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PREVENTION AND REHABILITATION IN ISCHEMIC HEART DISEASE

Edited by

Charles Long

Prevention and Rehabilitation in Ischemic Heart Disease

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PREVENTION AND REHABILITATION IN ISCHEMIC HEART DISEASE

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* *Originally published as part of the Physical Medicine Library, edited by Sidney Licht.*

Dedicated with love to my wife Rebecca and to Arielle, Ilana, Tamarah and Jonathan, for their patience and forbearance with the Editor

Series Editor's Foreword

This volume in the *Rehabilitation Medicine Library* series may well become a landmark in the literature of prevention and rehabilitation in ischemic heart disease. So much has been written on this subject at such great lengths and with so much messianic fervor that a book is needed to set the record straight. This is that book! Dr. Long and his stellar list of authors have cut through the verbiage and come up with both a sober and realistic analysis of the factors involved.

The book includes a remarkable amount of material that can be useful to the clinician and the scientist involved with patients who have ischemic heart disease, or in whom they fear its development. Ranging from a careful new look at the comprehensive Framingham Study to the latest results of studies on the effect of exercise on post-coronary cardiac function, the spectrum of concerns are covered with clarity and style. If there are gaps in the coverage, they are miniscule. The impression one gains on reading the chapters is one of massive authority tempered with genuine humane concern and open-mindedness. No position appears to be accepted or rejected by the authors because of prejudice or preconceived notions.

A major strength of this book is the dovetailing of authoritative, objective information from different sources, viewing the interdependent subjects of prevention and rehabilitation from numerous angles. Its strength is not only in its information content, but in its cohesion and unity. We are proud to have this landmark volume in the *Rehabilitation Medicine Library*.

Hamilton, Ontario JOHN V. BASMAJIAN, M.D.

Preface

The destiny of Man lies in the hands of Man himself . . .

Man has always aspired to control his own destiny. Only in modern times has he had the temerity to feel, and try to prove, that he can indeed be master of his own fate, at least within the limits imposed by his mortality. From the health consciousness of the ancients have come the modern prophets of the prevention of disease and the detection of the proper route to follow to health and long life. Through the efforts of many professionals, and the abiding desire of individuals to live longer and better lives, the great infectious epidemic diseases have been virtually wiped from the earth in this century. Many of us have deep faith in the eventual success of mankind in the overcoming of disease, and the extension of healthy life. In few areas of medical endeavor has more effort been exerted in behalf of this ideal than in coronary heart disease.

Beginning with the long-term, prospective Framingham study in the 1950s, the past three decades have yielded dramatic advances in the prevention and rehabilitation of coronary heart disease. All of the risk factors for coronary atherogenesis were being unearthed in orderly fashion as the Framingham study began. In the short span of 25 years, a vast amount of work has been done to establish some of these risk relationships on a scientific basis. Major areas of advance have included a documentation of the increased risk to individuals with the cigarette smoking habit, hypertension, a low level of high density lipoprotein cholesterol, a physically inactive life-style, or a driving, deadline-meeting personality. These factors were added to the already documented atherogenic risk associated with the male gender, atherogenic inheritance patterns, and diabetes mellitus.

A striking difference between the past two decades and the preceding years of study is the intensity with which the American public has accepted the gradual uncovering of risk relationships in atherogenesis. Moving ahead of reliable scientific proofs, a large mass of individuals has gradually changed its life-style, attempting to produce a lower level of risk for individuals and for the population at large. It is our impression, as will be detailed in this book, that the documentable change in American habits and the decline in cardiovascular mortality, is not a coincidence. The reduction in disease mortality must be considered a result of life-style changes resulting from

scientifically revealed relationships, with attendant publicity and public response.

As the relationships between risk factors and atherogenesis have increasingly unfolded, various technologies have been advanced for the measurement of factors related to risk and for the management of these factors to reduce risk. When these technologies are applied to a normal population, they are preventive; when applied to a coronary stricken population, they are "rehabilitative," though in a sense also preventive. It is impossible to detail the methods of rehabilitation without an academic investigation of the preventive rationale underlying the technology. It is our hope and belief that this book represents the State of the Art and Science today. It is further our hope that this book will influence the behavior of practitioners and ultimately the life-style of those at coronary-risk or coronary-stricken.

