CORONARY PREVENTION

A Clinical Guide

RICHARD G. HUTCHINSON

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To the families of the authors
with affection and appreciation.

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Foreword

THIRTY-FIVE YEARS AGO coronary heart disease was the leading cause of death in the United States. It was thought to be the inevitable consequence of aging and its prevention was not even considered. A book such as this one would have been unthinkable. Ancel Keys was just beginning his epidemiologic studies relating diet to serum cholesterol and coronary heart disease. The Framingham study was getting cranked up. Effective antihypertensive therapy was still in the investigational stage and attention was just being focused on cigarette smoking as a possible etiologic factor in pulmonary disease, but its relationship to coronary heart disease was not recognized.

In the ensuing three decades the risk factors for atherosclerotic heart disease have been identified, largely from insurance actuarial data and prospective epidemiologic studies such as Framingham, Tecumseh, Albany, and others. Cigarette smoking, hypercholesterolemia, and hypertension have emerged as the three major treatable risk factors, roughly in that order of importance.

But documentation that correction of these risk factors would reduce atherosclerotic heart disease morbidity and mortality has been slow in coming and in achieving acceptance by the community of practicing physicians.

It is generally acknowledged that treatment of hypertension will reduce the risk of stroke because all prospective, controlled treatment trials have demonstrated this. However, only the Hypertension Detection and Follow-up Program (HDFP) has shown a reduction in mortality from atherosclerotic heart disease and these data have been criticized because of the lack of a control group receiving placebo. The Multiple Risk Factor Intervention Trial (MRFIT) has raised searching questions about the possible adverse effects of oral diuretics in management of hypertension in high risk men with abnormal resting electrocardiograms, but this is largely by inference as there are no hard data to support this.

There is general agreement that within a few months after cessation of cigarette smoking the risk of myocardial infarction and/or sudden death is reduced.

The Lipid Research Clinics' primary prevention trial demonstrated a reduction in coronary events, fatal and nonfatal, this was roughly proportional to the reduction in serum cholesterol concentration, although overall mortality rate was not affected.

Secondary prevention has also been evaluated. A Mayo Clinic study showed that effective antihypertensive treatment reduced overall mortality and myocar-

dial infarction for patients who had angina and/or a previous myocardial infarction. Several well controlled trials have documented the value of beta blockers in preventing sudden death and recurrent myocardial infarction for up to 30 months after an acute myocardial infarction.

There is less evidence that correcting other risk factors (obesity, sedentary life style, diabetes) will reduce the risk of atherosclerotic heart disease unless the corrective measures also affect the primary risk factors.

The bottom line is that mortality from atherosclerotic heart disease has declined by more than 25 percent in the last 10 years in the United States. How much of this can be attributed to risk reduction and how much to better medical care of those already affected with the disease is speculative, but primary prevention has to be playing a role. In the United Kingdom where management of risk factors is less aggressive than it has been in this country, the coronary death rate has not declined.

Nevertheless, atherosclerotic heart disease is still the leading cause of death in the United States. However, it is now apparent that it is not the inevitable result of aging. It is preventable and this book by Dr. Richard Hutchinson and colleagues speaks to this issue.

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Preface

FOR SEVERAL DECADES the medical profession has been absorbed with the development and application of dramatic and effective methods of managing life-threatening cardiovascular crises. The importance of this is undeniable. Unfortunately, however, we have been slow in setting our sights on preventing these crises from occurring in the first place. Clearly, to emphasize treatment over prevention leaves logic behind. When possible, should we not prevent fires from starting rather than putting them out after they have begun? Public health professionals and the lay public have been significantly ahead of us in instigating life-style and other changes which have played a major role in the sharp decline in coronary heart disease mortality which has occurred in the last several decades. However, in recent years there has been increasing interest by physicians in the less dramatic, but all important, concept of prevention.

Ironically, because progress has been made in reducing coronary heart disease mortality and morbidity, there is a danger that complacency may set in, despite the fact that coronary heart disease is still the leading cause of death in the United States.

Given the foregoing considerations, this book has been written to stimulate physicians to wage the battle of prevention, to provide them with a clear discussion of the pathophysiologic actions of the various risk factors, and to provide detailed recommendations for intervention against the latter. Furthermore, the text is broad in scope and embraces all three facets of prevention,* primary, secondary, and tertiary.

Since primary care physicians and cardiologists have the greatest opportunities to have a major impact in the various facets of prevention, this book will be particularly useful to these groups, but it will be equally useful to practitioners in other fields who are concerned with reducing coronary heart disease morbidity and mortality.

RICHARD G. HUTCHINSON, M.D.

