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Health: How to Manage It

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HEALTH: HOW TO MANAGE IT

by

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PREFACE

My interest in writing on the subject of atheroscelrosis with ensuing heart disease and remedial measures which can be taken began primarily with awareness that everyone has atherosclerosis and will eventually die from it, provided nothing else intervenes before that time. This is a rather frightening idea, in spite of the old adage that we all have to go sometime. I have no intention of waiting for that sometime in a crippled state of mind and body. I want the quality of the rest of my life to be the best I can provide for it.

The physician may give his permission to embark on a self-preservation program, but the rest is up to the individual. That is the difficult part because once the decision has been made, it cannot be an off-and-on-again effort. The process must be steady and on-going with continued improvement and research for new concepts for self-help. The doctor's role is approval and guidance with regular reports on the progress made.

I wish to share the results of my research with you, my readers, because if I am able to contribute to helping others improve their way of living, or I have been improving my own, I shall be justifiably rewarded.

The process of health improvement is not only stimulating to the body, but to the mind, as well.

In the following pages, I will explain what atherosclerosis is and how it affects the circulatory system. I will describe how damaging it can be

and what preventative and reversal measures can be taken in order to enhance the quality and longevity of our lives.

I wish to thank my family and the many friends and acquaintances who patiently endured the length of time it took to write these chapters. Homer A. Rowell, M. D. kindly suggested research material in addition to his inspiring seminar. My very special thanks to Elayne Ramos who gave unselfishly of her time to type these many pages. Troy M. Price, M. D. and his nurse, Bonnie Bogues provided reading material. William J. Gribbrn, Helen Walker, Virginia Peters, Sylvia Borek and Richard R. Bottorff who contributed written matter. My thanks to Mary Minghelli, LVN, who donated many medical journals. Barbara Peters helped with the drawings and special thanks goes to Loretta Bates who made copies for my proofreaders. The American Heart Association sent educational material in reply to my request. Nathan Pritikin's Longevity Center in Santa Barbara, California, granted me permission to visit the Center. Emergency Medical Journal gave consent to utilize material requested and the Oklahoma Lipid Research Clinic, Family Study, sent an information letter. Also thanks to George W. Gooche, Administrator, for printed matter and the opportunity to counsel on a lifetime health plan. I am indebted to Mr. Gooche who served as proofreader, along with Craig Eisendrath, Ph.D., Dean, Lindenwood 4, as well as Valerie Simms, Ph.D., and Genevieve Skidmore, Administrator, who gave unstintingly of their time to proofread and offer constructive criticism.

Gail A. Fraser

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CHAPTER 1

HISTORY OF HEART DISEASE

Cardiovascular disease has become the leading cause of disablement and death in the United States and other Western countries. Heart disease has reached near epidemic proportions in the United States with more than one million Americans succumbing to it each year. More people are dying from heart attacks than from all other causes combined, thus becoming our most serious health problem. The mortality of heart disease is three times that of cancer and ten times that caused by accidents, which are the next two leading causes. In addition, more than twenty-seven million people suffer from some kind of cardiovascular disease. In 1975 the estimated economic costs surpassed 20 billion dollars. The population expectancy of the United States for 1980 is 22 million. Close to 68 million people, or about 35% of the population will be over 45 which is the age groups in which coronary artery disease most widely exists.[1]

Heart disease in modern civilization has been continually rising as control of other debilitating diseases has come into effect. The heart attack rate in England and Norway has tripled and it has quadrupled in Scotland.[2]

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[1]Norman Brachfeld, M. D., "Exercise and the Heart: A Rational Approach to Cardiac Rehabilitation," Primary Cardiology 3 (May 1977): 10.

[2]Arthur Blumenfeld, Heart Attack: Are You a Candidate? (New York: Harcourt Brace Jovanovich, Inc., Pyramid Books, 1976), p. 15.

A comparison study of heart disease in other countries revealed the United States rated highest whereas Japan ranked lowest. Considering that heart disease in the 40 to 59-year old group is almost nine times as common in the United States as in Japan,[3] heart disease is still the third highest ranking killer in Japan. Last year 100,000 died of heart disease there with cancer placing second and stroke first in the mortality statistics.[4]

Why so much ado about heart problems and disease today? Let us look back a period of time and see what has brought us to this dilemma.

In 1870, an eminent physician of New York City, Dr. Austin Flint, stated that he had rarely encountered coronary artery disease in his practice--that it was possible that five years could pass before he would see a patient of this kind.

Dr. James Herrick of Chicago made a diagnosis of his first six cases of heart disease in 1912. It was not until then that physicians in the United States learned from his inclusive recording of the events which lead to heart attack. Dr. Herrick's findings were disregarded at that time and it was not until the late 1920's that the field of medicine began to observe this new medical rarity.

Since those earlier days, heart disease has been consistently increasing at an alarming and ominous rate. A number of medical experts have noted and commented on this increase, including world-renowned heart

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[3]Jon N. Leonard, Jack L. Hofer, and Nathan Pritikin, Live Longer Now (New York: Gosset & Dunlap, 1974), p. 11.

[4]"To Cut Strokes, Japan Wages War on Salt," Medical World News 18 (October 17, 1977): 37.

specialist, Dr. Paul Dudley White, who said, "The strict truth is that cardiovascular disease has increased to astronomical heights."

Some skeptics in medical circles have been inclined to doubt the statistical increase in the cardiovascular death rate. They consider the population increase and diagnostic skills of physicians as causative factors for the increased mortality rate of heart disease.

In 1961, Dr. Henry M. Parish, postgraduate medical researcher on autopsy data at Yale University, reported his findings which showed a 60% increase in arterial obstruction in similar age groups in 1940 and 1950.

About this same time, Dr. David Spain of Beth-El Hospital in New York City made an even more startling discovery from autopsy examinations of certain age groups. His results indicated more severe arterial disease in present day forty-year-olds than the previous generation fifty-year-old group. This comparison was shown to exist in every age group indicating that younger people were now being affected with heart disease.

Among other researchers of this period, the Mayo Clinic conducted a survey[5] which showed that deaths from heart attack were greater in younger men than in older men and Dr. R. M. Drake of the California Department of Health indicated from his research that cardiac problems were 50% greater in men under sixty-five years of age than in men over sixty-five.

The evidence for coronary heart disease presented by these early researchers was soon followed by mass studies of various groups such as 20,000 railroad employees, longshoremen, and a number of others. The most notable mass-study is known as the Framingham study which began in

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[5]Blumenfeld, Heart Attack: Are You a Candidate?, p. 18.

1948 and continued for over twenty years. This project began under the auspices of the National Health Institute in Framingham, Massachusetts with about 5,000 adult volunteers. The residents who went about their normal everyday lives, were monitored and tested periodically with notations on signs of cardiac disease and the ways in which it shows up.[6]

The indications from these long-term studies pointed out that coronary artery disease (CAD) is not the normal result of aging nor does it occur haphazardly. It seems to happen as an effect from some definite personal traits which are called risk factors--and these manifested themselves to some extent in a remarkable number of those which took part in the large group studies and consequently developed heart disease.[7]

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[6] Ibid.

[7] "Reducing the Risks," Emergency Medicine 9 (September 1977): 32.

CHAPTER 2

STRUCTURE AND FUNCTION OF THE HEART

The heart consists of two main pumping chambers called ventricles which are the lower area of the heart. The upper heart is divided into two chambers called atria. The right half of the heart receives the blood returning to it from the other parts of the body. The blood coming back to the heart in veins is low in oxygen content because other parts of the body have been supplied with oxygen. The right half of the heart pumps the returning blood into the lungs by means of the pulmonary artery where the blood receives oxygen and flows back to the left half of the heart in the pulmonary veins. The left atrium receives this freshly oxygenated blood and, in turn, pumps it gently into the left ventricle which forcefully pumps the blood into the aorta, the largest artery of the body, from which it flows to the other arteries.[1]

The left chamber does four-fifths of the work of the heart and is the one most often damaged in heart attacks.[2]

Each day the heart accomplishes 100,000 of these pumping cycles which are known as heartbeats--pumping 1,400 gallons of blood a day.[3]

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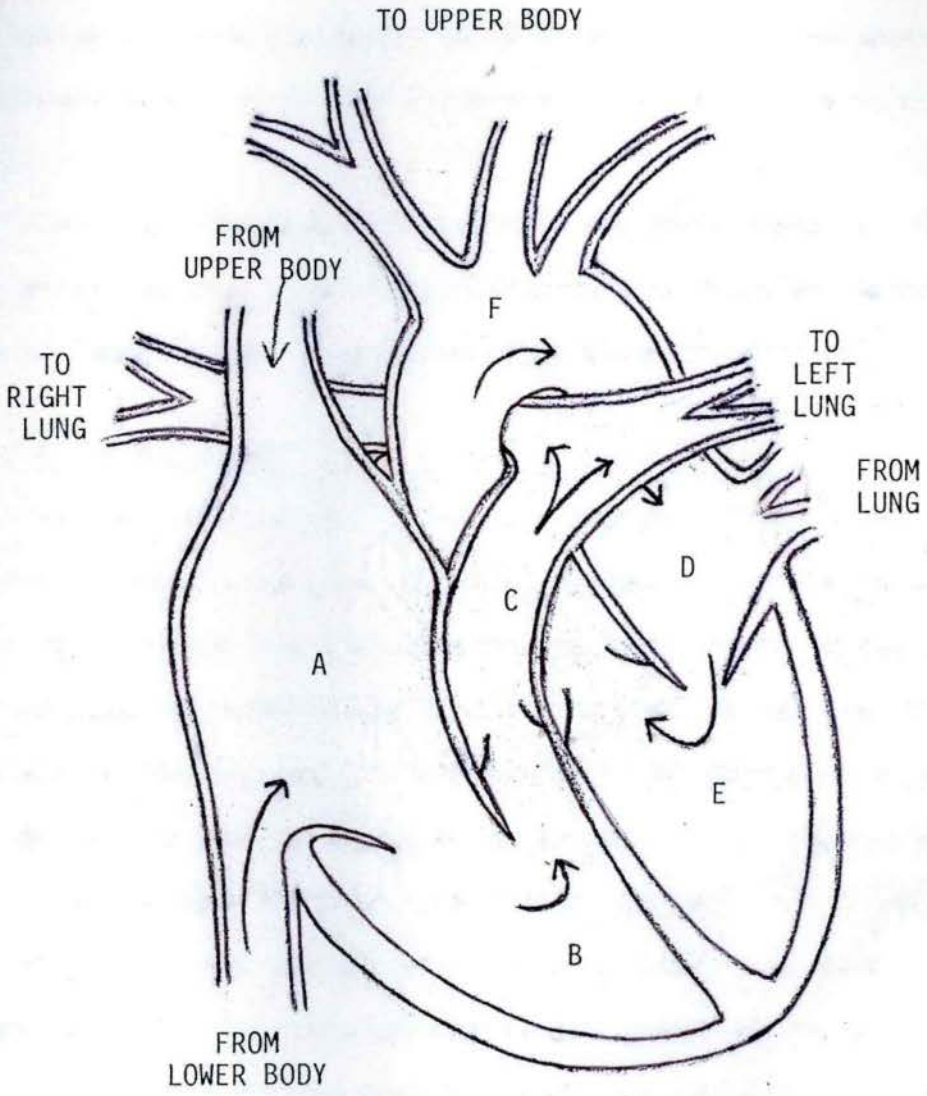
[1]Meyer Friedman, M. D. and Ray H. Rosenman, M. D., Type A Behavior and Your Heart (New York: Alfred A. Knopf, Inc., 1974), pp. 8-9.

[2]Warren Leary, "Mechanical Hearts Blaze Way to Saving Lives," Lancaster (Calif.) Antelope Valley Ledger-Gazette, 15 March 1977, p. 1.

[3]Friedman and Rosenman, Type A Behavior and Your Heart, p. 10.

STRUCTURE OF THE HEART



A RIGHT ATRIUM

B RIGHT VENTRICLE

C PULMONARY ARTERY

D LEFT ATRIUM

E LEFT VENTRICLE

F AORTA

Size of the Heart

The normal adult heart, which is about the size of your fist and weighs about eleven ounces, requires nourishment for its own muscles. The two main coronary arteries which branch off from the aorta carry a continuous supply of freshly oxygenated blood to all the muscles of the heart.

Electrical impulses from the brain are responsible for the rate of the heart's beating. The electrical discharge conducted between the two cardiac nodes is what is measured on an electrocardiogram.[4]

The Electrocardiogram

The electrocardiogram, which is a tracing over a period of time showing changes in electric potential produced by contractions of the heart can indicate irregularities in the heart rhythm to the physician. A patient may be asked to run in place in order to register the effect of exercise upon the heart. The rhythm of the heart should be consistent whether the body is in motion or at rest. A malfunctioning heart will show abnormal rhythm on an electrocardiogram. It is important that an individual has a regular record of electrocardiograms because a slight variation from an otherwise normal record may be very significant. We must also realize that exercise cardiograms should be performed for those of us who intend to begin a new physical fitness program.[5]

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[4] Ibid., p. 14.

[5] Michael DeBakey, M. D. and Antonio Gotto, M. D., The Living Heart (New York: David McKay Company, Inc., 1977), pp. 47-48.

Arrhythmia

Two terms we hear frequently in connection with the heart and may have a vague meaning for us will be defined here. The first is arrhythmia which is an irregularity of the heart rhythm. In brief, these arrhythmias may occur when the heart beats slower than fifty beats per minute or on the other hand, when the heart rate is more than 100 beats per minute. An arrhythmia of a certain nature may indicate the hidden coronary artery disease that we are going to be concerned with, atherosclerosis. Some of these abnormal variations may be normal--for example, an abnormal rhythm may be a normal pattern for a certain individual. Athletes tend to have a slower than normal heart rhythm while emotional excitement will produce increased heartbeat.[6]

Fibrillation

The second cardiac irregularity term that we hear occasionally is fibrillation which occurs when an individual current in the muscles of the heart works independently of the other currents instead of in unison. Auricular fibrillation is not as serious as ventricular fibrillation which can become rapidly fatal because pumping of blood from the heart ceases and so does the brain cease to function as it no longer receives fresh blood.[7] Ventricular standstill occurs when there is stimulation to the ventricle and the heart muscle virtually stands still. These ventricular conditions are responsible for cardiac arrest during which there

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[6] Ibid.

[7] Friedman and Rosenman, Type A Behavior and Your Heart, p. 15.

is no detectable pulse, heartbeat or blood pressure. Breathing may stop and the individual loses consciousness. If the person is not hospitalized when this happens, cardiopulmonary resuscitation (CPR) must be instigated immediately. This technique consists of breathing air into the victim's lungs and application of external heart massage in order to pump the blood from the heart. A number of courses on CPR are available --including the Red Cross. Everyone should consider it a duty to learn this procedure since many lives are saved in this manner.[8]

Your whole body benefits from a strong and healthy heart so therefore it is so very important to give the best care possible to your heart for the condition of it is reflected in the health of the rest of your body.

We have all heard the expression that hard work never hurts anybody and this old saying is true. Unbelievable as it may seem, it is nearly impossible to harm the heart with overwork while the elements that do harm it are disease and poor living habits.[9]

The heart muscles are the most durable of the body--they undergo a great deal of stress before damage with resulting breakdown. It has the capacity to repair itself while working when injury has occurred. Even during serious illness the heart aids in recovery by pumping at a greater speed than normal. It is essential to realize that the heart constantly needs care and nutrition just as much as an automobile needs regular care

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[8]DeBakey and Gotto, The Living Heart, p. 51.

[9]Clifford R. Anderson, Heart Attack (Nashville: Southern Publishing Association), pp. 5-6.

and servicing of its engine in order to give unfaltering service for its lifetime.

When danger is imminent the heart provides a protective action to the body by pumping blood more rapidly through its muscles to provide energy for the rest of the system so the individual has the strength necessary to overcome the stressor. The heart slows to its normal rate as the crisis passes and again resumes its steady, normal rate.

The amount of work accomplished in a day by this remarkable organ is astounding. At a normal rate the human heart has a beat of about seventy times a minute which adds up to thirty-seven million a year.[10] An adult has 60,000 miles of blood vessels which is almost two and one-half times around the world. In addition, this small but strong organ pumps over 220 million quarts of blood in a seventy year period--which is a number greater than the population of the United States.[11]

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[10] Ibid, pp. 7-8.

[11] DeBakey and Gotto, The Living Heart, p. 54.

CHAPTER 3

CORONARY ARTERY DISEASE

We have previously referred to the fact that coronary artery disease is possibly our most serious heart problem as millions of people in the United States die or are disabled each year from various forms of the disease.[1]

The United States and Finland outrank all other countries in the mortality rate of coronary artery disease. The appalling increase in the death rate is not exactly known but the general opinion of medical personnel is the belief in poor dietary habits--including consumption of junk foods, increase in smoking and decrease in exercise due to industry's progress in worksaving devices. We have indeed become a sedentary nation. Add stress to the modern day onrush and we have a sound basis for the cumulative factors of heart disease.

There are some indications of a slight decline in the mortality rate of coronary heart disease in the United States during recent years. This could be a result of public education and better diagnosis--speculatively speaking.

The Coronary Arteries

The coronary arteries are responsible for the nourishment of the heart muscles, which require about 20% of the total blood flow. In this sense they are the most important arteries in the body.[2]

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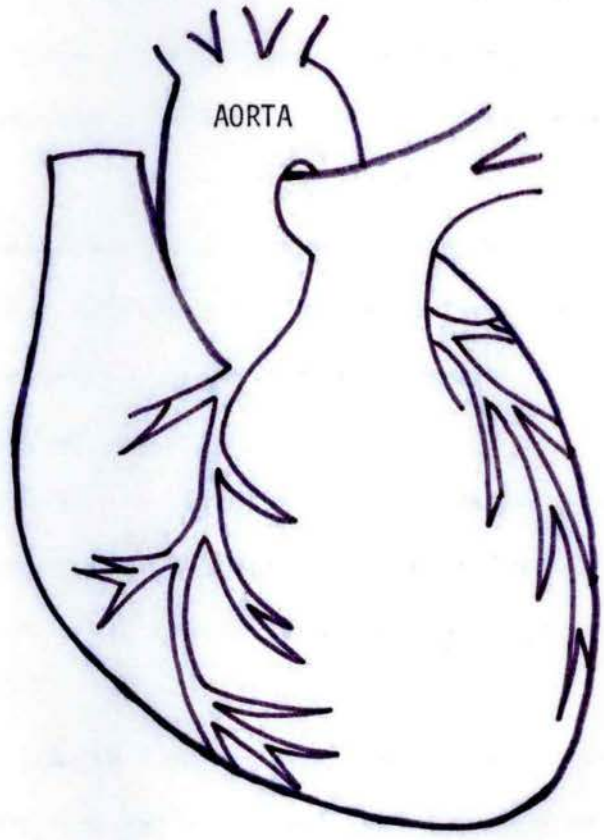
[1]Myron Winick, M. D., "Nutrition in Clinical Practice," Modern Medicine 45 (September 15, 1977): 45.

[2]Debakey and Gotto, The Living Heart, pp. 119-20.

The two coronary arteries, the first major branches of the aorta, bring a continuous supply of fresh blood to feed the pumping muscles of the heart. They are called the coronary arteries because they encircle the heart like a crown. The right coronary artery supplies the right



THE CORONARY ARTERIES

side of the heart and the left coronary artery provides for the left. These arteries branch out into a network of many smaller vessels supplying nourishment to the heart.

