DIET
AT THE HEART OF CVD PREVENTION
Dyslipidaemia managEment Tutorial 2.0

European Guidelines for the Management of Dyslipidaemias & Cardiovascular Disease Prevention highlight diet advice as the cornerstone for reducing cardiovascular disease risk

This guide provides an overview of the latest dietary recommendations for reducing cardiovascular disease (CVD) risk, based on guidelines from the EAS and ESC

By reading this guide you will:

- Understand the benefit of providing dietary advice in the context of risk alongside other lifestyle and drug interventions
- Be aware of the role of dietary fats, dietary fibres, and foods with added plant sterols and stanols in actively reducing cholesterol levels, and their place in the current guidelines for the prevention of CVD and the management of dyslipidaemias
- Be equipped with practical steps to share with patients, in order to support them in making changes to their diet

The latest guidelines of the European Atherosclerosis Society (EAS) and the European Society of Cardiology (ESC) are as follows:

1. **2019 ESC/EAS guidelines for the management of dyslipidaemias**[1]
2. **2016 European guidelines on cardiovascular disease prevention in clinical practice**[2]

Cardiovascular disease (CVD) prevention should start early

CVD is the result of a lifelong process and intervention strategies to reduce risk such as adopting a healthy diet and lifestyle should begin as early in life as possible

- in the general population by promoting healthy lifestyle behaviour[3] and
- at the individual level, in those at moderate to high risk of CVD or patients with established CVD, by tackling an unhealthy lifestyle and by optimising risk factors.

Prevention is cost effective in many scenarios, including population-based approaches and actions directed at high-risk individuals. ESC/EAS recommends measures aimed at implementing healthy lifestyles, as these are more cost effective than drug interventions at the population level.[2]

80% of CVD could be prevented through positive diet and lifestyle changes.

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Cardiovascular disease recommended interventions

Elevated Low-Density Lipoprotein-Cholesterol (LDL-C) is recognised as a key risk factor in CVD risk. LDL-C is recommended as the primary target for treatment in the prevention of CVD. Lifestyle intervention should be a key focus when seeking to lower LDL-C levels, and lifestyle advice, including healthy diet recommendations, should be provided as a first step whatever the level of CVD risk.

	Total CV risk (SCORE) % *	Untreated LDL-C levels					
		<1.4 mmoVL (55 mg/dL)	1.4 to <1.8 mmoVL (55 to <70 mg/dL)	1.8 to <2.6 mmoVL (70 to <100 mg/dL)	2.6 to <3.0mmoVL (100 to <116 mg/dL)	3.0 to <4.9 mmoVL (116 to <190 mg/dL)	≥4.9 mmol/L (≥ 190 mg/dL)
Primary prevention	<1 low risk	**Lifestyle advice**	**Lifestyle advice**	**Lifestyle advice**	**Lifestyle advice**	**Lifestyle intervention** consider adding drug if uncontrolled	**Lifestyle intervention and concomitant drug intervention**
	Class**/Level***	I/C	I/C	I/C	I/C	IIa/A	IIa/A
	≥1 to <5 or moderate risk	**Lifestyle advice**	**Lifestyle advice**	**Lifestyle advice**	**Lifestyle intervention** consider adding drug if uncontrolled	**Lifestyle intervention** consider adding drug if uncontrolled	**Lifestyle intervention and concomitant drug intervention**
	Class**/Level***	I/C	I/C	IIa/A	IIa/A	IIa/A	IIa/A
	≥5 to <10 or high-risk	**Lifestyle advice**	**Lifestyle advice**	**Lifestyle intervention** consider adding drug if uncontrolled	**Lifestyle intervention and concomitant drug intervention**	**Lifestyle intervention and concomitant drug intervention**	**Lifestyle intervention and concomitant drug intervention**
	Class**/Level***	IIa/A	IIa/A	IIa/A	I/A	I/A	I/A
	≥10 or at very-high risk due to a risk condition	**Lifestyle advice**	**Lifestyle intervention** consider adding drug if uncontrolled	**Lifestyle intervention and concomitant drug intervention**	**Lifestyle intervention and concomitant drug intervention**	**Lifestyle intervention and concomitant drug intervention**	**Lifestyle intervention and concomitant drug intervention**
	Class**/Level***	IIa/B	IIa/A	I/A	I/A	I/A	I/A
Secondary prevention	Very-high-risk	**Lifestyle intervention** consider adding drug if uncontrolled	**Lifestyle intervention and concomitant drug intervention**	**Lifestyle intervention and concomitant drug intervention**	**Lifestyle intervention and concomitant drug intervention**	**Lifestyle intervention and concomitant drug intervention**	**Lifestyle intervention and concomitant drug intervention**
	Class**/Level***	IIa/A	I/A	I/A	I/A	I/A	I/A

