



*Donne e salute: corsi di educazione
professionale continua per i giornalisti*

PREVENZIONE CARDIOVASCOLARE: I FATTORI DI RISCHIO



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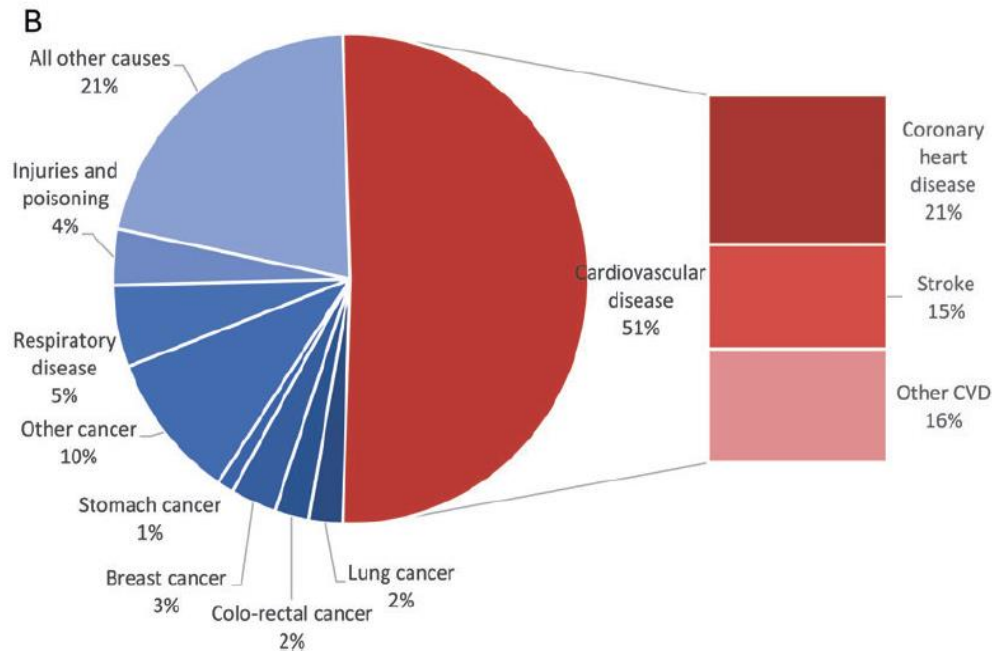
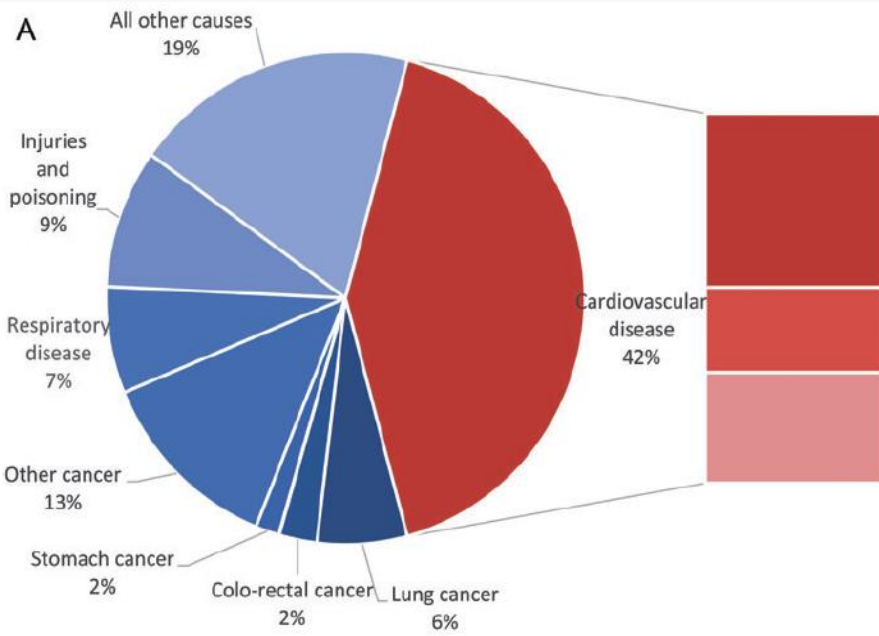


Deaths by cause in Europe

latest available year

MEN

WOMEN



What is CVD prevention?

“A coordinated set of actions, at public and individual level, aimed at eradicating, eliminating or minimizing the impact of cardiovascular diseases and their related disability.

The bases of prevention are rooted in cardiovascular epidemiology and evidence-based medicine”

A Dictionary of Epidemiology. 4th ed New York: Oxford University Press; 2001.