The coronary arteries, which lie on the surface of the heart, are not protected like other arteries in the body. As the heart performs its pumping action, the coronary arteries must accompany the contortions of

the heart with its every beat--over 100,000 times a day. Very early in our lives, a great many of us develop tiny defects in the lining of our coronary arteries as a consequence of the constant tumult--possibly the beginning of coronary artery disease.[3]

In an adult the coronary arteries are not seemingly larger, measuring four or five inches in length and about one-eighth of an inch in diameter. Each hour about fifteen gallons of blood are pumped through these arteries.

Many fine connections exist between these two coronary arterial systems so that in event of emergency in one part of the heart, these tiny vessels will expand and continue to supply needed blood--keeping many individuals alive after heart attack.[4]

The "silent killer" is coronary artery disease because it is a hidden disease, apparently symptomless, building up in our blood vessels from the time of childhood until the danger point is reached. Then suddenly, heart attack!

In the normal healthy heart blood flows freely through the coronary arteries, nourishing the heart. Thus, the heart muscles are kept pumping regularly and efficiently.

What causes heart attack? Obstruction in the coronary arteries caused by development of fibrous plaques as well as fatty deposits is the major cause. The coronary arteries that feed the heart are small--the largest being scarecely the diameter of a thin soda straw. This signifies

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[3]Friedman and Rosenman, Type A Behavior and Your Heart, pp. 10-11.

[4]Anderson, Heart Attack, p. 18.

that only a small amount of accumulation need be present in order to cause a reduction in the blood flow of these sustaining arteries. The deposits, known as plaques, are the cause of thickening of the arterial walls with resultant narrowing of the passageway through which the blood flows. Gradually the arteries become too narrow.

Angina Pectoris

Now, one of two things may happen when the supply of blood and oxygen is insufficient to meet the needs of the heart muscle. In the first instance, the decrease of blood to the heart causes a condition marked by chest pain called angina pectoris and is brought on by physical and emotional effort. The most frequent discomfort is centered in the front and middle of the chest beneath the breastbone with a tendency to extend up into the neck and radiate down the left arm. The pain is deep and aching with a feeling of pressure and is generally of short duration which is gradually relieved by rest. Angina pectoris is a temporary situation and does not damage the heart.

The Heart Attack

In the second case, the partially obstructed arteries cause the blood to flow slowly creating a predisposition toward clot formation. The formation of a clot (thrombus) in a coronary artery obstructing the flow of blood is known as coronary thrombosis. Myocardial infarction is also a term which is used to designate the heart attack. It is customary for physicians to refer to the heart attack as M. I. when speaking with

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[5]Blumenfeld, Heart Attack, pp. 21-23.

one another. Myocardial infarction and angina pectoris are the most frequent manifestations of coronary artery disease.

Symptoms of a Heart Attack

In coronary thrombosis or myocardial infarction the occlusion or thrombus is responsible for cutting off the blood supply to a particular area of the heart resulting in damage and death of the heart muscle. A severe, crushing pain is usually felt in the chest which may last for hours or days. Pain may also be felt in the left shoulder, arm, throat or jaw. Sometimes nausea or faintness is present along with the pain. Heart attack symptoms are similar to those of angina but become more painful, more widespread and prolonged. In addition, sweating and faintness is usually present along with the pain. In the event of an attack of this kind it is imperative that the person suffering these symptoms gets immediate professional care that can save his life. Call the Fire Rescue Squad or an ambulance or take him as rapidly as possible to the nearest hospital with a coronary care unit.

Over one-half of the people who die of myocardial infarction die before reaching the hospital and about 80% of those who reach a hospital survive. Neither the patient nor the family should delay in giving attention to chest pains that are symptomatic of heart attack. Too often a person experiencing these symptoms does not want to believe that it is indeed a heart attack because of fear or not being able to make a distinction between the symptoms and other complaints. One of the reasons for the decrease in mortality from heart attacks in recent years is

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[6]DeBakey and Gotto, The Living Heart, p. 122.

the development of hospital coronary care units which have reduced hospital mortality to 20% or less by monitoring and correcting abnormal heart rhythms. More lives could be saved if there were less delay in getting the patient to the hospital at the onset of indications of heart attack.[7]

Heart Failure

Among other forms of heart complications, heart failure is common. This can result from several conditions such as failure of the heart to act as a pump, irregular heart rhythm (ventricular fibrillation), and combination of several "silent" attacks in the coronary arterial branches. In these instances the heart attack victim dies suddenly unless treatment is available immediately.[8]

Collateral Circulation

Fortunately, the heart has wondrous powers of adaption and repair. Over a prolonged period of time when the blood vessels are becoming increasingly clogged and often obstructed nature compensates by the development of small arteries which bypass the blockage. This collateral circulation provides nourishment to areas of the heart which otherwise would be imperiled, thus lessening the efforts of artery impairment and even preventing heart attack. Although these tiny vessels do not carry as much blood as the original artery did, a person who has developed this interconnecting system is at an advantage during heart attack. It

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[7]Arthur J. Snider, Learning How to Live with Heart Trouble (Chicago: Budlong Press Company, 1973), pp. 25-27.

[8]DeBakey and Gotto, The Living Heart, p.

may be lifesaving in comparison to an individual who does not have this development. This is, however, a dangerous situation as the individual is usually free of symptoms and the impending heart attack is only being averted. It has been estimated that about 10% of the population of the United States has a collateral circulation adequate enough to prevent a heart attack. It has also been said that an older person suffering heart attack has a better chance of survival than a younger individual who has not yet had time for this improvised form of circulation.[9]

The Heart Repairs Itself

A damaged heart begins to repair itself with formation of new capillaries which serve the damaged area. A month to six weeks may be required for repair and development of the new circulatory vessels. During this time rest and inactivity is a necessary measure for the healing process. Additionally, protective scar tissue is produced which replaces the dead cells since the heart muscles do not have the ability to reproduce new tissue. Scar tissue has no power to pump blood but it contributes to the tone of the heart wall and, in general, is not a hindrance to the pumping action of the heart.[10]

There are some things to be aware of and to decide which are significant and which are normal occurrences. In any event, a person who experiences an abnormal body function should consult a physician even if he believes it to be a minor discomfort. Often the customary chest pain is

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[9]Blumenfeld, Heart Attack, p. 258.

[10]Snider, Learning How to Live with Heart Trouble, pp. 44-46.

absent and the doctor is the only one who is able to relate the symptoms to the problem in conjunction with special testing.

Palpitation

Some people notice a sudden change in the action of the heart--such as beating rapidly or throbbing. This "thumping" may not necessarily be related to the heart. The palpitations sometimes precede an attack of rapid heart beats which may be of short duration or more prolonged. Almost everyone has palpitations at one time or another and they can be annoying but are seldom serious. The provoked spot in the heart that sets off the attack initially causes extra beats, then the spot begins controlling the electrical behavior of the heart and may cause the short attack.[11] These sensations may be due to a variety of reasons such as menopause, exercise, excitement, nervousness or worry over an illness that is nonexistent. Few of the chest pains and discomforts are caused by heart disease but by other conditions such as arthritis, neuritis, emotional upsets and other health ailments. Lung diseases including cancer are also causative factors in chest pain.

Heartburn

Other disorders that can be mistaken for heart disease involve the digestive system. The esophagus is situated just behind the heart and when a person complains of "heartburn" it is often from a burning sensation behind the breastbone that originates in the digestive tract.

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[11]Lawrence Lamb, M. D., "Check Palpitations with EKG," Lancaster (Calif.) Antelope Valley Ledger-Gazette, 9 November 1977, p. 11.

Hyperventilation

Shortness of breath is common in coronary artery disease, especially after physical exertion of a mild nature.[12] A breathing problem unrelated to heart disease is produced by nervous strain. An individual undergoing tension may begin to breathe more deeply and then more rapidly and soon he is gasping for breath in an endeavor to get more air into his lungs. This situation would not occur if the person were exercising and using up the increased oxygen supply. The level of carbon dioxide in the blood falls which in turn causes chemical reactions in the brain. The person experiences weakness and is faint. The arms and legs have tingling sensations and hands and feet seem cold. The muscles may become spasmodic and the more he breathes the worse the situation becomes. It is understandably an alarming condition although not serious. Many patients with a complaint of this nature are seen in emergency rooms. A simple treatment often prescribed is to have the patient breathe into a paper bag, reusing the same air. This restores the carbon dioxide level in the blood and the patient returns to normal. A person who has this experience is said to be hyperventilating.[13]

Other Circulatory Disorders

Normal occurrences or physical disorders often provoke symptoms that are virtually indistinguishable from circulatory and heart problems. If unusual symptoms persist, do not attempt home remedies. Consult a physician. The atherosclerotic disease which affects the coronary arteries is

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[12] Anderson, Heart Attack, p. 15.

[13] Ibid., pp. 15-16

not confined to the coronary arteries but may affect other arteries of the body. Symptoms other than chest pain will signalize disorder in areas other than the heart. Forms of circulatory disease can affect such organs as the kidneys, the eyes and ears, the brain, stomach, pancreas, liver and other organs in addition to the legs and feet. Some indications to be on the alert for are light-headedness, dizziness, numbness or tingling in the extremities, fainting spells, loss of memory, and ringing in the ears.

Some other things to pay attention to are coughing and wheezing, crying spells, nervousness, fatigue and pain in the jaw.[14]

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[14]Snider, Learning How to Live with Heart Trouble, p. 33.

CHAPTER 4

EXAMINATION AND DIAGNOSIS

Physician-Patient Relationship

In matters of the heart and other related problems, it is of extreme importance to choose your physician wisely. Find a doctor who is willing to examine extensively and inform you freely of your circulatory system. He must also be disposed to discussing risk factors and exercise programs. It is most important that he will help you with behavior modifications and see to it that you do modify your behavior. This includes altering your diet and a regular exercise program. He should give you the assurance of good consultation if extensive testing or surgery is required. He must be a man you have confidence in and like his manner as well. The ideal doctor chosen in preference to others would be one who is a firm believer in prevention and correction of atherosclerosis and heart disease--and who prescribes to a regimented health program for himself.[1]

Conclusively, don't allow any doctor or a friend to convince you that aches and pains can be expected as you grow older. Aches and pains are not a natural expectation for aging--where there is an ache there is a reason. Have you noticed how many people have arthritis? Most aches and pains are said to be arthritis for lack of a definite diagnosis.

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[1]Friedman and Rosenman, Type A Behavior and Your Heart, pp. 244-46.

Tests for Heart Disease

Cardiovascular disease and its complications are often extremely difficult to diagnose because of the confusion of the symptoms with other disorders. The famed Dr. Herrick, whom we mentioned earlier for being noted for his diagnosis of heart disease, set forth twenty-eight disorders that he had found to be confused with heart attack or coronary complaints. The doctor, upon examination of his coronary patient, takes many precautionary measures to reassure himself of his opinion.

Case History

The physician begins his inquiry by asking questions about your background, including illnesses and cause of deaths of close family members. These are important to note since very often heredity plays an important role in disease and its diagnosis. He will also inquire about your past illnesses as well as childhood diseases for they can tell him where a resulting weakness or damage has left its mark. For example, rheumatic fever frequently leaves a damaged heart. Careful and thoughtful responses to your physician's probing questions may give him valuable assistance in tracing and correlating a past illness with today's complaints. Your cooperation together with the doctor's examination and sorting out of complaints and symptoms is called differential diagnosis.

Auscultation and the Stethoscope

A young French doctor, Rene Laennec, invented the stethoscope in 1819. Modest female patients were loathe to undress for examination of the chest such as tapping, known as percussion--and listening with an ear on the chest. Dr. Laennec recalled having seen children listening at one

end of a piece of wood while tapping on the other end. He rolled up sheets of paper into a cylinder and discovered this made a better listening (auscultation) device than the methods in use at the time.[2]

We are accustomed to our doctor placing the stethoscope in his ear with the receiver over the heart to hear its beat. The headset closes off outside noises while delivering the somewhat amplified heart sounds from the receiver through the rubber tubing to his ears. The physician hears two sounds of a normally beating heart. These are caused by the opening and closing of the valves of the heart--lubb-dup, lubb-dup. He is able to interpret various sounds such as murmur and an inflammatory disorder called pericarditis.[3]

Valvular Heart Disease

In the detection of valvular heart disease the stethoscope is of greater value than any other singular instrument or manner of examination. Even during physical examinations of the kind found in mass screenings which are inadequate as far as thorough examining goes, faulty functioning valves can easily be discovered. These findings may come as a great surprise to an otherwise seemingly normal individual who has always enjoyed good health. The case history is of significance now as a childhood disease such as strep throat or scarlet fever could very well account for the damaged heart valves. The disease process has caused formation of valvular scar tissue which gradually worsens over the period

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[2]Dr. William A. Brams, Managing Your Coronary 4th ed., (Philadelphia and New York: J. B. Lippincott Company, 1974), pp. 29-39.

[3]Ibid, p. 37.

of years until physical symptoms occur--perhaps shortness of breath or a rapid heart beat. There is no known medical treatment for this defect--valvular surgery may be the last resort when the patient is no longer able to sustain himself physically--even though his exertion has been of a limited state. However, as long as he continues to be active and no impending danger is apparent, the patient's risk of continuing on medications and limitations usually is less than the risk of undergoing corrective surgery. Again, the stethoscope is the tool for use in testing valvular disease whereas other diagnostic measures are required for different malformations such as congestive heart disease or ischemia (lack of oxygen)--these we are not to be concerned with at this point.[4]

Blood Pressure

Your doctor will take your blood pressure early in his examination as it is a gauge as to what's going on in the arterial network. We need an understanding of what blood pressure is and we need to know how to remedy the problem when it is abnormal. It is essential to be cooperative in the treatment of high blood pressure.

Let us think of our heart as a pump that sends the blood flowing through the blood vessels of the body. As the blood is pumped, it exerts pressure against the arterial walls. This blood pressure is known as systolic pressure and occurs when the heart is working. Diastolic pressure is the lower pressure when the heart is between beats and resting.

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[4]Faye C. Lewis, M. D., A Doctor Looks at Heart Trouble (New York: Doubleday & Company, Inc., 1970), pp. 23-32.

Blood pressure is determined by wrapping the cuff of the testing instrument (sphygmomanometer) around the arm and tightening it by forcing air into it. He does this by squeezing the bulb connected to the cuff by a rubber tube. The pressure of the inflated cuff cuts off the circulation of the artery in the arm. Now the stethoscope is placed on the inside of the elbow below the cuff to confirm that the blood flow has been stopped. Simultaneously, the column of mercury on the manometer is forced up in the tube by the pressure on the cuff and is read on the gauge. The normal reading should be between 100 and 140.

Now the doctor releases the air from the cuff slowly, listening to the artery with his stethoscope while watching the column of mercury. The blood flow returns and when he stops hearing the pulsation the heart is resting. A second reading is noted now as the diastolic pressure--which is the pressure of the blood in the vessels that raises the mercury to the normal levels of 70 to 95.

The figures your doctor records represent the systolic (highest) and diastolic (lowest) pressures and they are written in fraction form--for example, $\frac{138}{70}$. The numbers signify the pressure required to push a column of mercury to a specific height. Your doctor will tell you that your blood pressure is 138 over 70. Most doctors consider the figure 140/90 as the upper limit of normal. Everyone's blood pressure changes with varied circumstances such as being different in different parts of the body. Your blood pressure can rise during activity, illness and stress. The anxiety of the visit to the doctor alone can cause your doctor to raise his eyebrows when he takes your blood pressure! The important thing to remember is whether it is consistently above normal level. High blood

pressure or hypertension can cause damage to other organs in the body as well as the arteries. It can shorten your life. You must rely on the doctor to inform you if your blood pressure requires control, and which method or combination of methods to use. You should also not take advice from friends and relatives--and remember that blood pressure varies from one individual to another. Your pressure may be different than that of your friend.[5]

Low blood pressure is significant, too. It is usually low after a heart attack. In this instance the low pressure may assist in confirmation of heart attack.

Blood pressure instruments may be purchased and are excellent for taking your own blood pressure at home once you have mastered the technique. It is interesting to see how the pressure changes during the day and it is also a good way to monitor yourself if you are on medication.

Laboratory Tests

A battery of laboratory tests are excellent diagnostic aids to the physician. Some tests reveal heart disease in progress while others indicate the extent of damage. When the doctor suspects a heart attack has occurred or is in process he may order a panel of chemistry tests called cardiac enzymes which can indicate how long the heart attack has been in development. This set of enzymes is also utilized to monitor the course of the heart attack--the levels rising with the severity of the attack and falling again to normal as the heart attack subsides. A relatively

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[5]"High Blood Pressure: A Positive Approach," (New York: Boehringer Ingelheim Ltd.).

high blood uric acid level is present in the individual who is experiencing heart attack. It is also seen in conjunction with elevated levels of cholesterol which in this case may indicate metabolism disorders--in turn having the potential for being the causative factor for atherosclerotic plaques that produce heart disease. A high blood cholesterol as well as other lipid levels is a good indication that immoderate amounts of fats have been deposited in arterial walls.[6]

Other confirmative laboratory tests to take into account should not be overlooked by an exacting physician. A high hemoglobin and hematocrit as well as white blood cell count can point toward heart attack--in the presence of other signs. A fast falling sedimentation rate and an increase in body temperature are other indicators to be considered.

X-ray and the Fluoroscope

The size and position of your heart can be determined by use of x-rays. A series of x-rays show the physician if the heart, aorta or pulmonary artery is enlarged. He also views the lungs for congestion due to heart failure. Regularly taken x-rays are advisable because change such as damage to heart muscle and valves can be discovered by comparing to past x-ray photographs.[7]

The fluoroscope is an x-ray device which allows the physician to observe the heart in motion. He can view the movements of the aorta and

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[6]Edward B. Diethrich, M. D. and John J. Fried, Code Arrest: A Heart Stops (New York: Saturday Review Press E. P. Dutton & Co., Inc., 1974), p. 53.

[7]Ibid, p. 54.

pulmonary artery and can see whether there is congestion in the lungs as their shadows are cast on a fluorescent screen.[8]

The Electrocardiograph

Two German scientists discovered, about 1856, that heartbeats in frogs produced electrical impulses. Later a physiologist in London, Augustus Waller, recorded the electrical stimuli on man. He called this procedure electrocardiography. Around the turn of the century a German by the name of Einthoven refined the technique and instrument so successfully that he received the Nobel Prize.[9]

A normal heart has a system of electrical discharges which is responsible for the regularity of the heartbeat. In the heart the electrical current begins in a certain location in the right atrium called the sinoatrial node and travels over the entire heart along fixed electrical pathways at regulated speed. This electrical activity is the stimulus which is responsible for the contraction of the heart. The tiny (millivolt) waves are distributed throughout the body along definite pathways to the skin where they are picked up and registered on the electrocardiograph.[10]

While the patient is at rest on the examining table, electrodes are attached to certain spots on the arms, legs and chest. These positions are called leads and they pass the millivolt current to the galvanometer of the electrocardiograph machine where a marking device records the

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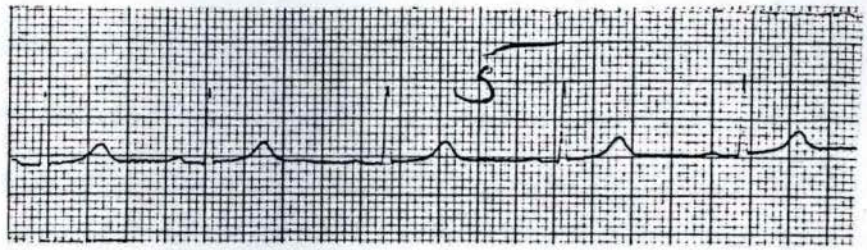
[8]Brams, Managing Your Coronary, pp. 40-41.