Recreated from 2019 ESC/EAS Guidelines for the management of dyslipidaemias[1]
*Systemic Coronary Risk Evaluation – www.escardio.org
** I = is recommended IIa = should be considered
*** A=Data derived from multiple randomised clinical trials or meta-analyses, C=Consensus of opinion of the experts and/or small studies, retrospective studies, registries

Lowering LDL-cholesterol is a key therapeutic target for reducing CVD risk.

Download Diet Fact Sheets from:
http://www.dietattheheart.com/pdf/EAS_factsheet.pdf

LDL-C treatment targets and goals for CVD prevention†

Plasma lipids: LDL-C is the primary target	**Very high-risk:** ≥50% LDL-C reduction from baseline‡ and an LDL-C goal of <1.4 mmol/L (<55 mg/dL)
	High-risk: ≥50% LDL-C reduction from baseline‡ and an LDL-C goal of <1.8 mmol/L (<70 mg/dL)
	Moderate risk: LDL-C goal of <2.6 mmol/L (<100 mg/dL)
	Low risk: LDL-C goal of <3.0 mmol/L (<116 mg/dL)

† Recreated from 2019 ESC/EAS guidelines for the management of dyslipidaemias[1]
‡ The term "baseline" refers to the level in a subject not taking any lipid lowering medication

Improving plasma cholesterol with dietary advice and interventions

Dietary approaches are effective to the lifestyle prevention of CVD. Dietary choices inspired by the Mediterranean diet should be recommended for both primary and secondary prevention of CVD. All individuals should be advised on lifestyles associated with a lower CVD risk. High-risk subjects, in particular those with dyslipidaemia, should receive specialist dietary advice, e.g. from a dietitian, if feasible.

When LDL-C is high, there are some more specific dietary recommendations that should be taken into account, as shown in the table below.

Lifestyle interventions to reduce LDL-C levels	Magnitude of the effect*	Level of evidence**	Recommendation
Avoid dietary trans fat	++	A	Avoid any consumption of trans fat
Reduce dietary saturated fat	++	A	<10% of energy (<7% in case of hypercholesterolemia); fat intake predominantly from MUFAs and PUFAs
Increase dietary fibre	++	A	25-40 g/day, including ≥ 7-13 g soluble fibre
Use functional foods with added phytosterols	++	A	At least 2 g/day plant stanols/sterols
Use red yeast rice supplements	++	A	Nutraceuticals containing purified red yeast rice may be considered in people with elevated plasma cholesterol concentrations who do not qualify for treatment with statins in view of their global CVD risk
Reduce excessive body weight	++	A	BMI 20-25 kg/m^2, waist circumference <94 cm (men) and <80 cm (women)
Reduce dietary cholesterol	+	B	Cholesterol intake should be reduced (<300 mg/day), particularly in people with high plasma cholesterol levels
Increase habitual physcial activity	+	B	3.5-7 h moderately vigorous physical activity per week or 30-60 min most days