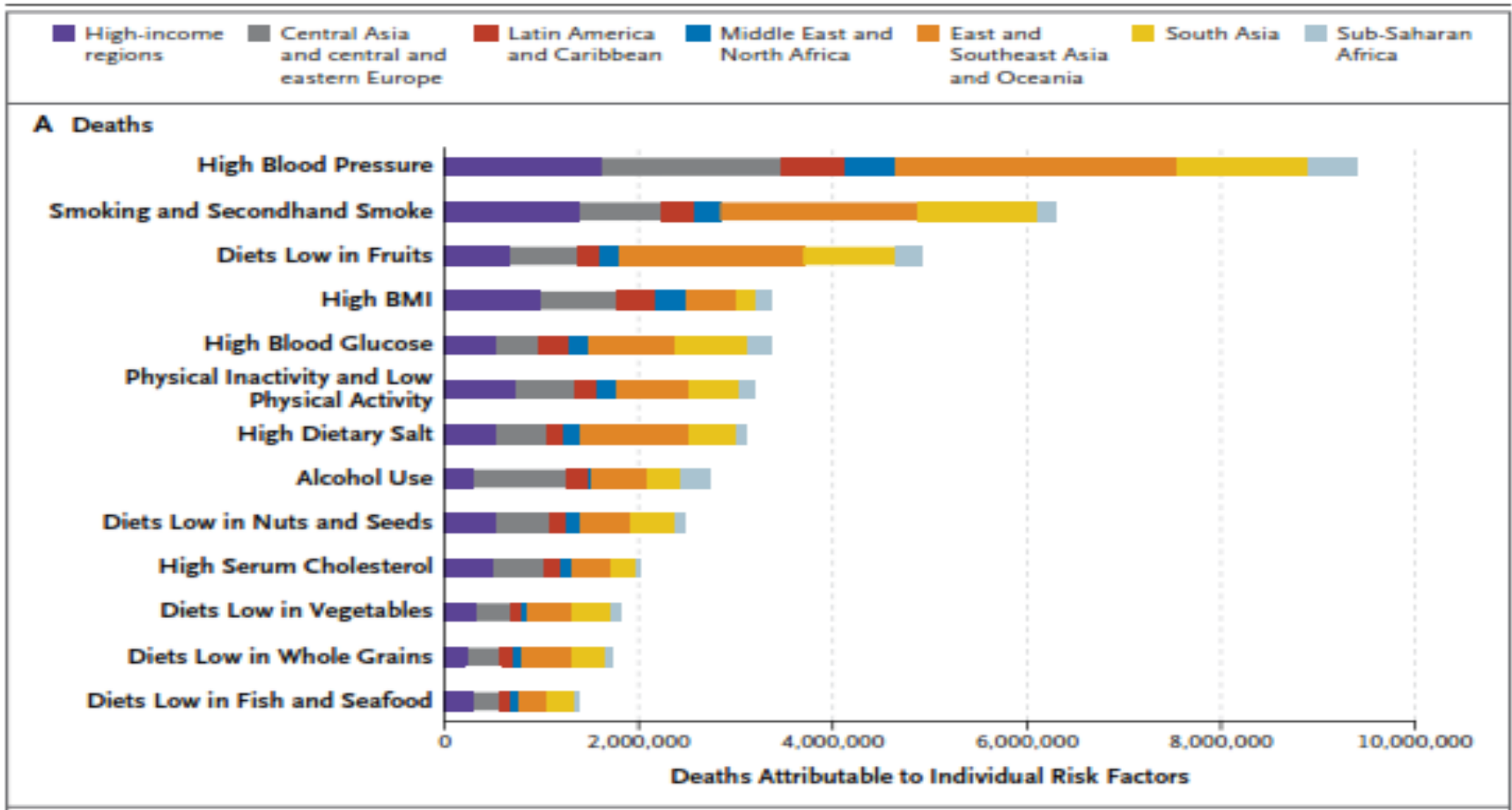
AHA Scientific Statement

Criteria for Evaluation of Novel Markers of Cardiovascular Risk

A Scientific Statement From the American Heart Association

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1. Proof of concept—Do novel marker levels differ between subjects with and without outcome?
 2. Prospective validation—Does the novel marker predict development of future outcomes in a prospective cohort or nested case-cohort/case-cohort study?
 3. Incremental value—Does the novel marker add predictive information to established, standard risk markers?
 4. Clinical utility—Does the novel risk marker change predicted risk sufficiently to change recommended therapy?
 5. Clinical outcomes—Does use of the novel risk marker improve clinical outcomes, especially when tested in a randomized clinical trial?
 6. Cost-effectiveness—Does use of the marker improve clinical outcomes sufficiently to justify the additional costs of testing and treatment?
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Behavioral and Dietary Risk Factors



PERCHE' VALUTARE IL RISCHIO CARDIOVASCOLARE GLOBALE

- 1. Identificare i soggetti che necessitano di interventi di prevenzione primaria**
- 2. Definire la soglia e l'intensità del trattamento, sia non farmacologico che farmacologico**

RISCHIO ASSOLUTO E RISCHIO RELATIVO

- **Rischio assoluto**

la probabilità, osservata o calcolata, di un evento in una popolazione in un periodo di tempo determinato (incidenza di nuovi casi per un dato periodo di tempo)

- **Rischio relativo**

il rapporto tra il rischio assoluto di un individuo, un gruppo, una popolazione, rispetto ad altri

($RR = \text{rapporto tra incidenza negli esposti} / \text{incidenza nei non esposti}$)

Risk factors
Male sex
Age (men ≥ 55 years; women ≥ 65 years)
Smoking
Dyslipidaemia
Total cholesterol >4.9 mmol/L (190 mg/dL), and/or
Low-density lipoprotein cholesterol >3.0 mmol/L (115 mg/dL), and/or
High-density lipoprotein cholesterol: men <1.0 mmol/L (40 mg/dL), women <1.2 mmol/L (46 mg/dL), and/or
Triglycerides >1.7 mmol/L (150 mg/dL)
Fasting plasma glucose 5.6–6.9 mmol/L (102–125 mg/dL)
Abnormal glucose tolerance test
Obesity [BMI ≥ 30 kg/m ² (height ²)]
Abdominal obesity (waist circumference: men ≥ 102 cm; women ≥ 88 cm) (in Caucasians)
Family history of premature CVD (men aged <55 years; women aged <65 years)

