

2021 ESC Guidelines on cardiovascular disease prevention in clinical practice

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ESC subspecialty communities having participated in the development of this document:

Associations: Association of Cardiovascular Nursing & Allied Professions (ACNAP), European Association of Cardiovascular Imaging (EACVI), European Association of Preventive Cardiology (EAPC), European Heart Rhythm Association (EHRA), Heart Failure Association (HFA).

Councils: Council on Valvular Heart Disease.

Working Groups: Aorta and Peripheral Vascular Diseases, Atherosclerosis and Vascular Biology, Cardiovascular Pharmacotherapy.

Patient Forum

2021 ESC Guidelines on cardiovascular disease prevention in clinical practice



Collaborating and endorsing societies:

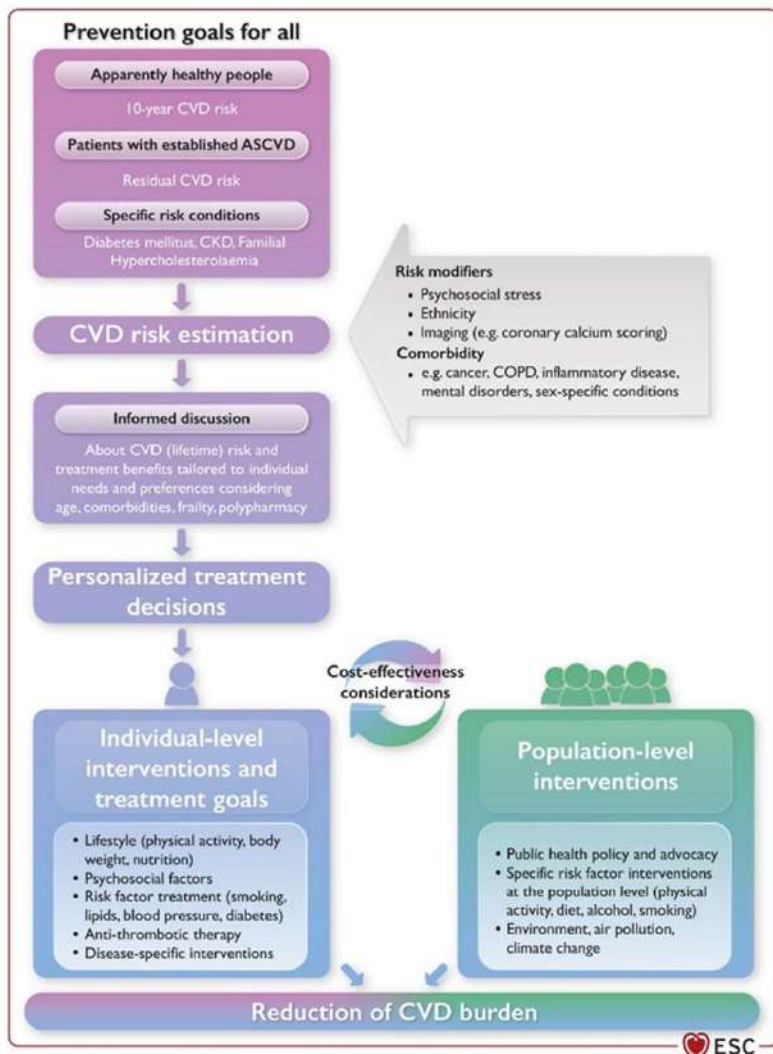
European Association for the Study of Diabetes (EASD); European Atherosclerosis Society (EAS); European Heart Network (EHN); European Renal Association - European Dialysis and Transplant Association (ERA-EDTA); European Society of Hypertension (ESH); European Stroke Organization (ESO); European Federation of Sports Medicine Association (EFSMA); European Geriatric Medicine Society (EuGMS); International Diabetes Federation Europe (IDF Europe); International Federation of Sport Medicine (FIMS); International Society of Behavioural Medicine (ISBM); International Society of Gender Medicine (IGM); World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians (WONCA) - Europe

ESC Classes of recommendations

	Definition	Wording to use	
Classes of recommendations	Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective.	Is recommended or is indicated
	Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure.	
	Class IIa	Weight of evidence/opinion is in favour of usefulness/efficacy.	Should be considered
	Class IIb	Usefulness/efficacy is less well established by evidence/opinion.	May be considered
	Class III	Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful.	Is not recommended

ESC Levels of evidence

Level of evidence A	Data derived from multiple randomized clinical trials or meta-analyses.
Level of evidence B	Data derived from a single randomized clinical trial or large non-randomized studies.
Level of evidence C	Consensus of opinion of the experts and/or small studies, retrospective studies, registries.



Prevention of CVD

New recommendations (1)

Recommendations	Class
<i>Risk factors and clinical conditions</i>	
In apparently healthy people <70 years of age without established ASCVD, DM, CKD, genetic/rarer lipid or BP disorders, estimation of 10-year fatal and nonfatal CVD risk with SCORE2 is recommended.	I
In apparently healthy people ≥70 years of age without established ASCVD, DM, CKD, genetic/rarer lipid or BP disorder, estimation of 10-year fatal and nonfatal CVD risk with SCORE2-OP is recommended.	I
Patients with established ASCVD and/or DM and/or moderate-to-severe renal disease and/or genetic/rarer lipid or BP disorders are to be considered at high or very high CVD risk.	I

New recommendations (2)

Recommendations	Class
<i>Risk factors and clinical conditions (continued)</i>	
A stepwise treatment-intensification approach aiming at intensive risk factor treatment is recommended for apparently healthy people at high or very high ASCVD risk, as well as patients with established ASCVD and/or DM, with consideration of CVD risk, treatment benefit of risk factors, risk modifiers, comorbidities, and patient preferences.	I
Treatment of ASCVD risk factors is recommended in apparently healthy people without DM, CKD, genetic/rarer lipid or BP disorders who are at very high CVD risk (SCORE2 $\geq 7.5\%$ for age under 50; SCORE2 $\geq 10\%$ for age 50–69; SCORE2-OP $\geq 15\%$ for age ≥ 70).	I
An informed discussion about CVD risk and treatment benefits tailored to the needs of a patient is recommended.	I

New recommendations (3)

Recommendations	Class
<i>Risk factors and clinical conditions (continued)</i>	
It is recommended that mental disorders with either significant functional impairment or decreased use of healthcare systems be considered as influencing	I
Treatment of ASCVD risk factors should be considered in apparently healthy people without DM, CKD, genetic/rarer lipid, or BP disorders who are at high CVD risk (SCORE2 2.5 to <7.5% for age under 50; SCORE2 5 to <10% for age 50–69; SCORE2-OP 7.5 to <15% for age ≥70 years), taking ASCVD risk modifiers, lifetime risk and treatment benefit, and patient preferences into account.	IIa
In apparently healthy people, after estimation of 10-year fatal and non-fatal CVD risk, lifetime risk and treatment benefit, risk modifiers, frailty, polypharmacy, and patient preferences should be considered.	IIa
Presence of migraine with aura should be considered in CVD risk assessment.	IIa
Assessment of CVD risk should be considered in men with ED.	IIa

New recommendations (4)

Recommendations	Class
<i>Risk factors and clinical conditions (continued)</i>	
In women with a history of premature or stillbirth, periodic screening for hypertension and DM may be considered.	IIb
Assessment of total CVD risk may be considered in adults with chronic inflammatory conditions.	IIb
Avoidance of combined hormonal contraceptives may be considered in women with migraine with aura.	IIb

New recommendations (5)

Recommendations	Class
<i>Risk factors and interventions at the individual level</i>	
It is recommended to reduce sedentary time to engage in at least light activity throughout the day to reduce all-cause and CV mortality and morbidity.	I
It is recommended to adopt a Mediterranean or similar diet to lower risk of CVD.	I
It is recommended to restrict alcohol consumption to a maximum of 100 g per week.	I
It is recommended to eat fish, preferably fatty, at least once a week and restrict (processed) meat.	I
Patients with mental disorders need intensified attention and support to improve adherence to lifestyle changes and drug treatment.	I
Smoking cessation is recommended regardless of weight gain, as weight gain does not lessen the ASCVD benefits of cessation.	I

New recommendations (6)

Recommendations	Class
<i>Risk factors and interventions at the individual level (continued)</i>	
In patients with established ASCVD, lipid-lowering treatment with an ultimate LDL-C goal of <1.4 mmol/L (55 mg/dL) and a $\geq 50\%$ reduction of LDL-C vs. baseline is recommended.	I
For secondary prevention patients not achieving their goals on a maximum tolerated dose of a statin and ezetimibe, combination therapy including a PCSK9 inhibitor is recommended.	I
In patients with type 2 DM at very high risk (e.g. with established ASCVD and/or severe TOD), intensive lipid-lowering therapy, ultimately aiming at $\geq 50\%$ LDL-C reduction and an LDL-C of <1.4 mmol/L (<55 mg/dL) is recommended.	I
In patients with type 2 DM >40 years of age at high risk, lipid-lowering treatment with an ultimate LDL-C goal of $\geq 50\%$ LDL-C reduction and an LDL-C of <1.8 mmol/L (70 mg/dL) is recommended.	I

New recommendations (7)

Recommendations	Class
<i>Risk factors and interventions at the individual level (continued)</i>	
It is recommended that the first objective of treatment is to lower BP to <140/90 mmHg in all patients, and that subsequent BP targets are tailored to age and specific comorbidities.	I
In treated patients aged 18–69 years, it is recommended that SBP should ultimately be lowered to a target range of 120–130 mmHg in most patients.	I
In treated patients aged ≥70 years, it is recommended that SBP should generally be targeted to <140 and down to 130 mmHg if tolerated.	I
In all treated patients, DBP is recommended to be lowered to <80 mmHg.	I

New recommendations (8)

Recommendations	Class
<i>Risk factors and interventions at the individual level (continued)</i>	
In persons with type 2 DM and ASCVD, the use of a GLP-1RA or SGLT2 inhibitor with proven outcome benefits is recommended to reduce CV and/or cardiorenal outcomes.	I
In patients with type 2 DM and CKD, the use of an SGLT2 inhibitor is recommended to improve ASCVD and/or cardiorenal outcomes.	I
In patients with type 2 DM and HFrEF, use of an SGLT2 inhibitor with proven outcome benefits is recommended to lessen HF hospitalizations and CV death.	I
Participation in a medically supervised, structured, comprehensive, multidisciplinary EBCR and prevention programme for patients after ASCVD events and/or revascularization, and for patients with HF (mainly HFrEF), is recommended to improve patient outcomes.	I

New recommendations (9)

Recommendations	Class
<i>Risk factors and interventions at the individual level (continued)</i>	
Lifestyle interventions, such as group or individual education, behaviour-change techniques, telephone counselling, and use of consumer-based wearable activity trackers, should be considered to increase PA participation.	Ila
Bariatric surgery for obese high-risk individuals should be considered when lifestyle change does not result in maintained weight loss.	Ila
ASCVD patients with stress should be considered for referral to psychotherapeutic stress management to improve CVD outcomes and reduce stress symptoms.	Ila
Patients with CHD and moderate-to-severe major depression should be considered for antidepressive treatment with an SSRI.	Ila

New recommendations (10)

Recommendations	Class
<i>Risk factors and interventions at the individual level (continued)</i>	
An ultimate LDL-C goal of <1.4 mmol/L (55 mg/dL) and LDL-C reduction of $\geq 50\%$ from baseline should be considered in apparently healthy persons <70 years at very high risk.	IIa
An ultimate LDL-C goal of <1.8 mmol/L (70 mg/dL) and LDL-C reduction of $\geq 50\%$ from baseline should be considered in apparently healthy persons <70 years at high risk.	IIa
For those motivated to try, considerable weight loss with use of low-calorie diets followed by food reintroduction and weight-maintenance phases early after diagnosis can lead to DM remission and should be considered.	IIa

New recommendations (11)

Recommendations	Class
<i>Risk factors and interventions at the individual level (continued)</i>	
In patients with type 2 DM and TOD, the use of an SGLT2 inhibitor or GLP-1RA with proven outcome benefits may be considered to reduce future CVD and total mortality.	IIb
For primary prevention patients at very high risk, but without FH, if the LDL-C goal is not achieved on a maximum tolerated dose of a statin and ezetimibe, combination therapy including a PCSK9 inhibitor may be considered.	IIb
In high-risk (or above) patients with triglycerides >1.5 mmol/L (135 mg/dL) despite statin treatment and lifestyle measures, n-3 PUFAs (icosapent ethyl 2 X 2 g/day) may be considered in combination with a statin.	IIb
Initiation of statin treatment for primary prevention in older people aged ≥ 70 may be considered, if at high risk or above.	IIb

New recommendations (12)

Recommendations	Class
<i>Risk factors and interventions at the individual level (continued)</i>	
Statin therapy may be considered in persons aged ≤ 40 years with type 1 or type 2 DM with evidence of TOD and/or an LDL-C level > 2.6 mmol/L (100 mg/dL), as long as pregnancy is not being planned.	IIb
In patients with DM at high or very high CVD risk, low-dose aspirin may be considered for primary prevention in the absence of clear contraindications.	IIb
Home-based CR, telehealth, and mHealth interventions may be considered to increase patient participation and long-term adherence to healthy behaviours.	IIb
In patients with HF and major depression, SSRIs, SNRIs, and tricyclic antidepressants are not recommended.	III
In patients with dialysis-dependent CKD who are free of ASCVD, commencing statin therapy is not recommended.	III

New recommendations (13)

Recommendations	Class
<i>Policy interventions at the population level</i>	
Putting in place measures to reduce air pollution, including reducing PM emission and gaseous pollutants, reducing the use of fossil fuels, and limiting carbon dioxide emissions, are recommended to reduce CVD mortality and morbidity.	I

New recommendations (14)

Recommendations	Class
<i>Risk management of disease-specific cardiovascular disease</i>	
It is recommended that patients with HF are enrolled in a comprehensive CR programme to reduce the risk of HF hospitalization and death.	I
It is recommended to screen patients with HF for both CV and non-CV comorbidities which, if present, should be treated, provided safe and effective interventions exist, not only to alleviate symptoms but also to improve prognosis.	I
In patients with a cerebrovascular event, improvement of lifestyle factors in addition to appropriate pharmacological management is recommended.	I
Identification and management of risk factors and concomitant diseases are recommended to be an integral part of treatment in patients with AF.	I

New recommendations (15)

Recommendations	Class
<i>Risk management of disease-specific cardiovascular disease (continued)</i>	
Adding a second antithrombotic drug (a P2Y ₁₂ inhibitor or low-dose rivaroxaban) to aspirin for long-term secondary prevention should be considered in patients with a high risk of ischaemic events and without high bleeding risk.	IIa
In patients with DM and chronic symptomatic LEAD without high bleeding risk, a combination of low-dose rivaroxaban (2.5 mg b.i.d.) and aspirin (100 mg o.d.) may be considered.	IIb
Adding a second antithrombotic drug to aspirin for long-term secondary prevention may be considered in patients with a moderate risk of ischaemic events and without a high bleeding risk.	IIb

Revised recommendations (1)

<i>Risk factors and clinical conditions</i>			
2016 CVD Prevention Guidelines	Class	2021 CVD Prevention Guidelines	Class
ABI may be considered as a risk modifier in CVD risk assessment.	IIb	The routine collection of other potential modifiers, such as genetic risk scores, circulating or urinary biomarkers, or vascular tests or imaging methods (other than CAC scoring or carotid ultrasound for plaque determination), is not recommended.	III

Revised recommendations (2)

<i>Risk factors and interventions at the individual level</i>			
2016 CVD Prevention Guidelines	Class	2021 CVD Prevention Guidelines	Class
Drug treatment should be considered in patients with grade 1 or 2 hypertension who are at high CVD risk.	IIa	For grade 1 hypertension, treatment initiation based on absolute CVD risk, estimated lifetime benefit, and the presence of HMOD is recommended.	I
In patients with type 2 DM and CVD, use of an SGLT2 inhibitor should be considered early in the course of the disease to reduce CVD and total mortality.	IIa	In persons with type 2 DM and ASCVD, the use of a GLP-1RA or SGLT2 inhibitor with proven outcome benefits is recommended to reduce CV and/or cardiorenal outcomes.	I

Recommendations for CVD risk assessment (1)

Recommendations	Class	Level
Systematic global CVD risk assessment is recommended in individuals with any major vascular risk factor (i.e. family history of premature CVD, FH, CVD risk factors such as smoking, arterial hypertension, DM, raised lipid level, obesity, or comorbidities increasing CVD risk).	I	C
Systematic or opportunistic CV risk assessment in the general population in men >40 years of age and in women >50 years of age or postmenopausal with no known ASCVD risk factors may be considered.	IIb	C
In those individuals who have undergone CVD risk assessment in the context of opportunistic screening, a repetition of screening after 5 years (or sooner if risk was close to treatment thresholds) may be considered.	IIb	C

Recommendations for CVD risk assessment (2)

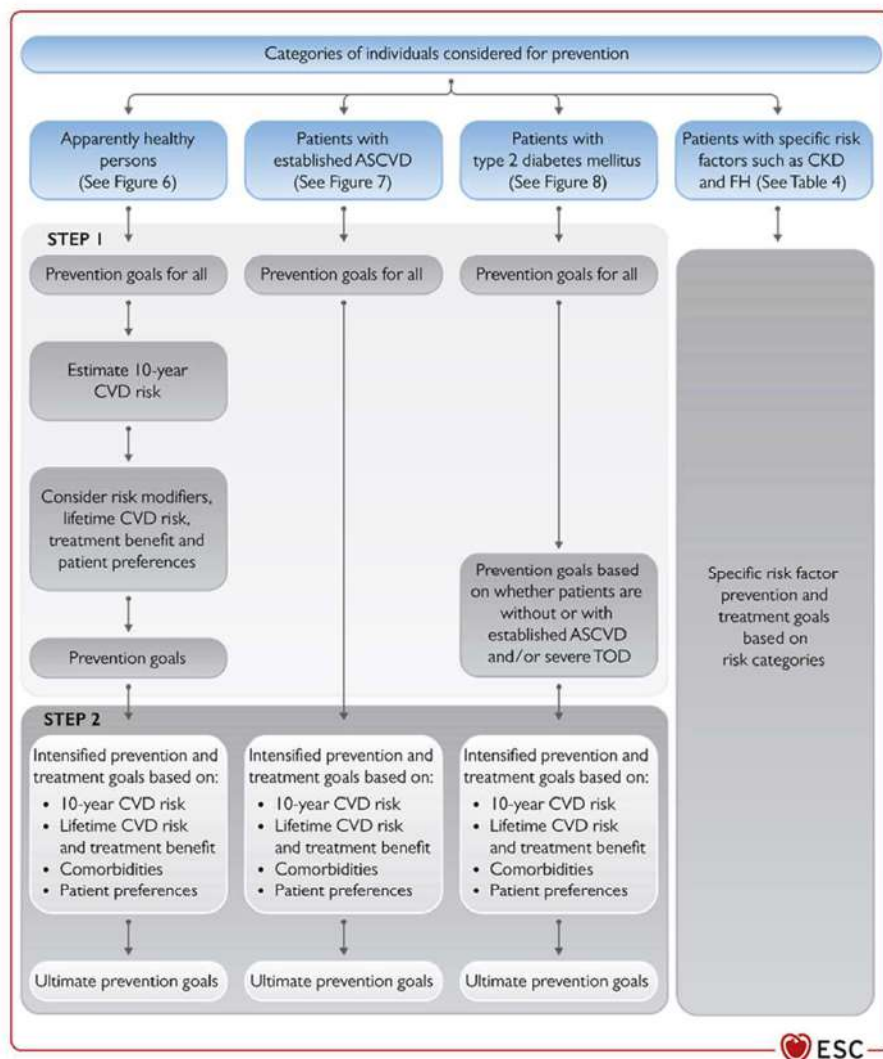
Recommendations	Class	Level
Opportunistic screening of BP in adults at risk for the development of hypertension, such as those who are overweight or with a known family history of hypertension, should be considered.	IIa	B
Systematic CVD risk assessment in men <40 years of age and women <50 years of age with no known CV risk factors is not recommended.	III	C

