Research on the Integrating Management of Cardiovascular Disease

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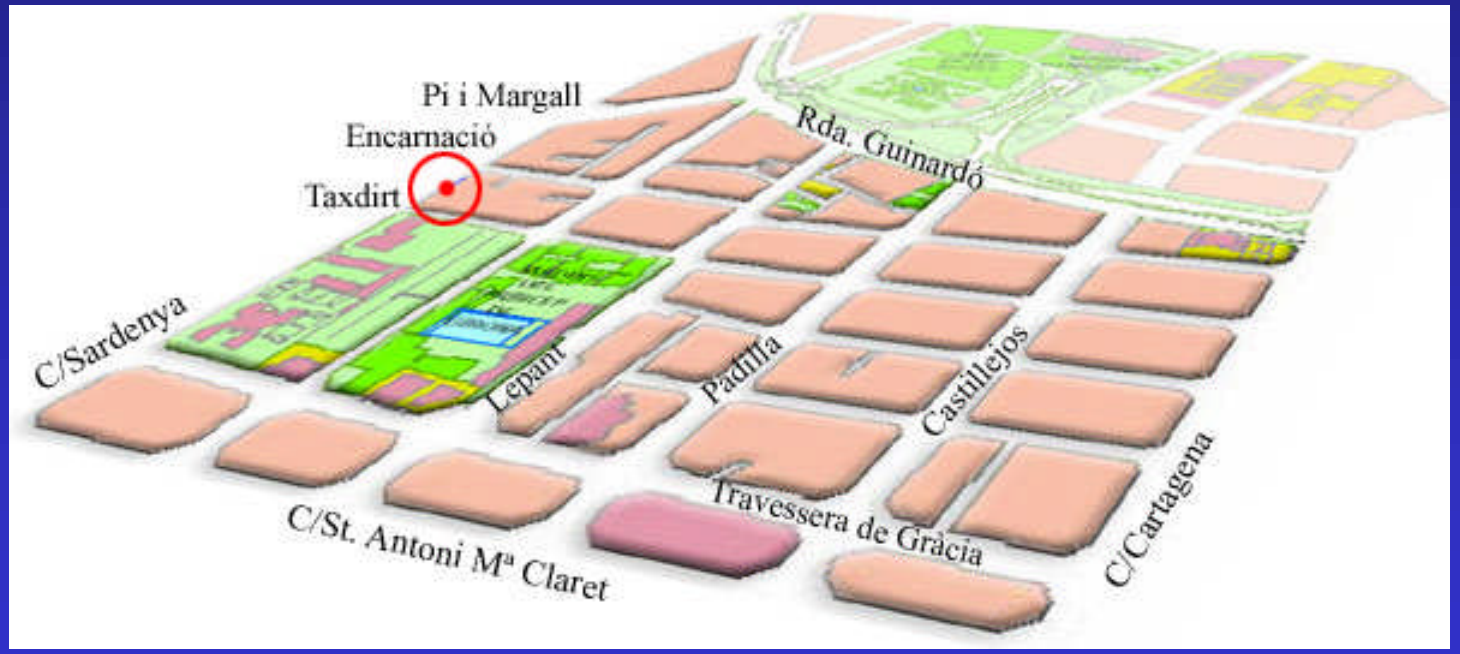
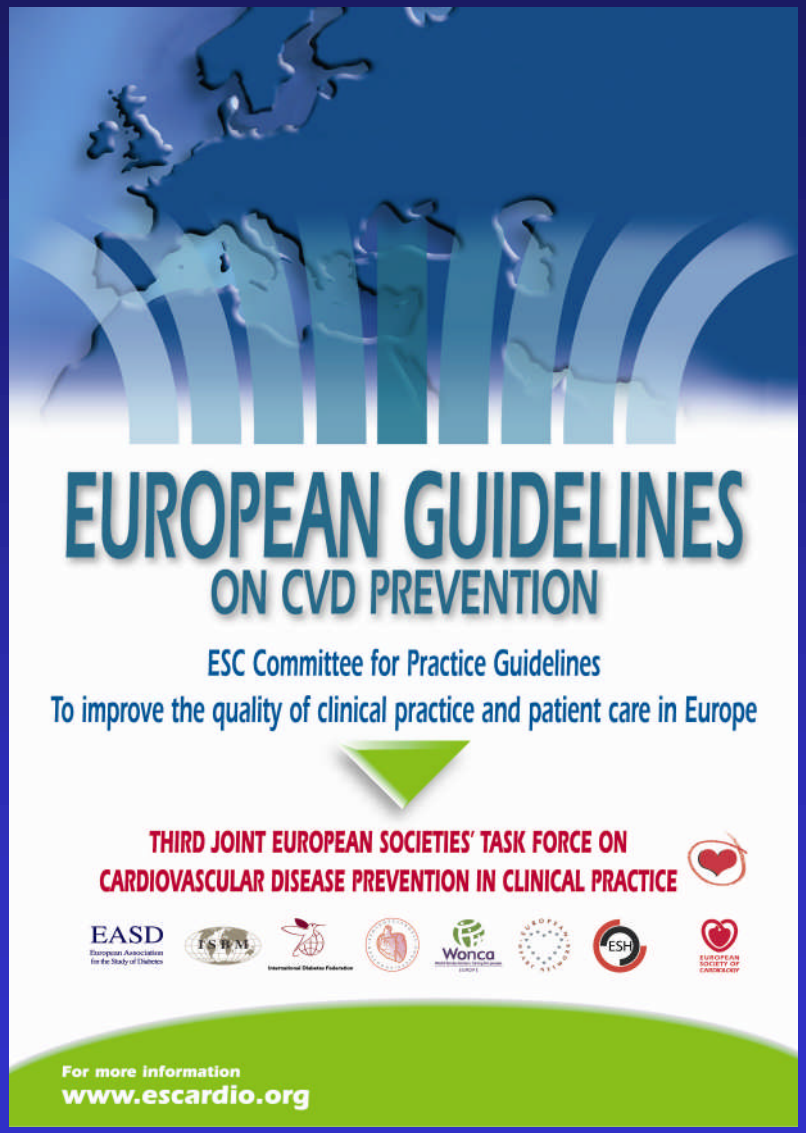