Diabetes mellitus

Fasting plasma glucose ≥ 7.0 mmol/L (126 mg/dL) on two repeated measurements, and/or

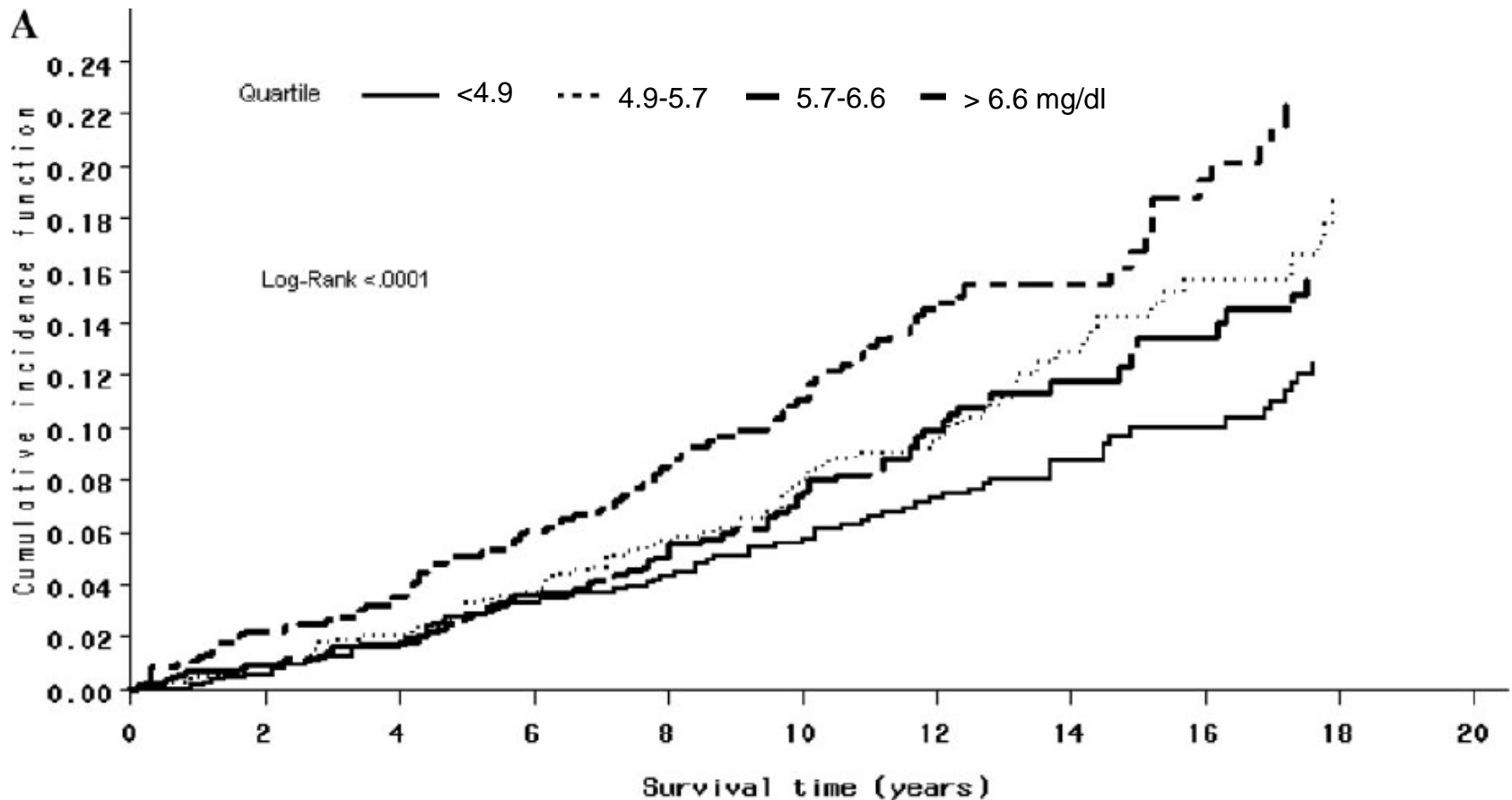
HbA_{1c} $>7\%$ (53 mmol/mol), and/or

Post-load plasma glucose >11.0 mmol/L (198 mg/dL)