Patient categories and associated cardiovascular disease risk (1)

Patient category	Subgroups	Risk categories	CVD risk and therapy benefit estimation
Apparently healthy persons			
Persons without established ASCVD, diabetes mellitus, CKD, Familial Hypercholesterolemia	<50 years	Low- to high-risk	10-year CVD risk estimation (SCORE2). Lifetime risk and benefit estimation of risk factor treatment (e.g. with the LIFE-CVD lifetime model) to facilitate the communication of CVD risk and treatment benefits.
	50-69 years	Low- to very high-risk	10-year CVD risk estimation (SCORE2). Lifetime benefit estimation of risk factor treatment (e.g. with the LIFE-CVD lifetime model) to facilitate the communication of treatment benefits.
	≥70 years	Low- to very high-risk	10-year CVD risk estimation (SCORE2-OP). Lifetime benefit estimation of risk factor treatment (e.g. with the LIFE-CVD lifetime model) to facilitate the communication of treatment benefits.
Patients with CKD			
CKD without diabetes or ASCVD	Moderate CKD (eGFR 30–44 mL/min/1.73 m ² and ACR <30 mg/g or eGFR 45–59 mL/min/1.73 m ² and ACR 30 mg/g –300 mg/g or eGFR ≥60 mL/min/1.73 m ² and ACR >300 mg/g)	High-risk	N/A
	Severe CKD (eGFR <30 mL/min/1.73 m ² or eGFR 30–44 mL/min/1.73 m ² and ACR >30 mg/g)	Very high-risk	N/A
Familial Hypercholesterolemia			
Associated with markedly elevated cholesterol levels	N/A	High-risk	N/A
Patients with type 2 diabetes mellitus			
Patients with type 1 DM above 40 years of age may also be classified according to these criteria	Patients with well controlled short-standing DM (e.g. <10 years), no evidence of TOD and no additional ASCVD risk factors	Moderate-risk	N/A
	Patients with DM without ASCVD and/or severe TOD, and not fulfilling the moderate risk criteria.	High-risk	Residual 10-year CVD risk estimation after general prevention goals (e.g. with the ADVANCE risk score or DIAL model). Consider lifetime CVD risk and benefit estimation of risk factor treatment (e.g. DIAL model).

Patient categories and associated cardiovascular disease risk (2)

Patient category	Subgroups	Risk categories	CVD risk and therapy benefit estimation
Patients with type 2 diabetes mellitus (continued)			
	Patients with DM with established ASCVD and/or severe TOD: <ul style="list-style-type: none"> • eGFR <45 mL/min/1.73 m² irrespective of albuminuria • eGFR 45-59 mL/min/1.73 m² and microalbuminuria (ACR 30 mg/g – 300 mg/g) • Proteinuria (ACR >300 mg/g) • Presence of microvascular disease in at least 3 different sites (e.g. microalbuminuria plus retinopathy plus neuropathy) 	Very high-risk	Residual 10-year CVD risk estimation after general prevention goals (e.g. with the SMART risk score for established CVD or with the ADVANCE risk score or with the DIAL model). Consider lifetime CVD risk and benefit estimation of risk factor treatment (e.g. DIAL model).
Patients with established ASCVD			
Documented ASCVD, clinical or unequivocal on imaging. Documented clinical ASCVD includes previous AMI, ACS, coronary revascularization and other arterial revascularization procedures, stroke and TIA, aortic aneurysm and PAD. Unequivocally documented ASCVD on imaging includes plaque on coronary angiography or carotid ultrasound or on CTA. It does NOT include some increase in continuous imaging parameters such as intima-media thickness of the carotid artery.	N/A	Very high-risk	Residual CVD risk estimation after general prevention goals (e.g. 10-year risk with the SMART risk score for patients with established CVD or 1- or 2-year risk with EUROASPIRE risk score for patients with CHD). Consider lifetime CVD risk and benefit estimation of risk factor treatment (e.g. SMART-REACH model; or DIAL model if diabetes).



Examples of a stepwise approach to risk stratification and treatment options

SCORE2 & SCORE2-OP
10-year risk of (fatal and non-fatal) CV events in populations at **low** CVD risk



Women

Men

Non-smoking

Smoking

Non-smoking

Smoking

Non-HDL cholesterol

Systolic blood pressure (mmHg)
SCORE2-OP

3.0-3.9
150 200 250

4.0-4.9
150 200 250

5.0-5.9
150 200 250

6.0-6.9
150 200 250

mmol/L
mg/dL

Age (y)

85-89

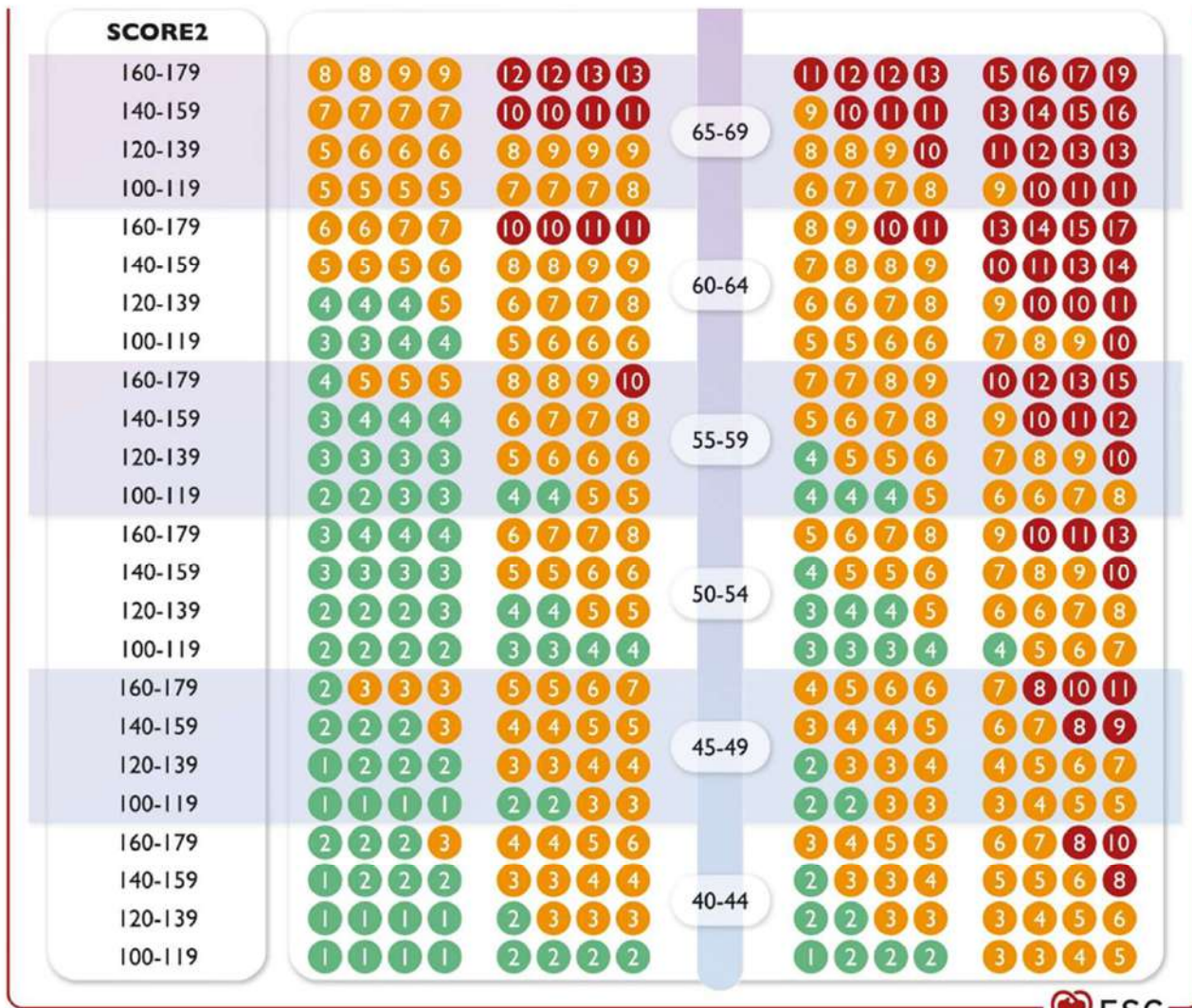
80-84

75-79

70-74

160-179	28	29	30	31	31	32	33	34	29	35	42	49	29	35	42	49
140-159	26	27	28	29	29	30	31	32	28	33	40	47	27	33	40	47
120-139	24	25	26	27	27	28	29	30	26	32	38	45	26	32	38	45
100-119	23	24	25	26	25	26	27	28	25	30	36	43	25	30	36	43
160-179	20	21	22	23	25	26	28	29	23	27	32	37	26	31	36	41
140-159	18	19	20	21	23	24	25	26	21	25	29	34	24	28	33	38
120-139	16	17	18	19	20	21	22	23	19	22	26	31	22	25	30	34
100-119	15	15	16	17	18	19	20	21	17	20	24	28	19	23	27	31
160-179	15	15	16	17	21	22	23	24	19	21	24	27	24	27	31	34
140-159	13	13	14	15	18	19	20	21	16	18	21	23	21	23	26	30
120-139	11	11	12	13	15	16	17	18	14	15	18	20	18	20	23	26
100-119	9	10	10	11	13	14	15	15	12	13	15	17	15	17	19	22
160-179	10	11	12	12	17	18	19	20	15	16	18	19	22	24	26	28
140-159	9	9	10	10	14	15	16	16	12	13	14	16	18	19	21	23
120-139	7	7	8	8	11	12	13	14	10	11	12	13	14	16	17	19
100-119	6	6	6	7	9	10	10	11	8	8	9	10	12	13	14	15

SCORE2 and SCORE2-OP
risk chart for fatal and non-fatal (MI, stroke) ASCVD
Low CVD Risk (1)



SCORE2 and SCORE2-OP
risk chart for fatal and
non-fatal (MI, stroke)
ASCVD
Low CVD Risk (2)

SCORE2 & SCORE2-OP
10-year risk of (fatal and non-fatal) CV events in populations at moderate CVD risk



Women

Men

Non-smoking

Smoking

Non-smoking

Smoking

Non-HDL cholesterol

Systolic blood pressure (mmHg)
SCORE2-OP

3.0-3.9
150 200 250

4.0-4.9
150 200 250

5.0-5.9
150 200 250

6.0-6.9
150 200 250

mmol/L

mg/dL

Age (y)

3.0-3.9
150 200 250

4.0-4.9
150 200 250

5.0-5.9
150 200 250

6.0-6.9
150 200 250

Systolic blood pressure (mmHg) SCORE2-OP	Women				Men											
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9								
160-179	37	39	40	42	41	43	44	46	37	45	53	62	37	45	53	61
140-159	35	36	38	39	39	40	42	43	36	43	51	59	35	43	51	59
120-139	32	34	35	37	36	38	39	41	34	41	49	57	34	41	48	57
100-119	30	32	33	34	34	35	37	38	32	39	47	55	32	39	46	55
160-179	27	28	30	31	34	35	37	39	30	35	41	47	34	40	46	53
140-159	24	25	27	28	30	32	33	35	27	32	37	43	31	36	42	48
120-139	21	22	24	25	27	28	30	31	25	29	34	40	28	33	38	44
100-119	19	20	21	22	24	25	27	28	22	26	31	36	25	30	35	40
160-179	19	20	21	23	27	29	30	32	24	27	31	35	31	35	39	44
140-159	16	17	18	19	24	25	26	28	21	23	27	30	27	30	34	38
120-139	14	15	15	16	20	21	22	24	17	20	23	26	23	26	29	33
100-119	12	12	13	14	17	18	19	20	15	17	19	22	19	22	25	29
160-179	13	14	15	16	22	23	25	26	19	21	23	25	28	31	34	36
140-159	11	11	12	13	18	19	20	22	15	17	18	20	23	25	28	30
120-139	9	9	10	11	15	16	17	18	12	13	15	16	19	20	22	24
100-119	7	7	8	8	12	13	13	14	10	11	12	13	15	16	18	20

SCORE2 and SCORE2-OP
risk chart for fatal and non-fatal (MI, stroke) ASCVD
Moderate CVD Risk (1)

SCORE2 & SCORE2-OP
10-year risk of (fatal and non-fatal) CV events in populations at high CVD risk



Women

Men

Non-smoking

Smoking

Non-smoking

Smoking

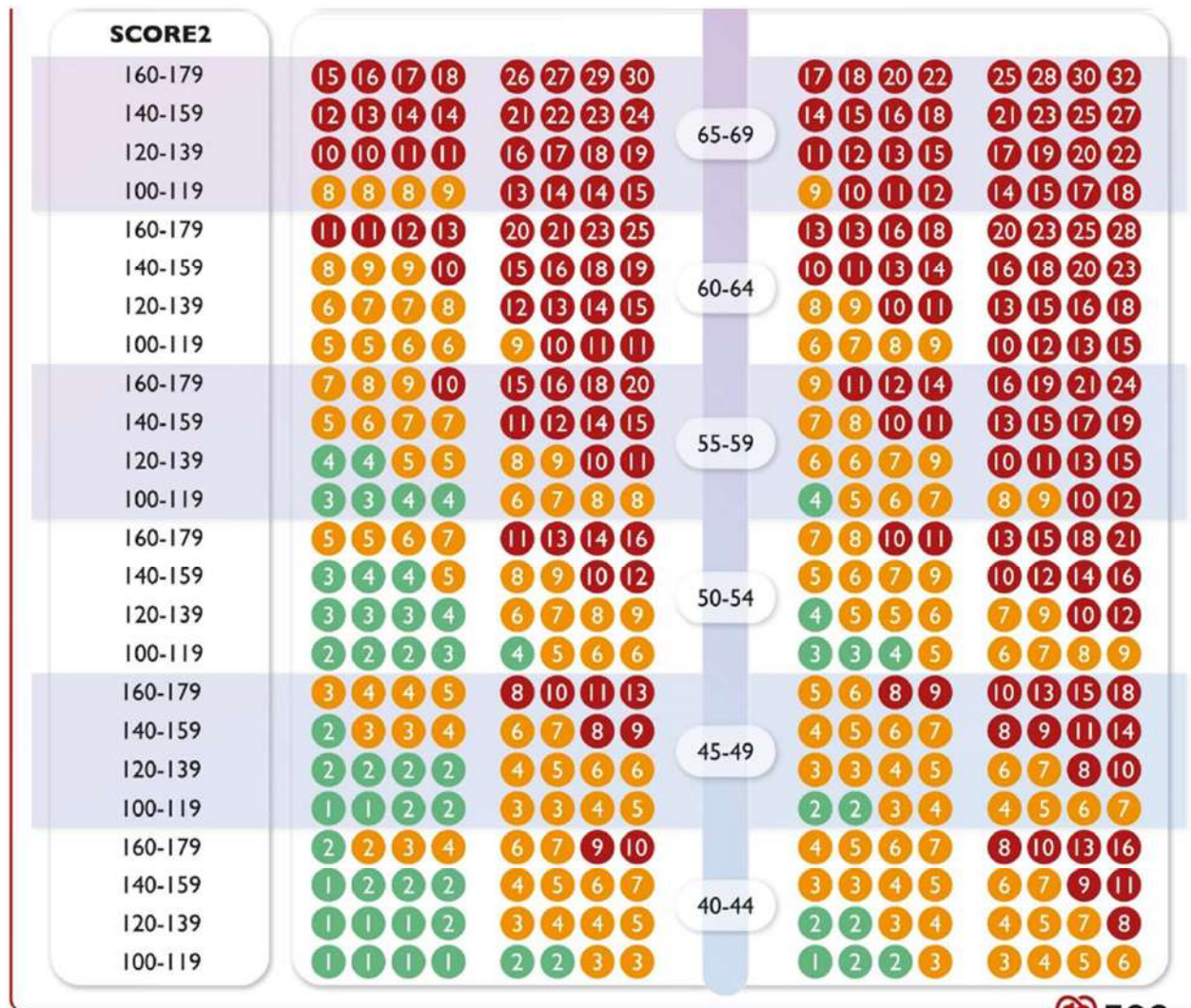
Non-HDL cholesterol

Systolic blood pressure (mmHg)
SCORE2-OP

3.0-3.9				4.0-4.9				5.0-5.9				6.0-6.9				mmol/L mg/dL
150	200	250		150	200	250		150	200	250		150	200	250		

160-179	53	55	57	58	58	59	61	63	42	49	57	65	41	49	56	65	85-89
140-159	50	52	54	55	55	56	58	60	40	47	55	63	40	47	54	62	
120-139	47	49	51	52	52	53	55	57	38	45	53	61	38	45	52	60	
100-119	44	46	48	50	49	51	52	54	36	43	51	58	36	43	50	58	
160-179	40	42	44	45	49	51	53	55	34	40	45	51	38	44	50	56	80-84
140-159	36	38	39	41	44	46	48	50	31	36	42	47	35	40	46	52	
120-139	32	34	36	37	40	42	44	46	29	33	38	44	32	37	42	48	
100-119	29	31	32	34	36	38	40	41	26	30	35	40	29	34	39	44	
160-179	29	31	32	34	41	43	45	47	28	32	35	39	35	39	44	48	75-79
140-159	25	27	28	29	35	37	39	41	24	27	31	34	31	34	38	43	
120-139	22	23	24	25	31	32	34	36	21	24	27	30	27	30	34	37	
100-119	18	19	20	22	26	28	29	31	18	20	23	26	23	26	29	33	
160-179	21	22	24	25	33	35	37	39	23	25	27	29	33	35	38	41	70-74
140-159	17	18	19	20	28	29	31	33	19	20	22	24	27	29	32	34	
120-139	14	15	16	17	23	24	26	27	15	17	18	20	22	24	26	28	
100-119	11	12	13	14	19	20	21	22	12	14	15	16	18	20	22	23	