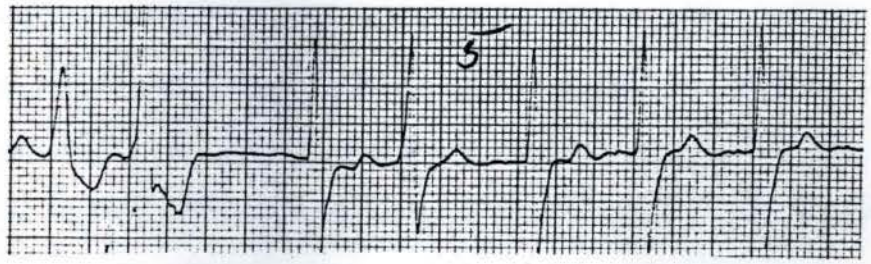
[9]DeBakey and Gotto, The Living Heart, pp. 44-46.

[10]Friedman and Rosenman, Type A Behavior and Your Heart, p. 14.

electrical waves on a ribbon of specially lined paper. It is this photographic paper, called the electrocardiogram, that provides the physician with a vast amount of information regarding the condition and function of the heart. He can discern if a previous heart attack has caused damage to the heart muscles and whether there is sufficient blood supply to the



NORMAL ELECTROCARDIOGRAM



ABNORMAL ELECTROCARDIOGRAM

heart. The electrocardiogram (ECG) can also indicate if a heart murmur in a child may be due to a structure defect of the heart. It can show the doctor if any of the chambers of the heart are enlarged.[11]

An illustration of the value in using ECG examination is the extensive testing of Prudential Insurance employees with the resultant

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[11]Diethrich and Fried, Code Arrest: A Heart Stops, pp. 54-56.

statistics showing that even the slightest variance in electrocardiogram patterns were related to increased heart attack rate and death.[12]

It is true that electrocardiography is not the sole answer for detecting heart disease and abnormal functions of the heart. Your doctor will rely on other tests and symptoms together with the ECG before reaching a decision. In many cases the electrocardiogram is used as a confirmatory measure since the doctor already has well in mind what the diagnosis is from past experiences of this nature. If the physician were to rely on the electrocardiograph as the one and only tool for diagnostic purposes some rather disastrous results could take place. For example, a patient could very well be on the brink of a heart attack with clogged coronary arteries, yet exhibit a normal resting ECG because there has not yet been damage to the heart.[13]

I shall illustrate this point with the story of Mr. S., who, in his early 40's had retired from a career in military service and had accepted a job which called for rather strenuous physical work. His new position required an annual physical examination including an electrocardiogram which was entirely normal. There were no abnormal findings during the process of examining Mr. S. The following evening this big, strong, apparently healthy man was dead of a sudden heart attack. His grief-stricken family learned that, at autopsy, severe atherosclerotic heart disease with occlusion was revealed as the cause of death.

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[12] Clement G. Martin, M. D., Managing Your Health: Profits Without Losses (Homewood, Illinois: Dow Jones-Irwin, Inc., 1971), p. 15.

[13] Ibid., p. 56.

In another instance, the electrocardiogram can demonstrate a normal pattern for up to two weeks following heart attack. Additionally, the ECG may show abnormality following a suspected heart attack but not of the typical pattern usually seen. The electrocardiogram may also be normal during apparent heart attacks brought on by emotional or psychological experiences[14]--and in atrial fibrillation, which is a type of heart irregularity. Thus, careful probing using diagnostic techniques is essential for the wary doctor in order to ensure the correctness of his decision. Many confusing symptoms are apt to present themselves where heart problems are concerned, calling for tact in addition to knowledge on the part of the physician who handles real as well as imaginary heart attacks.

Exercise Stress Testing

Since it is widely known that it is difficult to assess the function of the heart by its performance at rest medical science has turned to incorporating methods of examination while the heart is under stress due to body activity. This approach is reasonable because we do not live our lives in a resting state--therefore we should be tested according to the amount of stress which each individual can comfortably tolerate just as we would in everyday living.

Demonstration of exercise testing was first seen in 1928 when cardiologists noted electrocardiogram changes after patients with coronary disease had exercised. A year later a cardiologist gave a description

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[14]Martin, Managing Your Health: Profits Without Losses, p. 54.

of a test for endurance testing which prepared the way for exercise testing of the future.[15]

There are several devices used in exercise testing today. They all measure the cardiopulmonary fitness of the individual. An international group of experts reported to the World Health Organization (WHO) that the preferential order of exercise tests should be: bicycle ergometer, step test and treadmill.[16]

Although treadmill testing has become the most popular test, the other two methods will be considered briefly. The Masters test or two-step test was developed by Dr. Arthur M. Master who was an early pioneer in stress testing. The patient steps up and down a two-step staircase for a certain period of time or until the physician believes the heart rate of the patient is accelerated. The electrical impulses of the heart are then recorded by the electrocardiograph. This was an advance in heart function testing, but there are some disadvantages in this method, the most significant one being that the electrocardiogram is taken after the patient has finished exercising. The heartbeat rapidly decelerates following exercise, therefore validity of the test decreases once the patient is stationary.[17]

Even so a number of undisclosed cardiac abnormalities have been revealed by the step method its inadequacy can be summarized by the fact

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[15]John Davis Cantwell, M. D., Stay Young at Heart (Chicago: Nelson-Hall, 1975), pp. 29-31.

[16]Herbert A. DeVries, Physiology of Exercise for Physical Education and Athletics, 2nd ed. (Dubuque, Iowa: Wm. C. Brown Company Publishers, 1974), p. 192.

[17]Diethrich and Fried, Code Arrest: A Heart Stops, pp. 58-60.

that the exercise undertaken by the individual is either too rigorous for some and not strenuous enough for others--in which case a diagnosis of coronary artery disease could be missed.[18]

Bicycle stress testing is more popular in Europe than in the United States because the Americans are not as accustomed to using their legs, which accounts for greater exhaustion during testing.[19] The mechanism used is a stationary bicycle whose wheel is propelled by the individual's pedalling. The stress can be adjusted by changing the tension and the advantage is that the ECG can be taken during continuous exercise. Some authorities believe that the work load of the bicycle test can be evaluated more easily than the treadmill with the added attraction of being more inexpensive equipment.[20]

The bicycle exercise program is currently being used for testing children by Children's Hospital Medical Center, University of Cincinnati College of Medicine. Their findings in cases such as aortic obstruction and cardiac arrhythmias have shown that exercise electrocardiograms can be used for detection of obstruction and evaluation after corrective surgery. In addition to discovery of the abnormalities by this technique the information acquired has the potential for improved medical management of these young patients.[21]

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[18] Ibid., p. 59.

[19] DeVries, Physiology of Exercise for Physical Education and Athletics, pp. 191-192.

[20] Cantwell, Stay Young at Heart, p. 32.

[21] Samuel Kaplan, M. D. and Frederick W. James, M. D., "Exercise Testing in Children," Primary Cardiology 3 (November/December 1977):34-40.

Treadmill testing is gaining in popular use and perhaps a reasonable explanation could be that in bicycle testing the individual is motivated to pumping action whereas on the treadmill he has no choice and must keep up with the set pace. Therefore in treadmill testing, the subject can be better evaluated while under greatest permissible stress during which time his maximum endurance capacity is measured.

In preparation for treadmill testing a resting ECG is performed in order to determine any apparent abnormality of the heart. Other examinations are also conducted for the purpose of determining the individual's state of health and physical fitness--past history and exercise program included. When clearance for the testing has been approved the electrocardiograph electrodes are attached to the subject's chest. This is for the purpose of monitoring cardiac activity during the testing. When an abnormality is disclosed the test is stopped. In some treadmill setups a device is used to collect the air expired from which the amount of oxygen the patient uses during the test is calculated. When all the preparations have been made the subject steps on the treadmill platform which is moving slowly at a low incline. Calculations for the heartbeat target rate based on the person's age and sex have been determined by tables in advance and the patient is informed that when the target rate is reached the test is finished. For example, a 57-year-old woman would be programmed to attain 144 heartbeats per minute at the end of the third stage. The test is conducted in three-minute stages which become increasingly

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[22]Kenneth H. Cooper, M. D., M. P. H., Aerobics (New York: Bantam Books, Inc., 1972) pp. 29-30.

more difficult. The first stage when the patient steps on the platform is mainly for warm up and to assist the individual to become accustomed to the movement beneath the feet. You are told to relax and try not to grip the handrails tensely--and walk naturally with easy strides. At the beginning of the second stage the speed and incline are increased and you are running now. The ECG is taken at intervals while the patterns are observed on the oscilloscope screen. The technician or cardiologist frequently questions you about fatigue or chest pain. Now, entering the third phase, the incline and speed are again increased. Shortness of breath, dizziness and any pain in the upper extremities are watched for closely. Abnormalities may be apparent on the oscilloscope while the patient has no symptoms.[23] Most people reach their target rate somewhere between the third and fifth three-minute runs. It is not uncommon for an individual to be in such poor physical condition that he cannot go past phase one or two without extreme fatigue. The treadmill test is one of the most valuable aids in detecting heart function deficiences in people who are completely unaware of them. As an added bonus it also measures the physical fitness of the individual.[24]

There are several sophisticated tests which can be used once the discovery of heart malfunction or disease is made. After a positive stress test indicates the patient is in trouble further testing must be done to find the exact location and degree of heart disease present.

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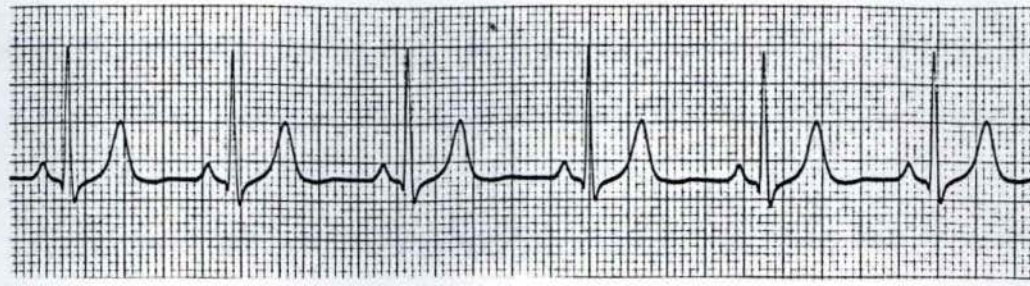
[23]School of Health, Loma Linda University, Loma Linda, California. Physical Fitness Evaluation under the direction of Dr. Charles Thomas; Lancaster, California, November 20, 1977.

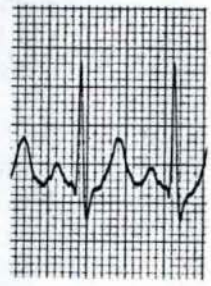
[24]Cooper, Aerobics, pp. 29-31.

NORMAL TREADMILL TEST

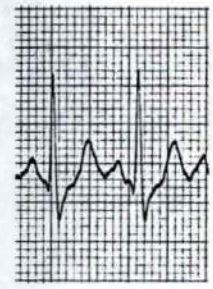
FOR PHYSICAL FITNESS EVALUATION



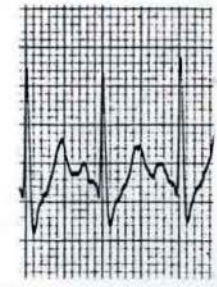
Resting Stage with Heart Rate (HR) of 69



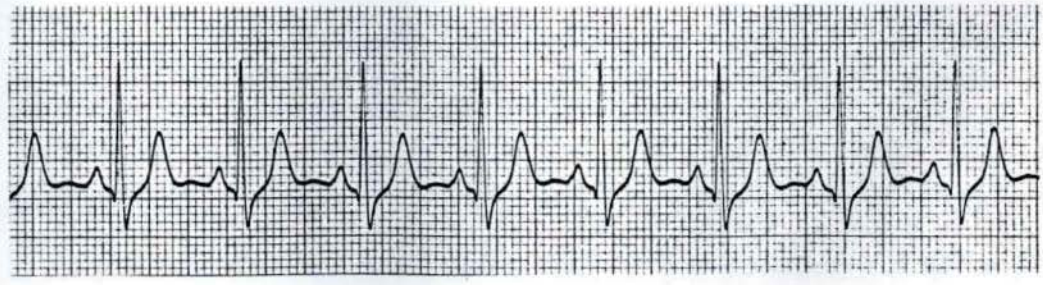
Stage I
HR 124



Stage II
HR 139



Stage III
HR 153



Two-Minute Recovery Stage with HR of 89

Cardio-vascular Stress Testing by the School of Health, Loma Linda University. Sponsored jointly by Seventh-day Adventist and Y. M. C. A., Lancaster, California, November 20, 1977.

Heart Catheterization

Cardiac catheterization was developed in 1929 by Dr. Werner Forssmann, a young German physician of twenty-five, who first tested his theory by working on cadavers and then later on himself. His technique was not widely accepted during the ensuing years until Dr. Forssmann received the Nobel prize in 1956. The method of catheterization consists of threading a tube into a vein of the arm and up into the shoulder and chest until it reaches and enters the heart. In this way the heart's function can be studied by withdrawing blood samples from the chambers of the heart and measuring the oxygen content of the blood. Pressures are also measured in order to ascertain the pumping ability of the heart.

Angiocardiography

A further procedure, once the catheter has reached the interior of the heart, is the injection of a dye into the catheter. Early methods used x-ray to photograph and view action of the heart. Today moving pictures are made during the movement of the dye within the heart's vessels. This process, known as angiocardiography, has provided understanding of many heretofore unknown conditions of the heart.

Arteriography

Another version of catheterization is arteriography which was developed by Dr. Mason Sones, Jr. in 1962. This technique allows heart specialists to look inside the coronary arteries for signs of coronary artery disease. It also aids in the location of plaques.[25]

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[25]Diethrich and Fried, Code Arrest, pp. 62-66.

Catheterization procedures are considered relatively safe and quite painless when performed in large cardiac centers conducted by expertly trained cardiologists and personnel. There is, of course, a certain risk involved whenever foreign material is introduced into the heart--a risk which must be weighed against the necessity. To illustrate, Mr. G., a 52-year old man who had been injured in an auto accident, was found to have a heart abnormality at the time of his accident. He was advised of the need for further testing, including heart catheterization, which could have led to corrective surgery. Mr. G. was told by ill-advised friends of the danger of having the testing done. He therefore determined in his mind that he was not afraid of the open-heart surgery but he was terrified of the catheterization process because he might die while undergoing such testing. Mr. G., was not able to absolve himself from this fixation and he died of a heart attack while still wearing the neck brace from his auto accident.[26]

Heart catheterizations are not a routine procedure. As mentioned earlier it is a highly complex technique and is used primarily in cases where it is expected that open-heart surgery will be the final result. It is also used only after a series of other tests such as we have described earlier. Only then a catheterization procedure is used as a diagnostic measure when warranted.

It seems appropriate to cite here the case of Mr. B. who was 55 years old at the time of his mild heart attack. During the previous 10-

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[26]Conversations of author with Mr. G. during early months of 1977 in Lancaster, California.

year period Mr. B. had severe headaches and was continually tired. An allergy specialist tested him extensively for allergies and the outcome was weekly shots for various grasses and tree pollens. Following a period of allergy shots, Mr. B. decided he did not experience relief and abandoned this treatment. He resigned himself to his lot of headaches with a heavy remedy of anti-pain drugs. One day, on a regular work day morning, Mr. B. felt chest pains which radiated to his throat and down the left arm. He knew these symptoms were of a serious nature and he went directly to the nearest hospital where he was admitted to the coronary care unit. After several days of testing and the subsidence of the episode he was taken to a hospital in a nearby city where he was examined by a noted team of cardiologists. A ninety percent blockage was discovered in one of Mr. B.'s coronary arteries during heart catheterization and arteriography. He subsequently underwent open-heart surgery with a single by-pass of the diseased coronary artery. Mr. B. was discharged from the hospital ten days after his surgery and was able to return to his work a short time later. This happy outcome of a frightening situation was due to Mr. B.'s prompt attention to his symptoms, modern methods of examination by capable medical personnel with surgery by a team of experts--and, not to say the least, Mr. B.'s consistently positive attitude. It is now over two years since this incident and Mr. B. has never had reoccurrence of his headaches. This is also a fine example of "hidden" heart disease--indeed, mistaken for an allergy![27]

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[27]Personal knowledge of Mr. B.'s attack which occurred in Lancaster, California in September, 1975.

Ultrasound Scanning

Yet another advancement being used in cardiological diagnostic centers is ultrasonic scanning of the heart in which high-frequency sound waves are bounced off the heart and picked up by a device that transforms them into electronic signals and an oscilloscope pattern. This technique enables the cardiologist to examine the heart and its function without invasion of the heart.[28]

Echocardiography

There have been many technical improvements since echocardiography's introduction over twenty years ago although the basic instrument is relatively the same. The Japanese were the first developers of the device which scanned the heart by use of the ultrasonic beam on the oscilloscope. Greater changes came with refinement of instrumentation by a Dutch engineer named Bom. The latest advancements are being used to identify tissue, such as scar tissue.[29]

Radionuclide Cineangiography

Researchers at the National Heart, Lung, and Blood Institute report a new effective method for the evaluation of coronary artery disease. The efficiency of the heart is measured at rest and during exercise by the use of movies taken after injection with radioactive technetium.

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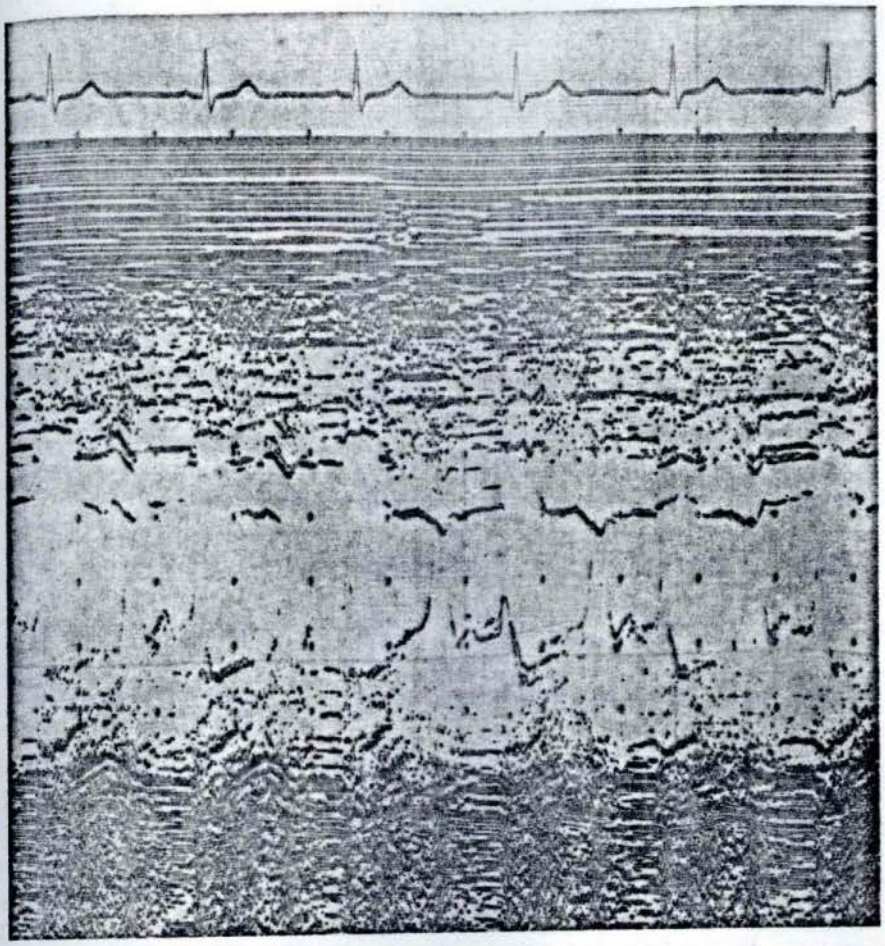
[28]Diethrich and Fried, Code Arrest, pp. 72-74.