Established CV or renal disease

Uric acid and cardiovascular mortality the Monica Study

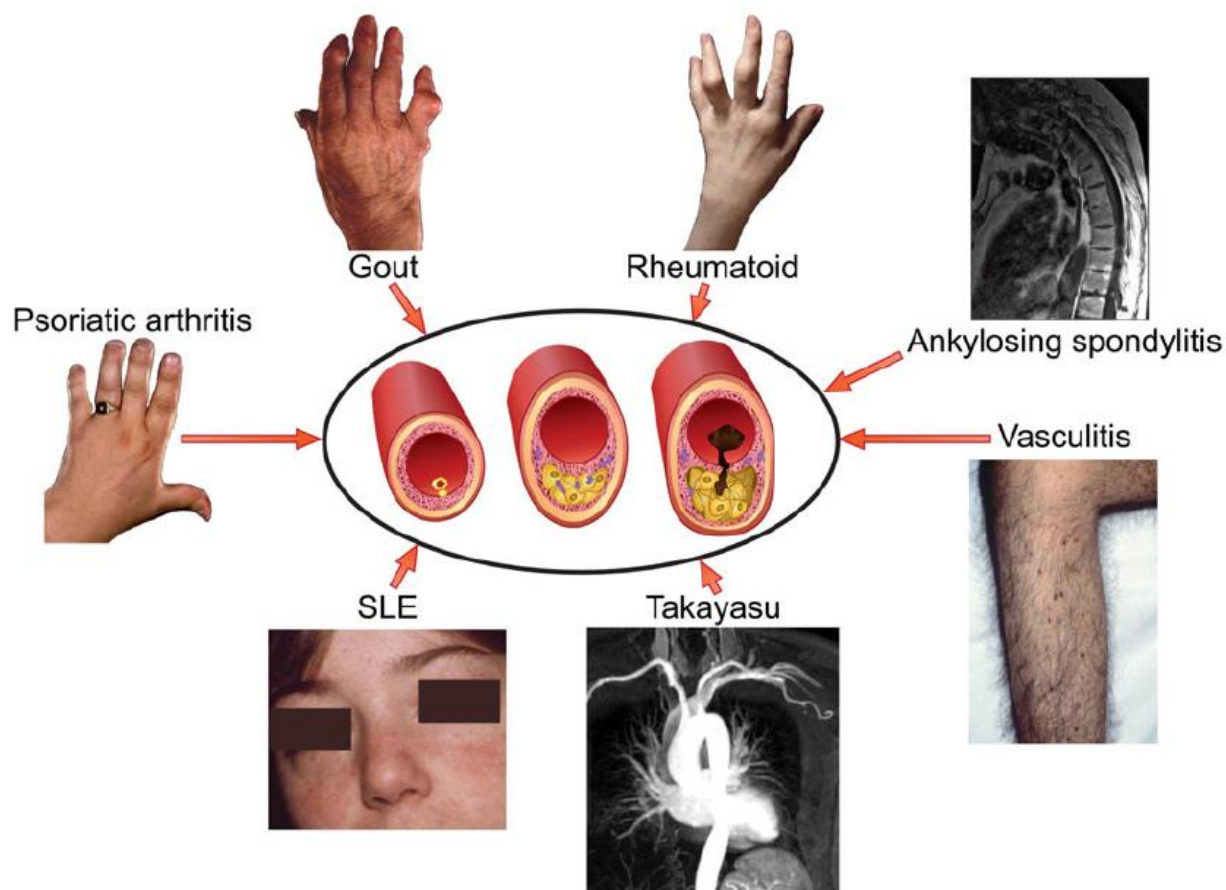
3604 men (45 to 74 years of age) who participated in 1 of the 3 MONICA Augsburg surveys between 1984 and 1995.



Cardiovascular disease in patients with chronic inflammation: mechanisms underlying premature cardiovascular events in rheumatologic conditions

Justin C. Mason^{1*} and Peter Libby²

European Heart Journal (2015)



European Guidelines on cardiovascular disease prevention in clinical practice (version 2012)

*“...While **women** appear to be at lower CVD risk than men, this is misleading as **risk is deferred by 10 years rather than avoided...**”*