SCORE2 and SCORE2-OP
risk chart for fatal and non-fatal (MI, stroke) ASCVD
High CVD Risk (1)



**SCORE2 and SCORE2-OP
risk chart for fatal and
non-fatal (MI, stroke)
ASCVD
High CVD Risk (2)**

SCORE2 & SCORE2-OP
10-year risk of (fatal and non-fatal) CV events in populations at very high CVD risk

<50 years	50-69 years	≥70 years
● <2.5%	● <5%	● <7.5%
● 2.5 to <7.5%	● 5 to <10%	● 7.5 to <15%
● ≥7.5%	● ≥10%	● ≥15%

Women

Men

Non-smoking

Smoking

Non-smoking

Smoking

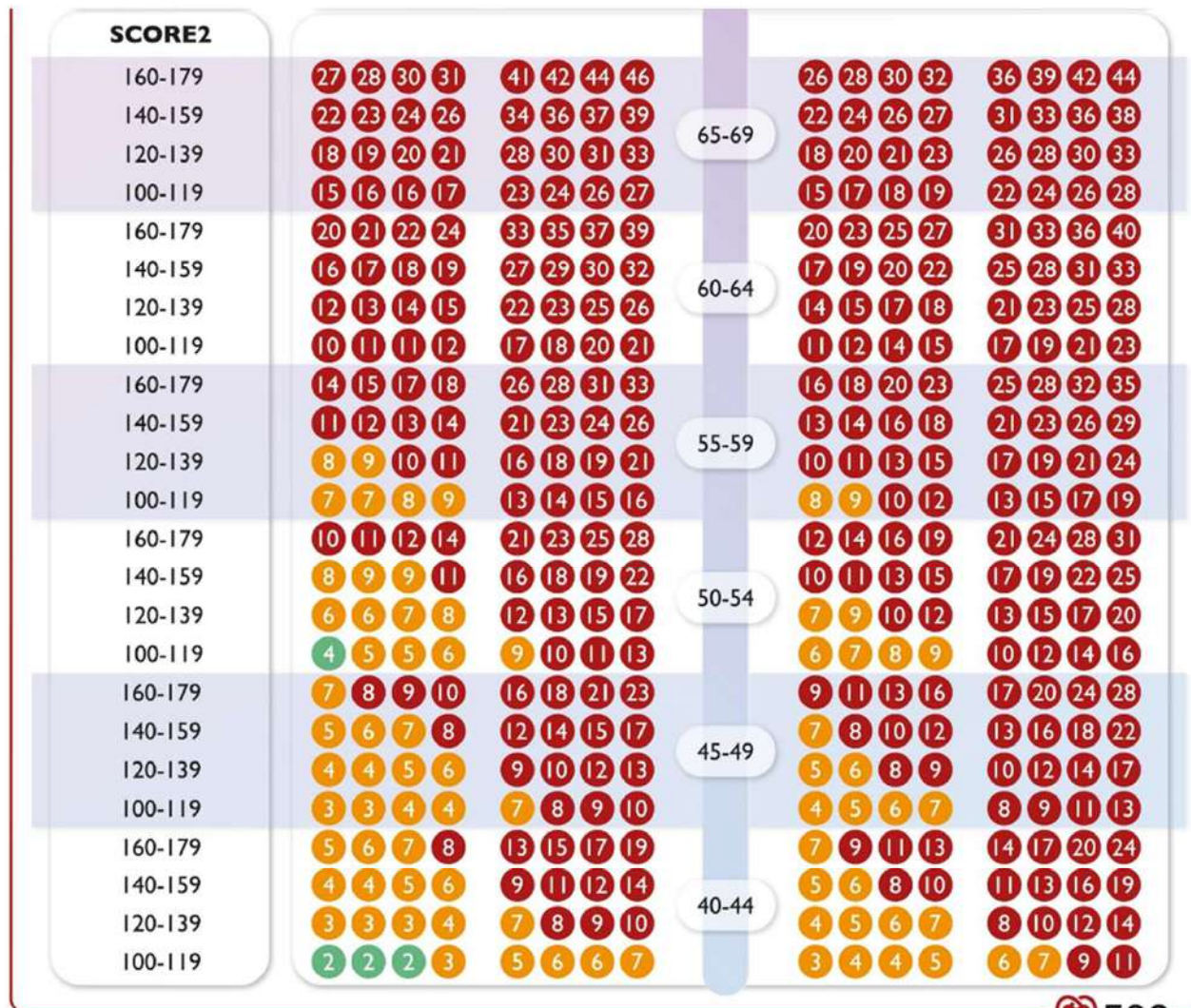
Non-HDL cholesterol

Systolic blood pressure (mmHg)
SCORE2-OP

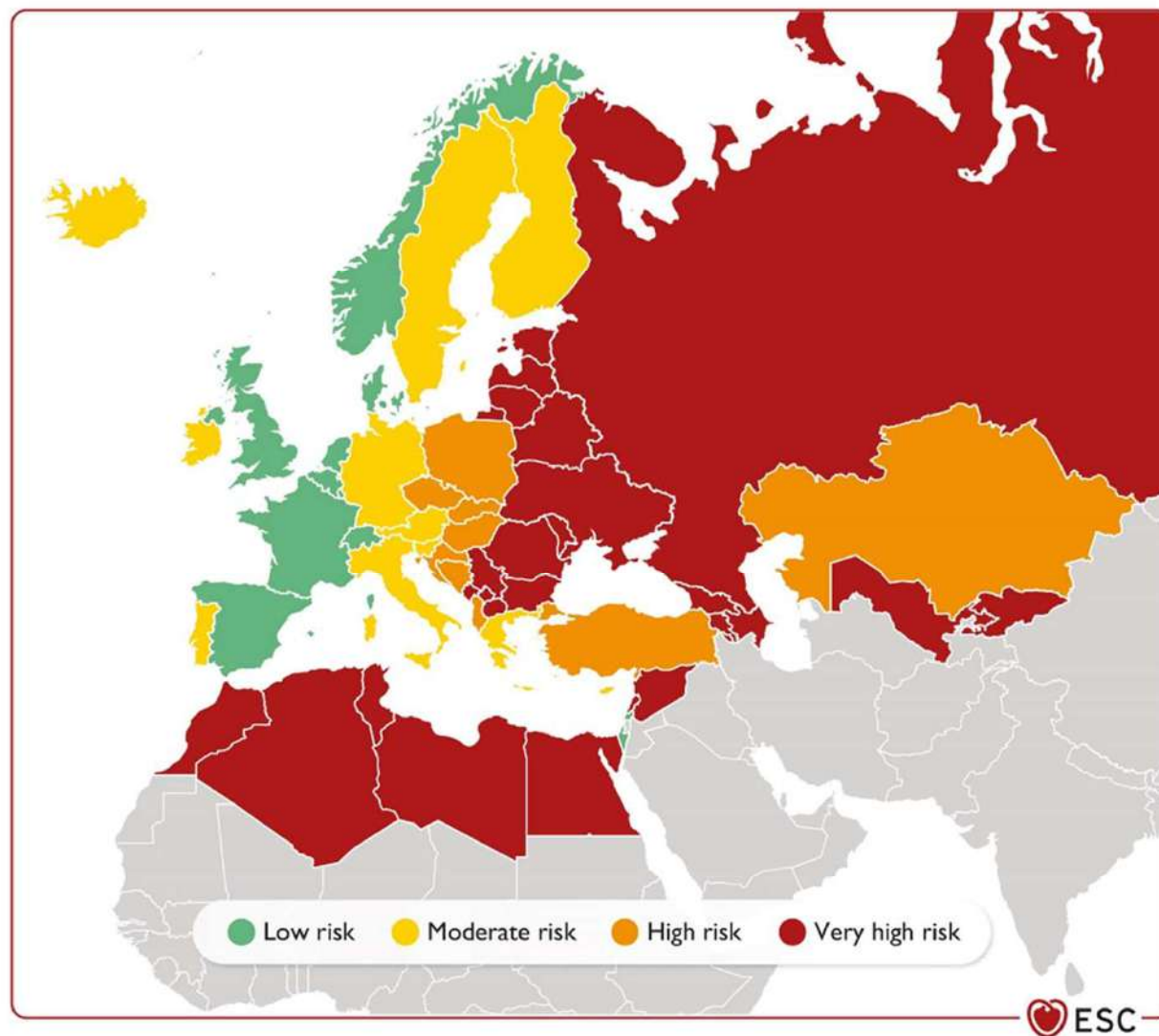
3.0-3.9				4.0-4.9				5.0-5.9				6.0-6.9				mmol/L mg/dL
150	200	250		150	200	250		150	200	250		150	200	250		

160-179	62	63	64	65	65	66	67	68	Age (y)	49	54	59	64	49	54	59	64
140-159	60	61	62	63	63	64	65	66	85-89	48	53	58	63	48	53	58	63
120-139	58	59	60	61	61	62	63	65		47	52	56	61	47	52	56	61
100-119	56	57	58	60	59	60	61	63		46	50	55	60	46	50	55	60
160-179	53	54	55	57	59	60	62	63		44	48	52	56	47	51	55	59
140-159	50	51	52	54	56	57	59	60	80-84	42	46	49	53	45	49	52	56
120-139	47	48	49	51	53	54	56	57		40	43	47	51	43	46	50	54
100-119	44	45	47	48	50	51	53	54		38	41	45	48	40	44	48	51
160-179	44	46	47	48	53	55	56	58		40	42	45	48	45	48	51	54
140-159	41	42	43	45	49	51	52	53	75-79	37	39	42	44	42	44	47	50
120-139	37	39	40	41	46	47	48	49		34	36	39	41	39	41	44	47
100-119	34	35	36	37	42	43	44	46		31	33	36	38	36	38	41	43
160-179	37	38	39	41	48	49	51	52	70-74	35	37	39	40	43	45	47	49
140-159	33	34	35	36	43	44	46	47		32	33	35	36	39	41	42	44
120-139	29	30	31	32	39	40	41	43		28	30	31	33	35	36	38	40
100-119	26	27	28	29	34	36	37	38		25	26	28	29	31	33	34	36

SCORE2 and SCORE2-OP
risk chart for fatal and non-fatal (MI, stroke) ASCVD
Very high CVD Risk (1)



**SCORE2 and SCORE2-OP
risk chart for fatal and
non-fatal (MI, stroke)
ASCVD**
Very high CVD Risk (2)

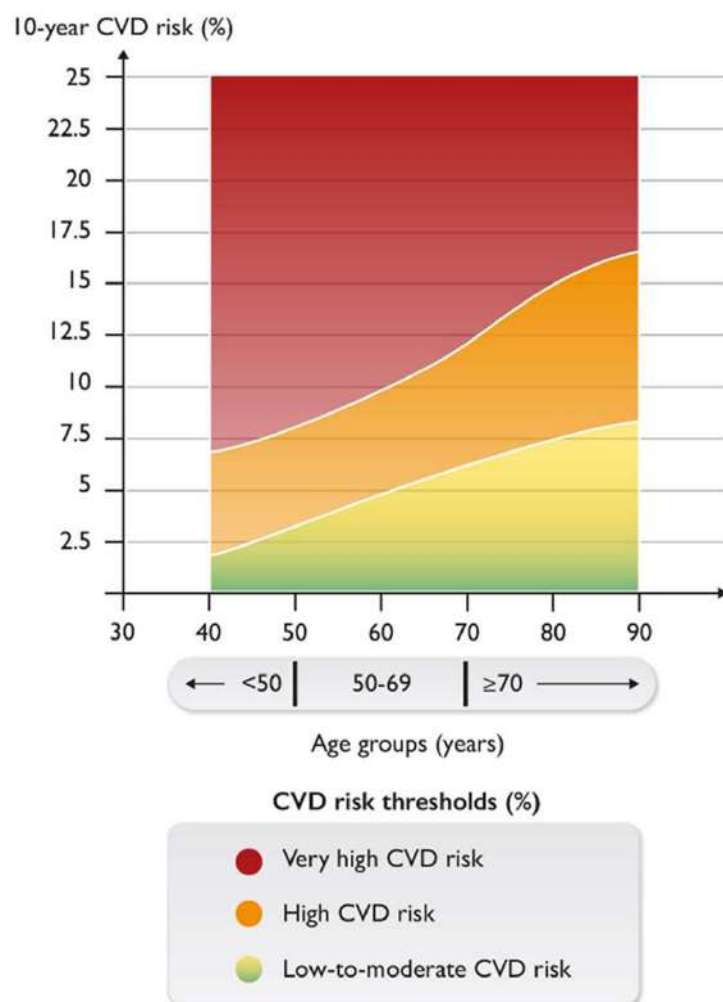


**Risk regions based on
World Health Organization
cardiovascular mortality
rates**

Cardiovascular disease risk categories based on SCORE2 and SCORE2-OP in apparently healthy people according to age

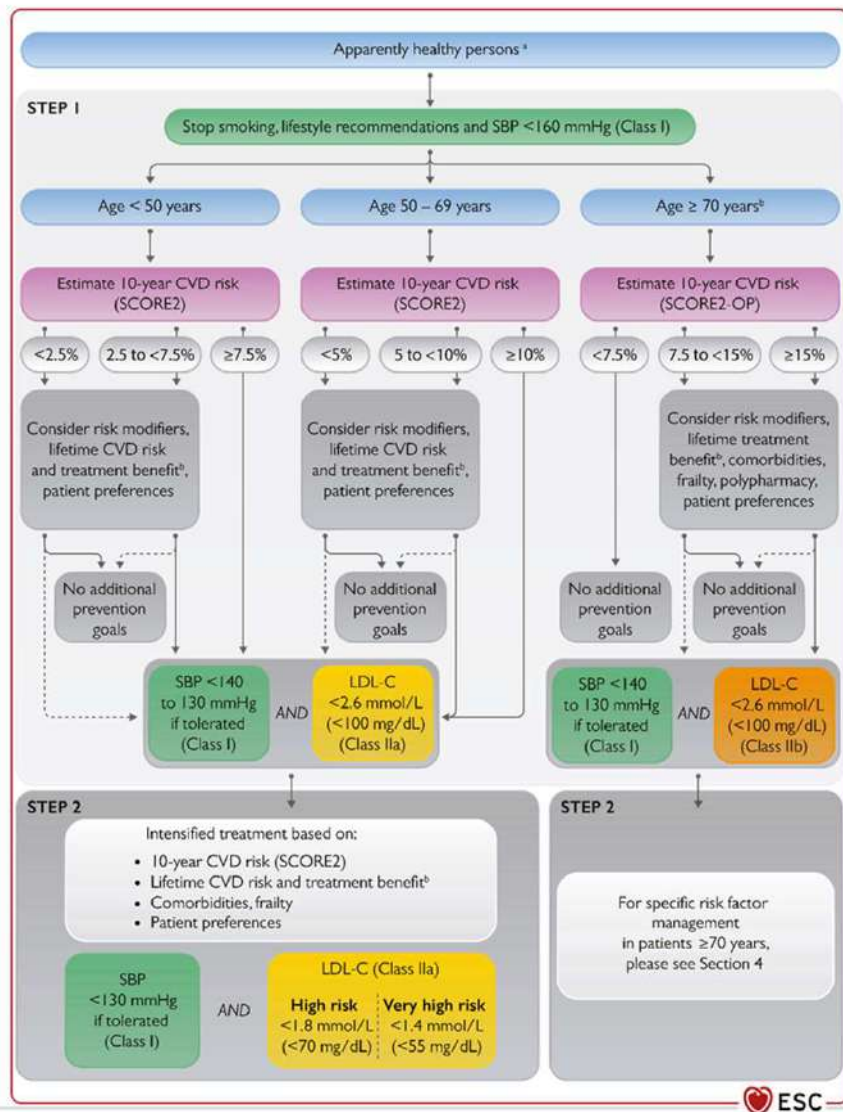


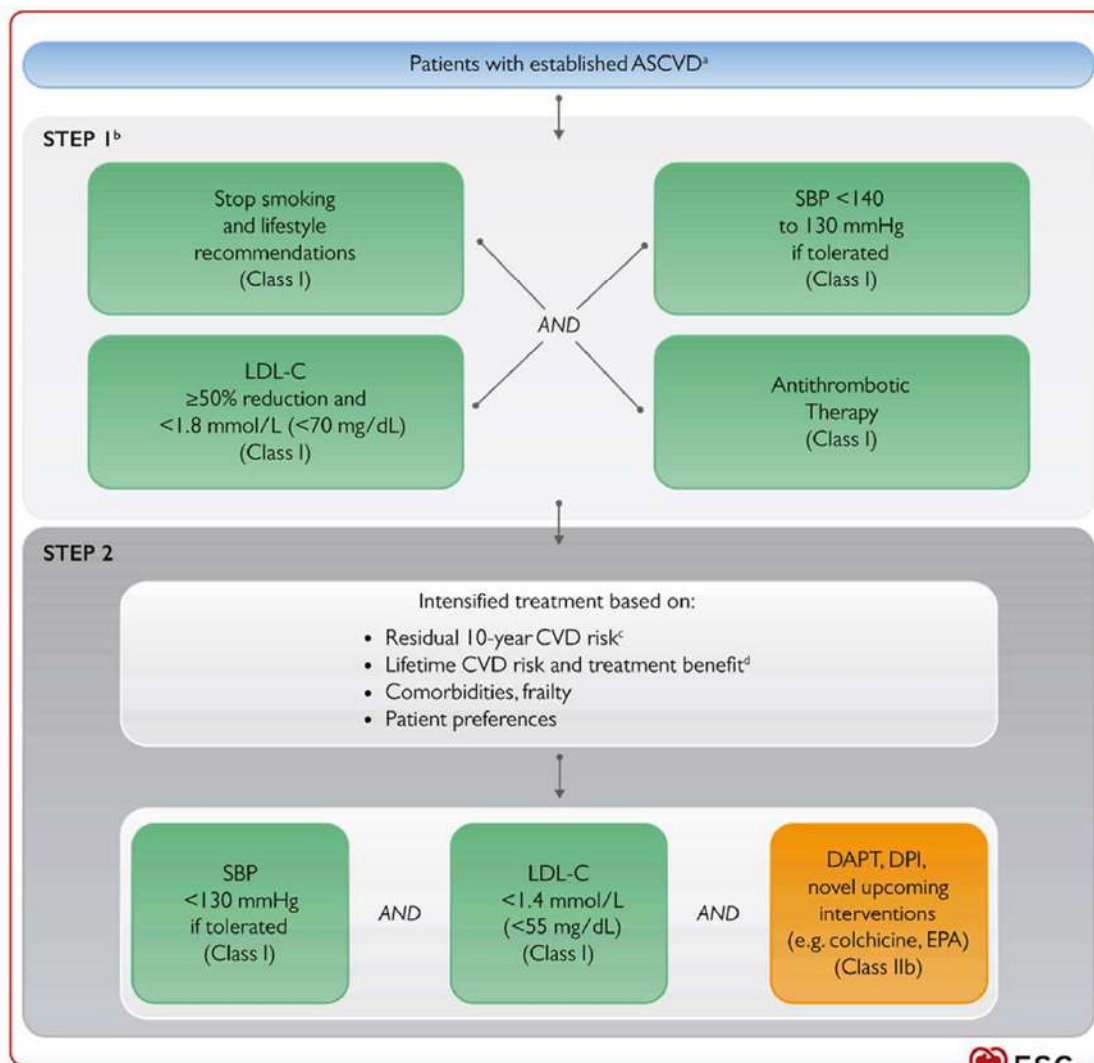
	<50 years	50-69 years	≥70 years ^a
Low-to-moderate CVD risk: risk factor treatment generally not recommended	<2.5%	<5%	<7.5%
High CVD risk: risk factor treatment should be considered	2.5 to <7.5%	5 to <10%	7.5 to <15%
Very high CVD risk: risk factor treatment generally recommended ^a	≥7.5%	≥10%	≥15%