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1

Cardiovascular Statistics in the United States

Framingham and Beyond

WILLIAM P. CASTELLI

The number of people who develop cardiovascular disease in the USA continues to be impressive by any standard of comparison. The American Heart Association which routinely publishes bulletins (12) to tell about the dimensions of this epidemic usually cites the National Center for Health Statistics analyses of reported deaths (death certificate analyses) showing that about 650,000 people in this country die annually from Coronary Heart Disease (CHD). Extrapolating measured rates of myocardial infarction (MI) from studies like Framingham and the National Health Survey, they assume that about 1,000,000 new and recurrent MIs occur per year in this country. They further assess that this represents about 4,000,000 cases of CHD present in the country at any one time.

Such numbers have never been moving to this author; their size overwhelms any point of reference one might have. It is preferable to look at friends and colleagues, neighbors on the street, particularly those people met and seen everyday, and try to guess what are their chances of CHD. Indeed, the practicing physician needs to know how many prime candidates pass through his practice every day. Figure 1.1 from Framingham helps to estimate such rates. It shows the number of new cases of CHD developing in the first 14 years of the Framingham Heart Study to every other man and woman who was free of the disease residing in Framingham, aged 30–62 years in 1950. As the numbers show, for example, every eighth man, aged 40–44 years initially, developed CHD in this time; every sixth man, aged 45–49 years; every fifth man aged 50–54 years, and every fourth man 55 years of age or older. Women ran about one-sixth of this rate under age 50; half of

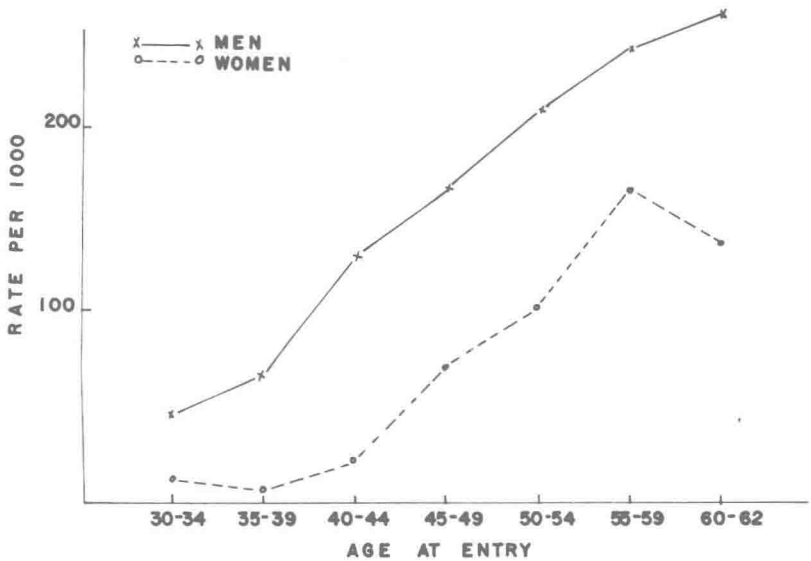

Fig. 1.1. Fourteen-year incidence of CHD (all clinical manifestations) according to age and sex, men and women aged 30–62 years at entry: Framingham Heart Study.

this rate over the age of 50. By age 60 in Framingham, every fifth man has already developed CHD of some form; either angina pectoris, coronary insufficiency, MI, or death due to CHD. One in 17 women are likewise affected by age 60. If one were to include all cardiovascular disease endpoints such as stroke, peripheral vascular disease, and other atherosclerotic disease, virtually every third man in Framingham is afflicted by such diseases by age 60.