[29]Harvey Feigenbaum, M. D., "Advances in Echocardiography," Practical Cardiology 3 (October 1977): 69-83.



Echocardiogram from a normal subject during echocardiographic study at Lancaster Cardiology Medical Group on January 16, 1978.

This technique, known as radionuclide cineangiography, is not used alone as a diagnostic measure, but in conjunction with other tests as well.[30]

Walking ECG

Another way of studying the heart during exercise is by means of the walking ECG, which is a very small ECG machine that the patient wears

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[30]"When a Treadmill Spots Heart Disease," Medical World News 18 (June 13, 1977): 41.

during a twenty-four-hour period. This device measures the heart's action during normal everyday activities--the results of some "normal" stresses can often amaze the most seasoned doctor. These devices which are equipped with an alarm system, can be connected to a telephone, so that wherever the patient is at the sign of cardiac disturbance, he received the signal to phone his physician.

Computer Diagnosis

With the advent of mass screening cardiac centers are resorting to computer assistance for interpretation of ECGs; thus freeing the cardiologist for time to spend on the abnormal ECGs received from the computer. Computers have even been programmed to read and select abnormal x-rays of the heart--and in addition, to give suggestions for further case studies by the physician. Now computers often monitor treadmill exercising with print-out of all information at the end of the test.[31]

The end product of the recent innovations in heart study along with stepped up mass screening campaigns has disclosed many unknown cases of heart disease and potential risks of heart attack. The information gained from testing individuals gives the physician the knowledge to ascertain the patients' problem and to plan the appropriate method of treatment--including preventive measures involving change of living habits. The knowledgeable physician will attempt to halt and to reverse the underlying cause of heart disease, atherosclerosis, by these means.

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[31]Diethrich and Fried, Code Arrest, pp. 74-78.

CHAPTER 5

ATHEROSCLEROSIS

Definition

Atherosclerosis, the major cause of heart attacks, affects at least six million Americans. Athero means fatty and sclerosis[1] means fibrous or hard. Atherosclerosis is a disease of the arteries characterized by the abnormal accumulation of fatty materials on the interior walls of the blood vessels--reducing the blood flow through the arteries.

How It Develops

There has been considerable debate over the composition and cause of these deposits, called plaques. The most generally accepted theory is that fatty streaks begin to be laid down in the arteries very early in childhood--in fact, the vessel walls start to thicken from the time of birth but, as some believe, not necessarily from atherosclerotic processes but from pressures of blood flow. These small amounts of fat are deposited on the innermost of three layers of the arterial walls called the intima. The place where this first fatty deposit occurs is called a lesion and it is not exactly known why it occurs--perhaps from some sort of injury, damage or disease process at that point. These small plaques may heal and disappear or they may become gradually enlarged.

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[1] Ibid., p. 127

When these small fatty deposits remain, changes begin occurring such as hemorrhages where small blood vessels have grown into the plaque and ruptured. Fibrous material is now laid down during the process of healing and scarring occurs--increasing the size of the plaque.

At the time of the damage to the intima or inner lining, the smooth muscle cells of the intima begin to proliferate. Blood lipids (fats) including cholesterol are inside the muscle cells giving them a yellow color and they are designated as foam cells which are seen in early atherosclerosis.

As the plaque gradually increases in size with foam cells, hemorrhages and fibrous material, it may become infiltrated with calcium (causing hardening), dead cells and debris. These older plaques, sometimes gray in color and called fibrous plaques protrude into the lumen of the vessel and become potentially dangerous as they often break open expelling material into the blood stream, in turn upsetting the blood-clotting mechanism with the formation of a thrombus or blood clot at another site. Eventually these ongrowing plaques may affect the inner artery layer, the media, and these advanced atherosclerotic stages stand little chance of healing.[2]

It will not be difficult for us to realize the outcome of the atherosclerotic process. With plaque build-up the interior diameter of the arteries becomes gradually smaller and smaller and the blood flow is diminished. Years may go by without any sign of atherosclerotic disease

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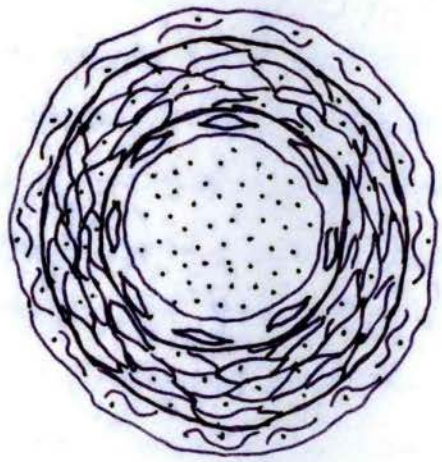
[2]Benjamin F. Miller, M. D. and Lawrence Galton with Daniel Brunner, M. D., Freedom from Heart Attacks (New York: Simon and Schuster, 1972), pp. 24-25.

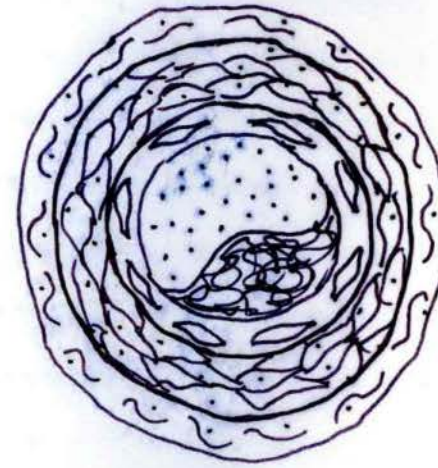
until a certain stage of the process has been reached, symptoms begin to occur and the individual undergoes pain when the demand for oxygen supply cannot be adequately met during some form of extra exertion--running up the stairs, excitement at a ball game, shoveling snow.[3]

Contributing Factors

No one theory seems to suffice for the explanation of atherosclerotic



Normal Artery



Artery with Plaque

development. A number of conditions need to be taken into consideration as each one of us acquires these fatty deposits in different areas, at various rates and diverse times. Risk factors such as hypertension, cigarette smoking and elevation of blood cholesterol and other blood fats are of prime importance as well as such things as age and sex. Atherosclerotic lesions are now being found more in younger people (beginning in infancy) than previously seen, increasing in degree with advancing

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[3] Ibid., p. 25.

age. Women have the protection of the female sex hormone, estrogen. After menopause when women no longer produce this hormone they become as vulnerable as men to the process of atherosclerosis. This does not hold true in blacks.[4]

Different races seem more susceptible to the development of this disease which is probably explainable because of dietary habits and exercise. Those living in higher altitudes have a lower incidence of atherosclerosis because more effort is required for daily accomplishments in lowered oxygen level atmosphere, therefore calling for increased exercise. The people living in mountainous areas have an added bonus of breathing more purified air than the inhabitants of smog-laden vicinities. There is a lack of statistical data to confirm the speculation that living in higher altitudes plays a significant role in lower heart disease but surveys have shown that the mountainous western states have a lower rate of heart related diseases than the rest of the United States.

The Maasai

In some areas of Asia and Africa atherosclerosis is practically nonexistent. The Maasai tribe in Africa is a good example and studies of the tribe have shown that their yogurt diet is responsible for the lowered heart attack rate.[5]

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[4]DeBakey and Gotto, The Living Heart, pp. 113-14.

[5]"Clinical Trends," Practical Cardiology 3 (April 1977): 8-11.

Heredity

Heredity plays a major part in susceptibility to atherosclerosis. Family histories often show a pattern of heart disease which may be a tendency carried by the genes or could be influenced by living habits; researchers have not as yet determined the correlation.[6]

Other factors involved are diseases such as diabetes and gout, the stresses of everyday living and industrialization--which leads to a more sedentary life.

We have been talking about atherosclerosis and the heart because wherever atherosclerosis is systemically located it eventually affects the heart with resultant heart attack. However, we are going to be mainly concerned with atherosclerosis itself and the risk factors involved and its prevention and reversal.

Atherosclerosis of the Brain

Atherosclerosis can affect any artery in the body producing disease in that area. When the blood flow to the brain is restricted senility or stroke may occur. Often corrective surgery is performed when the lesion is located within easy access, such as the carotid arteries in the neck. An incision is made and the atheroma or plaque is removed from the arterial wall.

Mr. M., a seventy-year-old senile diabetic had apparently incurred several light strokes with typical strokelike symptoms which led his

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[6]Michael P. Scott, "How You Can Make Your Heart Healthier," Better Homes and Gardens 55 (October 1977): 16.

physician to pursue an examination and evaluation for surgery. Mr. M. successfully underwent removal of a lesion in the carotid artery on the right side of his neck. He made an excellent recovery from the operation and is now partially relieved of his headaches and his impaired memory has greatly improved--and he states that he feels fine.[7]

Atherosclerosis of the brain takes place frequently and it is sad to behold senile old people ridiculed when in reality they have an arterial disease--moreover, it is not a normal state of the elderly. Many aged persons are productive into very old age--for instance, Vladimir Horowitz, the gifted and noted pianist, who this year, celebrates his fiftieth year in concert. At the age of seventy-four he is the highest paid concert pianist in history. His brilliant performance on the keyboard equals the strength and vigor of a younger man.[8]

Stroke

It takes many years of atherosclerotic development to produce a stroke. A stroke occurs in a similar manner as heart attack--when the blood supply to the brain is cut off or severely diminished. There are, however, four major arteries with several smaller connections which supply blood to the brain; thus serving as a protective measure when one or more vessels become clogged.

How do we know when a stroke is impending--or when atherosclerosis is affecting the arteries of the brain? There are signs and symptoms to

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[7]Discourse with Mr. M. on July 12, 1977 at which time he described his problems and carotid surgery evidenced by the well-healed scar.

[8]CBS "60 Minutes," Vladimir Horowitz, December 26, 1977.

look for; light-headedness, dizziness, headaches, head noises or ringing in the ears. Numbness and tingling in the feet and hands and impairment of vision as well as confusion are other signs of imminent danger.[9]

The word stroke originated long ago from the conviction that the individual victimized was struck down by God. Fatalities from stroke may be well over 400,000 annually and there is evidence that more than two million Americans suffer some effect of stroke such as losses of speech, balance, vision, hearing and sensation of pain, touch and temperature--and paralysis of some part of the body.[10]

Stroke Risk in Blacks

The major role that hypertension plays as risk factor in stroke is evidenced by statistical data which includes reports of the stroke risk in the black male being five times greater than in the white male. This should be understandable since hypertension is more prevalent in blacks. It is also of notable interest that mortality risk from heart attack is five times greater in white males than blacks. According to the International Atherosclerosis Project reports, blacks have more atherosclerosis of the brain than whites and whites have more comprehensive atherosclerotic coronary arterial disease. A similar comparison can be made between the Japanese and Caucasian Americans because of the higher rate of hypertension in Japan.[11]

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[9]Blumenfeld, Heart Attack, p. 32.

[10]Miller, Galton and Brunner, Freedom from Heart Attacks, p. 175.

[11]DeBakey and Gotto, The Living Heart, pp. 144-46.

Little Strokes

An atherosclerotic problem that is increasingly involving younger people in this country is becoming known as little strokes. France's Dr. P. Wertheimer calls this development the transient "little stroke" of the Americans while Dr. W. C. Alvarez and Dr. H. A. Schroeder apply the term "strokelets" to these vague characteristic symptoms which are so indefinite as to be overlooked and attributed to something else. Little strokes may be manifested by a brief fainting spell or dizziness, a period of clouded vision or perhaps some mental disorder such as confusion or memory loss. If the progression of little stroke occurrences continues at the present rate the future seems rather ominous because younger people will develop senility earlier and mental problems will become more rampant--including warped personalities.[12]

Ear Artery Blockage

We are inclined to think of only heart attacks and strokes in conjunction with atherosclerosis when in reality many different areas of the body are subject to this debilitating disease. Will it surprise you to learn that there is atherosclerosis of the arteries of the inner ear? The initial symptoms are "ringing" in the ears with progression to sensations of dizziness to deafness. Here again, we are finding frequent occurrence in young people--another destructive process generally associated with the elderly.[13]

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[12]Blumenfeld, Heart Attack, pp. 32-33.

[13]Ibid., p. 29

Occlusive Disease in the Legs

Increased deposits of atheromatous plaques in the legs is undoubtedly the result of greater blood pressure in the lower extremities. Here the pattern is typical of the atherosclerotic process with deposition of plaque or atheroma in certain areas such as the arteries in the lower abdomen, the thighs and below the knee. Pain occurs in the regions during walking or exercise and is relieved when resting only to return again when walking is resumed. The term for this periodic symptom is known as intermittent claudication and can become so severe that eventually pain is present even when resting. Diminished circulation to the lower extremities subjects the victim of this disorder to further dangers of the feet such as ulcers which may become gangrenous--necessitating amputation of a toe or even the leg.

Diagnosis and treatment of this atheromatous ailment is begun by the use of arteriography to pinpoint the location and extent of the plaques. Depending on the extent and nature of the atheromas, surgical procedure to remove them or to incorporate a bypass graft may be used. Both techniques are highly successful with a minimum of risk for both the arteriography and surgeries and the majority of patients are able to resume normal activities with improved circulation. There is not any very successful treatment when atheroma is involved in the area below the knee.[14]

Abdominal Artery Blockage

Besides supplying blood to the lower extremities the abdominal aorta is additionally responsible for the blood supply to the arteries that lead

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[14]DeBakey and Gotto, The Living Heart, pp. 154-61.

to the organs in the abdominal cavity. The stomach, liver, pancreas and kidneys are all recipients of atherosclerotic deposits. When the arteries to the kidneys are clogged, which occurs mostly in men from fifty to seventy years of age, the kidneys become severely damaged and may require surgical removal. In less serious cases a bypass graft may be employed or the atheroma is often removed by surgical technique called endarterectomy.

Artery blockage in the gastrointestinal tract, known as abdominal angina, is characterized by pains following meals. The patient has other typical abdominal complaints as well as diagnosis and treatment is by arteriography and surgery as in atherosclerotic lesions of other organs of the abdomen.[15]

The arteries to the pancreas are sometimes blocked, giving rise to a condition termed "senile" diabetes. Blindness and other disorders of the eyes, including cataracts can be caused by clogged vessels in the eyes.[16]

Aneurysms

A bulge or outpouching formed in a weakened wall of an artery is called an aneurysm. A dangerous situation exists when the arterial walls become so weakened that the outpouching sac is subject to bursting or leaking blood. The usual cause of this dilemma is atherosclerosis. Aneurysms occur most commonly in the abdominal aorta, the major artery running

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[15] Ibid., pp. 161-63.

[16] Blumenfeld, Heart Attack, p. 31.

down the center of the body. An aortic aneurysm can be effectively repaired if discovered before rupture.

Dr. Michael DeBakey, a renowned cardiovascular surgeon from Houston, Texas, has developed a surgical procedure for removal of the aneurysm and replacing it with a Dacron graft. It is interesting to note that the Duke of Windsor successfully underwent this surgical treatment.

Aneurysms occur at different points in the body other than the abdominal aorta. For example, some strokes happen because of arterial rupture in the brain. Coronary arteries are protected by muscular support--consequently aneurysm is not found there but a bulge can develop in the heart muscle itself following heart attack. An aneurysm located in the left ventricle interfers with the pumping action of the heart, thus depriving the body of essential blood supply. If it is located in an area indicating successful surgery, the aneurysm can be removed and the muscle repaired.[17]

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[17] Jesse E. Edwards, M. D., and Bernard Goott, M. D., The Illustrated Coronary Fact Book (New York: ARCO Publishing Company, Inc., 1974) pp. 58-60.

CHAPTER 6

LET'S TALK ABOUT CAUSE AND PREVENTION

The Problem of Modernization

In the foregoing chapters we discussed heart disease and the role that atherosclerosis plays in the development. We also talked about other degenerative disease caused by atherosclerosis, sometimes referred to as arteriosclerosis--a term meaning "hardening of the arteries" and is no longer in popular use. We discovered that everyone has atherosclerosis in varying degrees since childhood--that means us. Think of it! This "disease" we all have will progress, and although it may take a period of years in slow development, it will culminate in heart attack, stroke, or one of the other degenerative diseases such as kidney failure.

Now, let's look at it from a different angle. Aside from heart abnormalities not related to atherosclerosis, heart attack would not occur without an advanced case of clogged arteries. Other vital organs of the body would not slowly deteriorate if they had a good healthy supply of blood. When someone dies of a stroke or heart attack, not for a minute do we think that the individual died of atherosclerosis. But undoubtedly that is exactly what happened since most heart attacks are caused by atherosclerosis.

Ironically, the grief and tragedy caused by heart attack, to say nothing of the staggering amount of money spent annually in the United

States in payment for lifesaving services for this catastrophe, the cause of the problem has not been averted--atherosclerosis still remains.[1]

In the preceding chapters we have learned how heart disease is often difficult to diagnose. It has been pointed out that frequently a series of tests are required as diagnostic aids and then all too often a symptomless person falls victim to heart attack or some other cardiac dysfunction. By this time it is too late for the physician to help the patient with preventative measures for the atherosclerotic process--since statistics show that about 75% of those who die of heart disease will die before reaching a hospital and a number of persons will die shortly after admission. Most of these people die suddenly with no history of the disease.

It is not too late for us to talk about preventive measures. If we are going to conquer this number-one public health problem we will have to study the underlying causes. There is strong evidence that atherosclerosis can be prevented and with its prevention coronary heart disease will be lessened.

Prevention of atherosclerosis is concerned with the causes which are called risk factors because they introduce the risk of the disease.[2] Prevention is knowledge of these factors together with an effort by the individual and his doctor to correct and alleviate undesirable habits or ailments. We shall be discussing the risk factors in the ensuing pages and let's be aware of whether or not we have any of these risks--if we do it does not mean that we have heart disease. It does mean we are at risk,

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[1] Leonard, Hofer and Pritikin, Live Longer Now, p. 20.

[2] "Reviewing the Risks," Emergency Medicine, p. 31

that is, we have potential for atherosclerosis. When we know how the risk factors influence atherosclerotic deposits, hopefully we will be inspired to initiate and follow a program of prevention.[3]

In the first place, what has happened? And why suddenly, are we going to have to be concerned with things that we have always taken for granted--like, why we can no longer eat and drink the way we always have and why we have to quit smoking and lose weight, why do we have to concern ourselves with high blood pressure and learn what cholesterol is all about? And so many other whys--do we really need to have more exercise? Why do we? Because these things are all involved with risk factors that were not so critical when we were an active nation instead of a sedentary one--and when we ate frugally instead of, abundantly.

Science has conquered the illnesses that once were the major killer diseases. Diphtheria, smallpox, typhoid fever and soon others such as measles will be virtually unknown. Left in the wake of these triumphs is atherosclerosis.

Industrialization has set the stage for the development of atherosclerosis. The luxuries of modern day living are all programmed toward making life for us more comfortable and effortless. The food we eat is rich and plentiful. Our daily lives are filled with mechanization and motorization--from pushing buttons for changing television channels to opening and closing garage doors.