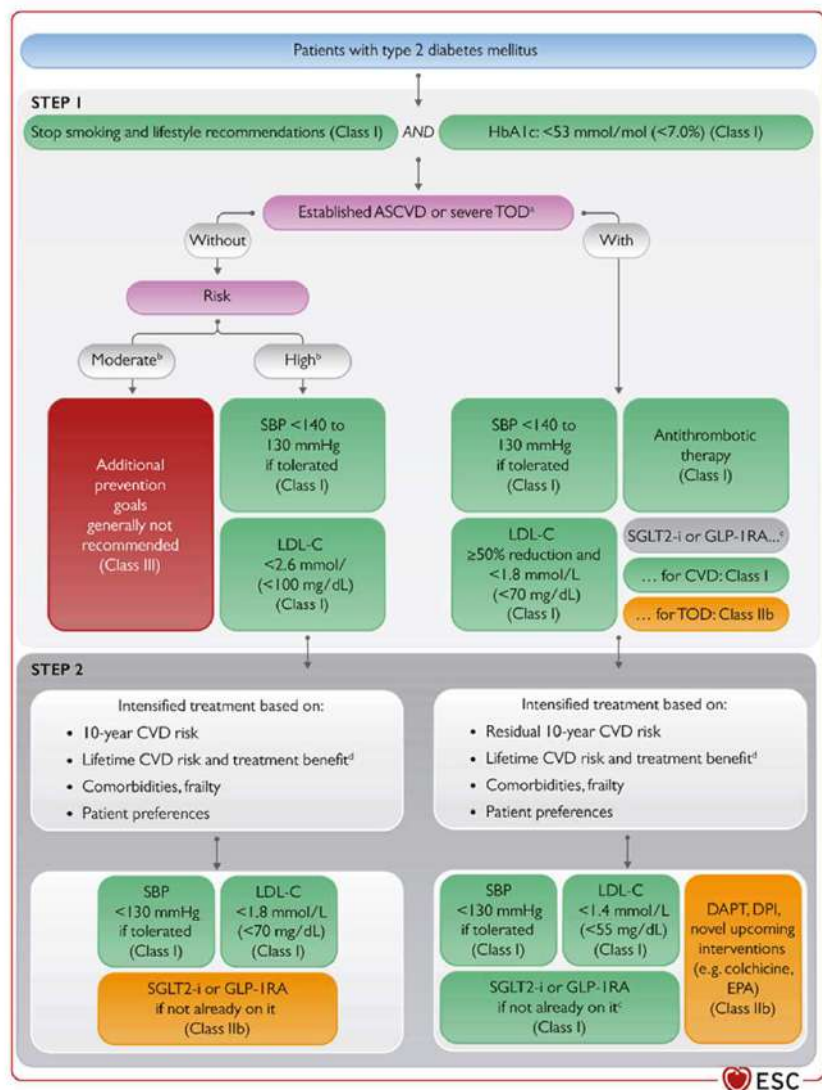
Schematic representation of increasing 10-year CVD risk thresholds across age groups

Cardiovascular risk and risk factor treatment in apparently healthy persons





Cardiovascular risk and risk factor treatment in patients with established cardiovascular disease



Cardiovascular risk and risk factor treatment in patients with type 2 diabetes mellitus

Recommendations for cardiovascular disease risk estimation (1)

Recommendations	Class	Level
In apparently healthy people <70 years without established ASCVD, DM, CKD, genetic/rarer lipid or BP disorders, estimation of 10-year fatal and non-fatal CVD risk with SCORE2 is recommended.	I	B
In apparently healthy people ≥70 years without established ASCVD, DM, CKD, genetic/rarer lipid or BP disorders, estimation of 10-year fatal and non-fatal CVD risk with SCORE2-OP is recommended.	I	B
In apparently healthy people, after estimation of 10-year fatal and non-fatal CVD risk, lifetime risk and treatment benefit, risk modifiers, frailty, polypharmacy, and patient preferences should be considered.	IIa	C
Patients with established CVD and/or DM and/or moderate-to-severe renal disease and/or genetic/rarer lipid or BP disorders are to be considered at high or very high CVD risk.	I	A

Recommendations for cardiovascular disease risk estimation (2)

Recommendations	Class	Level
A stepwise treatment-intensification approach aiming at intensive risk factor treatment is recommended for apparently healthy people at high or very high CVD risk, as well as patients with established ASCVD and/or DM, with consideration of CVD risk, treatment benefit of risk factors, risk modifiers, comorbidities, and patient preferences.	I	B
Treatment of ASCVD risk factors is recommended in apparently healthy people without DM, CKD, genetic/rarer lipid, or BP disorders who are at very high risk (SCORE2 $\geq 7.5\%$ for age under 50; SCORE2 $\geq 10\%$ for age 50–69; SCORE2-OP $\geq 15\%$ for age ≥ 70 years).	I	C
Treatment of ASCVD risk factors should be considered in apparently healthy people without DM, CKD, genetic/rarer lipid, or BP disorders who are at high risk (SCORE2 2.5 to $< 7.5\%$ for age under 50; SCORE2 5 to $< 10\%$ for age 50–69; SCORE2-OP 7.5 to $< 15\%$ for age ≥ 70 years), taking CVD risk modifiers, lifetime risk and treatment benefit, and patient preferences into account.	IIa	C

Recommendation for cardiovascular disease risk communication



Recommendation	Class	Level
An informed discussion about CVD risk and treatment benefits tailored to the needs of a patient is recommended.	I	C

Recommendations for risk modifiers

Recommendations	Class	Level
Stress symptoms and psychosocial stressors modify CVD risk. Assessment of these stressors should be considered.	IIa	C
CAC scoring may be considered to improve risk classification around treatment decision thresholds. Plaque detection by carotid ultrasound is an alternative when CAC scoring is unavailable or not feasible.	IIb	C
Multiplication of calculated risk by RR for specific ethnic subgroups should be considered. ^c	IIa	B
The routine collection of other potential modifiers, such as genetic risk scores, circulating or urinary biomarkers, or vascular tests or imaging methods (other than CAC scoring or carotid ultrasound for plaque determination), is not recommended.	III	B

Recommendations for cardiovascular disease risk related to air pollution



Recommendations	Class	Level
Patients at (very) high risk for CVD may be encouraged to try to avoid long-term exposure to regions with high air pollution.	IIb	C
In regions where people have long-term exposure to high levels of air pollution, (opportunistic) CVD risk screening programmes may be considered.	IIb	C

Recommendations for cardiovascular disease assessment in specific clinical conditions (1)



Clinical Condition	Recommendations	Class	Level
CKD	In all CKD patients, with or without DM, appropriate screening for ASCVD and kidney disease progression, including monitoring changes in albuminuria is recommended.	I	C
Cancer	It is recommended to monitor cardiac dysfunction using imaging techniques and circulating biomarkers before, periodically during, and after cancer treatment.	I	B
	Cardioprotection in high-risk patients (those receiving high cumulative doses or combined radiotherapy) receiving anthracycline chemotherapy may be considered for prevention of LV dysfunction.	IIb	B
	Screening for ASCVD risk factors and optimization of the CV risk profile is recommended in patients on treatment for cancer.	I	C

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Recommendations for cardiovascular disease assessment in specific clinical conditions (2)



Clinical Condition	Recommendations	Class	Level
COPD	It is recommended that all COPD patients be investigated for ASCVD and ASCVD risk factors.	I	C
Inflammatory conditions	Assessment of total CVD risk may be considered in adults with chronic inflammatory conditions.	IIb	B
	Multiplication of calculated total CVD risk by a factor of 1.5 should be considered in adults with rheumatoid arthritis.	IIa	B
Migraine	Presence of migraine with aura should be considered in CVD risk assessment.	IIa	B
	Avoidance of combined hormonal contraceptives may be considered in women with migraine with aura.	IIb	B

Recommendations for cardiovascular disease assessment in specific clinical conditions (3)



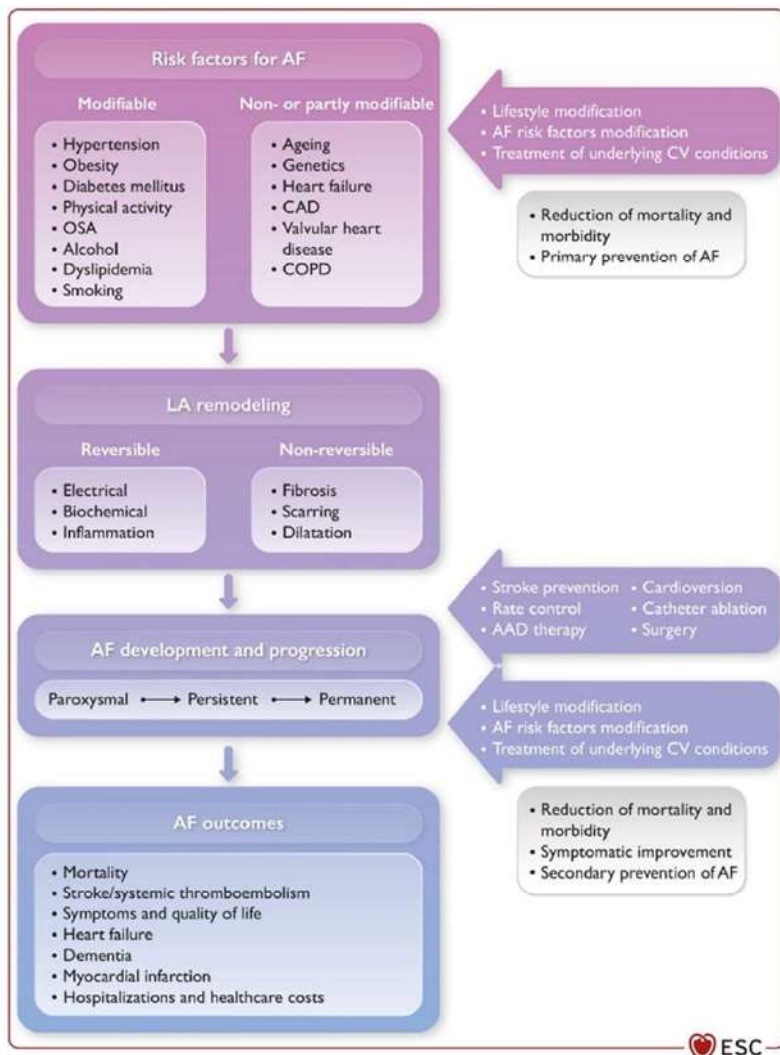
Clinical Condition	Recommendations	Class	Level
Sleep disorders and OSA	In patients with ASCVD, obesity, and hypertension, regular screening for non-restorative sleep is indicated (e.g. by the question: ‘how often have you been bothered by trouble falling or staying asleep, or sleeping too much?’).	I	C
	If there are significant sleep problems, which are not responding within 4 weeks to sleep hygiene, referral to a specialist is recommended.	I	C
Mental disorders	It is recommended that mental disorders with either significant functional impairment or decreased use of healthcare systems be considered as influencing total CVD risk.	I	C

Recommendations for cardiovascular disease assessment in specific clinical conditions (4)



Clinical Condition	Recommendations	Class	Level
Mental disorders	It is recommended that mental disorders with either significant functional impairment or decreased use of healthcare systems be considered as influencing total CVD risk.	I	C
Sex specific conditions	In women with a history of preeclampsia and/or pregnancy-induced hypertension, periodic screening for hypertension and DM should be considered.	IIa	B
	In women with a history of polycystic ovary syndrome or gestational DM, periodic screening for DM should be considered.	IIa	B
	In women with a history of premature or stillbirth, periodic screening for hypertension and DM may be considered.	IIb	B
	Assessment of CVD risk should be considered in men with ED.	IIa	C

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The role of risk factors and comorbidities in atrial fibrillation

Treatment goals for different patient categories (1)

Patient category	Prevention goals (STEP 1)	Intensified/additional prevention goals ^a (STEP 2)
Apparently healthy persons	For BP and lipids: initiation of drug treatment based on CVD risk assessment or SBP >160 mmHg	
<50 years	Stop smoking and lifestyle optimization SBP <140 down to 130 mmHg if tolerated ^b LDL-C <2.6 mmol/L (100 mg/dL)	SBP <130 mmHg if tolerated ^b LDL-C <1.8 mmol/L (70 mg/dL) and ≥50% reduction in high-risk patients LDL-C <1.4 mmol/L (55 mg/dL) and ≥50% reduction in very-high-risk patients
50–69 years	Stop smoking and lifestyle optimization SBP <140 down to 130 mmHg if tolerated ^b LDL-C <2.6 mmol/L (100 mg/dL)	SBP <130 mmHg if tolerated ^b LDL-C <1.8 mmol/L (70 mg/dL) and ≥50% reduction in high-risk patients LDL-C <1.4 mmol/L (55 mg/dL) and ≥50% reduction in very-high-risk patients
≥70 years	Stop smoking and lifestyle optimization SBP <140 mmHg if tolerated ^b LDL-C <2.6 mmol/L (100 mg/dL)	For specific risk factor management in patients ≥70 years old, please see relevant sections in section 4.
Patients with CKD	Stop smoking and lifestyle optimization SBP <140 down to 130 mmHg if tolerated ^b LDL-C <2.6 mmol/L (100 mg/dL) and ≥50% LDL-C reduction Otherwise according to ASCVD and DM history	LDL-C <1.8 mmol/L (70 mg/dL) in high-risk patients and <1.4 mmol/L (55 mg/dL) in very-high-risk patients (see Table 4)
Patients with FH	Stop smoking and lifestyle optimization SBP <140 down to 130 mmHg if tolerated ^b LDL-C <2.6 mmol/L (100 mg/dL) and ≥50% LDL-C reduction Otherwise according to ASCVD and DM history	LDL-C <1.8 mmol/L (70 mg/dL) in high-risk patients and <1.4 mmol/L (55 mg/dL) in very-high-risk patients (see Table 4)

Treatment goals for different patient categories (2)

Patient category	Prevention goals (STEP 1)	Intensified/additional prevention goals ^a (STEP 2)
People with type 2 DM		
Well-controlled short-standing DM e.g. <10 years), no evidence of TOD and no additional ASCVD risk factors	Stop smoking and lifestyle optimization	
Without established ASCVD or severe TOD (see Table 4 for definitions)	Stop smoking and lifestyle optimization SBP <140 down to 130 mmHg if tolerated ^b LDL-C <2.6 mmol/L (100 mg/dL) HbA1c <53 mmol/mol (7.0%)	SBP <130 mmHg if tolerated ^b LDL-C <1.8 mmol/L (70 mg/dL) and ≥50% reduction SGLT2 inhibitor or GLP-1RA
With established ASCVD and/or severe TOD (see Table 4 for definitions)	Stop smoking and lifestyle optimization SBP <140 down to 130 mmHg if tolerated ^b LDL-C <1.8 mmol/L (70 mg/dL) HbA1c <64 mmol/mol (8.0%) SGLT2 inhibitor or GLP-1RA CVD: antiplatelet therapy	SBP <130 mmHg if tolerated ^b LDL-C <1.4 mmol/L (55 mg/dL) and ≥50% reduction SGLT2 inhibitor or GLP-1RA if not already on <i>May additionally consider novel upcoming treatments: DAPT, dual pathway inhibition, colchicine, icosapent ethyl, etc.</i>
Patients with established ASCVD	Stop smoking and lifestyle optimization SBP <140 down to 130 mmHg if tolerated ^b Intensive oral lipid-lowering therapy aiming at LDL-C <1.8 mmol/L (70 mg/dL) and ≥50% reduction Antiplatelet therapy	SBP <130 mmHg if tolerated ^b LDL-C <1.4 mmol/L and ≥50% reduction (55 mg/dL) <i>May additionally consider novel upcoming treatments: DAPT, dual pathway inhibition, colchicine, icosapent ethyl, etc.</i>

Recommendations for physical activity (1)

Recommendations	Class	Level
It is recommended for adults of all ages to strive for at least 150–300 min a week of moderate-intensity or 75–150 min a week of vigorous-intensity aerobic PA, or an equivalent combination thereof, to reduce all-cause mortality, CV mortality, and morbidity.	I	A
It is recommended that adults who cannot perform 150 min of moderate-intensity PA a week should stay as active as their abilities and health condition allow.	I	B
It is recommended to reduce sedentary time to engage in at least light activity throughout the day to reduce all-cause and CV mortality and morbidity.	I	B

Recommendations for physical activity (2)

Recommendations	Class	Level
Performing resistance exercise, in addition to aerobic activity, is recommended on 2 or more days per week to reduce all-cause mortality.	I	B
Lifestyle interventions, such as group or individual education, behaviour-change techniques, telephone counselling, and use of consumer-based wearable activity trackers, should be considered to increase PA participation.	IIa	B

Classification of physical activity intensity and examples of absolute and relative intensity levels (1)

Absolute intensity			Relative intensity		
Intensity	MET ^a	Examples	%HR _{max}	RPE (Borg scale score)	Talk test
Light	1.1–2.9	Walking <4.7 km/h, light household work	57–63	10–11	
Moderate	3–5.9	Walking at moderate or brisk pace (4.1–6.5 km/h), slow cycling (15 km/h), painting/decorating, vacuuming, gardening (mowing lawn), golf (pulling clubs in trolley), tennis (doubles), ballroom dancing, water aerobics	64–76	12–13	Breathing is faster but compatible with speaking full sentences

Classification of physical activity intensity and examples of absolute and relative intensity levels (2)

Absolute intensity			Relative intensity		
Intensity	MET ^a	Examples	%HR _{max}	RPE (Borg scale score)	Talk test
Vigorous	≥6	Race-walking, jogging or running, cycling >15 km/h, heavy gardening (continuous digging or hoeing), swimming laps, tennis (singles)	77–95	14–17	Breathing very hard, incompatible with carrying on a conversation comfortably