Graham I. *Eur J Cardiovasc Prev Rehabil* 2007; **28:** 2375–2414.

European Guidelines on CV disease prevention

- **Priorities and implementation strategies that are adapted to suit local conditions.**

- **Total risk estimation as a crucial tool to guide patient management.**

Multivariable risk assessment

- CVD risk factors cluster and interact multiplicatively
- Development of multivariable risk prediction algorithms that incorporate risk factors

Multivariable risk assessment

- avoids overlooking high-risk individuals with multiple marginal risk factors.
- avoids needlessly alarming persons with only one isolated risk factor

Methods to estimate CV risk

- Anderson KM, Circulation 1991;83:356-62.
- Wilson PWF, Circulation 1998; 97:1837-1847.
- D'Agostino RB, Circulation 2008; 117:743-753.
- SCORE project. Eur Heart J 2003; 24:987-1003.

- Hippisley J. QRISK2. BMJ 2008; 336: 1475-1482.

Guidelines on CV disease prevention

- European guidelines on CVD prevention in clinical practice (2007)
- American Heart Association (AHA) http://www.americanheart.org/
- AHA/ACC guidelines for secondary prevention for patients with coronary and other atherosclerotic vascular diseases (2006 update)
- Evidence-based AHA guidelines for CVD prevention in women (2007 update)
- New Zealand cardiovascular (CV) guidelines group (2005)
- European guidelines for the management of arterial hypertension (2007)
- Joint British societies' guidelines (2005)
- NICE. Clinical guideline 48: MI: secondary prevention in primary and secondary care for patients following a myocardial infarction (2007).