Advancement of civilization is responsible for other debilitating factors such as environmental pollution and the stress of everyday modern life.

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[3]Edwards and Goott, The Illustrated Coronary Fact Book, pp. 68-69.

The Yemenite Jews

An interesting comparison of atherosclerosis and coronary heart disease in other countries show that atherosclerosis is not a physiological process but rather one of diet and living habits.

When Israel was founded in 1948 great numbers of people came from all parts of the world to live there, thus providing excellent means of study in heart disease because they brought a variety of ethnic, genetic and lifestyle backgrounds. Doctor Daniel Brunner, Israel's eminent researcher in cardiovascular disease has conducted extensive surveys on the Yemenites who were brought to Israel from Yemen which is located on the southern part of the Arabian peninsula. He and other investigators have found over a period of years of study and experiment in the Yemenite Jews --who came to Israel nearly free of heart disease and its risks from a land of very limited and simple food supply to a land of plenty--that they have shown marked increase in cardiovascular disease. The hardworking Yemenites, in addition, came from a country of low economic standards to one of modern industrialization. The pattern of atherosclerotic heart disease process of these people and the findings of similar studies of Western civilization are of a parallel nature.

Bedouins

The Bedouins, desert inhabitants of Israel, have a low incidence of heart disease. They have also provided an interesting study because those that have shown an increased heart disease rate are the sheikhs and their families who have adopted the living habits of the Western World.

Other segments of Israelian society have contributed valuable information to research data and the outcome is inevitably the same--richer

diets and sedentary living are responsible for increase in atherosclerotic heart disease.[4]

The Bantus

Heart disease among some 50 million Bantus in Southern Africa is virtually unknown. Their lives are as yet untouched by Western modes of living which is again strong evidence that their primitive diet and lifestyle is responsible for their heart disease-free bodies. A five-year study during the 1950s produced results that showed not one Bantu died of heart disease in a large hospital, the Nkawa Nune Hospital, throughout that period.

New Guineans

Another excellent example of low rate of heart disease in conjunction with simple living is the native of New Guinea. A study performed in the 1950s revealed that only one death in 600 could be ascribed to heart disease. Of further note is the fact that the blood pressure of the New Guinean does not increase with age as it does in the United States. It is known that high blood pressure adds to the incidence of heart disease.[5]

The lesson we can learn from the study of living habits of these primitive countries in various parts of the world should be of some benefit to us in modifying our lifestyles. Surely we do not wish to return to primitive living. Can we enjoy the Good Life and build healthy bodies,

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[4]Miller and Galton, Freedom from Heart Attacks, pp. 187-201.

[5]Leonard, Hofer and Pritikin, Live Longer Now, pp. 26-27.

too? It seems likely that with a little common sense and a knowledge of the risk factors involved in atherosclerotic heart disease that we should be able to achieve this goal. In fact, it is possible that life will be a whole lot more enjoyable when we realize that we are creating healthier lives for ourselves which, in turn, will enable us to live longer. And what is even more important is that the quality of our lives will be better.

CHAPTER 7

RISK FACTORS

Sex

Let's look first at risk factors over which we have no control. The risk of coronary heart disease is lower for women than for men because of the protection against atherosclerosis by the female hormone, estrogen. During the childbearing years of women, men of the same age group are developing atherosclerosis. After menopause, when the secretion of estrogen diminishes, the incidence of heart disease among women increases. Because of this natural immunity women usually tend to have heart attacks ten years later than men. Women who have had total hysterectomies with removal of the ovaries develop atherosclerosis and suffer heart attacks at a much younger age than women who have not had ovarian surgery.[1]

Controversy exists in regard to estrogen therapy for men and women. For men, in particular, adverse side effects can be produced including development of feminine characteristics. To illustrate, Mr. M. whom we mentioned earlier as having undergone carotid artery surgery, was also given estrogen treatment. After a period of time Mr. M., realized his breasts were enlarging and he refused further medication.

There is also a conflict of opinion over whether administration of estrogen to menopausal women will protect them against atherosclerosis

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[1] Edwards and Goott, The Illustrated Coronary Fact Book, p. 78.

and heart attack. Some authorities believe that estrogen therapy is beneficial in this respect while others decline its use because of its potential risk for causing cancer. Thus, we may debate its use. Would we rather have estrogen treatment and run the risk of cancer or shall we do without the treatment and face the risk of heart attack?

Heredity

There is evidence that heredity is of principal importance in atherosclerosis and it is another risk factor over which we have no control. We inherit genetic inclinations to risk factors such as elevated cholesterol, hypertension and diabetes. The individual who has a family history of heart disease is more apt to develop the disease than the person whose family shows absence from it.

A conflict of opinion exists over whether atherosclerosis is a genetic predisposition or if there is some other condition responsible for the prevalence of the disease in some families. Dr. G. P. Vecchi, of the University of Modena in Italy, headed a research project on families from several different locales in Italy. Dr. Vecchi found there was a correlation between dietary fat and the incidence of atherosclerosis. Therefore, his conclusions were that atherosclerotic heart disease is not so much a disease passed down through the genes in families as it is a disease resulting from mode of living and fat consumption passed from generation to generation.

Dr. J. F. Mustard of Canada conducted a similar experiment on dietary habits of families and his findings showed the families who had the highest degree of atherosclerosis were the ones who had high fat diets.

Other surveys show the same comparison between "hereditary elements" and fat consumption. Dr. D. R. Bassett of the National Heart Institute concluded from his findings that a familial behavior pattern may have been acquired which, in turn, is responsible for the atherosclerotic pattern.

In the face of much confusion over "hereditary tendencies," more genetic research will be needed in order to validate the theories presented by present day studies. Meanwhile, we can use the information of our family backgrounds for risk potential which will be useful to us as guidelines for avoiding the risk factors which are unfavorable for us.[2]

Can We Control Risks?

It should be mentioned that risk factors are not always the cause of heart disease although they may be related to it. The American Heart Association Committee on Stress, Strain, and Heart Disease has reported that risk factors are found in 40-60% of heart attacks. Atherosclerosis and heart attack generally, but not always, go hand in hand.[3]

There is, however, evidence that control over those risk factors that can be regulated can substantially influence the progress of atherosclerosis and heart disease. Since the occurrence of heart disease seems to be decreasing, a plausible explanation may be that programs are now under way to lessen the effects of risk factors.[4]

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[2]Blumenfeld, Heart Attack, pp. 74-82.

[3]"Hard Work May Offset Cardiac Risk Factors," Family Practice News 7 (November 1, 1977): 7.

[4]Charles E. Kossman, Atherosclerotic Coronary Artery Disease

A word is needed here about the individual and his concern for risk factors. It is a well-known fact among all of us that if our physician tells us to stop smoking or to lose weight because these factors are bad for our health, we take his suggestions lightly. Of course, we have intentions of doing as the doctor says and somehow we just cannot seem to start the program or to continue with it once we have started. It seems that we are loathe to modify our behavior. It is especially difficult as we never experience rewards for our efforts and we are never sure that there are any.[5]

Take the case of Mr. A., a 55-year-old retired businessman. His doctor advised him to give up his small business after a heart attack. This cheerful, friendly man walks briskly for five miles on a daily basis. He swings his arms as he walks for extra exercise. He says he learned this from his father who lived to a ripe old age. Mr. A. is concerned about his health--yet he smokes a pack of cigarettes a day. He knows that the habit is dangerous for him because it causes contraction of the blood vessels, thus causing his blood pressure to rise. Mr. A. already has high blood pressure and takes medication for it. Yet, he cannot seem to quit smoking although doing so may help reduce his high blood pressure.[6]

It is small wonder that today's physician is not inspired to play a more active role in the prevention program of controlling his patient's risks. Some of the risks that are easiest to change, for instance, smoking, can be the most difficult to change because the individual has to do

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[5]"A Research Paradigm for Preventive Cardiology," Cardiovascular Medicine 2 (July, 1977): 621.

[6]Authors acquaintance with Mr. A. and his case.

this himself. The doctor may be able to encourage his patient to stop smoking by explaining its hazards and the danger to the heart and lungs. The physician has no means of control over whether or not the patient adheres to the prescribed program of lowering his risk factors. It should be pointed out that the patient who is knowledgeable about his risk factors in comparison to persons with lower risks is more likely to accept and follow a program of prevention. The physician can do a great deal to lessen his patient's chances of dying from heart disease provided he has the cooperation of the patient.[7]

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[7]Linley E. Watson, M. D., "What You Can Do to Prevent Cardiovascular Disease," Consultant 17 (June, 1977): 89.

CHAPTER 8

THE ROLE OF CHOLESTEROL

Let us reconsider a notation we have mentioned earlier--that our rich Western diet apparently has a significant bearing on the atherosclerotic process. Blood fats or lipids, known as cholesterol is the important element of the diet responsible for atherosclerotic deposits, and therefore, is a major risk factor.

Cholesterol, a fatty substance is found in all living things. It is found in our bodies and in many of the foods we eat.

A Frenchman by the name of Chevreul was the first person to identify and describe cholesterol. Although another French scientist, Pouletier de la Salle, discovered cholesterol in human gallstones in 1769, it was Chevreul who gave cholesterol its name in about 1824. The term cholesterol is from the Greek, meaning "bile solid."[1]

As early as 1847, Dr. J. Vogel proclaimed in his Physiological Anatomy of the Human Body that when atherosclerosis exists in human coronary arteries, cholesterol also is present.[2]

Later, a German pathologist by the name of Virchow perceived that atherosclerotic deposits on arterial walls were composed of a soft, fatty material. Virchow names this plaque atherosclerotic--athero meaning soft

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[1]Menard M. Gertler, M. D., You Can Predict Your Heart Attack and Prevent It (New York: Random House, 1963), pp. 122-123.

[2]Blumenfeld, Heart Attack, p. 87.

or fatty and scleros, hard. It wasn't too long before he and his fellow workers discovered that cholesterol was a major component of the plaques. The way was now paved and other researchers demonstrated the relationship between cholesterol and atherosclerosis.[3]

During the early part of the century Dr. Anichkov, the first investigator in prevention of heart disease, affirmed that atherosclerosis did not exist without cholesterol. There was no need at that time for extensive research on this new curiosity as heart attacks were virtually unknown. When the rate of heart disease began increasing, ultimately reaching epidemic proportions, the medical authorities became hard pressed for explanation of the contributory causes.[4]

The importance of cholesterol in the atherosclerotic process had now become well established. Researchers found out that cholesterol exists in every cell of the human as well as the animal body. It is not found in the vegetables of our diet. Can the reason for the lack of atherosclerosis in animals be due to their low cholesterol diet? Is this why atherosclerosis can be produced so readily in experimental animals? The vegetarian rabbit has been the animal most often selected for research.

Function of Cholesterol

Cholesterol is an alcoholic substance technically called a sterol. There are two sources of cholesterol. One comes from the food we eat and the other is manufactured within the body, chiefly by the liver. Cholesterol, which is necessary for the health of the individual, exists--as we

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[3]Gertler, You Can Predict Your Heart Attack and Prevent It, p. 123.

[4]Blumenfeld, Heart Attack, p. 87.

have said--in every cell of the body. Thus, it is a normal element found in glands such as ovaries and testicles and is essential for production of the hormones estrogen and testosterone. It is found in the brain, nerve tissue and the blood.

Another function of cholesterol is that it serves as an electrical insulation. It coats and protects the network system of the brain and nerve cells, in much the same way the wires in an electrical network are insulated one from the other. It is understandable, that as an insulator, cholesterol must be of a most durable nature--which leads us to wonder if this could be an explanation for the tenacity of this fatty chemical in our arteries. Can, indeed, this essential substance become a culprit when there is too much of it?

Both the liver and the intestines synthesize cholesterol. That which is manufactured in the body is believed to be of a different nature than the cholesterol derived from the food we eat. The composition of the cholesterol from food metabolism is of a quality that seems to have an affinity for arterial walls. Therefore, intake of fatty foods can result in the type of cholesterol that will be deposited as atherosclerotic plaques --leading eventually to heart disease.[5]

What is meant by too much cholesterol? An excess of cholesterol in the blood stream is called hyperlipidemia and can be measured by a simple laboratory blood test. The assay is calculated as milligrams percent and then the individual's blood cholesterol level is compared with a normal range. For instance, if your cholesterol value is 250 mg% and the normal range is 150-300 mg% your cholesterol falls within the normal range.

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[5]Friedman and Rosenman, Type A Behavior and Your Heart, p. 36-41.

What Is "Normal" Cholesterol?

Let's talk about what constitutes normal cholesterol levels. If we are to help ourselves prevent and even reverse our atherosclerotic conditions, the knowledge of normal cholesterol levels and what each of our own level amounts to is of prime importance. The big controversy is over the normal limitation of cholesterol and it varies somewhat in different parts of the country. But let's start with the figure we just mentioned, 150-300. What has happened in the United States is, this and other similar ranges have been established from the national average. Our blood cholesterol average of about 220 to 250, is the highest in the world--so this means our established normal range based on the national average is too high. And the rate of increase in the cholesterol average has been climbing over the past years.

A mass study of risk factors and heart disease with periodic testing of cholesterol levels was carried out in Framingham, Massachusetts. The findings of the Experiment revealed the association of high cholesterol with coronary heart disease. The results indicated that a thirty to fifty-year-old man with a blood cholesterol of over 260 increases his risk of coronary artery disease in the following five years by at least three and one-half times in comparison to the risk if he had a cholesterol less than 200.[6]

Dr. Irving M. Levitas, author of the book, You Can Beat the Odds on a Heart Attack, is among those who express doubt as to whether a cholesterol level of 240 is a normal value. Too many doctors are under the false

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[6]DeBakey and Gotto, The Living Heart, p. 221.

impression that the national average is the normal value. Dr. Levitas compares our cholesterol values with those of countries where heart disease is almost nonexistent. For example, investigation of the entire adult population in a village in Equador revealed a cholesterol mean of 160-165. A number of the people studied were from the age of 75 to age 100.

The aborigines of West Malaysia were the subjects of further study, according to Dr. Levitas. This group of people who has never had any recorded heart disease, exist on a simple diet composed mainly of fruit, rice, cereals and fish. Their average cholesterol was 143.[7]

Dr. Blankenhorn, Chief Cardiologist at the University of Southern California, Los Angeles County Medical Center believes that a person with a cholesterol level above 300 should be treated. He would also consider treatment for those patients in the range of 200 and 250--depending on whether other risk factors are involved. Dr. Blankenhorn advocates cholesterol levels under 200 for adults. Children's cholesterol levels can be determined by adding the age of the child to 200.[8]

Cholesterol in Children

A study of school-age children in Muscatine, Iowa has produced evidence that some children can maintain persistently high cholesterol levels which, in turn, warrant attention from the physician. Dr. Ronald M.

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[7]"What Are Your Odds of Having a Heart Attack?", The Clinical Laboratorian (Fall, 1976): p. 6.

[8]"Hyperlipidemia Treatment Individualized by Type, Lipid Level," 7 Family Practice News (October 1, 1977): 34.

Lauer, director of the survey, has found that 5% of the schoolchildren have cholesterol levels greater than 230. This figure is considered to be bordering on risk for an adult. Notable statistics emerging from this study indicate a familial link in that children with consistently elevated cholesterol levels are those with families who have a greater than average risk for heart disease. Dr. Lauer's contention is that the physician should recommend a low fat, low cholesterol diet for a child of this type.[9]

The Cholesterol Controversy

There is, of course, much dispute--and many pros and cons over the cholesterol hypothesis. Some notables in the field of nutrition feel that dietary restriction of cholesterol intake causes the body to produce more cholesterol to compensate for the lack of cholesterol consumption. There are many conflicting theories--among which some say that only small amounts of dietary cholesterol are absorbed in the body while, on the other hand, if you take in abnormally low amounts of cholesterol foods you are depriving your body, thus leaving it subject to other diseases.

Dr. Robert Levy of the National Heart, Lung and Blood Institute, Bethesda, Maryland, has said that it has not yet been proven that lowering of cholesterol levels will decrease the risk of heart disease.

One of our foremost leading heart specialists, Dr. Paul Dudly White, has said that he finds the role of cholesterol difficult to access. He

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[9]"What Do Risk Factors In Children Mean?," Medical World News 18 (March 21, 1977): 37.

also believes the cholesterol manufactured in the body is not related to the cholesterol derived from the foods we eat.[10]

Arising from so much conflict of opinion are the basic facts which still prevail--heart disease and cholesterol levels continue to increase. Let's hear what several of our authorities have to say about it.

Dr. DeBakey holds the theory that although we don't have proof that high cholesterol is responsible for atherosclerosis it may contribute to its development. He also notes that our diets have changed within the last 100 years and that our dietary customs are different from the inhabitants of those economically depressed nations where rich foods with high cholesterol measure are scarce.[11]

Although Dr. Levy has stated that lowering cholesterol levels is not positive proof of decreased risk of heart disease he, along with Dr. Jeremiah Stamler and Dr. Antonio M. Gotto, Jr., emphasizes that direct evidence is strong indication that we in America should alter our diets by lowering our intake of saturated fat and by reduction of our blood cholesterol levels. Dr. Levy is confident that the major risk factors for heart disease are hypertension, cigarette smoking and hypercholesterolemia.

Dr. Gotto of the Baylor College of Medicine, Huston, Texas, advises that--from the results of the Framingham study--the death rate from cardiovascular disease would probably decrease if diets lower in cholesterol

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[10]Edward R. Pinckney, M. D. and Cathey Pinckney, The Cholesterol Controversy (Los Angeles: Sherbourne Press, 1973), pp. 22-25.

[11]"Current Psychological Factors in Managing the Cardiovascular Patient," 4 Practical Psychology for Physicians (June, 1977): p. 11.

and saturated fats were begun in childhood and continued during lifetime. This eminent physician has also stated that the American Heart Association recommends that we Americans lower our blood cholesterol levels ten percent by dietary control.[12]

Triglycerides

If you have a cholesterol level which your doctor considers abnormally high he may order further lipid testing and one of the terms he may mention is triglycerides. These are types of fats that are normal components of the blood and when they are present in excess--like cholesterol--become deposited in atherosclerotic plaques. Triglycerides, meaning glycerines in combination with three fatty acids, are, again like cholesterol, derived from fats in our diet as well as produced in the body. Triglyceride levels are usually not elevated along with a high cholesterol and are generally related to other conditions when elevated such as hypothyroidism, obesity, liver and kidney disease, diabetes and alcoholism. Oral contraceptives may be responsible for a rise in the triglyceride level.[13]

"Good" and "Bad" Cholesterols

When we speak of cholesterol we are talking about total cholesterol which contains different types of fat particles, fat-carrying proteins of the blood, called lipoproteins. These, in turn, are divided into

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[12]"Evidence Still Sought About Cholesterol Effect on Heart," 7 Family Practice News (April 1, 1977): p. 47.

[13]William Likoff, M. D., Bernard Segal, M. D., and Lawrence Galton, Your Heart: Complete Information for the Family (Philadelphia and New York: J. B. Lippincott Company, 1972) p. 184.

several classifications, the most important as far as cardiac risk is concerned are high-density lipoproteins (HDL) and low-density lipoproteins (LDL). The high-density lipoproteins (HDL) carry cholesterol and are looked upon as the "good" cholesterol because the role of HDL is the removal of free cholesterol from the body cells and transporation of it to the liver for excretion--furnishing protection against coronary artery disease.[14] The low-density lipoprotein, LDL, contains the bulk of cholesterol in the blood and, therefore, is the most dangerous as it has a proclivity toward the deposition of cholesterol on the arterial walls. It makes sense, then, that the higher the HDL is in proportion to the LDL would be better for our health.