Recommendations for nutrition and alcohol

Recommendations	Class	Level
A healthy diet is recommended as a cornerstone of CVD prevention in all individuals.	I	A
It is recommended to adopt a Mediterranean or similar diet to lower risk of CVD.	I	A
It is recommended to replace saturated with unsaturated fats to lower the risk of CVD.	I	A
It is recommended to reduce salt intake to lower BP and risk of CVD.	I	A
It is recommended to choose a more plant-based food pattern, rich in fibre, that includes whole grains, fruits, vegetables, pulses, and nuts.	I	B
It is recommended to restrict alcohol consumption to a maximum of 100 g per week.	I	B
It is recommended to eat fish, preferably fatty, at least once a week and restrict (processed) meat.	I	B
It is recommended to restrict free sugar consumption, in particular sugar-sweetened beverages, to a maximum of 10% of energy intake.	I	B

Healthy diet characteristics (1)

Adopt a more plant- and less animal-based food pattern

Saturated fatty acids should account for <10% of total energy intake, through replacement by PUFAs, MUFAs, and carbohydrates from whole grains

Trans unsaturated fatty acids should be minimized as far as possible, with none from processed foods

<5 g total salt intake per day

30–45 g of fibre per day, preferably from wholegrains

≥200 g of fruit per day (≥2–3 servings)

≥200 g of vegetables per day (≥2–3 servings)

Healthy diet characteristics (2)

Red meat should be reduced to a maximum of 350–500 g a week, in particular processed meat should be minimized

Fish is recommended 1–2 times per week, in particular fatty fish

30 g unsalted nuts per day

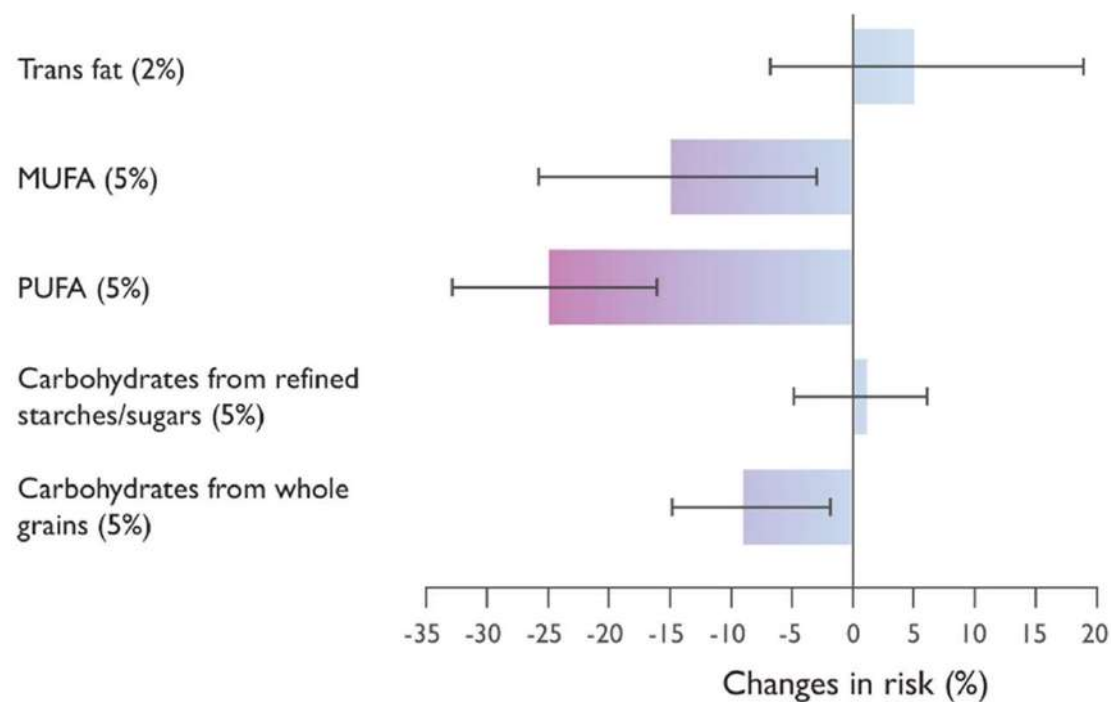
Consumption of alcohol should be limited to a maximum of 100 g per week

Sugar-sweetened beverages, such as soft drinks and fruit juices, must be discouraged

Red meat should be reduced to a maximum of 350–500 g a week, in particular processed meat should be minimized

Fish is recommended 1–2 times per week, in particular fatty fish

Estimated percent change in risk of coronary heart disease associated with isocaloric substitutions of saturated fat for other types of fat or carbohydrates



Recommendations for body weight

Recommendations	Class	Level
It is recommended that overweight and obese people aim for a reduction in weight to reduce BP, dyslipidaemia, and risk of type 2 DM, and thus improve their CVD risk profile.	I	A
While a range of diets are effective for weight loss, it is recommended that a healthy diet in regard to CVD risk is maintained over time.	I	A
Bariatric surgery for obese high-risk individuals should be considered when lifestyle change does not result in maintained weight loss.	IIa	B

Recommendations for mental healthcare and psychosocial interventions at the individual level

Recommendations	Class	Level
Patients with mental disorders need intensified attention and support to improve adherence to lifestyle changes and drug treatment.	I	C
In ASCVD patients with mental disorders, evidence-based mental healthcare and interdisciplinary cooperation are recommended.	I	B
ASCVD patients with stress should be considered for referral to psychotherapeutic stress management to improve CV outcomes and reduce stress symptoms.	IIa	B
Patients with CHD and moderate-to-severe major depression should be considered for antidepressive treatment with an SSRI.	IIa	B
In patients with HF and major depression, SSRIs, SNRIs, and tricyclic antidepressants are not recommended. ^c	III	B

Recommendations for smoking-intervention strategies

Recommendations	Class	Level
All smoking of tobacco should be stopped, as tobacco use is strongly and independently causal of ASCVD.	I	A
In smokers, offering follow-up support, nicotine replacement therapy, varenicline, and bupropion individually or in combination should be considered.	IIa	A
Smoking cessation is recommended regardless of weight gain, as weight gain does not lessen the ASCVD benefits of cessation.	I	B

LIFE-CVD model
CVD-free lifetime gain from smoking cessation (in years)

● < 0.5 years ● 0.5 - 0.9 years ● 1.0 - 1.4 years ● 1.5 - 2.0 years ● ≥ 2.0 years

Systolic blood pressure (mmHg)	Women				Age (y)	Men			
	Non-HDL cholesterol					Non-HDL cholesterol			
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9		3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9
	150	200	250		mmol/L	150	200	250	
160-179	0.8	0.8	0.9	0.9	90+	0.5	0.5	0.5	0.6
140-159	0.8	0.8	0.8	0.8		0.5	0.5	0.6	0.6
120-139	0.8	0.8	0.8	0.8		0.5	0.6	0.6	0.7
100-119	0.8	0.8	0.8	0.8		0.5	0.7	0.7	0.7
160-179	1.6	1.7	1.9	1.9	85-89	0.7	0.9	0.9	1.0
140-159	1.7	1.8	1.9	1.9		0.8	0.9	1.0	1.0
120-139	1.8	1.8	1.8	1.8		0.8	0.9	1.0	1.1
100-119	1.7	1.7	1.8	1.8		0.8	1.0	1.0	1.1
160-179	2.0	2.3	2.4	2.4	80-84	1.2	1.3	1.4	1.4
140-159	2.2	2.3	2.4	2.5		1.2	1.3	1.4	1.4
120-139	2.2	2.3	2.5	2.5		1.2	1.3	1.4	1.5
100-119	2.2	2.4	2.5	2.5		1.2	1.3	1.4	1.5
160-179	2.6	2.8	2.8	2.9	75-79	1.6	1.7	1.9	1.9
140-159	2.6	2.7	2.9	3.0		1.7	1.8	1.9	1.9
120-139	2.6	2.7	2.9	3.0		1.6	1.8	1.9	2.0
100-119	2.6	2.7	2.9	3.0		1.7	1.8	1.9	1.9
160-179	3.0	3.2	3.4	3.4	70-74	2.1	2.3	2.4	2.5
140-159	3.1	3.2	3.3	3.4		2.1	2.2	2.4	2.4
120-139	3.0	3.1	3.3	3.4		2.0	2.2	2.3	2.4
100-119	3.0	3.1	3.2	3.3		2.1	2.2	2.3	2.3

Lifetime CVD benefit from smoking cessation for apparently healthy persons (1)

160-179	3.4	3.6	3.8	3.9	65-69	2.6	2.7	2.9	2.9
140-159	3.4	3.6	3.7	3.8		2.5	2.7	2.8	2.8
120-139	3.3	3.5	3.6	3.7		2.4	2.6	2.7	2.7
100-119	3.6	3.6	3.8	3.9		2.7	2.7	2.9	2.9
160-179	3.7	4.0	4.1	4.3	60-64	3.0	3.1	3.3	3.4
140-159	3.7	3.9	4.1	4.2		2.9	3.0	3.2	3.3
120-139	3.6	3.7	4.0	4.0		2.8	2.9	3.0	3.1
100-119	3.6	3.6	3.8	3.9		2.7	2.7	2.9	2.9
160-179	4.1	4.3	4.5	4.6	55-59	3.3	3.5	3.7	3.8
140-159	4.0	4.2	4.4	4.5		3.1	3.2	3.5	3.6
120-139	3.9	4.0	4.3	4.3		2.9	3.1	3.3	3.4
100-119	3.8	3.9	4.0	4.1		2.8	3.0	3.1	3.2
160-179	4.3	4.5	4.8	4.9	50-54	3.5	3.7	3.9	4.2
140-159	4.2	4.4	4.6	4.7		3.3	3.5	3.7	3.9
120-139	4.1	4.3	4.4	4.5		3.1	3.3	3.4	3.6
140-159	3.9	4.0	4.2	4.3		2.9	3.1	3.2	3.3
100-119	4.5	4.7	5.0	5.1	45-49	3.7	3.9	4.2	4.4
120-139	4.4	4.5	4.8	4.9		3.4	3.7	3.9	4.1
160-179	4.2	4.4	4.6	4.7		3.3	3.4	3.6	3.7
100-119	4.1	4.2	4.4	4.5		3.1	3.2	3.3	3.5
160-179	4.5	4.8	5.1	5.2	40-44	3.7	4.0	4.3	4.5
140-159	4.4	4.6	4.9	5.0		3.5	3.7	4.0	4.2
120-139	4.3	4.5	4.6	4.8		3.3	3.5	3.7	3.9
100-119	4.1	4.3	4.5	4.5		3.2	3.3	3.4	3.6

Lifetime CVD benefit from smoking cessation for apparently healthy persons (2)

“Very brief advice” for smoking cessation

‘Very brief advice’ on smoking is a proven 30-second clinical intervention, developed in the UK, which identifies smokers, advises them on the best method of quitting, and supports subsequent quit attempts. There are three elements to very brief advice:

- ASK – establishing and recording smoking status
- ADVISE – advising on the best ways of stopping
- ACT – offering help

Corresponding non-high-density lipoprotein cholesterol and apolipoprotein B levels for commonly used low-density lipoprotein cholesterol goals

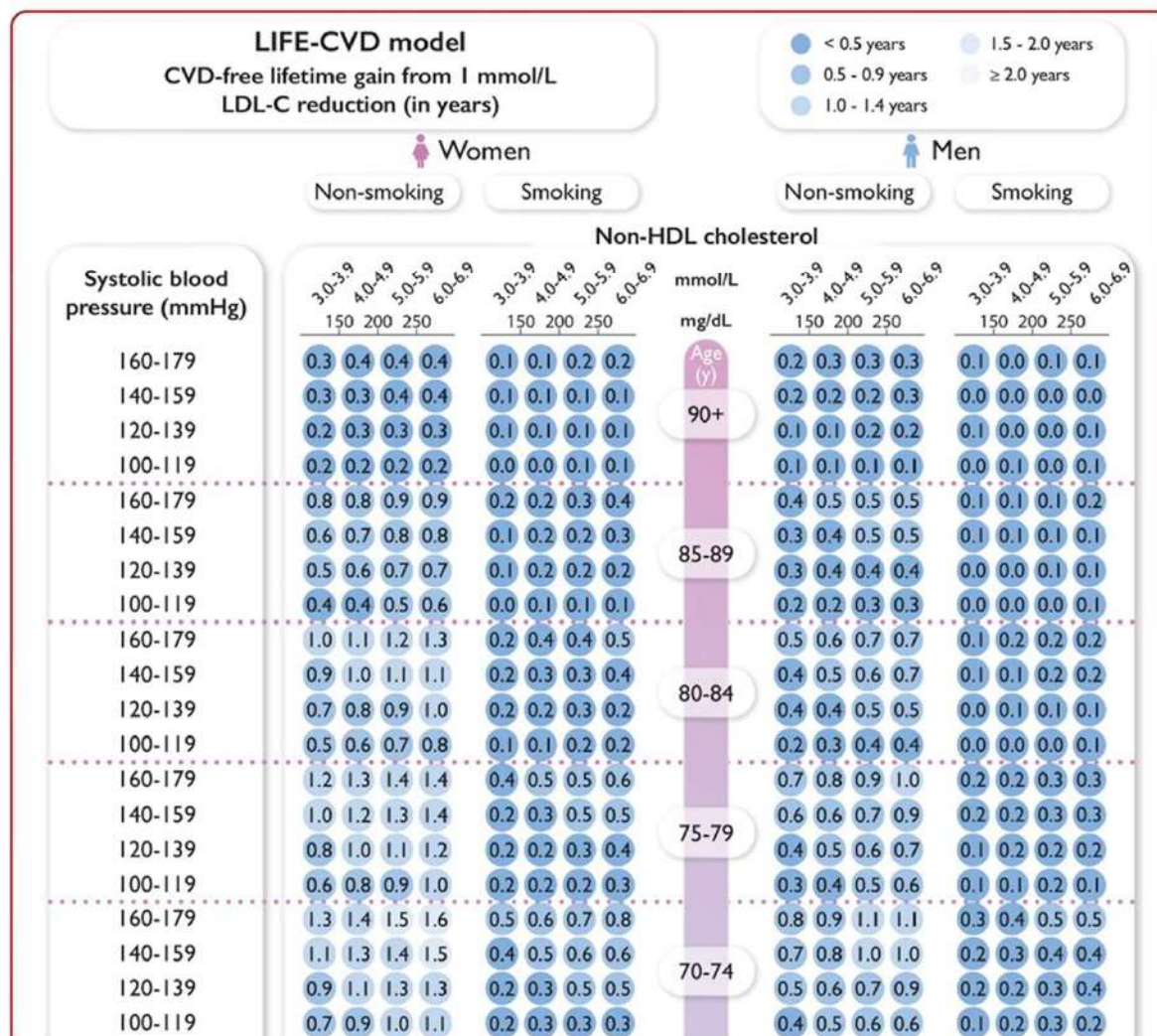


LDL-C	Non-HDL-C	Apolipoprotein B
2.6 mmol/L (100 mg/dL)	3.4 mmol/L (131 mg/dL)	100 mg/dL
1.8 mmol/L (70 mg/dL)	2.6 mmol/L (100 mg/dL)	80 mg/dL
1.4 mmol/L (55 mg/dL)	2.2 mmol/L (85 mg/dL)	65 mg/dL

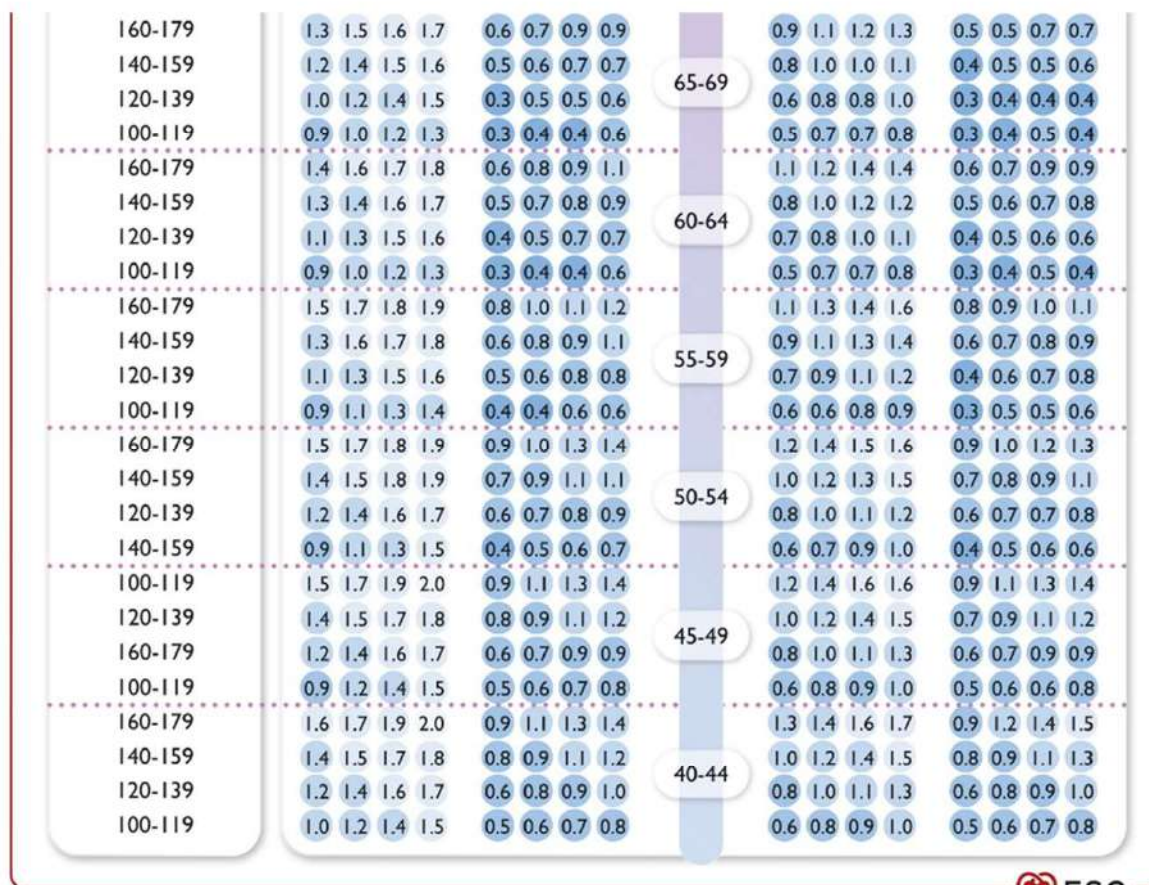
Recommendation on low-density lipoprotein cholesterol goals



Recommendations	Class	Level
A stepwise treatment-intensification approach is recommended for apparently healthy people at high or very high CVD risk, as well as patients with established ASCVD and/or DM with consideration of CVD risk, treatment benefit, risk modifiers, comorbidities, and patient preferences.	I	C



Average years-free-of-cardiovascular disease gained per 1 mmol/L (40 mg/dL) LDL-C reduction in apparently healthy persons (1)