Discrepancies among guidelines concerning the risk level from which aspirin should be recommended

- AHA

  -10-year CHD (Framingham) risk >10% (20% in women)

- Joint British societies' guidelines
  - 10-year CVD risk ≥20% (CHD ≥15%)
- 2007 guidelines for the management of arterial hypertension
  - 10-year CV risk >15%-20% (probably refers to CHD)
- New Zealand CV guidelines group
  - 5-year CVD risk >15% (10-year CVD risk >30% or CHD >25%)
- European guidelines on CVD prevention in clinical practice
  - SCORE >10% over 10 years (CHD >40%)

Calculating the risk of a patient

Age	72 years
Gender	Female
Smoker	Yes
Total cholesterol	6.6 mmol/l (245 mg/dl)
HDL-cholesterol	1.1 mmol/l (42 mg/dl)
Systolic blood pressure	129 mmHg
Blood pressure medication	No
Family history of premature CHD	No

http://hp2010.nhlbihin.net/atpiii/calculator.asp

NATIONAL CHOLESTEROL EDUCATION PROGRAM
Third Report of the Expert Panel on
Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III)

Risk Assessment Tool for Estimating Your 10-year Risk of Having a Heart Attack

The risk assessment tool below uses information from the Framingham Heart Study to predict a person's chance of having a heart attack in the next 10 years. This tool is designed for adults aged 20 and older who do not have heart disease or diabetes. To find your risk score, enter your information in the calculator below.

Age:	[ ] years
Gender:	○ Female ○ Male
Total Cholesterol:	[ ] mg/dL
HDL Cholesterol:	[ ] mg/dL
Smoker:	○ No ○ Yes
Systolic Blood Pressure:	[ ] mm/Hg
Are you currently on any medication to treat high blood pressure.	○ No ○ Yes