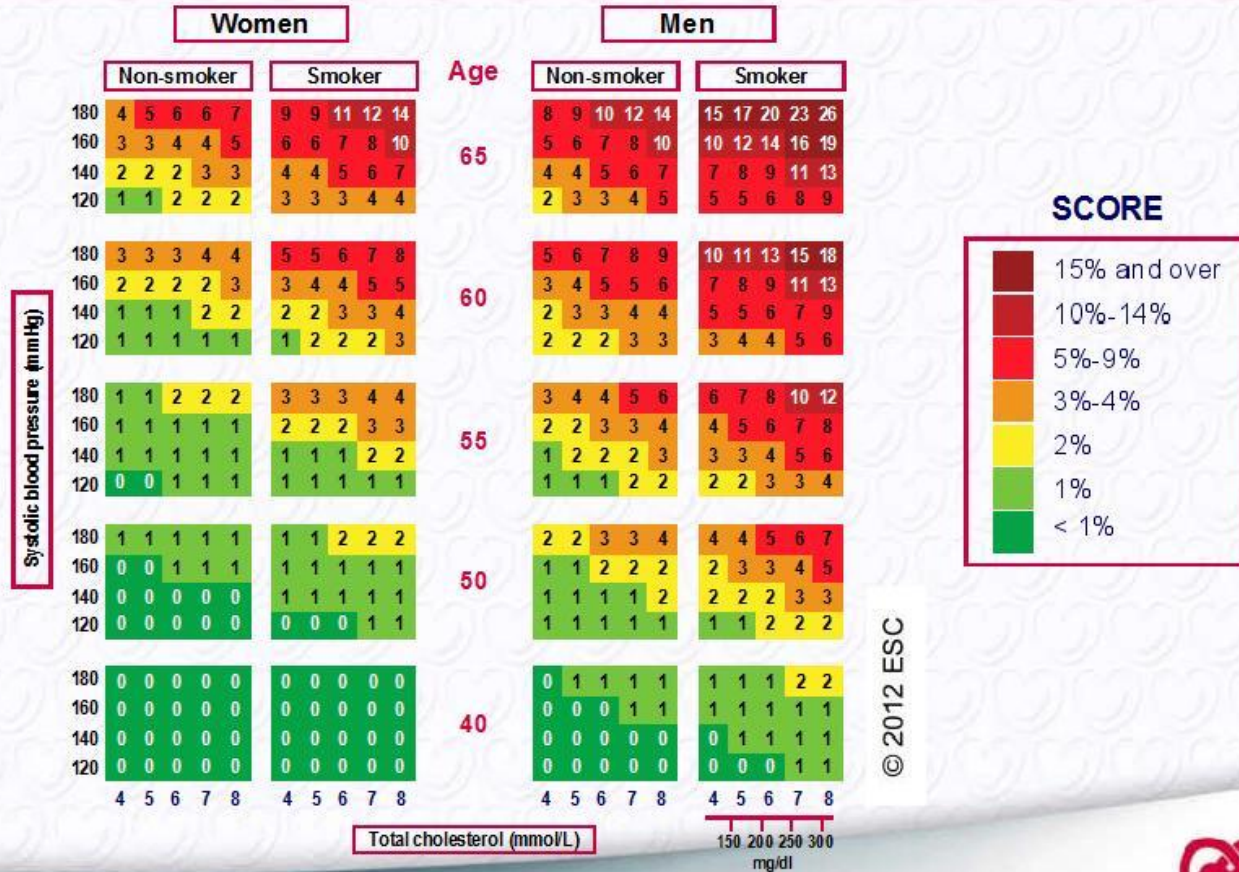
Other gender-specific aspects:

- *CV risk in women often underestimated*
- *Possible effect of hormonal therapy*
- *Lower prevalence of HT in women under 50 yrs of age, but steeper increase of BP values with ageing*
- *Autoimmune disease*
- *Increasing prevalence of smokers in recent years*

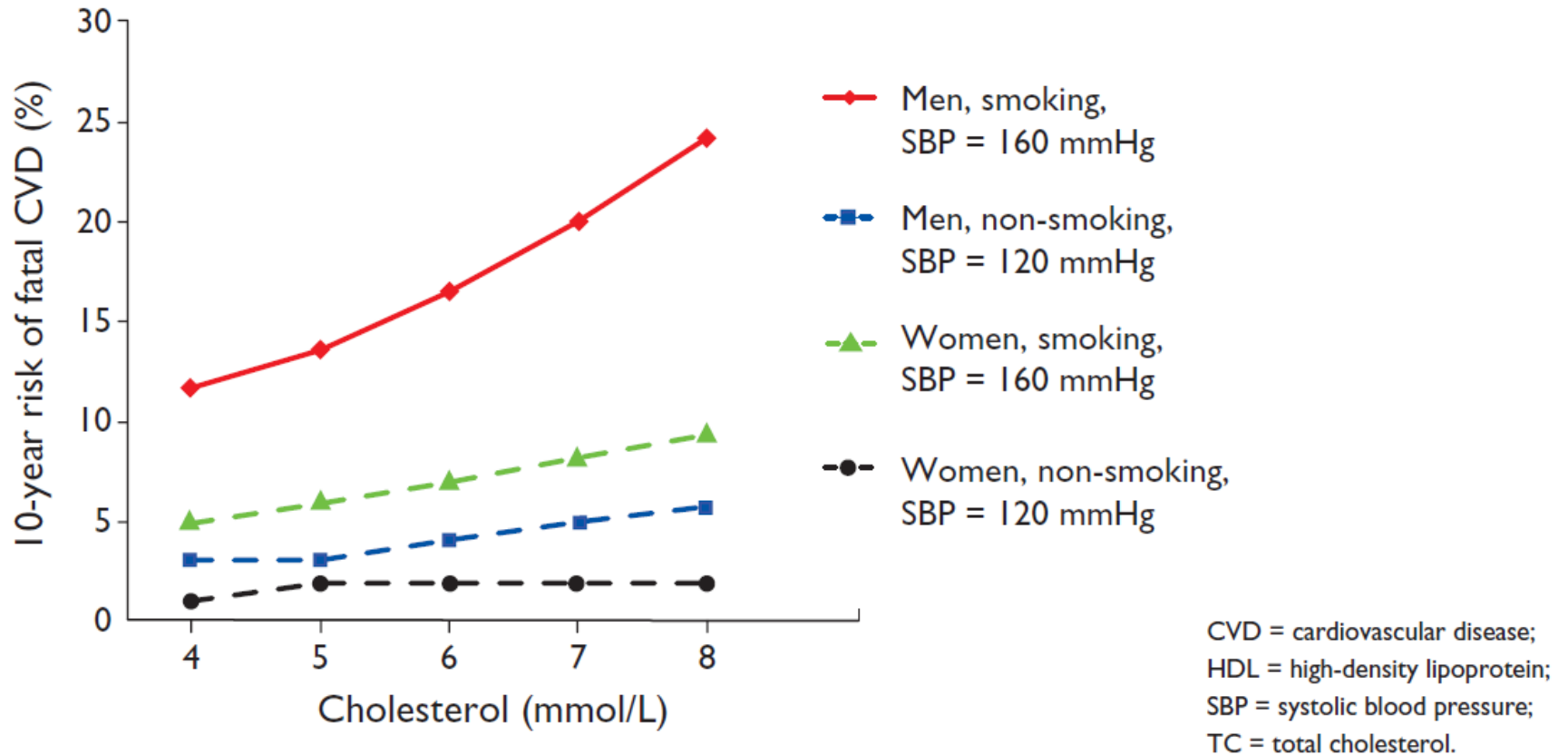
Total Cardiovascular Risk

“... when concomitantly present, BP and other CV risk factors may potentiate each other, leading to a total CV risk that is greater than the sum of its individual components...”