Average years-free-of-cardiovascular disease gained per 1 mmol/L (40 mg/dL) LDL-C reduction in apparently healthy persons (2)



Expected low-density lipoprotein cholesterol reductions for combination therapies

Recommendations for pharmacological low-density lipoprotein cholesterol lowering up to 70 years of age (recommendations for persons aged >70 years, see respective recommendations tables) (1)

Recommendations	Class	Level
It is recommended that a high-intensity statin is prescribed up to the highest tolerated dose to reach the LDL-C goals set for the specific risk group.	I	A
An ultimate LDL-C goal of $\geq 50\%$ reduction vs baseline and an LDL-C of < 1.4 mmol/L (< 55 mg/dL) should be considered in apparently healthy persons < 70 years at very high risk.	IIa	C
An ultimate LDL-C goal of $\geq 50\%$ reduction vs baseline and an LDL-C of < 1.8 mmol/L (< 70 mg/dL) should be considered in apparently healthy persons < 70 years at high risk.	IIa	C

Recommendations for pharmacological low-density lipoprotein cholesterol lowering up to 70 years of age (recommendations for persons aged >70 years, see respective recommendations tables) (2)

Recommendations	Class	Level
In patients with established ASCVD, lipid-lowering treatment with an ultimate LDL-C goal of $\geq 50\%$ reduction vs baseline and an LDL-C of < 1.4 mmol/L (< 55 mg/dL) is recommended.	I	A
If the goals are not achieved with the maximum tolerated dose of a statin, combination with ezetimibe is recommended.	I	B
For primary prevention patients at very high risk, but without FH, if the LDL-C goal is not achieved on a maximum tolerated dose of a statin and ezetimibe, combination therapy including a PCSK9 inhibitor may be considered.	IIb	C

Recommendations for pharmacological low-density lipoprotein cholesterol lowering up to 70 years of age (recommendations for persons aged >70 years, see respective recommendations tables) (3)

Recommendations	Class	Level
For secondary prevention patients not achieving their goals on a maximum tolerated dose of a statin and ezetimibe, combination therapy including a PCSK9 inhibitor is recommended.	I	A
For very-high-risk FH patients (that is, with ASCVD or with another major risk factor) who do not achieve their goals on a maximum tolerated dose of a statin and ezetimibe, combination therapy including a PCSK9 inhibitor is recommended.	I	C
If a statin-based regimen is not tolerated at any dosage (even after rechallenge), ezetimibe should be considered.	IIa	B

Recommendations for pharmacological low-density lipoprotein cholesterol lowering up to 70 years of age (recommendations for persons aged >70 years, see respective recommendations tables) (4)

Recommendations	Class	Level
If a statin-based regimen is not tolerated at any dosage (even after rechallenge), a PCSK9 inhibitor added to ezetimibe may be considered.	IIb	C
If the goal is not achieved, statin combination with a bile acid sequestrant may be considered.	IIb	C
Statin therapy is not recommended in premenopausal female patients who are considering pregnancy or are not using adequate contraception.	III	C

Recommendations for drug treatments of patients with hypertriglyceridaemia ESC

Recommendations	Class	Level
Statin treatment is recommended as the first drug of choice for reducing CVD risk in high-risk individuals with hypertriglyceridaemia (triglycerides >2.3 mmol/L [200 mg/dL]).	I	A
In patients taking statins who are at LDL-C goal with triglycerides >2.3 mmol/L (200 mg/dL), fenofibrate or bezafibrate may be considered.	IIb	B
In high-risk (or above) patients with triglycerides >1.5 mmol/L (135 mg/dL) despite statin treatment and lifestyle measures, n-3 PUFAs (icosapent ethyl 2 x 2 g/day) may be considered in combination with a statin.	IIb	B

Recommendations for the treatment of dyslipidaemias in older people (>70 years)

Recommendations	Class	Level
Treatment with statins is recommended for older people with ASCVD in the same way as for younger patients.	I	A
Initiation of statin treatment for primary prevention in older people aged ≥ 70 may be considered, if at high risk or above.	IIb	B
It is recommended that the statin is started at a low dose if there is significant renal impairment and/or the potential for drug interactions.	I	C

Recommendations for the treatment of dyslipidaemias in diabetes Mellitus (1) ESC

Recommendations	Class	Level
In patients with type 2 DM at very high risk (e.g. with established ASCVD and/or severe TOD ^a), intensive lipid-lowering therapy, ultimately ^b aiming at $\geq 50\%$ LDL-C reduction and an LDL-C of < 1.4 mmol/L (55 mg/dL) is recommended.	I	A
In patients with type 2 DM > 40 years at high risk, lipid-lowering treatment with an ultimate LDL-C goal of $\geq 50\%$ LDL-C reduction and an LDL-C of < 1.8 mmol/L (70 mg/dL) is recommended.	I	A
Statin therapy may be considered in persons aged ≤ 40 years with type 1 or type 2 DM with evidence of TOD and/or an LDL-C level > 2.6 mmol/L (100 mg/dL), as long as pregnancy is not being planned.	IIb	C
If the LDL-C goal is not reached, statin combination with ezetimibe should be considered.	IIa	B

Recommendations for lipid management in patients with moderate-to-severe chronic kidney disease (Kidney disease Outcomes Quality Initiative stages 3–5)

Recommendations	Class	Level
The use of statins or statin/ezetimibe combination is recommended in patients with non-dialysis-dependent, stage 3–5 CKD.	I	A
In patients already on statins, ezetimibe, or a statin/ezetimibe combination at the time of dialysis initiation, continuation of these drugs should be considered, particularly in patients with ASCVD.	IIa	C
In patients with dialysis-dependent CKD who are free of ASCVD, commencing statin therapy is not recommended.	III	A

Summary of recommendations for the clinical management of hypertension (1)

Recommendations	Class	Level
Classification of BP		
It is recommended that BP should be classified as optimal, normal, high-normal, or grades 1–3 hypertension, according to office BP.	I	C
Diagnosis of hypertension		
It is recommended to base the diagnosis of hypertension on out-of-office BP measurement with ABPM and/or HBPM when feasible.	I	C
It is recommended to base the diagnosis of hypertension on repeated office BP measurements, on more than one visit, except when hypertension is severe (e.g. grade 3 and especially in high-risk patients).	I	C

Summary of recommendations for the clinical management of hypertension (2)

Recommendations	Class	Level
Assessment of HMOD		
<p>To evaluate for the presence of HMOD, measurement of serum creatinine, eGFR, electrolytes, and ACR is recommended for all patients. A 12-lead ECG is recommended for all patients, and echocardiography is recommended for those with ECG abnormalities or signs/symptoms of LV dysfunction. Fundoscopy or retinal imaging is recommended for patients with grades 2 or 3 hypertension and all hypertensive patients with DM.</p>	I	B

Summary of recommendations for the clinical management of hypertension (3)

Recommendations	Class	Level
Thresholds for initiation of drug treatment of hypertension		
For grade 1 hypertension, treatment initiation based on absolute CVD risk, estimated lifetime benefit, and the presence of HMOD is recommended.	I	C
For patients with grade 2 hypertension or higher, drug treatment is recommended.	I	A

Summary of recommendations for the clinical management of hypertension (4)

Recommendations	Class	Level
Office BP treatment targets		
It is recommended that the first objective of treatment is to lower BP to <140/90 mmHg in all patients, and that subsequent BP targets are tailored to age and specific comorbidities.	I	A
In treated patients aged 18–69 years, it is recommended that SBP should ultimately be lowered to a target range of 120–130 mmHg in most patients.	I	A
In treated patients aged ≥70 years, it is recommended that SBP should generally be targeted to <140 and down to 130 mmHg if tolerated.	I	A
In all treated patients, DBP is recommended to be lowered to <80 mmHg.	I	A

Summary of recommendations for the clinical management of hypertension (5)

Recommendations	Class	Level
Treatment of hypertension: lifestyle interventions		
Lifestyle interventions are recommended for people with high-normal BP or higher.	I	A
Treatment of hypertension: drug treatment		
It is recommended to initiate antihypertensive treatment with a two-drug combination in most patients, preferably as a single-pill combination. Exceptions are frail older patients and those with low-risk, grade 1 hypertension (particularly if SBP <150 mmHg).	I	B

Summary of recommendations for the clinical management of hypertension (6)

Recommendations	Class	Level
Treatment of hypertension: drug treatment (continued)		
It is recommended that the preferred combinations include a RAS blocker (i.e. an ACE inhibitor or ARB) with a CCB or diuretic, but other combinations of the five major classes can be used (ACE inhibitor, ARB, beta-blocker, CCB, thiazide/thiazide-like diuretic).	I	A
It is recommended, if BP remains uncontrolled with a two-drug combination, that treatment be increased to a three-drug combination, usually a RAS blocker with a CCB and a diuretic, preferably as a single-pill combination.	I	A

Summary of recommendations for the clinical management of hypertension (7)

Recommendations	Class	Level
Treatment of hypertension: drug treatment (continued)		
It is recommended, if BP is not controlled by a three-drug combination, that treatment should be increased by the addition of spironolactone, or if not tolerated, other diuretics such as amiloride or higher doses of other diuretics, an alpha-blocker or beta-blocker, or clonidine.	I	B
The combination of two RAS blockers is not recommended.	III	A

Summary of recommendations for the clinical management of hypertension (8)

Recommendations	Class	Level
Management of CVD risk in hypertensive patients		
Statin therapy is recommended for many patients with hypertension.		See main text section 4.6
Antiplatelet therapy is indicated for secondary prevention in patients with hypertension.		See main text section 4.9

Definition and classification of hypertension

Category	SBP (mmHg)		DBP (mmHg)
Categories for conventionally measured seated office blood pressure^a			
Optimal	<120	and	<80
Normal	120–129	and/or	80–84
High-normal	130–139	and/or	85–89
Grade 1 hypertension	140–159	and/or	90–99
Grade 2 hypertension	160–179	and/or	100–109
Grade 3 hypertension	≥180	and/or	≥110
Isolated systolic hypertension ^b	≥140	and	<90
Office BP ^a	≥140	and/or	≥90
Definitions of hypertension according to office, ambulatory, and home blood pressure			
Office BP ^c	≥140	and/or	≥90
Ambulatory BP			
Daytime (or awake) mean	≥135	and/or	≥85
Night-time (or asleep) mean	≥120	and/or	≥70
24-h mean	≥130	and/or	≥80
Home BP mean	≥135	and/or	≥85

Considerations in blood pressure measurement (1)

Patients should be seated comfortably in a quiet environment for 5 min before BP measurements.

Three BP measurements should be recorded, 1–2 min apart, and additional measurements if the first two readings differ by >10 mmHg. BP is recorded as the average of the last two BP readings.

Additional measurements may have to be performed in patients with unstable BP values due to arrhythmias, such as in patients with AF, in whom manual auscultatory methods should be used as most automated devices have not been validated for BP measurement in AF.

Use a standard bladder cuff (12–13 cm wide and 35 cm long) for most patients, but use larger and smaller cuffs for larger (arm circumference >32 cm) and smaller (arm circumference <26 cm) arms, respectively.

The cuff should be positioned at the level of the heart with the back and arm supported, to avoid muscle contraction and isometric-exercise-dependant increases in BP.

Considerations in blood pressure measurement (2)

When using auscultatory methods, use phase I and V (sudden reduction/disappearance) Korotkoff sounds to identify SBP and DBP, respectively.

Measure BP in both arms at the first visit to detect possible between-arm differences. Use the arm with the higher value as the reference.

Measure BP 1 min and 3 min after standing from the seated position in all patients at the first measurement to exclude orthostatic hypotension. Lying and standing BP measurements should also be considered in subsequent visits in older people, in people with DM, and in other conditions in which orthostatic hypotension may frequently occur. Initial orthostatic hypotension may occur <1 min after standing and may be difficult to detect with conventional measurement techniques.

Record heart rate and use pulse palpation to exclude arrhythmia.

Indications for home blood pressure monitoring or ambulatory blood pressure monitoring

Conditions in which white-coat hypertension is more common, for example:

- Grade 1 hypertension on office BP measurement
- Marked office BP elevation without HMOD

Conditions in which masked hypertension is more common, for example:

- High-normal office BP
- Normal office BP in individuals with HMOD or at high total CV risk

Postural and post-prandial hypotension in untreated and treated patients

Evaluation of resistant hypertension

Evaluation of BP control, especially in treated higher-risk patients

Exaggerated BP response to exercise

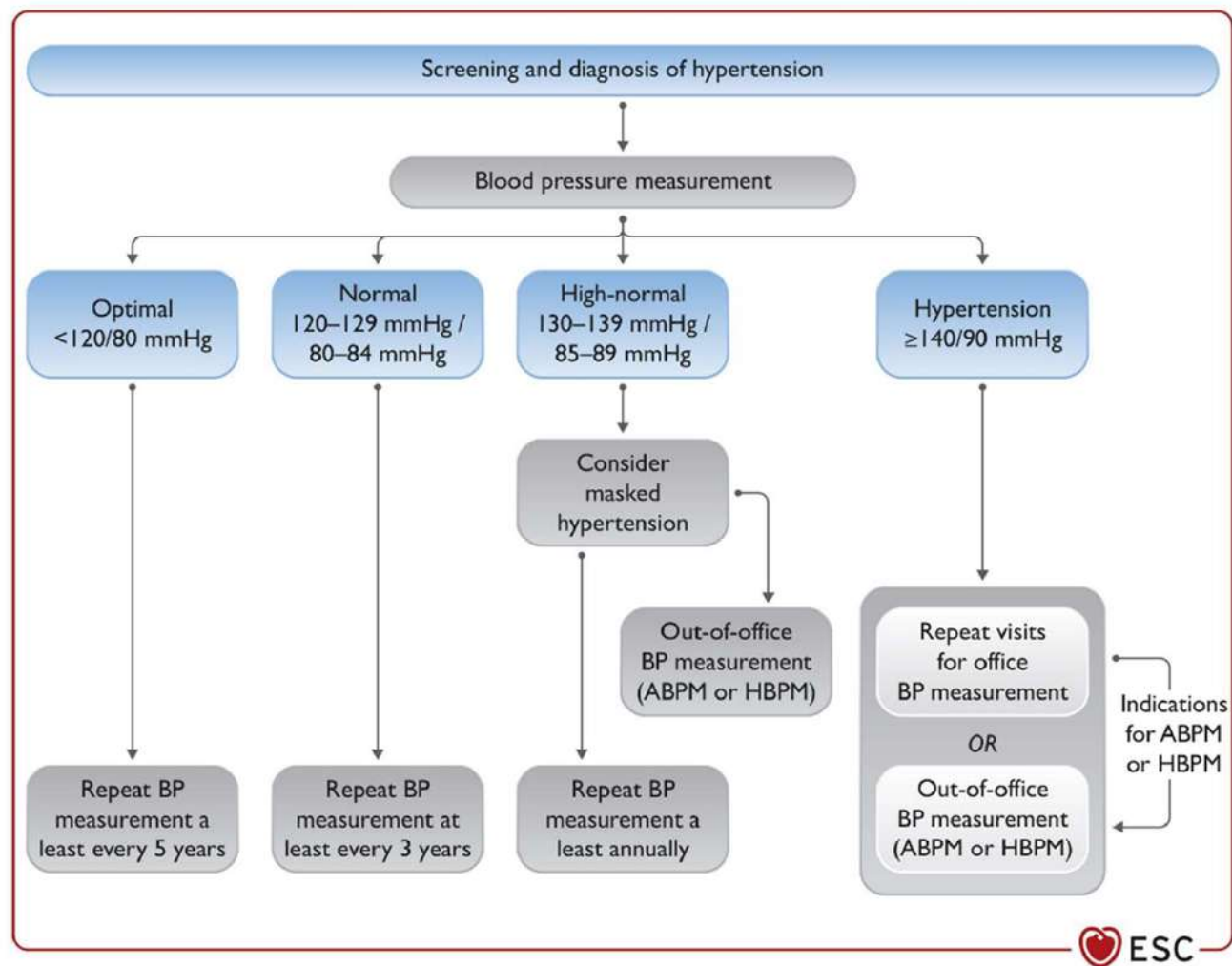
Evaluating symptoms consistent with hypotension during treatment

When there is considerable variability in the office BP

Specific indications for ABPM rather than HBPM:

- Assessment of nocturnal BP values and dipping status (e.g. suspicion of nocturnal hypertension, such as in sleep apnoea, CKD, DM, endocrine hypertension, or autonomic dysfunction)

Screening and diagnosis of hypertension



Routine tests for patients with hypertension

Routine test

Haemoglobin and/or haematocrit

Fasting blood glucose and/or HbA1c

Blood lipids: total cholesterol, LDL-C, HDL-C, triglycerides

Blood potassium and sodium

Blood uric acid

Blood creatinine and eGFR

Blood liver function tests

Urine analysis: microscopic; urinary protein by dipstick, or, ideally, ACR

12-lead ECG

Patient characteristics that should raise the suspicion of secondary hypertension

Characteristics

Younger patients (<40 years) with grade 2 hypertension or onset of any grade of hypertension in childhood

Acute worsening of hypertension in patients with previously documented chronically stable normotension

Resistant hypertension (BP uncontrolled despite treatment with optimal or best tolerated doses of three or more drugs including a diuretic, and confirmed by ABPM or HBPM)

Severe (grade 3) hypertension or a hypertension emergency

Presence of extensive HMOD

Clinical or biochemical features suggestive of endocrine causes of hypertension or CKD

Clinical features suggestive of OSA

Symptoms suggestive of pheochromocytoma or family history of pheochromocytoma

LIFE-CVD model
CVD-free lifetime gain from 10 mmHg
Systolic Blood Pressure reduction (in years)

- < 0.5 years
- 0.5 - 0.9 years
- 1.0 - 1.4 years
- 1.5 - 2.0 years
- ≥ 2.0 years

Women

Men

Non-smoking

Smoking

Non-smoking

Smoking

Non-HDL cholesterol

Systolic blood pressure (mmHg)