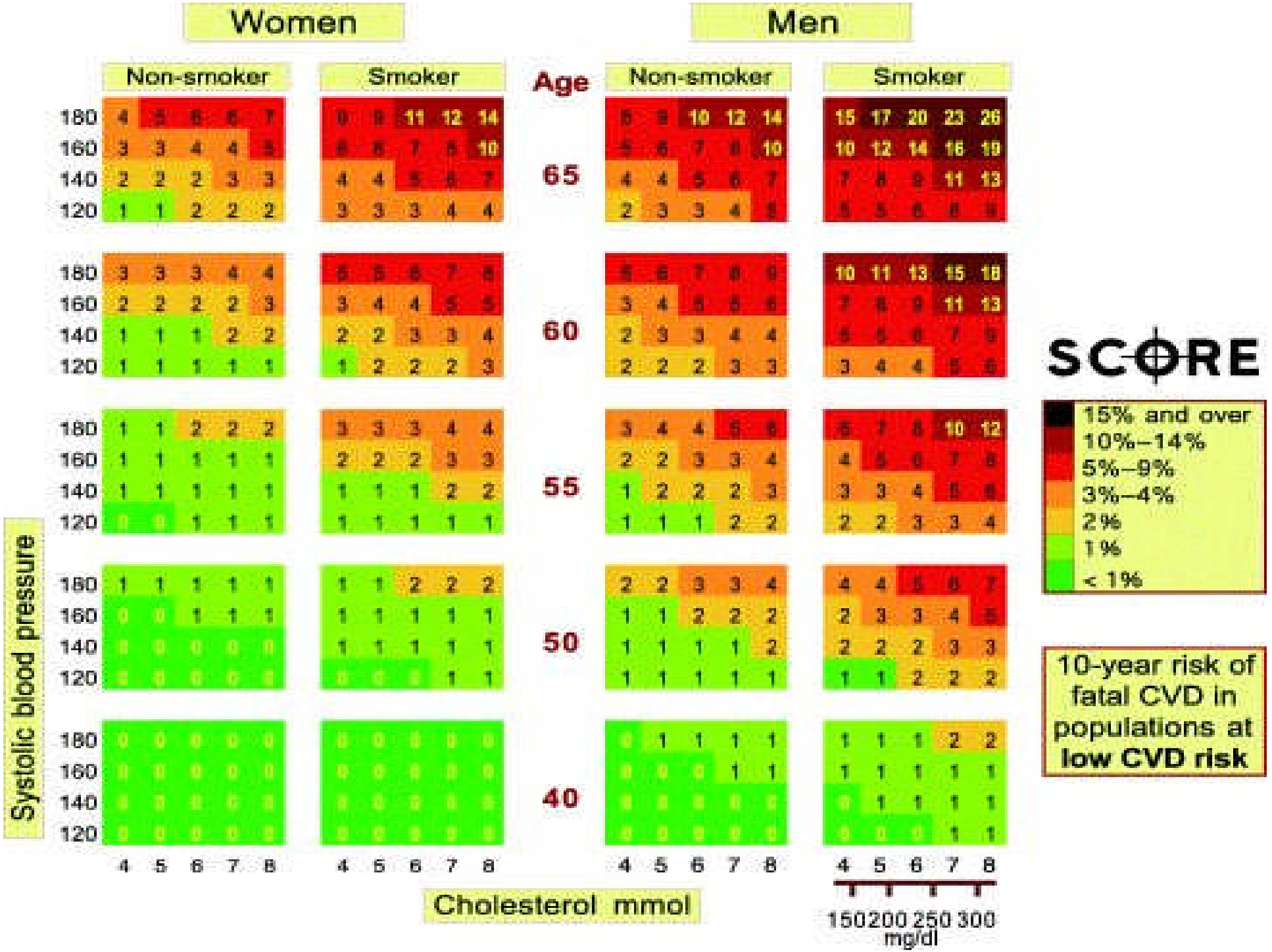
Calculate Your 10-Year Risk

TOP

Total cholesterol - Total cholesterol is the sum of all the cholesterol in your blood. The higher your total cholesterol, the greater your risk for heart disease. Here are the total values that matter to you:

Less than 200 mg/dL 'Desirable' level that puts you at lower risk for heart disease. A cholesterol level of 200 mg/dL or greater increases your risk.

200 to 239 mg/dL 'Borderline-high.'


Women
Men
Non-smoker
Smoker
Age
Non-smoker
Smoker
Systolic blood pressure
180
160
140
120
65
60
55
50
40
4 5 6 7 8
Cholesterol mmol
150 200 250 300
mg/dl
SCORE
15% and over
10%–14%
5%–9%
3%–4%
2%
1%
< 1%
10-year risk of fatal CVD in populations at low CVD risk

Estimation of risk

- FRAMINGHAM: 9%
- SCORE (low-risk countries): 4%
- SCORE (high-risk countries): 6%

Criticisms to CV risk scoring systems

- All are inaccurate and potentially confusing.
- Even the best charts have predictive accuracy of only 60-70% for individual patient.
- A bewildering variety of charts exist
- Many GPs do not understand, interpret, or use the chart well

Criticisms to CV risk scoring systems

- The hard part is to discuss the predicted risk and the predicted treatment benefit with the patient.
- This is more complex and time-consuming than telling patients that they have hypertension and need to lower their blood pressure.

How to improve CV risk scoring systems

- How to improve the accuracy
- How to improve the implementation in clinical practice

How to improve the accuracy of CV risk scoring systems

QRISK-2
CV Framingham
Ankle Brachial Index Collaboration
SHAPE Task Force

QRISK-2

Based on routinely collected data from general practice in UK
Better calibrated equation
Their accuray has improved with the addition of measures of social deprivation and ethnicity

Hippisley-Cox J. BMJ 2008;336:a332.

Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION

American Heart Association.
Learn and Live.

General Cardiovascular Risk Profile for Use in Primary Care: The Framingham Heart Study

Ralph B. D'Agostino, Sr, Ramachandran S. Vasan, Michael J. Pencina, Philip A. Wolf, Mark Cobain, Joseph M. Massaro and William B. Kannel

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Epidemiology

General Cardiovascular Risk Profile for Use in Primary Care

The Framingham Heart Study

Ralph B. D'Agostino, Sr, PhD; Ramachandran S. Vasan, MD; Michael J. Pencina, PhD; Philip A. Wolf, MD; Mark Cobain, PhD; Joseph M. Massaro, PhD; William B. Kannel, MD

Background—Separate multivariable risk algorithms are commonly used to assess risk of specific atherosclerotic cardiovascular disease (CVD) events, ie, coronary heart disease, cerebrovascular disease, peripheral vascular disease, and heart failure. The present report presents a single multivariable risk function that predicts risk of developing all CVD and of its constituents.

