

Authors: E. AGABITI-ROSEI - G. AMBROSIO - L. BADIMON - JP. BASSAND - A. BAYÉS DE LUNA - M.E. BERTRAND - E. CHAZOV - S. CHERCHIA - J. CLELAND - D. CLEMENT - D. COKKINOS - N. DANCHIN - R. DIETZ - P. DOMINIAK - I. EDES - E. ERDMANN - R. FERREIRA - H.R.FIGULLA - W. FLAMENG - I. GRAHAM - G. JACKSON - W. JANUSZEWICZ - J.C. KASKI - P. KEARNEY - W. KLEIN - F. KOLBEL - M. KOMAJDA - W. KÜBLER - J.L. LOPEZ-SENDON HENTSCHEL - G. MANCIA - W.J. McKENNA - T. MEINERTZ - J.M.LCZOCH - D. MULCAHY - E. O'BRIEN - A. OTO - J. PAPP - W.J. PAULUS - J. POLONIA - I. PRÉDA - L.A. PROVIDENCIA - J. REID - W.J. REMME - W. RUZYLO - Z. SADOWSKI - P. SERRUYS - P. SLEIGHT - J. SOLER-SOLER - J. SOMERVILLE - P.G. STEG - H.A.J. STRUIJKER BOUDIER - B. SWYNGHEDAUW - L. TAVAZZI - M. TENDERA - P. TOUTOUZAS - A. VAHANIAN - J.L. VANOVERSCHELDE - J. WIDIMSKY - M. YACOB

Risk stratification for the evaluation of coronary heart disease: different score systems

Risk stratification for coronary heart disease (CHD) has great implications. It is a tool to evaluate the burden of CHD in the future, indicating an increase in CHD in the early industrialized western nations due to an unhealthy lifestyle, and a dramatic rise in the late industrialized and in the developing countries due to urbanization and adopting "western habits" with lack of physical exertion, cheap but fatty food, weight gain, cigarette smoking, etc.

Risk stratification for CHD is likewise important for the evaluation of an apparently healthy person, indicating the individual risk, guiding and—if necessary—implementing preventive measures for primary prevention. For this purpose, three different algorithms are available in Europe: the Framingham risk score,¹ the PROCAM algorithm,² and the ESC Score.³

The Framingham study¹ started as early as 1948, comprising women and men at an age of 35 to 62 years; in 1971 an additional 5124 "offspring" were included. Due to the long observation period, a high level of evidence could be expected. The end point is cardiovascular disease, the broadest end point of all three studies. Therefore, the risk derived from the Framingham Score is generally higher than that of the other two algorithms. Another reason for the rather high event rate in the Framingham study is based on the high incidence of CHD at the beginning of the observation period, with a dramatic decline in the following years from 470 to 185/10⁵ =>60%.⁴ According to model calculations for different LDL- levels and systolic blood pressure values of the Framingham score are on average about 25% higher than those obtained by the PROCAM algorithm and 85 % compared with those of the ESC charts (calculations not shown).

The PROCAM scoring- system² started in 1985, and is based on >5000 male persons, living in the area of Münster, Germany, aged 35 to 65 years. The end point is myocardial infarction. Compared with the Framingham score, the event rate is about 25% lower, and compared with the ESC charts almost 80% higher. The algorithm is almost exclusively based on men and can only be extrapolated to postmenopausal women, with some arbitrary correction factors of about 25% to 30% with the exception of diabetic women.⁵

The ESC risk charts are based on several prospective European trials with the end point of lethal cardiovascular events—such as myocardial infarction, stroke, aortic rupture, etc. Due to different risks in various European countries, charts for low-, medium-, and high-risk countries were developed. The end point of cardiovascular death in the ESC- charts in Europe yields lower event rates compared to the Framingham- score (- 85%) and to the PROCAM- score (- 80%). These correction factors for the comparison of the 3 risk scores, however, can only be used correctly, if the different end points—cardiovascular death, myocardial infarction, and CHD – are linearly correlated to each other.

In all of these three risk algorithms some risk indicators, which have been shown to be of prognostic importance, are not included, such as physical fitness, body weight, impaired glucose tolerance, or inflammation markers. Other risk factors are only considered qualitatively as present or not present, eg, smoking, although the number

of cigarettes consumed is of prognostic significance. The new CARRISMA system of Prof Gohlke and coworkers⁶ covers the quantitative values of body weight (body mass index [BMI]), number of cigarettes consumed per day, and physical exercise (Kcal/week). The results gained are used in addition to the existing 3 scoring systems improving the prognostic information. The significance of this supplemental information system can be exemplified by some model calculations. These are based in the following examples on a 50-year-old man, LDL 170 (mg/dL), HDL 40 (mg/dL), TGL 200 (mg/dL), systolic blood pressure 140 (mm Hg) and no sports:

Cigarettes/day	0	10	20	30	40	50	60
ESC-charts	1.0						
CARRISMA	1.0	0.80	1.30	1.77	2.23	2.66	3.08

Taking the same person and assuming a cigarette consumption of 20/day:

Physical exercise [Kcal/week]	0	500	1000	1500	2000	2500	3000
ESC-charts	1.00						
CARRISMA	1.30	1.28	1.13	0.98	0.83	0.78	0.78

The maximum protective effect is practically achieved with 2000 (Kcal/ week) corresponding to 2.5 hrs jogging (10 km/h) for a man of 55 years and a weight of 80 kg⁵.

Calculations for a similar person consuming 20 cigarettes/ day and no sports:

Body weight (BMI)	22	23	25	26	28	30	32	34	36	37
ESC-charts	1.0									
CARRISMA	1.30	1.23	1.22	1.21	1.26	1.44	1.57	1.67	1.67	1.67

At least 70% to 80% of cardiovascular mortality is related to an unhealthy life style; and most heart attacks occur in persons with an average risk. In order to implement preventive measures and especially drugs, which then have to be taken lifelong, a risk evaluation as precise as possible is mandatory. For this purpose, the new CARRISMA system yields important additional information.

W. KÜBLER – Heidelberg, Germany

References: 1. www.nhlbi.nih.gov/about/Framingham/riskmen. 2. www.chd-taskforce.de 3. Conroy RM et al. *Eur Heart J.* 2003;24:987-1003. 4. Assmann G et al. *Circulation.* 2002;105:310-315. 5. Gohlke H. *Clin Res Cardiol Suppl.* 2006;1:139-148. 6. www.CARRISMA-pocket-LL.de

All texts for *The European Cardiologist - Journal by Fax* are available on our website: www.servier.com

In the event of any questions, or if you wish to receive the referenced publications, please contact fax n° 01 55 72 75 02

Medical service from Serdia Pharmaceuticals
Makers of

COVERSYL®
PERINDOPRIL *Once daily*

NATRILIX® SR
1 TABLET DAILY

FLAVEDON® MR
2 tablets daily

SERDIA PHARMACEUTICALS (INDIA) PVT. LTD.

Serdia House, Off Dr. S.S. Rao Road, Parel, Mumbai 400 012.

Under Licence from: Les Laboratoires Servier, France. Visit us at: www.serdiapharma.com

