Prospects for primary prevention of coronary heart disease

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ABSTRACT. Major contributors to coronary heart disease have been identified through epidemiologic research. These risk factors fall into a number of interdependent categories including: atherogenic personal attributes, living habits which promote them, signs of a compromised circulation and host susceptibility to these risk factors. Modifiable atherogenic risk attributes include blood lipids, blood pressure, glucose tolerance and fibrinogen. The risk associated with each is markedly affected by those others which coexist. Modifiable living habits exist which promote these atherogenic traits including overeating, unrestrained weight gain, faulty diet, cigarette smoking, and lack of exercise. Innate susceptibility is signified by a family history of premature vascular disease, identifying persons in particular need of risk factor control. At a given level of serum total cholesterol risk varies widely depending on total/HDL-cholesterol ratio providing an efficient and practical means for assessing the joint effect of the two-way traffic of total cholesterol. Optimal treatment must improve this lipid profile. Diabetes on average doubles CHD mortality imparting greater risk in women than men and exerting an independent effect. Risk in diabetics varies widely depending on coexistent risk factors providing a means for reducing the risk. The same applies for hypertension and dyslipidemia. Preclinical indicators of a compromised coronary circulation and ischemic myocardial involvement include ECG evidence of left ventricular hypertrophy, blocked intraventricular function, repolarization abnormality and abnormal response to exercise. Such persons are in dire need of correction of modifiable risk factors. Optimal risk predictions require a quantitative synthesis of risk factors into a composite estimate. Handbooks, hand calculators and P.C. software, based on multiple logistic risk formulations have been devised for office use requiring only ordinary office procedures and simple laboratory tests to measure the risk factor ingredients. Preventive management as well as risk estimation should be multifactorial if good results are to be achieved. Preventive strategies should include public health measures to alter the ecology so as to shift the whole distribution of risk factors to a more favorable level, health edu-
cation to enable people to protect their own health and preventive medicine for high risk candidates. Greater skill at modifying behavior must be developed to carry out such risk factor interventions.

Introduction
Chances of a major cardiovascular catastrophe before age 60 are one in three in most affluent countries and one in five men will have a coronary attack before that age. Women lag men in incidence by ten years, but cardiovascular disease is also their chief cause of death. Coronary disease must be anticipated and prevented because one in five attacks present with sudden death as the first, last and only symptom and half of all coronary deaths are sudden deaths (1).

Fortunately, vulnerability can be readily assessed from a risk profile comprised of blood lipids, blood pressure, fibrinogen, glucose, cigarette habit and ECG findings using only ordinary office procedures and simple laboratory tests (2). These modifiable atherogenic risk attributes are promoted by a faulty life-style typified by a diet too rich in calories, saturated fat, and salt; and too low in fiber, vegetable content, calcium and magnesium. Fish in the diet, by providing omega-3 fatty acids in abundance, and by substituting for red meat, has been found to be protective against coronary mortality in three major epidemiologic studies. Sedentary habits, unrestrained weight gain and cigarettes also predispose.

Risk Factor Analysis
Coronary heart disease (CHD) is the leading cause of mortality and a major determinant of morbidity in the industrialized countries. Epidemiologic investigation has been instrumental in identifying risk factors for CHD. Many studies have shown a strong and consistent relationship of subsequent rates of development of CHD to antecedent serum total cholesterol and its low-density lipoprotein fraction. High levels of the high-density lipoprotein (HDL) fraction have been found to be protective (3). Triglycerides appear not be an independent risk factor for CHD in men, but may be in women. The weight of evidence indicates that a high-fat diet is related to coronary disease through its influence on blood lipid precursors (4). Hypertension is a powerful contributor to coronary disease (5,6,7). At any age, in either sex, risk of coronary events is proportional to the height of the blood pressure, systolic or diastolic, casual or basal. Systolic hypertension in the elderly is not innocuous, being associated with an increased risk of CHD and stroke. Cigarette smoking is another important independent predictor of coronary disease; the risk of myocardial infarction increases in relation to the number of cigarettes smoked daily (8). Diabetes is a cardiovascular risk factor for both men and women, with the incidence in diabetic men and women being, respectively, two and three times that in nondiabetics (9). Although obesity is often found not to be an independent predictor of coronary disease, obesity is important because of its promotion of other risk