Methods and Results—We used Cox proportional-hazards regression to evaluate the risk of developing a first CVD event in 8491 Framingham study participants (mean age, 49 years; 4522 women) who attended a routine examination between 30 and 74 years of age and were free of CVD. Sex-specific multivariable risk functions ("general CVD" algorithms) were derived that incorporated age, total and high-density lipoprotein cholesterol, systolic blood pressure, treatment for hypertension, smoking, and diabetes status. We assessed the performance of the general CVD algorithms for predicting individual CVD events (coronary heart disease, stroke, peripheral artery disease, or heart failure). Over 12 years of follow-up, 1174 participants (456 women) developed a first CVD event. All traditional risk factors evaluated predicted CVD risk (multivariable-adjusted $P<0.0001$). The general CVD algorithm demonstrated good discrimination (C statistic, 0.763 [men] and 0.793 [women]) and calibration. Simple adjustments to the general CVD risk algorithms allowed estimation of the risks of each CVD component. Two simple risk scores are presented, 1 based on all traditional risk factors and the other based on non–laboratory-based predictors.

Conclusions—A sex-specific multivariable risk factor algorithm can be conveniently used to assess general CVD risk and risk of individual CVD events (coronary, cerebrovascular, and peripheral arterial disease and heart failure). The estimated absolute CVD event rates can be used to quantify risk and to guide preventive care. **(*Circulation*. 2008;117: 743-753.)**

Key Words: cardiovascular diseases ■ coronary disease ■ heart failure ■ risk factors ■ stroke

FRA General CV Risk Profile

The present investigation extends and expands onthe previous general CVD risk formulation on the basis of a large number of events, incorporates HDL cholesterol, and estimates absolute CVD risk

We proposed a general CVD risk function that demonstrates very good discrimination and calibration both for predicting CVD and for predicting risk of individual CVD components.

D'Agostino RB, et al. Circulation 2008;117:743

Ankle Brachial Index Collaboration

Ankle Brachial Index Combined with FRA Risk Score to Predict Cardiovascular Events and Mortality: A meta-analysis

ABI provided independent risk information compared with FRS, and when combined with the FRS, a low ABI (<0.90) approx. doubled the risk of total mortality, CV mortality, and major coronary events across all FRA risk categories.

JAMA 2008;300:197

Screening for Heart Attacked Prevention and Education (SHAPE) Task Force

For patients at intermediate risk (10-20%) clinicians should consider testing for high-risk but asymptomatic atherosclerosis with high-sensitivity CRP, stress testing, electronbeam computer tomography, ABI, or ultrasound to measure CIMT

Naghavi M. et al. Am J Cardiol 2006;98(2a):2H-15H

How to improve the implementation of CV risk scoring systems/guidelines

- CHECK-UP Study
- EUROACTION (implementation of guidelines in practice)

CHECK-UP Study

- Patients were randomised to received usual care or ongoing feedback regarding their calculated coronary risk
- Outcomes: changes in blood lipid levels, coronary risk, and the frequency of reching lipid levels.

Grover SA. Arch Intern Med 2007; 167:2296

CHECK-UP STUDY

Results

Greater mean reduction in LDLc and TC levels (small difference -3.3 mg/dl)

More likely to reach lipid targets (OR 1.26 95%CI 1.07-1.48).

Grover SA. Arch Intern Med 2007; 167:2296

EUROACTION

Matched cluster randomised controlled trial in 8 European countries.
Six pairs of general practice were assigned to intervention group or usual care for patients at high risk of developing CV disease.

Outcomes: family-based lifestyle change, management of BP, lipids and blood glucose to target levels, prescription of cardioprotective drugs

Wood DA. Lancet 2008;371:1999

EUROACTION

Results

No Reduction in tobacco
Increased consumption of fruits and vegetables
Achieved BP target
No achievement of TC target

Wood DA. Lancet 2008;371:1999

CONCLUSION

It is unknown whether reducing the global risk of patients with an increased risk of CV disease- rather than decreasing isolated risk factors provides cardiovascular benefit in terms of morbidity and mortality.

Research projects on how to improve the accuracy of CV risk scoring systems and how to improve implementation of guidelines in real practice are welcome.

CONCLUSION

More evidence is needed for the inclusion of routine imaging testing before they can be recommended in primary care

Thank you !!

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