In fact, results of the Framingham study indicate that total serum cholesterol is not effective in itself as a predictor of risk for coronary disease. Our American diet contains far too much cholesterol and saturated fat, thereby raising the level of the "bad" cholesterol (LDL). The higher the "good" cholesterol (HDL) level, the better it appears to function as it seems, in addition to its duty of carrying cholesterol for excretion, to prevent the "bad" cholesterol (LDL) from depositing its fatty materials on the arterial walls. The medical world is realizing that HDL rather than total serum cholesterol is the best forcaster of coronary heart disease in people after age 50. Those of us over 50 can benefit by this knowledge at our next visit to the doctor by asking him for HDL and LDL tests instead of, "How about a cholesterol test today, Doctor?"

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[14] "New Look at Lipids--Why They're Not All Bad," 3 Current Prescribing (June, 1977), p. 39.

Family studies have shown that where members of some generations have lived into the 80s or 90s with little cardiovascular disease, their HDL levels are high with correspondingly low levels of LDL.[15] Statistics also show that, on the average, women have a higher HDL than men which could be one explanation of the lower heart attack rate in women. However, when the HDL levels of men and women are comparable, the risks become the same. It also has been shown that at birth about 50% of our cholesterol is HDL and subsequently the effects of the American diet and lack of exercise reduce it to 25%. That leaves the soaring LDL to do its arterial damage.

Some sidelights on the lipoprotein levels demonstrate that women on the Pill have lower HDL cholesterols. Diabetics have lower HDLs and higher LDLs than nondiabetics. Programs of regular physical exercise such as regular running will raise the HDL level. In addition, diet can raise the HDL as well as lowering the total serum cholesterol. Vegetarians have been found to have HDL levels similar to the birth rate level while those vegetarians who strayed from a strict vegetarian diet raised their LDL levels. It is interesting to note that eating of fish apparently increases the level of HDL.

In the case of a patient with hyperlipidemia, the doctor will no doubt attempt to lower blood lipids by natural means of diet and an exercise program.[16] When a patient doesn't respond to these methods, a drug therapy with the use of drugs known to reduce the "bad" lipoproteins

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[15] Ibid., pp. 39-40.

[16] Ibid., pp. 40-42.

and raise the "good" can be introduced. It is always better to save drug therapy as a last resort. The diet program, of course, will advocate avoidance of those foods high in cholesterol such as dairy products and meats.[17]

Some curious statistics have emerged from these "good" and "bad" cholesterol surveys and they concern other risks for heart disease. Smoking lowers the HDL level as it has been shown experimentally that when a person quits smoking his HDL level rises--which is good. On the other hand, it has been discovered that excessive alcohol consumption raises the HDL! Could it be possible that heavy drinking damages the liver, thus preventing its function from properly excreting the cholesterol brought there by the HDL? These conclusions on smoking and alcohol consumption are based on reports from a study under the federal government known as the Multiple Risk Factor Intervention Trial (Mr. FIT).[18] Now, if one has the choice of which risk factor to dispose of, drinking or smoking, one can stop smoking and let the alcohol raise the HDL level --but do have a "heart" for your lives.

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[17] Ibid., pp. 42-43.

[18] "HDLs: New Heart Risk Buzzword," 18 Medical World News (October 3, 1977) p. 20-21.

CHAPTER 9

HYPERTENSION--THE SILENT DISEASE

In Chapter 4, which is devoted to the discussion of blood pressure, I mentioned what blood pressure is, how it is measured and what normal values represent. Blood pressure, which we all have, is a natural characteristic action of the body's circulation. We need the pressure to keep our blood circulating through the body's network of blood vessels. But when high blood pressure--a widespread problem--exists, it is known as hypertension. It is only when blood pressure is immoderately high that it becomes a coronary risk factor. And it is a key risk in atherosclerotic vascular disease which increases in significance if other risk factors are involved, such as cigarette smoking, for example. Additionally, hypertension is a major risk factor in stroke.

Earlier Speculations

During the first quarter of the century little was known about hypertension. In fact, physicians often held the opinion that high blood pressure could be beneficial. It was even postulated that atherosclerosis preceded hypertension and that increased blood pressure was required to get the blood through the clogged blood vessels. Because of this outlook on the process, no means of controlling high blood pressure were used. In the course of early research such remedies as cucumber and watermelon seed extracts, garlic and mistletoe were used. Also red meat and overindulgence in sex were taboo. We have come a long way in a short

time from such methods of treating which later included psychotherapy, proper diet, bowel regulation and warm baths.[1]

The Incidence of Hypertension

Population studies have turned up evidence that the United States has more than 25 million hypertensives and at least half of those afflicted are not aware of it. It affects all ages including children and is more prevalent in black people than in whites. Hypertension is the most widely existing cardiovascular disease in this country, yet about half of the known hypertensives are under treatment--and the great majority of these receive inadequate medical care.[2] Some of the reasons for this inadequacy is, firstly, patients believe they need only take medication when symptoms, which they think are relative, present themselves. Many reliable drugs for lowering blood pressure are on the market today. If patients would regard the condition of high blood pressure more seriously by regular check-ups and taking their medicine regularly, the incidence of further complications would be lessened. Secondly, physicians need to be more persevering in education of the individual as to the seriousness of hypertension and the value of monitoring the medication program. The individual should also be schooled as to the other risks involved such as smoking, obesity and improper diet.[3]

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[1]Lawrence Galton, The Silent Disease: Hypertension (New York: Crown Publishers, Inc., 1973), pp. 13-14.

[2]DeBakey and Gotto, The Living Heart, p. 194.

[3]Cantwell, Stay Young at Heart, p. 105.

Types of Hypertension

Two terms are used when referring to hypertension, the first being malignant hypertension. Although exceedingly rare, it deserves some mention because of the advances in control of this very fatal disease. This condition occurs more often in younger people and death occurs rapidly unless controlled by medication. The blood pressure is generally very high with vision and kidneys becoming affected. The development of drugs to lower the pressure has given these individuals thusly affected longer and more productive lives.

Benign hypertension is the term applied to all other hypertension other than malignant hypertension. The use of benign is a misnomer in that the condition it refers to is not benign at all but a disease to be viewed seriously. Here the pressure is lower and there may be no symptoms for a long period of time. During this time before discovery it can wreak its havoc in the circulatory system by preparing the way for fatalities such as heart attack, stroke and kidney failure. In both of these kinds of hypertension lots is still to be known about the causes, and in the meantime, control is the key word.

There are cases of high blood pressure that are considered curable because the cause can be identified and removed. For example, a kidney infection may be the underlying cause of hypertension. When the infection is cleared up by medical treatment the blood pressure goes down permanently. In this case the patient has been cured of his high blood pressure. This type of hypertension is also referred to as secondary because it is resultant to the cause of the condition.

Essential hypertension is the type which accounts for the majority of hypertensive cases for which no cause or cure has been found. This kind of hypertension does not seem related to other diseases and other terms for it are primary or idiopathic--meaning a primary disease without known cause.[4]

What Are the Causes?

Let's talk about causes of hypertension that can be corrected. We must understand, first of all, that it is the expansion and contraction of the arterioles that are responsible for regulation of the blood pressure. Arterioles are tiny blood vessels, the smallest branches on the arterial tree. These tiny vessels carry the blood from the larger arteries to smaller ones where they finally merge with the capillaries. Arterioles have strong muscular walls and can expand and contract rapidly. When they expand, blood pressure drops because resistance to blood flow is decreased. In contracting, they increase resistance to blood flow and the blood pressure is raised because the heart is caused to beat harder. Blood flows from the arterioles through the capillaries and into the tissues of the body. Blood pressure is, therefore, determined by their action. We may say, then, that the key to high blood pressure is the arteriole network. When the arterioles malfunction or remain too constricted, hypertension is the result. The blood pressure is controlled by mechanisms that automatically expand and contract the arterioles according to demands. For instance, when we lie down or stand up this

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[4]Galton, The Silent Disease: Hypertension, pp. 61-63.

process maintains our blood pressure. Impulses from the nervous system are involved as well as hormones from the adrenal glands.

As we have indicated, hypertension from kidney infection can be eliminated by clearing up the infection. Atherosclerotic obstruction of the renal artery to one or both kidneys can likewise cause high blood pressure which can be relieved by surgical bypass of the diseased portion of the renal artery.

Hypertension may also be caused by a tumor in the adrenal gland which secretes hormones that cause a rise in blood pressure. There are two variations of adrenal tumors and the treatment for both is surgical removal of the tumor.

Another curable cause of hypertension is coarctation of the aorta, a congenital narrowing of the aorta that causes elevation of blood pressure because of restricted flow. Surgery to repair this constriction relieves the increase in blood pressure.[5]

Some other treatable cases of hypertension are diseases such as glomerulonephritis and Cushing's disease. Obesity and excessive salt in the diet may elevate the blood pressure. Hypertension conditions can worsen from lack of sleep and extreme stress.[6] Of not much consequence, since it is unlikely any of us are licorice addicts, is the information that high licorice consumption causes hypertension.[7] Too bad for the

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[5]Likoff, Segal and Galton, Your Heart: Complete Information for Family, pp. 77-78.

[6]DeBakey and Gotto, The Living Heart, p. 199.

[7]Snider, Learning How to Live with Heart Trouble, p. 67.

dieters--I once knew a woman who ate lots of licorice because, she said, it was the candy lowest in calories. A full bladder may cause the blood pressure to rise, in which case the situation is easily remedied.

Essential Hypertension

As we have mentioned, essential hypertension, which is found in 85 to 90 percent of elevated blood pressure cases, has no known etiology or cure. Various suppositions have been projected to explain possible causes of essential hypertension. Perhaps a defect exists in the arterioles. Since impulses from the nervous system are involved, a logical explanation might be that an abnormal relationship occurs between the impulses and arterioles. Or another consideration could be that an abnormal chemical is present in the blood system that causes the arterioles to contract, thus raising the blood pressure.

Inheritance is yet another factor for investigation as essential hypertension seems to be a common familial trait. If one parent has hypertension, a child will have a 50 percent chance of acquiring it and if both parents are affected, the child's risk is almost 100 percent. Here again, is the hereditary trait versus environment. Family groups have the same lifestyle within their membership. Therefore, perhaps heredity or environmental factors--or a combination of these--could be responsible for essential, or primary, hypertension. There may be other contributing conditions as well. In most cases, this type of hypertension can be controlled.[8]

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[8]Likoff, Segal and Galton, Your Heart: Complete Information for the Family, p. 79.

Are There Symptoms?

The "silent" killer is the term often used when referring to hypertension because many people who have it feel well for many years before any symptoms present themselves or it is accidentally discovered during a physical checkup. When symptoms finally occur, they are frequently overlooked as being related to hypertension because they resemble those of other illnesses--and they often are connected to other malfunctions rather than hypertension. Consider for example, that headaches are thought to be caused by high blood pressure when in reality they may accompany hypertension and can be resultant of something else--perhaps tension.

Other vague symptoms that may or may not be related to high blood pressure are dizziness, nosebleeds, ear ringing and--to some individuals --even heart palpitations. Many hypertensives think they experience such conditions in relation to their high blood pressure and, consequently when they don't have any of these signs, they think their medication is unnecessary.

In advanced cases of hypertension the aforementioned symptoms are often present and, even then, may be a signal of the harm that has already taken place in the body.[9]

Detection

Without any definite symptoms to be on the lookout for, we must rely on at least an annual blood pressure test. Older people should have their

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[9]Galton, The Silent Disease: Hypertension, pp. 48-49.

blood pressure checked several times annually. We have said that $\frac{140}{90}$ is the upper limit of normal. Tell your doctor to explain the meaning of the figures. Most doctors have a booklet for you to study. It's a good idea to make a little chart and record your blood pressure readings each time you have it done. The idea is to get involved in the knowledge of blood pressure. Reliable instruments for measuring blood pressure can be purchased and should be used regularly in the home as well as in businesses. An individual can learn this procedure as well as a diabetic learns to monitor the course of his disease. Dr. G. E. Burch of Tulane University of Medicine has suggested that just as every American home has a thermometer, so should it have a sphygmomanometer for measuring blood pressure.[10] With millions of Americans walking around with unsuspected hypertension, the home blood pressure measurement should be taken more seriously. It is certainly better than mass screening where a one-time measurement can be inaccurate.

When you visit the doctor and he is testing you for hypertension there are other signs he looks for besides elevated blood pressure. He will no doubt become more thorough in his examination if there is hypertension in your family history.

The physician looks for enlargement of the heart--especially of the left ventricle--which occurs over a period of time from the force of high blood pressure pounding on its walls. This picture shows up in chest x-rays but the doctor can hear a great deal through his stethoscope such

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[10]Robert A. Miller, M. D., How to Live with a Heart Attack (and How to Avoid One), Revised ed. (Radnor, Pennsylvania: Chilton Book Company, 1973), p. 193.

as valves closing under pressure and certain murmurs caused by the on-rushing blood. The sounds may even tell him if hypertension has existed for an extended period of time.

One of the best warning signals of hypertension can be found in examination of the blood vessels of the eyes. By use of an opthalmoscope, an instrument that checks damage to the arterioles of the retina, the physician can readily ascertain if this condition is present.

Should high blood pressure exist, a series of tests may be used to rule out underlying causes and to determine whether the condition is primary or secondary and what course of treatment to follow.[11]

Treatment

When it has been established that an individual is hypertensive of the essential type, the physician will formulate a program of treatment according to the severeness of the disease. In cases of mildly elevated blood pressure the treatment may not involve drugs but could include changes in such things as diet, stopping smoking, regular exercise program, reduction of stress and other alterations in lifestype that may seem pertinent.[12]

Sometimes high blood pressure can be controlled by diet alone. If you are overweight your doctor will likely suggest a weight reduction

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[11] Likoff, Segal, Galton, Your Heart: Complete Information for the Family, p. 80.

[12] High Blood Pressure, printed in U. S. A., MSD Merck, Sharp and Dohme, prepared in cooperation with the National High Blood Pressure Education program.

program first, since blood pressure, for some people may return to normal by weight loss alone.

He may tell you to reduce your intake of sugar, dairy products, eggs and meat in order to prevent atherosclerotic deposits on the arterial walls. These deposits cause increase in blood pressure by narrowing the diameter of the arteries.

Modification of the diet in hypertensive cases is generally accompanied by cautions of lowering salt intake for salt causes retention of fluids in the body. Salt restriction lowers blood pressure by elimination of the excess fluid.[13]

It would be well for all of us to lower our salt intake--this means very little salt in cooking and no salt at the table. It is surprising how soon some foods can be enjoyed with no salt. The importance of low salt consumption can be emphasized by the knowledge that under some conditions salt can produce hypertension that cannot be alleviated by withdrawal of salt from the diet. It is not known by what means this condition occurs, but experiment has shown it to be a reality. As a matter of fact, we can help prevent hypertension and protect ourselves by low salt intake, low cholesterol and low sugar diets, plus regular exercise.[14] Mild exercise is helpful in controlling blood pressure. Walking is perhaps the best form of exercise that can be incorporated with regular daily activities. It gives you many benefits in addition to lowering blood pressure. It is beneficial to muscles, heart and state of mind--

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[13] High Blood Pressure: A Positive Approach, printed in U. S. A., Boehringer Ingelheim Ltd., Elmsfort, New York.

[14] Leonard, Hofer and Pritikin, Live Longer Now, p. 70-73.

as well as an aid in weight control. Regular, steady walking, burns calories. You should consult your doctor before embarking on a strenous exercise program.[15]

When the physician must resort to drugs for the mildly hypertensive individual he often finds that sedatives--including tranquilizers--are sufficient for controlling blood pressure in emotionally tense persons who are under duress either at home or at work. Drugs have remarkably changed the prognosis of individuals subjected to hypertension. Today most hypertension can be controlled by drugs and this is probably partly responsible for the death rate from strokes dropping in recent years.

The physician may have to try several drugs or a combination of medications before his patient is stabilized. Various drugs work in different ways in the body and some produce undesirable side effects. You can help with your treatment program and it is good advice to become acquainted with the kinds of drugs used and their performances. In other words, don't bury your head in the sand because, if you are a hypertensive and you are interested in improving your lot in life, you must know you will need to have regular blood pressure checks and you will have to take drugs regularly for the rest of your life. Hypertension cannot be cured but it can be controlled, thus preventing extensive damage throughout the body. You also must be aware of the fact that when you feel good and your blood pressure is down you cannot stop taking the medication--that is the mistake so many hypertensives make.[16]

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[15] High Blood Pressure: A Positive Approach, Boehringer Ingelheim.

[16] Snider, Learning How to Live with Heart Disease, p. 70.

The anecdotal case of 63-year-old Mrs. T. is a classic example of hypertension with all of its complications. She has a somewhat elevated cholesterol reading and kidney test. Headaches make her feel like a band is around her head. Mrs. T., who has atherosclerotic cardiovascular disease, has had a stroke as well as right carotid artery surgery for removal of plaque. She has an enlarged heart (but a normal ECG) and she is overweight. It is almost superfluous to relate that Mrs. T. has a tendency to nosebleeds and her eyes show indications of narrowing of the arteries. Her HDL is low and her LDL is high. Mrs. T. must be unaware of the seriousness of her high blood pressure of 225/110. In fact, she may not have been educated to the fact that it may be the basis for all her other problems since she did not have her blood pressure taken during a five-year period and she had stopped her medication. When she began experiencing increasingly bad headaches, her pulse seemed rapid and she had difficulty breathing, only then did she see her doctor. Mrs. T. may consequently pay dearly for the neglect of herself in all likelihood, by a shortened lifespan.[17]

We are all bent on destroying our bodies one way or the other and hypertensives rank up near the top as far as regimentation of their therapy is concerned--as in the case of Mrs. T. Prescribing the medicine and getting the patient to take it are two different matters. Despite vast amount of publicity and education programs, only about 30 percent of the 23 million hypertensives in the United States are under sufficient blood pressure control. Only about 50 percent of the patients with high blood

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[17]Personal knowledge by the author of the case history of Mrs. T.

pressure take medication as directed. In many instances the physician does not realize which patients do not comply with their drug programs because a number of them do not return to the doctor's office regularly --as in the case of Mrs. T.

Dr. Podell of Overlook Hospital in Summit, New Jersey points out that, "There's a vast gulf between knowing and doing." But studies do show that understanding of the drug program and a simple schedule (one pill a day) produces good results as far as the patient's compliance is concerned. Surveys show that the personality of the patient has no bearing on his failure to take his medicine although medical professionals are inclined to blame the patient in this respect.

Further studies have indicated that patients' beliefs in whether or not the drug program would be successful for them is an important factor in taking their medication. The best possible answer to the dilemma is good rapport with the physician and the patient's involvement in the regimen.[18]

It is of note that research has shown hypertension can be lowered by regular use of relaxation exercises and some forms of meditation and yoga. It has been demonstrated that biofeedback can lower blood pressure--as well as a combination of biofeedback and relaxation exercises. In some instances, patients have been able to reduce their medication while on a program of regular relaxation therapy. Theoretically--since the progress of atherosclerosis has a direct relationship to blood

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[18]"Hypertension Compliance," Medical World News 18 (May 30, 1977): 20-25.

pressure--if blood pressure could be lowered, even in normal individuals, the development of atherosclerosis should be decreased.[19]

Don't Forget the Children

Hypertension is found in children. Dr. Sidney Blumenthal of the National Heart, Lung and Blood Institute believes hypertension is a preventable disease and he believes that, since essential hypertension begins in childhood, study and management of hypertensive children can possibly lead to prevention of the ailment in the adult. He recommends that all children over three years of age should have blood pressure tests once a year and should be included in routine examination. Since blood pressure in children is subject to variations, blood pressure readings should be taken during at least three different visits to the doctor before determining that hypertension exists. Because overweight may be a condition in childhood, development of hypertension, weight control and excessive salt intake should be important factors to consider for programming treatment for youngsters who are at risk.[20]

For the child with genetic inclinations to hypertension the value of early identification is important. The number of older children and adolescents found to have mild, essential hypertension is on the increase. There is much to be learned about elevated blood pressure in children but

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[19]Ruanne K. Peters, S. D., Herbert Benson, M. D., and John M. Peters, M. D., "Daily Relaxation Response Breaks in a Working Population: II. Effects on Blood Pressure," American Journal of Public Health 67 (October, 1977): 954.