Systolic blood pressure (mmHg)	Non-HDL cholesterol								Age (y)	Non-HDL cholesterol								
	Women Non-smoking				Women Smoking					mmol/L	Men Non-smoking				Men Smoking			
	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9			3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9
150	200	250		150	200	250		mg/dL	150	200	250		150	200	250			
160-179	0.3	0.3	0.4	0.4	0.1	0.1	0.2	0.2	90+	0.2	0.2	0.3	0.3	0.1	0.0	0.0	0.1	
140-159	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1	90+	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	
120-139	0.2	0.3	0.3	0.3	0.0	0.1	0.1	0.1	90+	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.1	
100-119	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	90+	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
160-179	0.7	0.8	0.8	0.8	0.2	0.2	0.3	0.3	85-89	0.3	0.4	0.5	0.5	0.1	0.1	0.1	0.2	
140-159	0.6	0.6	0.7	0.8	0.1	0.2	0.2	0.3	85-89	0.3	0.3	0.4	0.5	0.1	0.1	0.1	0.1	
120-139	0.4	0.5	0.6	0.6	0.1	0.2	0.2	0.2	85-89	0.3	0.3	0.3	0.4	0.0	0.0	0.1	0.1	
100-119	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	85-89	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
160-179	0.9	1.0	1.1	1.2	0.2	0.3	0.4	0.4	80-84	0.5	0.5	0.6	0.7	0.1	0.2	0.2	0.2	
140-159	0.8	0.9	1.0	1.0	0.2	0.3	0.3	0.4	80-84	0.4	0.5	0.6	0.6	0.1	0.1	0.2	0.1	
120-139	0.6	0.7	0.8	0.9	0.2	0.1	0.3	0.2	80-84	0.3	0.4	0.4	0.5	0.0	0.1	0.1	0.1	
100-119	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	80-84	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
160-179	1.1	1.2	1.3	1.3	0.3	0.5	0.5	0.5	75-79	0.6	0.7	0.8	0.9	0.2	0.2	0.3	0.3	
140-159	0.9	1.1	1.2	1.2	0.2	0.3	0.4	0.5	75-79	0.5	0.6	0.7	0.8	0.2	0.2	0.3	0.3	
120-139	0.7	0.9	1.0	1.1	0.2	0.2	0.3	0.4	75-79	0.4	0.5	0.6	0.6	0.1	0.2	0.2	0.2	
100-119	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	75-79	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
160-179	1.2	1.3	1.4	1.5	0.4	0.5	0.7	0.7	70-74	0.7	0.8	1.0	1.0	0.3	0.4	0.5	0.5	
140-159	1.0	1.3	1.4	1.5	0.4	0.4	0.5	0.6	70-74	0.6	0.7	0.9	0.9	0.2	0.3	0.4	0.4	
120-139	0.8	1.0	1.1	1.2	0.2	0.3	0.4	0.5	70-74	0.4	0.6	0.7	0.8	0.1	0.2	0.3	0.3	
100-119	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	70-74	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	

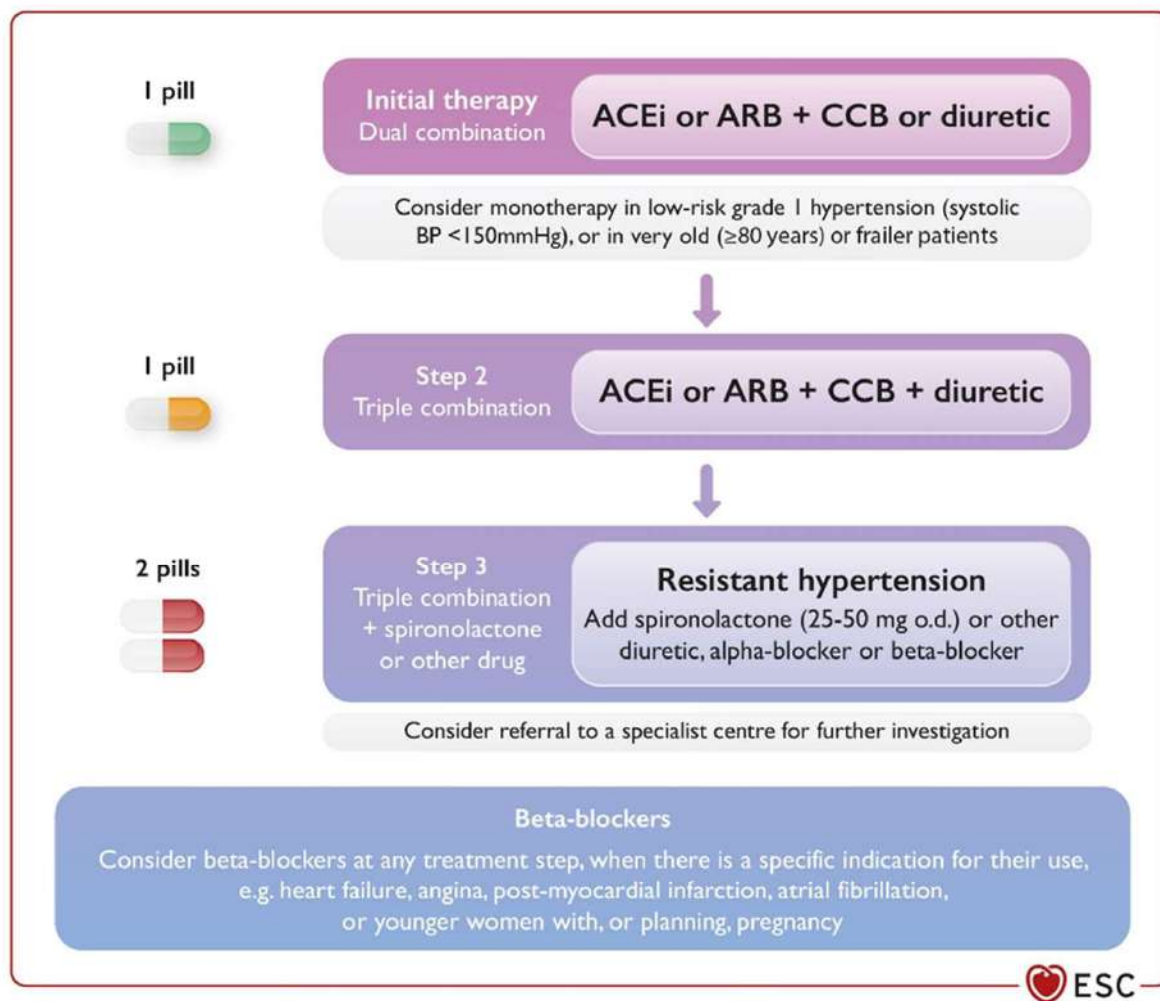
Lifetime benefit from lowering systolic blood pressure by 10 mmHg for apparently healthy Persons (1)

160-179	1.2	1.3	1.5	1.5	0.5	0.7	0.8	0.9	65-69	0.8	1.0	1.1	1.1	0.5	0.5	0.7	0.6
140-159	1.0	1.3	1.4	1.5	0.4	0.5	0.6	0.7	65-69	0.7	0.9	0.9	1.0	0.3	0.5	0.5	0.5
120-139	0.9	1.1	1.2	1.3	0.3	0.4	0.5	0.5	65-69	0.5	0.7	0.8	0.9	0.2	0.4	0.4	0.4
100-119	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	65-69	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
160-179	1.3	1.4	1.5	1.6	0.6	0.7	0.9	1.0	60-64	1.0	1.1	1.2	1.3	0.6	0.7	0.8	0.8
140-159	1.2	1.3	1.4	1.5	0.5	0.6	0.7	0.8	60-64	0.8	0.9	1.1	1.1	0.5	0.5	0.7	0.7
120-139	1.0	1.1	1.3	1.4	0.4	0.4	0.6	0.6	60-64	0.7	0.7	0.9	1.0	0.4	0.4	0.5	0.5
100-119	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	60-64	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
160-179	1.3	1.5	1.6	1.7	0.7	0.9	1.0	1.1	55-59	1.0	1.2	1.3	1.4	0.7	0.9	0.9	1.0
140-159	1.1	1.4	1.6	1.6	0.6	0.7	0.8	1.0	55-59	0.8	1.0	1.2	1.2	0.5	0.6	0.8	0.9
120-139	1.0	1.2	1.4	1.5	0.4	0.5	0.7	0.7	55-59	0.7	0.8	1.0	1.0	0.4	0.5	0.6	0.7
100-119	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	55-59	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
160-179	1.3	1.5	1.7	1.7	0.8	1.0	1.1	1.2	50-54	1.0	1.3	1.4	1.5	0.8	0.9	1.0	1.2
140-159	1.3	1.4	1.6	1.7	0.6	0.8	1.0	1.0	50-54	0.9	1.1	1.2	1.3	0.7	0.7	0.8	1.0
120-139	1.1	1.2	1.4	1.5	0.5	0.6	0.7	0.8	50-54	0.7	0.9	1.0	1.1	0.5	0.6	0.7	0.7
140-159	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	50-54	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
100-119	1.3	1.6	1.7	1.8	0.8	1.0	1.2	1.3	45-49	1.1	1.3	1.5	1.5	0.8	1.0	1.2	1.3
120-139	1.3	1.4	1.6	1.6	0.7	0.8	1.0	1.1	45-49	0.9	1.1	1.3	1.3	0.7	0.8	1.0	1.1
160-179	1.1	1.2	1.4	1.5	0.5	0.7	0.8	0.8	45-49	0.8	0.9	1.0	1.2	0.6	0.7	0.8	0.8
100-119	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	45-49	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
160-179	1.4	1.6	1.7	1.8	0.8	1.0	1.2	1.3	40-44	1.1	1.3	1.4	1.6	0.9	1.1	1.3	1.4
140-159	1.3	1.4	1.6	1.7	0.7	0.8	1.0	1.1	40-44	0.9	1.1	1.3	1.4	0.7	0.9	1.0	1.2
120-139	1.1	1.3	1.4	1.5	0.6	0.7	0.8	0.9	40-44	0.7	0.9	1.0	1.2	0.6	0.7	0.8	0.9
100-119	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	40-44	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Lifetime benefit from lowering systolic blood pressure by 10 mmHg for apparently healthy Persons (2)

Recommended office blood pressure target ranges

Age group	Office SBP treatment target ranges (mmHg)				
	Hypertension	+ DM	+ CKD	+ CAD	+ Stroke/TIA
18–69 years	120–130	120–130	<140–130	120–130	120–130
	<i>Lower SBP acceptable if tolerated</i>				
≥70 years	<140 mmHg, down to 130 mmHg if tolerated				
	<i>Lower SBP acceptable if tolerated</i>				
DBP treatment target (mmHg)	<80 for all treated patients				



Core drug treatment strategy for hypertension. This algorithm is appropriate for most patient with hypertension-mediated organ damage, diabetes mellitus, cerebrovascular disease, and peripheral artery disease

Recommendations for treatment of diabetes mellitus (1)

Recommendations	Class	Level
Screening		
When screening for DM in individuals with or without ASCVD, assessment of HbA1c (which can be done non-fasting) or fasting blood glucose should be considered.	IIa	A
Lifestyle		
Lifestyle changes including smoking cessation, a low saturated fat, high-fibre diet, aerobic PA, and strength training are recommended.	I	A
Reduction in energy intake is recommended to patients, to help achieve lower body weight or prevent or slow weight gain.	I	B

Recommendations for treatment of diabetes mellitus (2)

Recommendations	Class	Level
Lifestyle (continued)		
For those motivated to try, considerable weight loss with use of low-calorie diets followed by food reintroduction and weight-maintenance phases early after diagnosis can lead to DM remission and should be considered.	IIa	A
Glycaemia targets		
A target HbA1c for the reduction of CVD risk and microvascular complications of DM of <7.0% (53 mmol/mol) is recommended for the majority of adults with either type 1 or type 2 DM.	I	A

Recommendations for treatment of diabetes mellitus (3)

Recommendations	Class	Level
Glycaemia targets (continued)		
For patients with a long duration of DM and in old or frail adults, a relaxing of the HbA1c targets (i.e. less stringent) should be considered.	Ila	B
A target HbA1c of $\leq 6.5\%$ (48 mmol/mol) should be considered at diagnosis or early in the course of type 2 DM in persons who are not frail and do not have ASCVD.	Ila	B

Recommendations for treatment of diabetes mellitus (4)

Recommendations	Class	Level
Treatment of hyperglycaemia and ASCVD/cardiorenal risks		
Metformin is recommended as first-line therapy, following evaluation of renal function, in the majority of patients without previous ASCVD, CKD, or HF.	I	B
In persons with type 2 DM with ASCVD, metformin should be considered, unless contraindications are present.	IIa	B
Avoidance of hypoglycaemia and excessive weight gain should be considered.	IIa	B

Recommendations for treatment of diabetes mellitus (5)

Recommendations	Class	Level
Treatment of hyperglycaemia and ASCVD/cardiorenal risks (continued)		
In persons with type 2 DM and ASCVD, the use of a GLP-1RA or SGLT2 inhibitor with proven outcome benefits is recommended to reduce CV and/or cardiorenal outcomes.	I	A
In patients with type 2 DM and TOD, ^a the use of an SGLT2 inhibitor or GLP-1RA with proven outcome benefits may be considered to reduce future CV and total mortality.	IIb	B
In patients with type 2 DM and CKD, the use of an SGLT2 inhibitor is recommended to improve ASCVD and/or cardiorenal outcomes.	I	A

Recommendations for treatment of diabetes mellitus (6)

Recommendations	Class	Level
Treatment of hyperglycaemia and ASCVD/cardiorenal risks (continued)		
In patients with type 2 DM and HFrEF, use of an SGLT2 inhibitor with proven outcome benefits is recommended to lessen HF hospitalizations and CV death.	I	A
In patients with type 2 DM but without ASCVD, HF, or CKD, use of an SGLT2 inhibitor or GLP-1RA should be considered based on estimated future risks (e.g. with the ADVANCE risk score or DIAL model) for adverse CVD or cardiorenal outcomes from risk factor profiles.	IIa	B

Recommendations for antithrombotic therapy

Recommendations	Class	Level
Aspirin 75–100 mg daily is recommended for secondary prevention of CVD.	I	A
Clopidogrel 75 mg daily is recommended as an alternative to aspirin in secondary prevention in case of aspirin intolerance.	I	B
Clopidogrel 75 mg daily may be considered in preference to aspirin in patients with established ASCVD.	IIb	A
Concomitant use of a proton pump inhibitor is recommended in patients receiving antiplatelet therapy who are at high risk of gastrointestinal bleeding.	I	A
In patients with DM at high or very high CVD risk, low-dose aspirin may be considered for primary prevention in the absence of clear contraindications.	IIb	A
Antiplatelet therapy is not recommended in individuals with low/moderate CV risk due to the increased risk of major bleeding.	III	A

Recommendation for anti-inflammatory therapy

Recommendations	Class	Level
Low-dose colchicine (0.5 mg o.d.) may be considered in secondary prevention of CVD, particularly if other risk factors are insufficiently controlled or if recurrent CVD events occur under optimal therapy.	IIb	A

Recommendations for cardiac rehabilitation

Recommendations	Class	Level
Participation in a medically supervised, structured, comprehensive, multidisciplinary EBCR and prevention programme for patients after ASCVD events and/or revascularization, and for patients with HF (mainly HFrEF), is recommended to improve patient outcomes.	I	A
Methods to increase CR and prevention referral and uptake should be considered (i.e. electronic prompts or automatic referrals, referral and liaison visits, structured follow-up by nurses or health professionals, and early programme initiation after discharge).	IIa	B
Home-based CR, telehealth, and mHealth interventions may be considered to increase patient participation and long-term adherence to healthy behaviours.	IIb	B

Recommendations for policy interventions at the population level

Recommendations	Class	Level
Policies and population approaches to PA, diet, smoking and tobacco use, and alcohol in governmental restrictions and mandates, media and education, labelling and information, economic incentives, schools, worksites, and community settings follow different levels of recommendations (see specific tables in the supplementary material for section 5).		

Policy suggestions for physical activity – Methods (1)

Recommendations	Class	Level
Governmental restrictions and mandates		
Consideration of PA when planning new landscaping/building is recommended, including increasing cycling and pedestrian lanes and reduced speed trafficking.	I	C
Media and education		
Sustained, focused media and educational campaigns, using multiple media modes (e.g. apps, poster, flyers, and signage) may be considered to promote PA.	IIb	C
Short-term community-based educational programmes and wearable devices promoting healthy behaviours, such as walking, should be considered.	IIa	C
Labelling and information		
Point-of-decision prompts should be considered to encourage the use of stairs.	IIa	B
Exercise prescription for health promotion by physicians, especially general practitioners, similar to drug prescription, should be considered.	IIa	C

Policy suggestions for physical activity – Methods (2)

Recommendations	Class	Level
Economic incentives		
Increased fuel taxes should be considered to increase active transport.	IIa	C
Tax-reduction incentives for individuals to purchase exercise equipment or health club/fitness membership may be considered.	IIb	C
Sustained individual financial incentives may be considered for increased activity/fitness or weight loss.	IIb	C
Tax-reduction incentives to employers to offer comprehensive corporate wellness programmes with nutrition, PA, and tobacco cessation/prevention components may be considered.	IIb	C

Policy suggestions for physical activity – Settings (1)

Recommendations	Class	Level
Schools		
Increased availability and types of school playground spaces and equipment for exercise activity and sports are recommended.	I	C
Regular classroom PA breaks during academic lessons should be considered.	IIa	B
Increasing active commuting to school should be considered, e.g. walking school bus programme with supervised (for safety) walking routes to and from school.	IIa	C
Increasing number and duration of PA classes, with revised PA curricula to implement moderate activity and trained teachers in exercise and sports may be considered.	IIb	B

Policy suggestions for physical activity – Settings (2)

Recommendations	Class	Level
Worksites		
Comprehensive corporate wellness programmes should be considered with nutrition and PA components, possibly with medical supervision and governance.	Ila	B
Structured corporate wellness programmes that encourage PA also during work hours. Improving stairway access and appeal, potentially in combination with elevators that skip some floors, should be considered.	Ila	C
Promoting worksite fitness centres/gyms should be considered.	Ila	C
Community setting		
Healthcare providers should consider inquiring about PA in every medical evaluation and promoting it.	Ila	C
Improving accessibility of recreation and PA spaces and facilities, and improved walkability, should be considered.	Ila	C
Improved neighbourhood aesthetics to increase activity in adults should be considered.	Ila	C

Policy suggestions for population-based approaches to diet – Methods (1)



Recommendations	Class	Level
Governmental restrictions and mandates		
Legislation on the composition of foods and beverages to reduce energy density, salt and saturated fat, and (added) sugar content, and to limit portion sizes, is recommended.	I	B
Implementation of the regulation on the upper limit of industrially produced trans fats, or their ban, is recommended.	I	A
Facilitating an integrated and coherent policy and activities of (local) governments, non-governmental organizations, the food industry, retail, catering, schools, workplaces, and other stakeholders to promote a healthy diet and prevent overweight is recommended.	I	C
Legislation restricting marketing aimed at children of foods that are high in fats, sugar and/or salt, less healthy options, junk foods, drinks with alcohol and non-alcoholic beverages rich in sugar (e.g. on television, the internet, social media, and on food packages) is recommended.	I	C

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Policy suggestions for population-based approaches to diet – Methods (2)



Recommendations	Class	Level
Media and education		
Reformulation of foods, accompanied by educational information campaigns, should be considered to create awareness among consumers on the nutrition quality of foods.	Ila	C
Labelling and information		
Mandatory and harmonized front-of-pack nutrition labelling is recommended.	I	C
Independently and coherently formulated criteria for nutrients should be considered in support of health and nutrition claims and front-of-pack logos (e.g. lights, healthy choices, keyholes, Nutri-score).	Ila	C
Mandatory nutrition labelling for non-prepackaged foods, including in restaurants, hospitals, and workplaces, should be considered.	Ila	C