10 year risk of fatal CVD in low risk regions of Europe



Relationship between total cholesterol/HDL cholesterol ratio and 10-year fatal CVD events in men and women aged 60 years with and without risk factors, based on a risk function derived from the SCORE project

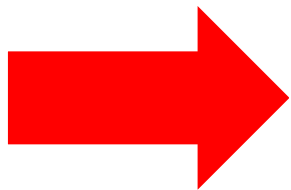


Risk may be higher than indicated in the charts in:

- Sedentary subjects and those with central obesity; the increased relative risk associated with overweight is greater in younger subjects than in older subjects.
- Socially deprived individuals and those from ethnic minorities.
- Subjects with elevated fasting glucose and/or an abnormal glucose tolerance test, who do not meet the diagnostic criteria for diabetes.
- Individuals with increased triglycerides, fibrinogen, apolipoprotein B, lipoprotein(a) levels and high-sensitivity C-reactive protein.
- Individuals with a family history of premature CVD (before the age of 55 years in men and 65 years in women).



Recommendations	Class ^a	Level ^b	GRADE
Total risk estimation using multiple risk factors (such as SCORE) is recommended for asymptomatic adults without evidence of CVD.	I	C	Strong
High-risk individuals can be detected on the basis of established CVD, diabetes mellitus, moderate to severe renal disease, very high levels of individual risk factors, or a high SCORE risk, and are a high priority for intensive advice about all risk factors.	I	C	Strong



The SCORE system estimates the 10-year risk of a first fatal atherosclerotic event, whether heart attack, stroke, aneurysm of the aorta, or other

Relation between age and cardiovascular disease in men and women with diabetes compared with non-diabetic people: a population-based retrospective cohort study

Gillian L Booth, Moira K Kapral, Kinwah Fung, Jack V Tu

“Interpretation Diabetes confers an equivalent risk to ageing 15 years. However, in general, younger people with diabetes (age 40 or younger) do not seem to be at high risk of CVD. Age should be taken into account in targeting of risk reduction in people with diabetes.”

Lancet 2006; 368: 29–36

Other risk groups

- **High risk:**

- Markedly elevated single risk factors such as familial dyslipidaemias and severe hypertension,
- Diabetes mellitus (type 1 or type 2) but without CV riskfactors or target organ damage,
- Moderate chronic kidney disease (CKD) (estimated glomerular filtration rate [eGFR] 30-59 mL/min/1.73 m²),
- A calculated SCORE of ≥5% and <10% for 10-year risk of fatal CVD.

- **Moderate risk:**

- Subjects are considered to be at moderate risk when their SCORE is ≥1 and <5% at 10 years. Many middle-aged subjects belong to this category.

- **Low risk:**

- The low-risk category applies to individuals with a SCORE <1% and free of qualifiers that would put them at moderate risk.

OTHER RISK RECOMMENDATIONS

- Genetic testing has no place in CVD risk assessment (III, B, strong).
- Psychosocial factors should be taken into account in risk assessment (IIA, B, strong).
- Fibrinogen, high sensitivity CRP and/or homocysteine may be measured as part of refined risk assessment in patients with an unusual or moderate CVD risk profile (IIB, B, weak).
- In patients with a moderate CVD risk profile the use of carotid IMT, ABI (ankle-brachial index) (IIA, B, strong) or CT-scan calcium score (IIa, B, weak) may be considered.
- Risk assessment should be conducted in patients with sleep-apneic disease (IIA, A, strong), or those with erectile dysfunction (IIa, B, strong).

“...strong effect of age on total CV risk models. It is so strong that younger adults (particularly women) are unlikely to reach high risk levels even when they have more than one major risk factor and a clear increase in relative risk (i.e. the existing risk compared to their peers). By contrast, most elderly men (e.g >70 years) will often reach a high total risk level whilst being at very little increased risk relative to their peers....”

“...The consequences are that most resources are concentrated on older subjects, whose potential lifespan is relatively short despite intervention, and little attention is given to young subjects at high relative risk despite the fact that, in the absence of intervention, their long term exposure to an increased risk may lead to a high and partly irreversible risk situation in middle age,....”

Stratification of total CV risk

“... Further emphasis has been given to identification of organ damage, since hypertension-related asymptomatic alterations in several organs indicate progression in the CVD continuum, which markedly increases the risk beyond that caused by the simple presence of risk factors...”