[20]Sidney Blumenthal, M. D., "The Search for Causes of Essential Hypertension (Based on the Report of the NHLBI Task Force on Blood Pressure Control in Children)," Primary Cardiology 3 (October, 1977): 12-16.

it is apparent that those afflicted should be monitored and ought to be educated not only on weight reduction and salt intake but on smoking and exercise. Drug therapy in children should be avoided whenever lifestyle modification can accomplish the desired results of lowered blood pressure.[21]

In summary, it is encouraging that today hypertension is being treated earlier and more persistantly than in the past. Effective drugs, to be used singly or in combination, are on the market for use by the doctor-patient team.

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[21] "Mass Hypertension Screening Among Children Is Discouraged," Family Practice News 7 (April 15, 1977): 36.

CHAPTER 10

THE SMOKING RISK

The three major risk factors for cardiac disease are considered by the majority of authorities to be elevated cholesterol, hypertension and cigarette smoking. Oddly enough, these risk factors are the easiest to change but actually, accomplishment of change involves breaking of unhealthy habits which can be very difficult. Medications can be given to control some risk factors but smoking is an addictive habit that the individual has to cope with by himself. Of course, there is plenty of help all around us for guidance in giving up smoking. Our physician may advise as to the damage done by smoking and the involvement of it with other risk factors.[1] There are no longer tempting cigarette advertisements on television. Admonitions such as "no smoking" signs are now seen in some public places--and nonsmokers are rising to claim their rights to breathing air free from cigarette polutants. It's indicated on every cigarette package:

WARNING: The Surgeon General has determined that cigarette smoking is dangerous to your health.

Everything to be said about the hazards of smoking has already been said--we hear them over and over--but, to refresh our memories let's look at some hard facts. Over 50 million people in America spend billions of

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[1]Linley E. Watson, M. D., "What You Can Do to Prevent Cardiovascular Disease," Consultant 17 (June, 1977): 89.

dollars annually on cigarette smoking. Do you realize that a cigarette contains about forty poisons, some of which are arsenic, carbon monoxide, formaldehyde and nicotine?

Smoking is bad for the health in general. Not only is it harmful to the heart but it can lead to cancer, peptic ulcers, and emphysema as well as shortening the life span. During pregnancy the development of the fetus can be retarded and ultimate death of the infant may occur.

Yet, there are over 21 million ex-smokers in America today. It is encouraging to know that some of our leaders have joined the ranks. Senator S. I. Hayakawa is one of them and then there is, to set a fine example, Secretary of Health, Education and Welfare, Joseph Califano, a former three-pack-a-day smoker.

Some useful facts to help us along the way that have been publicized by ex-smokers and stop smoking programs:

. It takes about 72 hours to rid the body of cigarette poisons.

. It takes about 21 days to break the habit.

. It takes from six months to a year for a healthy individual who hasn't been a long-time smoker for recovery of healthy lungs.

. Weight gain and cigarette craving need not symptomize quitting.[2]

When we think of harmful effects of smoking it is mostly the lungs that are thought of in that respect. But studies have shown that the heart may be subject to more damage than the lungs from cigarette smoking.

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[2]Linda Bernier, "A Smoker's Saga: She's Free at Last," Los Angeles Herald Examiner, 1 January 1978, F-2.

Statistics indicate the death rate in cigarette smokers is more than twice as high for men who smoke more than twenty cigarettes a day in comparison to men who have never smoked.

The American Cancer Society has found that death from heart disease in those who smoke is more prevalent than death from cancer. Also the death rate from heart disease in middle-aged men in this country is more than twice as high as those who smoke two or more packs of cigarettes a day than for nonsmokers.[3]

The Framingham studies have shown that the risk of cigarette smoking for heart attack and stroke in hypertensives is greater than any other risk, including elevated cholesterol.[4]

How Smoking Affects the Heart

Smoking stimulates the adrenal glands, causing excessive amounts of hormones to be released which, in turn, causes a rise in the level of blood fats. Stimulation of the adrenals causes an increase in the heart rate as well as increased tension of the heart muscle, thus adding to the work load of the heart and its need for oxygen. Now that the heart requires more oxygen, it gets less because smoking adversely affects lung function and less oxygen is circulated to the heart muscle.

Smoking also increases the amount of carbon monoxide in the blood by displacing the oxygen there, so that the oxygen supply to the tissues,

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[3]Snider, Learning How to Live with Heart Trouble, p. 91.

[4]Galton, The Silent Disease: Hypertension, p. 103.

blood vessels and the heart muscle is reduced.[5] Shortness of breath in smokers often is due to the carbon monoxide usurpation of oxygen.

Nicotine in cigarettes causes the heart to beat more rapidly by constricting the arteries, temporarily raising the blood pressure and putting additional stress on the heart.[6] Nicotine is one of the most toxic ingredients found in cigarettes. It over stimulates the blood vessels and heart and is largely responsible for a condition referred to as Buerger's disease in which the peripheral arteries in the feet and hands become constricted--sometimes requiring amputation of these extremities in severe cases.[7] Let's look at what can happen to blood vessels clogged by atherosclerosis. Smoking not only increases the buildup of fatty deposits but nicotine causes the vessels to constrict, causing the blood to flow through even narrower channels. Now a potentially dangerous situation is at hand because heart attack is imminent and it takes only a small factor to trigger the attack. It is at this point that the nicotine from just one cigarette can constrict the arteries enough to cause sudden death.[8]

If the heart has not already had enough punishment there is more to come. Nicotine affects the conducting system of the heart, which is the

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[5] Ibid., p. 104.

[6] Snider, Learning How to Live with Heart Trouble, p. 91.

[7] Astor Scott, Cholesterol, The Invisible Killer: A Health Report, Bicentinnial ed. (Fort Lauderdale, Florida, Scott Books, 1976), p. 71.

[8] Brian Richard Boylan, The New Heart (Philadelphia New York London: Chilton Book Company, 1969), pp. 153-4.

mechanism responsible for the heartbeat. The electrical impulses are disturbed by nicotine, resulting in impaired function of the heart which can cause sudden heart attack.[9] For those of us who are coronary-prone it is obvious that it is essential that we stop smoking. Although some other risk factor may do us in at this point, this is one risk we can control by eliminating it.

Look at it this way. The purpose of the lungs is to remove essential substances from the inhaled air for the body's use and to expel the waste products from the body. When cigarette smoke is inhaled the lungs remove detrimental materials for the body such as carbon monoxide, nicotine and coal-tar derivatives instead of the beneficial substances and then expel the air minus the pollutants. In other words, the lungs are performing the reverse of their function.[10]

Smoking and Atherosclerosis

Surveys show that advanced atherosclerosis of the coronary arteries occurs three times more often in men who smoke two or more packs of cigarettes a day than in men who do not smoke regularly. This is clear explanation for the increased mortality in under 55-year old smokers of one to two packs of cigarettes a day and also is reason for the increase in mortality from heart disease in all age groups in comparison to non-smokers.

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[9]Anthony Owen Colby, M. D., "What Does Smoking Really Do to the Heart?", Modern Medicine 45 (November 30, 1977): 57.

[10]Friedman and Rosenman, Type A Behavior and Your Heart, p. 121.

These surveys also researched changes that occur in smokers showing that atherosclerosis increases with the number of cigarettes smoked a day while the size of the artery decreases correspondingly.[11]

A forty three-year-old executive was struck down in the prime of his life by sudden death while resting after trimming his trees. He had previously been well, although he had a number of risk factors that made him a potential candidate for cardiovascular disease. His job was of a sedentary nature and he was known to smoke up to four packs of cigarettes a day. Besides being somewhat overweight, he consumed a moderate quantity of beer per day. Perhaps most significant at this time was the stress from the loss of his job and his efforts to seek a new one which required him to commute a long distance. Autopsy reports showed that this comparatively young man died as a result of severe atherosclerosis. It could be a matter of future interest to note what becomes of his two business associates that had scarcely walked five feet from the coffin at the funeral before lighting up their cigarettes. Is it the old belief, "It can't happen to me?" A piteous sidelight of the tragic affair occurred when the deceased man's teenaged son returned from the funeral and took all the beer from the refrigerator, opened it, and poured it down the kitchen sink. The boy resolutely stated that there would never be any more beer in the house. This man's boys will be at considerable inherited risk for coronary artery disease and counseling for them as to the

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[11]"Smoking Increases Arterial Thickening," Modern Medicine 45 (June 15, 1977): 92.

various risk factors involved and how to avoid them would be of great benefit.[12]

Marijuana

The effect of marijuana smoking is also deleterious to the heart in that it provokes responses similar to those of conventional cigarette smoking. Besides being a lung irritant, marijuana causes the heart rate to increase. Experiment has shown that marijuana, unlike tobacco, does not increase blood levels of sugar and some lipids. It increases the flow of blood to the arms and muscles but, on the other hand, causes impairment of some blood vessel responses. Also, in case of need for local anesthetics containing epinephrine or certain presurgical medication, the marijuana smoker's increased heart rate could be further enhanced by drugs of this kind. Marijuana also causes changes on the electrocardiogram which may be mistaken for inadequate blood supply to the heart muscle. Marijuana smoking raises the blood pressure somewhat which could produce unfavorable effects in a person with hypertension. Exercise tolerance has also been shown to decrease with marijuana smoking--probably because of increased oxygen requirements combined with decreased oxygen supply to the heart.[13]

Stress and Smoking

It is apparent that risk factors work hand in hand and one factor by itself should not be blamed for heart disease. Stress alone has been

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[12]Account of case told to author February 14, 1978.

[13]Cantwell, Stay Young at Heart, p. 98.

proven to be a major risk factor in coronary disease, and when it is coupled with other risk factors such as smoking, a lethal blow can be dealt to the smoker. There is much dispute over smoking and stress since some investigators have concluded that persons subjected to emotional stress smoke more than those in less stressful situations. It is a good bet that the tobacco industry favors the theory that smoking is not the cause of heart disease, but, on the contrary, the stress that drives the person to smoke is at fault.[14]

A good illustration is the example of Mr. L., a prominent attorney who suffered lung cancer and finally succumbed from it. He began a lawsuit against a well-known cigarette company while still living, contending that cigarette smoking was the cause of his lung cancer. He also maintained the pressure of his work drove him to excessive smoking. After his death, Mr. L.'s widow continued the lawsuit and won the case, including a large monetary settlement. Although the jury was convinced that smoking led to Mr. L.'s demise, who is to say which of the risk factors was at fault--or was it a combination of them?[15]

Some Other Effects

We know smoking is bad for our health. Some other immediate effects include curbing of the appetite. We like that because it helps keep off unwanted pounds. I know of a woman who quit smoking and she gained fifteen pounds. She had to start smoking again so she could take the undesirable

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[14]Boylan, The New Heart, p. 154.

[15]Familiarity of the writer with story of Mr. L., who was a former resident of Lancaster, California.

weight back off. Smoking not only dulls the sense of taste and smell but the tar content causes malodorous breath. Smoking gives us a sense of stimulation due to release of sugar from the liver, however, it is short-lasting and fatigue returns--only to cause us to light another cigarette for another "lift."

When smoking causes the smaller arteries to constrict, skin temperature drops because of reduction in the flow of blood. This accounts for a temperature drop of as much as 5 degrees Fahrenheit after one cigarette is smoked.

Smoking causes coughing as well as inflammation of the nose and throat, making it easy for the physician to spot a smoker. He can also identify the brown deposits on the teeth and fingers.

Among other things, cigarette smoking interferes with the action of the cilia, the hairlike processes which line the respiratory tract, preventing debris from entering the lungs.[16] The cilia may, in fact become destroyed over an extended period of smoking. It has been said that if you must smoke continuously at least wait for the cilia to clear between cigarettes.

Cigarette smokers seem to have a higher sugar consumption than non-smokers. Since sugar intake is a factor in heart disease, this is an added risk to a smoker who probably tends to drink more beverages containing sugar to relieve the dryness of the mouth caused by smoking.

Women Smokers

I was asked recently how women smokers fare in comparison to men by a colleague of mine. Women are rapidly catching up with the intrusion of

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[16]Miller, Galton, and Brunner, Freedom from Heart Attacks, p. 159-160.

women into all areas of men's occupations. Women are becoming exposed to the same lifestyles and occupational stress as men and they are smoking more.

As we mentioned earlier, women have the protection of estrogen before menopause, but after menopause they are at the same risk as men. While cigarette smoking on the national average has declined in men, women smokers show an increase.

British investigators have made significant findings in a study of young men and women smokers. They found that blood cholesterol levels were more increased in women heavy smokers than in the men heavy smokers --possibly accounting for loss of their natural protection to cardiovascular disease.[17]

"You Have to Stop Smoking"

Your physician tells you that smoking is harmful to your hypertension or your ailing heart and he says you must stop or your life may be in danger. Chills run up and down your spine and you wonder how you can stop a favorite part of your life--might as well be dead. Has he told you that if you have a heart attack you may not live long enough to develop cancer? Obviously people will only think seriously about quitting smoking if they think their lives are at stake. Let's not wait until our lives become endangered before we decide to stop smoking.[18] Why should we stop when we feel fine--besides, it can't happen to us. The trouble is, we can't see

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[17] Ibid., p. 162-63.

[18] DeBakey and Gotto, The Living Heart, p. 225.

the damaging process going on within us. If we could but take a look inside our bodies, it would no doubt be a shocking revelation.

There are so many ways to stop smoking that you can select from a wide choice of methods. We don't have to make a big thing about it either--just quietly decide what you will do and then proceed with your plan. It may be a very simple project such as postponing smoking a cigarette when you want one. Or try eliminating one that you have at a certain time, for instance, after a meal or the one you smoke while driving to work.

You might try a method that a popular orthodontist uses to halt thumb sucking in his young patients. He guarantees that it works every time and immediately. You look at your thumb and say to it, "I don't need you and I am not going to let you rule my life." And when you see your thumb coming toward your mouth, tell it, "No, no, you are not coming in my mouth."

An eleven year-old boy had sucked his thumb consistently since birth. His teacher at school complained of the infantile habit and, in addition, his teeth were becoming displaced. No previous means of stopping the habit had worked. Just a few minutes of counseling with the orthodontist were so effective that the boy never put his thumb in his mouth again.[19]

Whatever works for you will be the way to go, whether it is a simple or a complex method--and whether it is free or expensive. If you can't do it on your own there are many programs offered locally. There is usually advertisement of smoking programs or you may inquire. It may be

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[19]The boy and his family are acquaintances of author.

that you won't be successful in quitting with one program so you will have to try another. You may choose to stop gradually by smoking one cigarette a day less or for those for whom this doesn't work, they may be able to go "cold turkey." Smoking is not an addictive habit so there will be no withdrawal symptoms. You may even try not inhaling which is better than inhaling. Remember, nicotine can be absorbed and enter your system from your mouth as easily as from the lungs.[20] I once knew a woman who boasted that she smoked a pack of cigarettes a day and never inhaled. One day I received a letter from her written while she was recuperating from surgery for lung cancer. If a person will trouble himself enough to understand the perils of his smoking habit to his health, then it should not be too difficult to quit. At least, if one cannot stop smoking, it would be advisable to smoke no more than ten cigarettes a day.[21]

Stop-Smoking Programs

Let's look briefly at some types of anti-smoking programs available. Group sessions for those who like companionship are conducted by various organizations in most communities. Private counseling is another approach for the individual who prefers to do this thing alone.

Hypnosis helps some people and you may be able to find a physician who uses the technique if you are convinced that acceptance and cooperation

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[20]Friedman and Rosenman, Type A Behavior and Your Heart, p. 121.

[21]Scott, Cholesterol, the Invisible Killer: A Health Report, p. 71.

with this method is for you. The point to remember is that the singular goal of hypnosis is to quit smoking.[22]

The Seventh-Day Adventists sponsor an intensive Five-Day Plan to Stop Smoking. This program emphasizes the advantages and benefits of not smoking and embellishes the message with films, lectures and group therapy.

Other programs available offer different methods of approach to stop smoking. The plans using group therapy offer such things as information, counseling, encouragement, behavior modification techniques and aversion conditioning. Each program has its own special techniques for quitting smoking and can run from five days to four weeks in length.[23]

Joseph Califano, Secretary of Health, Education and Welfare, has committed himself to a major prevention program in the light of the mounting costs of health care for curing the ill. He and those he consulted have realized that encouragement of smokers to give up smoking and youngsters not to start was the most important effort to be made in the line of prevention. His campaign to stop smoking and to protect nonsmokers came about as a result of factual evidence that smoking causes cancer, heart disease and respiratory ailments. The fact that more than 75 percent of our population who smoke begin to do so and form the habit before they are 20 years old.

Mr. Califano believes that the $30 million anti-smoking program is not too much to spend on the health of the people--especially the health

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[22]Colby, Modern Medicine , pp. 55-56.

[23]Bernier, Los Angeles Herald Examiner, F.2

of our young people who must be informed of the hazards of cigarette smoking.[24]

Children Smokers

The foundation for smoking is laid down in childhood, mostly by wanting to try out something new. The old days of going out behind the barn to smoke corn silk are gone. It's easier nowadays to go behind the school gymnasium for a real cigarette--or when time is short, the school washroom is closer. Of course there is always the risk of getting caught but the penalty isn't too great and, in most cases, parental objection isn't very severe. The smoking youngster acquires a bigger image in the eyes of the fellow students and it isn't long before the child is hooked on smoking.

According to the federal government's National Smoking Clearinghouse, 4.5 million youngsters under eighteen smoke cigarettes. It has been said by authorities that intervention in early years could prevent 40% of cancer deaths attributed to smoking.

Prevention programs of the American Cancer Society use 40% of its annual budget for about 200,000 programs for development of good health habits, including non-smoking. However, it seems that these programs conducted annually in the schools of this country by the ACS have no provisions for those students who already have acquired the habit.

An elementary school principal in St. Louis, having become frustrated with no help for her student smokers, designed her own campaign with the help of an ACS representative--which may be the first stop-smoking program

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[24]Joseph Califano, "Is There Anyone, Including Tobacco Executives, Who Would Want Their Children to Smoke?", Los Angeles Herald Examiner, 29 January 1978, F-6.

for youngsters. Her program includes aggressive lectures, group sessions, counseling, buddy system, yoga and use of a substitute for cigarettes, such as a food. Some measure of success is apparent as about 25 percent of the sub-teenagers have quit smoking with improvement in the habit of the other participants.[25]

It is time that we give more attention to the prevention of smoking at an early age. We must turn away from the tobacco companies' advertisements that promote smoking in young people. Indeed, as Joseph Califano has stated, "Is there anyone, including tobacco company lobbyists and executives, who would encourage their own children to smoke cigarettes?"[26]

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[25]"School's Stop-Smoking Drive Bolder than Cancer Society's," Medical Tribune 18 (Monday, May 18, 1977): 5-8.