Policy suggestions for population-based approaches to diet – Methods (3)



Recommendations	Class	Level
Economic incentives		
Pricing and subsidy strategies are recommended to promote healthier food and beverage choices.	I	B
Taxes on foods and beverages rich in sugar and saturated fat, and on alcoholic drinks, are recommended.	I	B

Policy suggestions for population-based approaches to diet – Settings

Recommendations	Class	Level
Schools		
At all schools, preschools, and day-care centres, a multicomponent, comprehensive, and coherent policy is recommended to promote a healthy diet.	I	B
Availability of fresh drinking water and healthy foods in schools, and in vending machines, is recommended.	I	B
Worksites		
At all companies, a coherent and comprehensive health policy and nutritional education are recommended to stimulate the health awareness of employees.	I	B
Increased availability of fresh drinking water and improved nutritional quality of food served and/or sold in the workplace, and in vending machines, should be considered.	IIa	C
Community setting		
Regulation of the location and density of fast food and alcohol purchasing outlets and other catering establishments should be considered.	IIa	C

Policy suggestions for population-based approaches to smoking and other tobacco use – Methods (1)

Recommendations	Class	Level
Governmental restrictions and mandates		
Banning smoking in public places is recommended to prevent smoking and promote smoking cessation.	I	A
Banning smoking in public places, outside public entrances, and in workplaces, restaurants, and bars is recommended to protect people from passive smoking.	I	A
Prohibiting sales of tobacco products to adolescents is recommended.	I	A
Banning of tobacco vending machines is recommended.	I	A
Restrictions on advertising, marketing, and sale of smokeless tobacco are recommended.	I	A

Policy suggestions for population-based approaches to smoking and other tobacco use – Methods (2)

Recommendations	Class	Level
Governmental restrictions and mandates (continued)		
Complete ban on advertising and promotion of tobacco products is recommended.	I	B
Reduced density of retail tobacco outlets in residential areas and near schools and hospitals is recommended.	I	B
Harmonization of border sales and tax-free sales of all tobacco products is recommended.	I	B
Restrictions on advertising, marketing, and sale of electronic cigarettes should be considered.	IIa	A

Policy suggestions for population-based approaches to smoking and other tobacco use – Methods (3)

Recommendations	Class	Level
Media and education		
Telephone and internet-based lines for cessation counselling and support services are recommended.	I	A
Media and educational campaigns as part of multicomponent strategies to reduce smoking and increase quit rates, reduce passive smoking and use of smokeless tobacco are recommended.	I	A
Media and educational campaigns concentrating solely on reducing smoking, increasing quit rates, reducing passive smoking and the use of smokeless tobacco should be considered.	IIa	B

Policy suggestions for population-based approaches to smoking and other tobacco use – Methods (4)

Recommendations	Class	Level
Labelling and information		
Cigarette package pictorial and text warnings are recommended.	I	A
Plain packaging is recommended.	I	A
Economic incentives		
Differential taxes on nicotine-yielding products on the basis of degree of risk is recommended.	I	B

Policy suggestions for population-based approaches to smoking and other tobacco use – Settings (1)

Recommendations	Class	Level
Schools		
Banning smoking in schools, preschools, and in childcare facilities to protect from passive smoking is recommended.	I	A
Promotion and teaching of a healthy lifestyle, including tobacco-free life, should be considered in all schools.	IIa	B
Worksites		
Workplace specific bans on smoking to reduce passive smoking and increase quit rates are recommended.	I	A
Workplace policy on tobacco cessation/prevention is recommended.	I	A

Policy suggestions for population-based approaches to smoking and other tobacco use – Settings (2)

Recommendations	Class	Level
Community setting		
It is recommended that health personnel, caregivers, and school personnel set an example by not smoking or using tobacco products at work.	I	A
It is recommended to advise parents to be tobacco-free when children are present.	I	A
It is recommended to advise pregnant women to be tobacco-free during pregnancy.	I	A
It is recommended to advise parents to never smoke in cars and private homes.	I	A
Residence-specific restrictions on smoking should be considered.	IIa	B

Policy suggestions for population-based approaches to alcohol abuse – Methods (1)

Recommendations	Class	Level
Governmental restrictions and mandates		
Regulating physical availability of alcoholic beverages is recommended, including minimum legal purchase age, restrictions on outlet density and time and place of sales, public health-orientated licensing systems, and governmental monopolies of retail sales.	I	B
Drink-driving countermeasures are recommended such as lowered blood-alcohol concentration limits and “zero tolerance”, random breath testing, and sobriety check points.	I	B
Implementing comprehensive restrictions and bans on advertising and promotion of alcoholic beverages is recommended.	I	C
Media and education		
Educational information campaigns may be considered to create awareness on the hazardous effects of alcohol.	IIb	B

Policy suggestions for population-based approaches to alcohol abuse – Methods (2)



Recommendations	Class	Level
Labelling and education		
Labelling alcohol with information on caloric content and health warning messages of the harmful effects of alcohol may be considered.	IIb	B
Economic incentives		
Taxes and minimum prices on alcoholic beverages are recommended.	I	B

Policy suggestions for population-based approaches to alcohol abuse – Settings (1)

Recommendations	Class	Level
Schools		
At every school, preschool, and day-care centre, a multicomponent, comprehensive, and coherent education may be considered to prevent alcohol abuse.	IIb	B
Worksites		
At every company, a coherent and comprehensive health policy and nutritional education on stimulating the health of employees, including limiting excessive alcohol intake, are recommended.	I	B

Policy suggestions for population-based approaches to alcohol abuse – Settings (2)

Recommendations	Class	Level
Community setting		
Measures to support and empower primary care to adopt effective approaches to prevent and reduce harmful use of alcohol are recommended.	I	B
Enacting management policies relating to responsible serving of alcoholic beverages should be considered to reduce the negative consequences of drinking.	IIa	B
Planning of location and density of alcohol-purchasing outlets and other catering establishments should be considered.	IIa	C

Recommendations for policy interventions at the population level



Recommendations	Class	Level ^a
Putting in place measures to reduce air pollution, including reducing PM emission and gaseous pollutants, reducing the use of fossil fuels, and limiting carbon dioxide emissions, are recommended, to reduce CVD mortality and morbidity.	I	C

Recommendations for coronary artery disease (1)

Recommendations	Class	Level
Aspirin 75 - 100 mg daily is recommended for patients with a previous myocardial infarction or revascularization.	I	A
Aspirin 75 - 100 mg daily may be considered in patients without a history of myocardial infarction or revascularization, but with definitive evidence of CAD on imaging.	IIb	C
In ACS, DAPT with a P2Y ₁₂ inhibitor in addition to aspirin is recommended for 12 months, unless there are contraindications such as excessive risk of bleeding.	I	A

Recommendations for coronary artery disease (2)

Recommendations	Class	Level
In patients with CCS, clopidogrel 75 mg daily is recommended, in addition to aspirin, for 6 months following coronary stenting, irrespective of stent type, unless a shorter duration (1 – 3 months) is indicated due to risk or occurrence of life-threatening bleeding.	I	A
Adding a second antithrombotic drug (a P2Y ₁₂ inhibitor or low-dose rivaroxaban) to aspirin for long-term secondary prevention should be considered in patients with a high risk of ischaemic events and without high bleeding risk.	IIa	A

Recommendations for coronary artery disease (3)

Recommendations	Class	Level
Adding a second antithrombotic drug to aspirin for long-term secondary prevention may be considered in patients with a moderate risk of ischaemic events and without a high bleeding risk.	IIb	A
ACE inhibitors (or ARB) are recommended if a patient has other conditions (e.g. HF, hypertension, or DM).	I	A
Beta-blockers are recommended in patients with LV dysfunction or systolic HF.	I	A
In patients with established ASCVD, oral lipidlowering treatment with an ultimate LDL-C goal of <1.4 mmol/L (55 mg/dL) and a \geq 50% reduction in LDL-C vs. baseline is recommended.	I	A

Recommendations regarding pharmacological and non-pharmacological interventions for patients with symptomatic (New York Heart Association class II–IV) heart failure with reduced ejection fraction (left ventricular ejection fraction <40%) with proven benefits on clinical outcomes, including cardiovascular morbidity and mortality (1)

Recommendations	Class	Level
It is recommended that patients with HF are enrolled in a comprehensive CR programme to reduce the risk of HF hospitalization and death. ^a	I	A
EBCR is recommended in stable symptomatic patients with HFrEF to reduce the risk of HF hospitalization.	I	A
It is recommended to screen patients with HF for both CV and non-CV comorbidities which, if present, should be treated, provided safe and effective interventions exist, not only to alleviate symptoms but also to improve prognosis. ^a	I	A

Recommendations regarding pharmacological and non-pharmacological interventions for patients with symptomatic (New York Heart Association class II–IV) heart failure with reduced ejection fraction (left ventricular ejection fraction <40%) with proven benefits on clinical outcomes, including cardiovascular morbidity and mortality (2)

Recommendations	Class	Level
An ACE inhibitor is recommended, in addition to a beta-blocker and an MRA, for patients with symptomatic HFrEF to reduce the risk of HF hospitalization and death.	I	A
A beta-blocker is recommended, in addition to an ACE inhibitor (or an ARNI) and an MRA, for patients with stable, symptomatic HFrEF to reduce the risk of HF hospitalization and death.	I	A
An MRA is recommended for patients with HFrEF already treated with an ACE inhibitor (or an ARNI) and a beta-blocker, to reduce the risk of HF hospitalization and death.	I	A

Recommendations regarding pharmacological and non-pharmacological interventions for patients with symptomatic (New York Heart Association class II–IV) heart failure with reduced ejection fraction (left ventricular ejection fraction <40%) with proven benefits on clinical outcomes, including cardiovascular morbidity and mortality (3)



Recommendations	Class	Level
Sacubitril/valsartan is recommended as a replacement for an ACE inhibitor to reduce the risk of HF hospitalization and death in patients with HFrEF.	I	B
An ARB is recommended to reduce the risk of HF hospitalization or CV death in symptomatic patients with HFrEF who are unable to tolerate an ACE inhibitor and/or ARNI (patients should also receive a beta-blocker and an MRA).	I	B
Dapagliflozin or empagliflozin are recommended, in addition to optimal treatment of an ACE inhibitor (or ARNI), a beta-blocker, and an MRA, for patients with HFrEF to reduce the risk of HF hospitalization and death.	I	A

Recommendations regarding pharmacological and non-pharmacological interventions for patients with symptomatic (New York Heart Association class II–IV) heart failure with reduced ejection fraction (left ventricular ejection fraction <40%) with proven benefits on clinical outcomes, including cardiovascular morbidity and mortality (4)

Recommendations	Class	Level
Vericiguat may be considered in patients with symptomatic HFrEF who have experienced HF worsening despite treatment with an ACE inhibitor (or an ARNI), a beta-blocker, and an MRA, to reduce the risk of HF hospitalization or CV death.	IIb	B
Diuretics are recommended in patients with HFrEF with signs and/or symptoms of congestion to reduce the risk of HF hospitalization.	I	C
Ivabradine should be considered in symptomatic patients with LVEF $\leq 35\%$, in sinus rhythm, and with a resting heart rate ≥ 70 bpm despite treatment with an evidence-based dose of a beta-blocker (or maximum tolerated dose below that), an ACE inhibitor (or an ARNI), and an MRA, to reduce the risk of HF hospitalization or CV death.	IIa	B

Recommendations regarding pharmacological and non-pharmacological interventions for patients with symptomatic (New York Heart Association class II–IV) heart failure with reduced ejection fraction (left ventricular ejection fraction <40%) with proven benefits on clinical outcomes, including cardiovascular morbidity and mortality (5)



Recommendations	Class	Level
<p>Ivabradine should be considered in symptomatic patients with LVEF \leq35%, in sinus rhythm, and with a resting heart rate \geq70 b.p.m. who are unable to tolerate or have contraindications for a beta-blocker to reduce the risk of HF hospitalization or CV death. Patients should also receive an ACE inhibitor (or ARNI) and an MRA.</p>	<p>Ia</p>	<p>C</p>
<p>Hydralazine and isosorbide dinitrate should be considered in self-identified black patients with LVEF \leq35% or with LVEF <45% combined with a dilated LV in NYHA class III/IV despite treatment with an ACE inhibitor (or ARNI), a betablocker, and an MRA, to reduce the risk of HF hospitalization and death.</p>	<p>Ia</p>	<p>B</p>

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Recommendations regarding pharmacological and non-pharmacological interventions for patients with symptomatic (New York Heart Association class II–IV) heart failure with reduced ejection fraction (left ventricular ejection fraction <40%) with proven benefits on clinical outcomes, including cardiovascular morbidity and mortality (6)

Recommendations	Class	Level
Hydralazine and isosorbide dinitrate may be considered in patients with symptomatic HFrEF who cannot tolerate ACE inhibitors, ARBs, or ARNIs (or if they are contraindicated), to reduce the risk of death.	IIb	B
Digoxin may be considered in patients with symptomatic HFrEF in sinus rhythm despite treatment with an ACE inhibitor (or ARNI), a beta-blocker, and an MRA, to reduce the risk of hospitalizations (all-cause and HF).	IIb	B

Recommendations for patients with cerebrovascular disease (1)

Recommendations	Class	Level
In patients with a cerebrovascular event, improvement of lifestyle factors in addition to appropriate pharmacological management is recommended.	I	A
In patients with ischaemic stroke or TIA, prevention with antithrombotics is recommended; choice of antithrombotic depends on the mechanism of event. Use of an antiplatelet is recommended for patients with non-cardioembolic ischaemic stroke or TIA, and use of an anticoagulant is recommended in patients with cardioembolic ischaemic stroke or TIA.	I	A

Recommendations for patients with cerebrovascular disease (2)

Recommendations	Class	Level
In patients with non-cardioembolic ischaemic stroke or TIA, prevention with aspirin only, or dipyridamole plus aspirin, or clopidogrel alone is recommended.	I	A
In patients with minor ischaemic stroke ^a or TIA, DAPT with aspirin and clopidogrel or with aspirin and ticagrelor, for 3 weeks after the acute event should be considered.	IIa	A
In patients with stroke or TIA who have BP of 140/90 mmHg or higher, BP lowering is recommended.	I	A

Recommendations for patients with lower extremity artery disease: best medical therapy (1)

Recommendations	Class	Level
Smoking cessation is recommended in all patients with LEAD.	I	B
Healthy diet and PA are recommended for all patients with LEAD.	I	C
In patients with intermittent claudication:	I	A
- Supervised exercise training is recommended	I	A
- Non-supervised exercise training is recommended when supervised exercise training is not feasible or available.	I	C
Antiplatelet therapy is recommended in patients with symptomatic LEAD. ^a	I	C

Recommendations for patients with lower extremity artery disease: best medical therapy (2)

Recommendations	Class	Level
In patients with LEAD and hypertension, it is recommended to control BP at <140/90 mmHg.	I	A
In patients with LEAD and DM, strict glycaemic control is recommended.	I	A
ACE inhibitors or ARBs should be considered as first-line therapy in patients with PAD and hypertension. ^a	IIa	B
In patients with DM and chronic symptomatic LEAD without high bleeding risk, a combination of low-dose rivaroxaban (2.5 mg b.i.d.) and aspirin (100 mg o.d.) may be considered.	IIb	B

Recommendations in patients with chronic kidney disease: best medical therapy

Recommendations	Class	Level
Treatment with an ACE inhibitor or an ARB is recommended in patients with DM, hypertension, and albuminuria. These medications should be titrated to the highest approved dose that is tolerated.	I	B
An SGLT2 inhibitor with proven outcome benefits should be considered for the prevention of renal deterioration and mortality in patients with CKD.	IIa	B
Combination treatment with ACE inhibitors and ARBs is not recommended.	III	C

Recommendations for lifestyle interventions and management of risk factors and concomitant diseases in patients with atrial fibrillation (1)



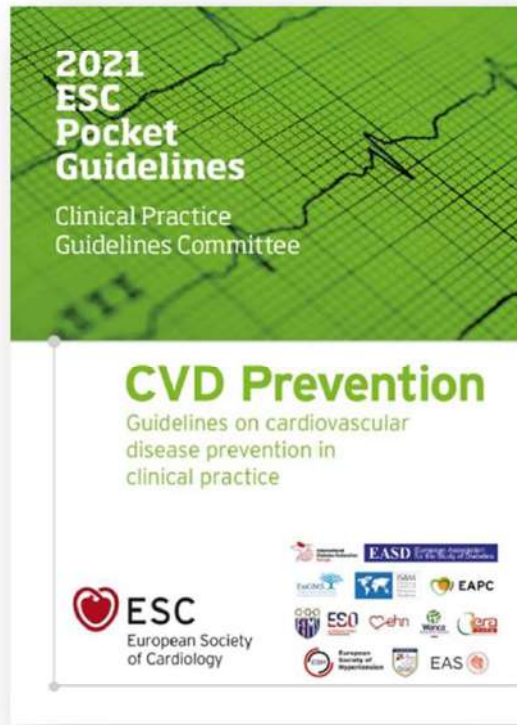
Recommendations	Class	Level
Identification and management of risk factors and concomitant diseases are recommended to be an integral part of treatment.	I	B
Modification of unhealthy lifestyle and targeted therapy of intercurrent conditions is recommended to reduce AF burden and symptom Severity.	I	B
Attention to good BP control is recommended in AF patients with hypertension to reduce AF recurrences and risk of stroke and bleeding.	I	B
In obese patients with AF, weight loss together with management of other risk factors should be considered to reduce AF incidence, AF progression, AF recurrences, and symptoms.	IIa	B

Recommendations for lifestyle interventions and management of risk factors and concomitant diseases in patients with atrial fibrillation (2)

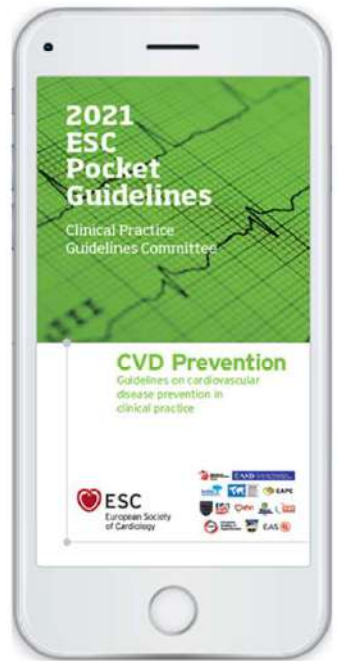


Recommendations	Class	Level
Advice and management to avoid alcohol excess should be considered for AF prevention and in AF patients considered for oral anticoagulant therapy.	IIa	B
PA should be considered to help prevent AF incidence or recurrence, with the exception of excessive endurance exercise, which may promote AF.	IIa	C
Optimal management of OSA may be considered to reduce AF incidence, AF progression, AF recurrences, and symptoms.	IIb	C

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