Modified from the 2019 ESC/EAS Guidelines for the management of dyslipidaemias[1]
* The magnitude of the effect (++= 5-10%; + = <5%) and the level of evidence refer to the impact of each dietary modification on plasma levels of a specific lipoprotein class.
** A=Data derived from multiple randomised clinical trials or meta-analyses, B=Data derived from a single randomised clinical trial or large non-randomised studies

Healthy Diet Characteristics

- Encourage consumption of fruit (2-3 servings / day), vegetables (2-3 servings / day), legumes, nuts, wholegrain cereal foods and (oily) fish (1-2 servings / week)
- Reduce foods rich in trans or saturated fat (e.g. fatty or processed meat, sweets, cream, butter, solid margarines, regular cheese)
- Replace with the above foods and with monounsaturated fat (e.g. olive or rapeseed oil) and polyunsaturated fat (vegetable oils, soft spreads).
- Added sugar intake max 10% of energy; limit the intake of soft drinks and foods with added sugar
- Dietary fibre 25-40 g / day, including ≥ 7-13 g of soluble fibre – preferably from wholegrain products (e.g. oats and barley)
- Alcohol intake <10 g (1 unit / day) for men and women
- Limited salt intake <5 g / day

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Functional foods and food supplements for the treatment of dyslipidaemias

In addition to a cholesterol lowering diet, innovative nutritional strategies to improve dyslipidaemias have been developed and can be used either as alternatives or in addition to lipid-lowering drugs.[4]

Plant sterols and stanols

Plant sterols and stanols (phytosterols) occur naturally in vegetable oils and in smaller amounts in vegetables, fresh fruits, nuts and seeds, grains and legumes.

Phytosterols compete with cholesterol for intestinal absorption thereby reducing blood cholesterol levels.

Plant sterols and stanols have been added to spreads and margarine, as well as dairy foods like milk and yoghurt. The daily consumption of 2 g of phytosterols can effectively lower LDL-C by 7-10% in humans (with a certain degree of heterogeneity among individuals), while it has little or no effect on HDL-C and TG levels. Research indicates that plant sterols and stanols additionally reduce LDL-C levels by up to 5–10% in patients taking a stable dose of a statin, and this combination is also well tolerated and safe.[5,6]

Based on LDL-C lowering and the absence of adverse signals, functional foods with plant sterols and stanols (at least 2 g / day with a main meal) may be considered[1,2,5]

- in individuals with high cholesterol levels at intermediate or low global CV risk who do not qualify for pharmacotherapy;
- as an adjunct to pharmacotherapy in high- and very high-risk patients who fail to achieve LDL-C goals on statins or are statin intolerant; and
- in adults and children (>6 years) with familial hypercholesterolaemia (FH), in line with current guidelines.

Plant sterols/stanols should be considered for LDL-C lowering as part of a healthy diet and in combination with cholesterol lowering drug treatment.

Other dietary approaches for cholesterol management

- Dietary fibre: Foods enriched with beta-glucan, the soluble fibre in oats and barley, are well tolerated, effective and recommended for LDL-C lowering at a daily dose of at least 3g / day.[7,8]
- Soy protein has a modest LDL-C lowering effect when replacing animal protein foods. However, this was not confirmed when changes in other dietary components were taken into account.[1,9]
- Red Yeast Rice (RYR): The hypocholesterolemic effect of RYR is related to a statin-like mechanism of monacolin K (a statin), which represents the bioactive ingredient. Different commercial preparations have different concentrations of monacolin and lower LDL-C to a variable extent[10], but the long-term safety of regular consumption of these products is not fully documented and safety issues due to the possible presence of contaminants in some preparations have been raised. Side effects like those observed with statins have also been reported.[1]

In a nutshell: Smart choices for a healthy diet to lower LDL-C

- Replace saturated fats with mono- and polyunsaturated fats
- Avoid intake of trans fatty acids
- Reduce intake of dietary cholesterol
- Increase the intake of (soluble) dietary fibre
- Consider foods with added plant sterols / stanols as a dietary adjunct to further lower elevated LDL-cholesterol

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