Risk estimation

- ✓ In apparently healthy persons, CVD risk is most frequently the result of multiple interacting risk factors.
- ✓ Certain individuals are at high CVD risk without needing risk scoring and require immediate intervention for all risk factors.
- ✓ In younger persons, a low absolute risk may conceal a very high relative risk, and use of the relative risk chart or calculation of their 'risk age' may help in advising them of the need for intensive lifestyle efforts.
- ✓ While women appear to be at lower CVD risk than men, this is misleading as risk is deferred by 10 years rather than avoided.
- ✓ All risk estimation systems are relatively crude and require attention to qualifying statements.

Interventions for CV risk reduction

Nutrition



	Class	Level	GRADE
A healthy diet is recommended as being the cornerstone of CVD prevention.	I	B	Strong

- Saturated fatty acids to account for <10% of total energy intake, through replacement by polyunsaturated fatty acids.
- Trans unsaturated fatty acids: as little as possible, preferably no intake from processed food, and <1% of total energy intake from natural origin.
- <5 g of salt per day.
- 30–45 g of fibre per day, from wholegrain products, fruits and vegetables.
- 200 g of fruit per day (2-3 servings).
- 200 g of vegetables per day (2-3 servings).
- Fish at least twice a week, one of which to be oily fish.
- Consumption of alcoholic beverages should be limited to 2 glasses per day (20 g/d of alcohol) for men and 1 glass per day (10 g/d of alcohol) for women.



	Class	Level	GRADE
Weight reduction in overweight and obese people is recommended as this is associated with favourable effects on blood pressure and dyslipidaemia, which may lead to less CVD.	I	A	Strong

Key messages body weight

- Both overweight and obesity are associated with a risk of death in CVD.
- There is a positive linear association of BMI with all-cause mortality.
- All-cause mortality is lowest with a BMI of 20 to 25 kg/m².
- Further weight reduction cannot be considered protective against CVD.

Healthy adults should spend 2.5-5 hours a week on physical activity or aerobic exercise training of at least moderate intensity, or 1-2.5 hours a week on intense exercise. Sedentary subjects should be strongly encouraged to start light-intensity exercise programmes.

Physical activity/aerobic exercise training should be performed in multiple bouts lasting ≥ 10 minutes and spread throughout the week.

Patients with previous acute myocardial infarction, CABG, PCI, stable angina pectoris or stable chronic heart failure should undergo moderate-to-vigorous intensity aerobic exercise training ≥ 3 times a week and 30 min per session. Sedentary patients should be strongly encouraged to start light-intensity exercise programmes after adequate exercise-related risk stratification.

Smoking

	Class	Level	GRADE
All smoking is a strong and independent risk factor for CVD and has to be avoided.	I	B	Strong
Exposure to passive smoking increases risk of CVD and has to be avoided.	I	B	Strong
Young people have to be encouraged not to take up smoking.	I	C	Strong
All smokers should be given advice to quit and be offered assistance.	I	A	Strong

Psychosocial factors

	Class	Level	GRADE
Multimodal behavioural interventions, integrating health education, physical exercise and psychological therapy for psychosocial risk factors and coping with illness, should be prescribed.	I	A	Strong
In case of clinically significant symptoms of depression, anxiety and hostility, psychotherapy, medication or collaborative care should be considered. This approach can reduce mood symptoms and enhance health related quality of life, although evidence for a definite beneficial effect on cardiac endpoints is inconclusive.	Ila	A	Strong

Lifestyle interventions to reduce raised blood pressure: a systematic review of randomized controlled trials

Heather O. Dickinson^a, James M. Mason^{a,b}, Donald J. Nicolson^{a,c},
Fiona Campbell^a, Fiona R. Beyer^a, Julia V. Cook^a, Bryan Williams^d and
Gary A. Ford^e

“...Robust statistically significant effects were found for:

- improved diet: SBP – 5 mmHg*
- aerobic exercise : SBP – 4.6 mmHg*
- alcohol restriction: SBP – 3.8 mmHg*
- sodium restriction : SBP – 3.6 mmHg*
- fish oil supplements: SBP – 2.3 mmHg*

with corresponding reductions in diastolic blood pressure...”

Terapia antiipertensiva

- **La maggior parte del beneficio attribuibile alla riduzione della pressione arteriosa *per se* (ampiamente indipendente dai farmaci impiegati)**
- **Principali classi di farmaci utilizzabili per l'inizio/prosecuzione della terapia**
 - **D**
 - **BB**
 - **CCB**
 - **ACEI**
 - **AII ant**

Effetti favorevoli del trattamento antiipertensivo

- **Riduzione significativa della morbilità/mortalità cardiovascolare**
- **Rilevante riduzione di**
 - **Ictus cerebrale** (-30 to -40%)
 - **Cardiopatía ischemica** (-20%)
 - **Scompenso cardiaco** (> -40%)
 - **Insufficienza renale terminale (ritardata insorgenza)**
- **Effetto favorevole anche nell'età avanzata, inclusa l'ipertensione sistolica isolata (ed in pazienti con età ≥ 80 anni)**
- **Riduzione del rischio in donne/uomini**
- **Effetto favorevole confermato in differenti gruppi etnici**
 - **Caucasici**
 - **Asiatici**
 - **Neri**
- **Effetto favorevole in molteplici condizioni cliniche**

