improves glycaemic control, lipids, and BP

- ***Mediterranean-style with olive oil or nuts:***

  risk of ASCVD was reduced by 28–31%

- **Mediterranean diet > a low-fat diet intervention**
- ***A shift from a more animal-based to a plant-based food pattern***

- n–3 fatty acid supplements for secondary prevention of CVD in T2DM for secondary prevention

- *The consumption of sugars, sugar-sweetened soft drinks, and fruit juices should be avoided*

A high-protein diet *(30% protein, 40% carbohydrates, and 30% fat)*

>

standard-protein diet *(15% protein, 55% carbohydrate, 30% fat)*

in overweight and obese patients with HF

Smoking cessation: **key** lifestyle intervention
in patients with T2DM with or without CVD
a ***36% reduction in mortality*** in CVD patients

Recommendation Table 6 — Recommendations for smoking cessation in patients with type 2 diabetes with or without cardiovascular disease

Recommendations	Class[a]	Level[b]
It is recommended to stop smoking to reduce cardiovascular risk.[118–120]	I	A
Nicotine replacement therapy, varenicline, and bupropion, as well as individual or telephone counselling, should be considered to improve smoking cessation success rate.[121]	IIa	B

Electronic cigarettes :

- as a potential smoking cessation aid to bridge transition from smoking to abstention

a short period of time.

A consensus regarding the efficacy and safety for this approach has yet to be reached.