Vital Statistics and CHD

These rates are a good vantage point as a departure to look at the general trends of CHD mortality and CHD morbidity which are currently occurring in this country. That such a task is not easy has been described by Gordon and Thom (8). A major problem has to do with the revisions in the international Classification of Disease which defines how causes of death are ascribed. As time passes, medical knowledge changes and the revisions reflect these changes. Inasmuch as the modern revision that delineated the high rate of CHD mortality dates back to 1929, one could begin there. However, the 1939 revision was a considerable change and many feel that rates should start from that period. From 1940–1960 there is a considerable rise in CHD death rates in men, 25.7% in white men, 48.2% in nonwhite men with no increase in white women but a 34.4% increase in nonwhite women. Over most of that period of time and up to the present, total age-specific mortality has been falling in this country, thought largely to be due to salvage of babies and decreases in the impact of infectious disease (Fig. 1.2)

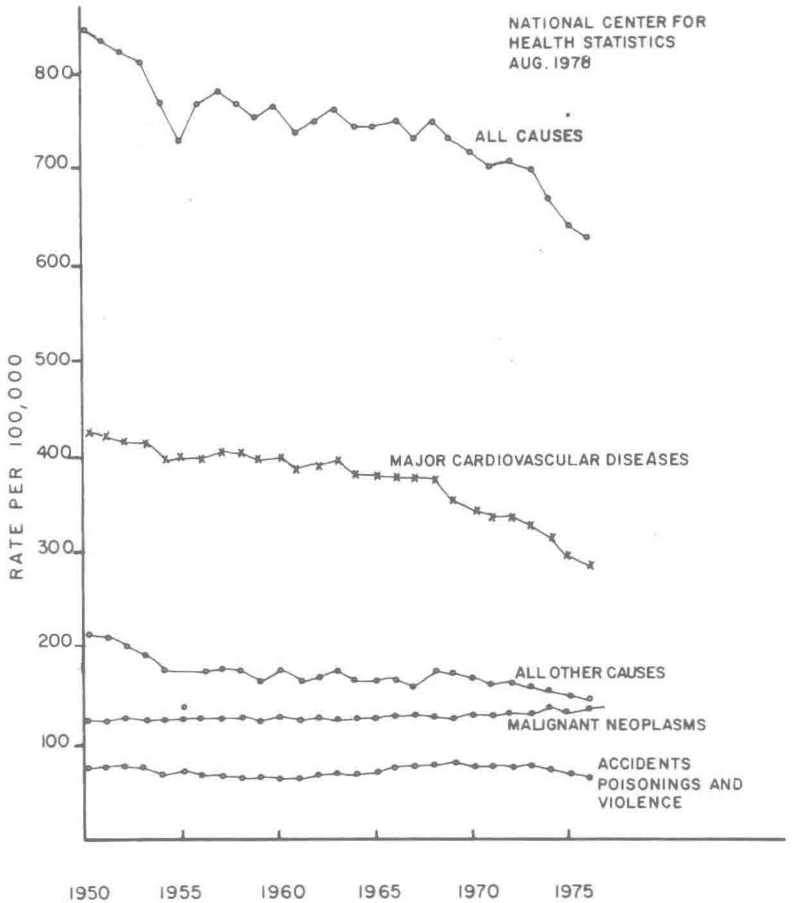

Fig. 1.2. Age-adjusted death rates for major causes of deaths, United States 1950–1976 (22).

In this same time period, as Figure 1.3 shows, cardiovascular diseases in general were falling but CHD rose from 1950–1963, leveling off through the 1960s. In 1967 there was a new revision of the International Classification of Diseases which resulted in reclassification of endpoints to CHD from diseases formally placed in hypertensive diseases and other major cardiovascular diseases. As shown in Figure 1.3, this resulted in a clearcut drop in these latter two categories with a sharp rise in the CHD rubric. Since then, one can see the remarkable fall occurring in CHD endpoints that continues right up to 1976, the last year completely analyzed.

Evidence from Framingham covers some of these points. The incidence of cardiovascular disease *death* appears to be falling as seen in Table 1.1. Unfortunately, no similar fall is seen in the *incidence* of "coronary attacks" or morbidity which rose 17/1000 in men and 15/1000 in women (Table 1.2).