Blood pressure goals in hypertensive patients

Recommendations	Class ^a	Level ^b	Ref. ^c
A SBP goal <140 mmHg:			
a) is recommended in patients at low–moderate CV risk;	I	B	266, 269, 270
b) is recommended in patients with diabetes;	I	A	270, 275, 276
c) should be considered in patients with previous stroke or TIA;	IIa	B	296, 297
d) should be considered in patients with CHD;	IIa	B	141, 265
e) should be considered in patients with diabetic or non-diabetic CKD.	IIa	B	210, 212
In elderly hypertensives less than 80 years old with SBP ≥160 mmHg there is solid evidence to recommend reducing SBP to between 150 and 140 mmHg.	I	A	265
In fit elderly patients less than 80 years old SBP values <140 mmHg may be considered, whereas in the fragile elderly population SBP goals should be adapted to individual tolerability.	IIb	C	-
In individuals older than 80 years and with initial SBP ≥160 mmHg, it is recommended to reduce SBP to between 150 and 140 mmHg provided they are in good physical and mental conditions.	I	B	287
A DBP target of <90 mmHg is always recommended, except in patients with diabetes, in whom values <85 mmHg are recommended. It should nevertheless be considered that DBP values between 80 and 85 mmHg are safe and well tolerated.	I	A	269, 290, 293

Diabetes

	Class	Level	GRADE
The target HbA1c for the prevention of CVD in diabetes of <7.0% (<53 mmol/mol) is recommended.	I	A	Strong
Statins are recommended to reduce cardiovascular risk in diabetes.	I	A	Strong
BP targets in diabetes are recommend to be <140/80 mmHg.	I	A	Strong
Hypoglycaemia and excessive weight gain must be avoided and individual approaches (both targets and drug choices) may be necessary in patients with complex disease.	I	B	Strong
Metformin should be used as first-line therapy if tolerated and not contraindicated.	IIa	B	Strong
Further reductions in HbA1c to a target of <6.5% (<48 mmol/mol) (the lowest possible safely reached HbA1c) may be useful at diagnosis. For patients with a long duration of diabetes this target may reduce risk of microvascular outcomes.	IIb	B	Weak

Guidelines to Manage Dyslipidemia

2013 ACC/AHA Guidelines ^{a,c}		2011 ESC/EAS Guidelines ^{b,c}	
Category	Recommendation	Category	Recommendation
Clinical ASCVD	<ul style="list-style-type: none"> High-intensity statin Combination therapy if 50% LDL-C lowering not reached 	CVD	<ul style="list-style-type: none"> LDL-C < 70 mg/dL or 50% reduction in LDL-C
Primary LDL-C ≥ 190 mg/dL	<ul style="list-style-type: none"> High-intensity statin 	Familial dyslipidemia (FH, FCH)	<ul style="list-style-type: none"> LDL-C < 100 mg/dL or maximal LDL-C reduction with drug combination and LDL apheresis
Diabetes (type 1 or 2) without clinical ASCVD but LDL-C = 70-189 mg/dL	<ul style="list-style-type: none"> Low risk: moderate-intensity statin High risk: high-intensity statin 	Diabetes mellitus or type 1 with target organ damage	<ul style="list-style-type: none"> LDL-C < 70 mg/dL or 50% reduction in LDL-C
None of the above but estimated 10-y risk ≥ 7.5%	<ul style="list-style-type: none"> Moderate- to high-intensity statin 	None of the above but estimate 10-y risk (SCORE)	<ul style="list-style-type: none"> Very high risk (SCORE > 10%) LDL-C < 70 mg/dL or 50% reduction High risk (SCORE 5% to 10%) LDL-C < 100 mg/dL Moderate risk (SCORE 1% to 5%) LDL-C < 120 mg/dL

a. Stone NJ, et al. *J Am Coll Cardiol*. 2014;63(25 Pt B):2889-2934^[11]; b. European Association for Cardiovascular Prevention & Rehabilitation, et al. *Eur Heart J* 2011;32:1769-1818^[12]; c. Ray KK, et al. *Eur Heart J*. 2014;35:960-968.^[13]

Antithrombotic treatment

	Class	Level	GRADE
In the acute phase of coronary artery syndromes and for the following 12 months, dual antiplatelet therapy with a P2Y ₁₂ inhibitor (ticagrelor or prasugrel) added to aspirin is recommended unless contraindicated due to such as excessive risk of bleeding.	I	B	Strong
Clopidogrel (600 mg loading dose, 75 mg daily dose) is recommended for patients who cannot receive ticagrelor or prasugrel.	I	A	Strong
In the chronic phase (>12 months) after myocardial infarction aspirin is recommended for prevention.	I	A	Strong
In patients with non-cardioembolic transient ischemic attack or ischemic stroke, secondary prevention with either dipyridamole plus aspirin or clopidogrel alone is recommended.	I	A	Strong

Pet Ownership and Cardiovascular Risk: A Scientific Statement From the American Heart Association

Glenn N. Levine, Karen Allen, Lynne T. Braun, Hayley E. Christian, Erika Friedmann, Kathryn A. Taubert, Sue Ann Thomas, Deborah L. Wells and Richard A. Lange
on behalf of the American Heart Association Council on Clinical Cardiology and Council on Cardiovascular and Stroke Nursing

Recommendations

1. Pet ownership, particularly dog ownership, may be reasonable for reduction in CVD risk (*Class IIb; Level of Evidence B*).