*Three Facets of Prevention:

Primary: Keeping the disease (e.g., coronary heart disease) from occurring.

Secondary: Treating the disease once it has occurred, to prevent complications and recurrences.

Tertiary: Attempting to minimize (prevent) the consequences once the disease and its complications have supervened (e.g, cardiac rehabilitation).

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Contents

1 / Magnitude of the Problem

RICHARD G. HUTCHINSON, M.D.

CARDIOVASCULAR DISEASES account for almost one million deaths annually in the United States, more than all other diseases combined (Table 1–1). Over 200,000 of these occur before the age of 65, mostly from coronary heart disease (CHD). Over 50% of all cardiovascular deaths are due to coronary heart disease, and total over one-half million per year. In men over age 40 and women over 50–55, CHD is the leading cause of death.[1, 2] Coronary heart disease deaths outnumber those from cancer by more than one-third.

As distressing as these figures are, they do not take into account the numerous nonfatal cardiac events and the attendant emotional stress for both the victims and their families, the medical expenses, time lost from work and, often, temporary or permanent disability. In fact, over 16 million people in the United States have partial or complete disability from cardiovascular disease[1] with the probability that about one half of these are attributable to coronary heart disease.

Coronary disease becomes a problem for men much earlier than for women. While the degree of difference between male and female susceptibility diminishes with age, men remain at greater risk at all ages. White males between 35–44 have five times the coronary heart disease mortality of women of the same age group and maintain this ratio until the 55–64 age bracket when it falls to a figure still in excess of 3:1 (Table 1–2). This sex difference can also be expressed as a time lag which is about a decade in length. For example, the coronary mortality risk for white females at age 45–54 is approximately that of their male counterparts at age 35–44. This pattern for white females persists all the way through the 65–74 age bracket. For nonwhites too, there is a considerable difference in male-female mortality over the decades, but the difference does not approximate that between white men and women.

While the etiology for the male-female gap remains unclear, it may be mediated at least in part by sex hormone differences. Hormonal factors are discussed in more detail in the chapter entitled Other Risk Factors.

SUDDEN DEATH

Of the three modes by which coronary heart disease manifests itself, sudden death, myocardial infarction, and angina pectoris, sudden death poses the most

TABLE 1–1.—DEATHS IN 1978 AND 1979 FOR SELECTED CAUSES OF DEATH: UNITED STATES*

CAUSE OF DEATH	NUMBER OF DEATHS 1978†	1979†
All causes	1,924,000	1,895,380
Cardiovascular Diseases	985,785	967,953‡
Coronary heart disease	641,140	545,200
Stroke	172,520	167,320
Hypertensive disease	15,480	30,330
Rheumatic heart disease	12,790	7,420
Congenital heart disease	6,445	6,445‡
All other CV disease	137,410	211,240
All Other Causes	938,215	927,425
Cancer	396,060	401,450
Accidents, poisonings, violence	159,970	153,850
Influenza and pneumonia	58,290	43,770
Cirrhosis of the liver	29,910	29,620
Diabetes	32,780	32,780
COPD including asthma	46,810	49,580
All other causes	214,395	216,375

*Source: Vital Statistics from the National Center for Health Statistics. Reprinted by permission of the National Heart, Lung, and Blood Institute.
†Provisional, based on a 10% sample of death certificates.
‡Estimated by NHLBI.

difficult problem. There is even confusion regarding its definition. However, one major study of previous myocardial infarction victims, the Aspirin Myocardial Infarction Study (AMIS),[3] defined it as death within one hour of the onset of symptoms. Lown[4] defined it as death occurring within an hour of the initiation of symptoms, or, in the case of unwitnessed death, with the victim

TABLE 1–2.—AGE-SPECIFIC MORTALITY RATES PER 100,000 POPULATION FOR CORONARY HEART DISEASE (ICD 410–413): SELECTED AGE GROUPS BY SEX-COLOR, UNITED STATES, 1978*

AGE	WHITE MEN	WHITE WOMEN	NONWHITE MEN	NONWHITE WOMEN
35–44	55.9	10.4	87.2	32.2
45–54	254.9	54.7	304.7	139.0
55–64	697.3	211.4	772.1	400.4
65–74	1597.0	692.3	1399.8	895.7
75–84	3736.3	2380.3	2918.6	2334.9
85+	7597.7	6276.0	3788.5	3297.9

*From *Arteriosclerosis:* Report of the Working Group on Arteriosclerosis of the National Heart, Lung, and Blood Institute (NHLBI). U.S. Department of HHS, Public Health Service, National Institutes of Health, NIH Publication No. 82–2035, Vol. 2, 1981. Reprinted by permission of NHLBI.