[26]Califano, Los Angeles Herald Examiner, F-6.

CHAPTER 11

THE RISK OF DIABETES

The association of diabetes with heart disease has been well established and is looked upon as one of the most important risk factors for atherosclerosis. The probability of death from heart attack for the diabetic is more than twice that for the normal individual. Atherosclerosis occurs with more frequency and earlier in life than in nondiabetics. Moreover, this arterial disease presents itself in a deadlier form in diabetics and affects males and females alike.

Other risk factors such as hypertension and obesity are often involved in diabetes, therefore it can be difficult to determine the exact role of diabetes in atherosclerosis.[1]

Diabetes mellitus, a metabolic disorder, can afflict an individual during any time of life although it is primarily a disease of adulthood. It can also be a silent disease, in the manner of hypertension. And similarly, anyone can acquire the condition without any forewarning or family history. More than half the number of the known diabetics in this country could be diagnosed and become known diabetics if they were aware of symptoms and sought testing and treatment. Mass screening programs often uncover large numbers of unsuspected diabetes.[2]

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[1] Likoff, Segal and Galton, Your Heart: Complete Information for the Family, p. 172.

[2] Miller, Galton and Brunner, Freedom from Heart Attacks, p. 179-80.

A good example of unsuspected diabetes is the case of Mrs. F. who was employed in a medical office. After suffering a chronic ailment she underwent successful major surgery. After recuperation seemed unduly lengthy, a closer look was taken of Mrs. F.'s hospital entrance chemistry tests. An elevated blood glucose signalled the need for further testing --performance of a glucose tolerance test. The result indicated that Mrs. F. had undergone major surgery as an unknown diabetic.

Diabetes, Cholesterol and Hypertension

Elevated cholesterol and hypertension, both major risk factors in the development cardiovascular disease, are more prevalent in diabetics than in nondiabetics. The occurrence of heart attack in these subjects is four times higher than in their normal counterparts. There is evidence which shows that triglycerides and atherosclerosis are linked with diabetes and additionally, there are many factors that may coincide, causing a prolonged hypertension. Studies conducted in Rochester, Minn. have shown an increase in death from heart attack in diabetics during a specified time period. Atherosclerosis of the coronary arteries is mainly responsible for death from heart disease in 57% of diabetics from 40-59 years of age.[3]

Diabetes and Obesity

As is seen in hypertension and in individuals with high cholesterol, the development of diabetes occurs four times more often in obese people as in those whose weight is normal.

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[3]Shirley Rubler, M. D., "Cardiac Manifestations of Diabetes Mellitus, Cardiovascular Medicine 2 (September, 1977): 823-34.

The obese individuals who become diabetic during middle age are most generally returned to normalcy--about 75% of them--when loss of weight has taken place. It has been reported that the majority of the obese who have been on insulin have been able to discontinue the medication when the weight has been reduced to normal. Mrs. F., whom we have mentioned as having undergone surgery as an unknown diabetic, was also overweight and was to eventually bring her diabetes under control by loss of weight alone.

An obese person on insulin is more difficult to regulate than one of normal weight. When weight loss occurs there is better control of the diabetic condition.[4]

What Causes It?

Insulin is the hormone produced in the pancreas that regulates the entrance of sugar from the blood into the cells. When the pancreas fails to produce sufficient insulin, abnormal amounts of sugar are accumulated in the blood which lead to the condition known as diabetes mellitus.[5]

The ancient Greeks called the disease diabetes, which means "to run through." About A. D. 70 Aretaeus noted that individuals with this condition passed abnormal quantities of urine. The word mellitus--denoting sweetness--was added to the word diabetes in the sixteenth century when it was discovered that the urine of diabetics contained immoderate amounts of sugar.

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[4]Blumenfeld, Heart Attack: Are You a Candidate?, p. 210.

[5]Charles Weller, M. D. and Brian Richard Boylan, The New Way to Live with Diabetes (Garden City, New York: Doubleday & Company, Inc., 1966), p. 3.

Although the exact cause of diabetes is not known in most instances, some individuals who have diseases of the pancreas, such as cancer or chronic pancreatitis, develop diabetes. In these cases there is destruction of the insulin-producing process and no insulin is produced.[6]

The most widely accepted therapy for the cause of diabetes is the exhaustion of the gland which produces the insulin enzyme which, in turn, leads to excessive blood sugar. At one time there was a commonly accepted misunderstanding that diabetes was caused by too much sugar in the diet--which is not true. Medical opinion today expresses the belief that an excess of dietary fat is as much if not more to blame.

Since we all have different biological systems, according to Dr. Roger G. Williams, we each are capable of producing varying amounts of enzymes. Some of us have the ability to produce enzymes that enable us to overeat into later years while others have such inadequate glands that they acquire metabolic diseases during an early age of life.

Enzyme systems overworked by parents with rich dietary habits are thought to be responsible for diabetic newborns who have acquired the glandular weakness. Since two generations ago this "hereditary" condition was unheard of, it may be a safe measure to assume that the poor dietary habits and lifestyle of the American people are at fault.

We have no way of knowing the state of our enzyme producing system until it is too late and disease has set in. Artery blockage and gout are other conditions caused by enzyme exhaustion. The best method of

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[6]Miller, How to Live with a Heart Attack (and How to Avoid One), pp. 139-41.

prevention is to assume that we must avoid overloading our digestive systems in order to keep from enzyme exhaustion.

It has been said that those individuals over forty years of age should reduce consumption of sugar and calories. Research of Dr. Clarence Cohn of the Michael Reese Hospital indicates that eating five small meals a day could be more beneficial than our two medium and one large meal. Moreover, nibbling produces benefits in that it strengthens metabolic activity and enhances glucose tolerance.[7]

Another theory for the cause of diabetes is that the blood contains a hereditary factor for diabetes which acts as an insulin barrier and prevents the normal action of insulin. Although a normal amount of insulin is present, sugar (glucose) is not absorbed and remains in the blood stream at a higher than normal level. Now the pancreas is further stimulated to manufacture more insulin which is responsible for moving sugar into the body, causing weight gain. Finally the pancreas becomes exhausted and diabetes has developed.[8]

Types of Diabetes

There are, in general, two characteristic forms of diabetes. The first is juvenile or growth-onset diabetes which may not develop until adulthood, at which time it manifests itself by a lack of insulin or none at all. This young individual will be dependent on insulin for the rest of his life. Before the discovery of insulin the prognosis of the

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[7]Blumenfeld, Heart Attack: Are You a Candidate?, pp. 212-13.

[8]Miller, How to Live with a Heart Attack (and How to Avoid One), pp. 144-45.

juvenile diabetic was poor, with a life expectancy of only weeks or months from the time of onset. The discovery and use of antibiotics has also been a boon to diabetics because they are more affected by infections than normal people. Today the average juvenile diabetic can expect a life span of about thirty years from the start of the disease. The treatment for this type of diabetic is insulin, diet and exercise. This young individual will have to be especially careful of his diet which should be programmed for a balanced one aimed at promoting normal growth and development. While undue restriction of carbohydrates is no longer advised, consumption of free sugar is prohibitive. The juvenile-type diabetic needs to realize that exercise is conducive to burning up blood sugar and can aid in decreasing the amount of insulin needed. Exercise increases glucose metabolism and thereby is beneficial even when the insulin level is low.

The second form of diabetes that occurs later in life is adult or maturity-onset diabetes which usually comes on gradually and runs a milder course than the juvenile type. These people generally have insulin present but in lesser amounts. Most persons who develop this type are overweight and oftentimes when the weight is brought under control the diabetic process is likewise halted. The treatment is control of weight, diet and exercise.[9]

Oral medications are frequently used in the treatment of maturity-onset diabetes. There has been much controversy over this therapy as these drugs are not insulin. These oral agents were originally to have been substitutes for insulin treatment. Patients have treated these pills as

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[9]DeBakey and Gotto, The Living Heart, pp. 226-7.

though they were insulin and have thus abused the therapy by using them as substitutes for their diabetic diet. For instance, they take extra pills whenever they have eaten an overabundance of sweets. Some diabetics are under the impression that as long as they take the drugs they no longer have diabetes.

It was reported in 1970 that investigation showed increased death rate from cardiovascular disease in patients taking one of the oral drugs. There is risk of other side effects, moreover. Certainly with the risk of heart disease already prevalent among diabetics, it would seem inadvisable to use an oral drug which enhances heart disease.

Furthermore, the oral drugs have been shown to produce no particularly favorable effect in mildly elevated blood glucose levels. The best treatment, apparently, for mild adult-onset diabetes is variable insulin doses rather than pills. Weight control measures and recommendation of proper diabetic diet are often sufficient treatment for control of the disease.[10]

Diabetes can manifest itself temporarily when a person is under emotional stress. At this time the physician should be consulted when diabetic symptoms such as thirst, hunger and frequency of urination occurs. It is important that the physician knows about this because he may need to administer insulin during the period of extreme stress. Such an individual may not know when he is experiencing stress so he should visit his physician often to learn if he needs treatment. If tension and diabetic

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[10]F. John Service, M. D., "What Did the UGDP Really Show?" Modern Medicine 45 (November 15, 1977): 32-34.

tendency with its symptoms are disregarded, a real diabetic situation with insulin dependency can take place.[11]

Diagnosis

Diabetes can be as stealthy as hypertension. However, because of routine testing for the disease, most cases are uncovered before reaching advanced stages. Hospital admission laboratory tests include tests for diabetes and your doctor will test for it in this office, especially if you have suggestive symptoms.

Some things to look for at the onset of diabetes are a general feeling of malaise, loss of energy and fatigue. There may be skin problems such as itching and infections. Women may have recurrent urinary or bladder infections. Bruises and cuts heel slowly and vision can change. A person may have diabetes without any of these symptoms but when the disease becomes advanced the obvious symptoms are excessive thirst, increase in appetite in spite of weight loss and frequent urination.

The diagnosis is relatively simple when the physician suspects diabetes. A urine sample may have sugar present. Different kinds of blood sugar tests may be performed, such as fasting levels and testing after a meal. A glucose tolerance test is usually performed to aid in the diagnosis. These tests indicate whether the pancreas is producing sufficient insulin.[12]

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[11]Weller and Boylan, The New Way to Live with Diabetes, p. 11.

[12]Miller, How to Live with a Heart Attack (and How to Avoid One), pp. 145-47.

Hypoglycemia

We shall mention hypoglycemia briefly because there is so much controversy about this disorder. It is the opposite of diabetes since the blood sugar is low as a result of too much insulin produced by the pancreas. Stress, depression and excessive exercise may promote hypoglycemia.

The symptoms are numerous and the diagnosis is often difficult as these symptoms sometimes resemble those of other diseases--heart disease, migraine headaches, ulcers and mental ailments. Hypoglycemia is often a precursor of diabetes and it can develop in the obese as well.

Treatment for the hypoglycemic patient is a high protein diet with low intake of sugars, starches and fats. Frequent small meals are better for the maintenance of the blood sugar level and function of the pancreas.[13]

Treatment

Treatment, including diet for the diabetic is individual as each patient's metabolic disorder is different. The doctor diagnoses and prescribes the regimen. The diabetic is predisposed to elevated cholesterol levels and so it is essential to avoid foods with high cholesterol content. Likewise, he should regulate his insulin dosage carefully. If the blood sugar level drops abruptly the coronary arteries may receive inadequate nourishment.[14]

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[13]Weller and Boylan, The New Way to Live with Diabetes, pp. 103-107.

[14]Peter J. Steincrohn, M. D., Your Heart Is Stronger Than You Think (New York: Cowles Book Company, Inc., 1970), p. 223.

Early detection and careful monitoring of diabetes will greatly improve the everyday health of the diabetic individual. Good management of the disease will lower his risk of atherosclerosis and ensuing heart disease.[15]

Exercise is known to have an insulin-like effect. A study at the University of Minnesota's Laboratory of Physiological Hygiene seeks to demonstrate it with a group of unmedicated men with maturity-onset diabetes who will walk on a treadmill for regular periods over a 12 week span of time. The conclusions hope to show the possibility of exercise replacing drugs as treatment for diabetes.[16]

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[15]Alexander Marble, M. D., Diagnostic Criteria, (Pearl River, New York: Lederle Laboratories, 1968), p. 4

[16]"Walking Off Diabetes," Medical Tribune (Wednesday, October 26, 1977): 22.

CHAPTER 12

OBESITY

When we look at the fact that 20-30% of the American population is too fat, then we must realize that obesity is a serious problem in our society. Not only is it a major risk factor for heart disease but it is associated, moreover, with other risk factors of coronary artery disease such as diabetes, hypertension and high blood lipids.

Who is overweight? If an individual is 20% above the optimal weight for his age group, he is overweight. His longevity is shortened. For example, a thirty five-year-old male who is obese is shortening his life by five and one-half years. The Framingham study has developed statistics which show the increased risk of coronary heart disease in overweight persons. As far as risk is concerned, correction of obesity is most important next to quitting cigarette smoking.[1]

Although obesity is classified as a risk factor some authorities believe that it is not a strong risk by itself. Other diseases such as we have mentioned as well as other ailments including gallbladder disease are most often involved. Seldom is obesity present by itself--it intensifies the problems caused by other factors and should be avoided.[2]

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[1]Homer A. Rowell, M. D., Lecture on the Family Practitioner's Approach to the Annual Physical at the American Association of Medical Assistants' Meeting, Palmdale, California, October 29, 1977.

[2]Irving M. Levitas, M. D. with Libby Machol, *You Can Beat the Odds on a Heart Attack* (Indianapolis/New York: The Bobbs-Merrill Company, Inc., 1975), p. 61.

It Harms the Heart

Many more blood vessels are required to circulate blood through fat tissue which, in turn, creates an extra work load on the heart by demanding more oxygen from the blood supply. Statistics show that in overweight individuals there is a higher mortality from heart disease.[3]

When atherosclerosis is present in the obese the problem becomes more complex. The reduction in blood flow through clogged vessels provides the individual with less oxygen just when he needs more for nourishment of the heart. The overweight person subjects his heart to a needless work load just by being fat. Heart attack may be imminent. The risk of heart attack can be lessened by reduction of weight which will alleviate the burden on the heart and improve the ability of an impaired heart's performance.[4]

Overweight people have a tendency to hypertension. There is a significant increase in their blood volume which is added strain to the heart. The heart becomes enlarged from burdensome work and can't maintain its efficiency. There is an overload of the waste product carbon dioxide in the blood and the individual becomes short of breath from the least amount of effort. This can become a dangerous situation for one who is excessively obese--it may lead to heart failure.[5]

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[3]DeBakey and Gotto, The Living Heart, p. 228.

[4]Edwards and Goott, The Illustrated Coronary Fact Book, pp. 84-85.

[5]Levitas, You Can Beat the Odds on a Heart Attack, pp. 73-74.

Who Is Overweight?

Let's not fool ourselves as to whether or not we have on too many pounds. Most of us are too fat. How we look in our clothes and what our physician and family tell us is normal is no yardstick for fatness. We make all kinds of excuses for our bulges and some races of people believe that to be fat is healthy. In fact, if you are lean you are thought to be sick.

The scales are deceiving, too. Muscle fat and "fatty" fat are different; muscle fat weighs more. When a person has reached adulthood there is less physical activity and fat production begins if dietary habits remain the same. Can you fit into your wedding dress or old army uniform?

First of all, let's be honest with ourselves and take a scrutinizing look in a full-length mirror. Every home should have one. Don't spend time admiring the lean and firm parts of the anatomy. Look for the "spare tire" around the waist, fat deposits on the small of the back, buttocks, arms or thighs. Now, dare to stand sideways for the revealing truth.

If you are still in doubt about the shape you are in, there are other ways of assessment. Physiologists Ancel Keys and Joseph Brozek developed the skinfold test--whereby you pinch the skin on the back of the upper arm. If you can measure an inch or more thickness you are overweight. Your doctor may have a device for this measurement.[6]

You can't estimate your flabbiness by weight alone. If you can pick up a fold on your abdomen you are too fat. Look at the back of your hand.

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[6]Stanley L. Englebardt, How to Avoid Your Heart Attack (New York: Reader's Digest Press, 1974), pp. 76-77.

Is the skin loose and free of underlying fat? The skin should be this way over the entire body.[7]

Dr. Irving M. Levitas tells his patients, "Keep losing until you can't pick up a fold of your belly anymore." He also prescribes this test for a male: If the waist measurement exceeds the chest measurement, you are overweight.[8]

If you are advancing in age don't let yourself be led into the belief that the lean look of the back of your hand means you are slim. Oftentimes the older person's derriere shrinks and the fat moves up front --or settles in some other spot.

Cause of Obesity

The basic reason for obesity is the same as we have discussed in an earlier chapter on atherosclerosis; it is the rich American diet and the progress of industrialization, leading to a sedentary lifestyle. We don't move around anymore than is necessary.

Other factors are also responsible for overweight problems. Most people think continual overeating is the sole cause of fatness. True, food is the source of fat, or adipose tissue--but there are sometimes causes for the abnormal consumption of it. We should certainly consider heredity as a prime factor. But there again, is it heredity or the eating habits passed on from one generation to the next? Certain body builds are inherited. There is the person with a small body and long arms and

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[7]Lawrence E. Lamb, M. D., Your Heart and How to Live with It (New York: The Viking Press, 1969), p. 105.

[8]Levitas, You Can Beat the Odds on a Heart Attack, p. 63.

legs who is generally thin. The body type that tends to be obese is the one with a large torso and short arms and legs.

Some people like to believe their plumpness is a result of a quirk of metabolism related to the thyroid gland. But although they may eat the same amount, the hyperthyroid individual is more active and burns off his calories; whereas the one with hypothyroidism is sluggish and retains his. The physician can diagnose and correct this ailment.[9]

Psychological reasons for being fat are difficult to sort out. A compulsive eater probably acquired the habit in childhood. Eat to celebrate a joyous occasion--or eat to tide over a sad one. Oftentimes the obese may not be seen eating because of their neuroses; they probably became neurotic because they were fat.

There is a process in the brain that regulates the satisfaction of our appetites. We instinctively know when we have had enough. If this mechanism is malfunctioning a person doesn't know when to stop eating.

Dr. Albert Stunkard of the University of Pennsylvania reported a study showing that obese people eat whether they are hungry or not while their counterparts apparently eat only what they require. He also found a correlation between obesity and income. Those with lesser incomes must consume greater quantities of less expensive foods, particularly of the carbohydrates that are fattening.[10]

A thirty one-year-old executive secretary for a small business firm complains of her weight problem. She relates that because of her limited

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[9]Levitas, You Can Beat the Odds on a Heart Attack, pp. 64-65.

[10]Ibid, pp. 66-69.

salary she is forced to eat quantities of cheap, starchy foods, such as spaghetti. This example gives credence to Dr. Stunkard's theory.[11]

Overweight Children

Obesity in children is a serious health problem in relation to increased risk of some physical and psychological problems, among them being high blood pressure. A study of Iowa school children showed obesity to be linked to the coronary risk factors of hypertension and elevated lipids.

Overweight children as well as adolescents suffer problems which are frequently continued into adulthood. They become physically inactive because of self-consciousness. Their peers are unmerciful with such name calling as "Fatso," "Fatty Arbuckle," "Chubs" and more recently, "Bubbles." They experience depression, have a poor concept of their body image, are discriminated against by adults and possess a low self-esteem. These young obese are apt to develop disturbed personalities.

The obese child should be helped as soon as possible to correct faulty dietary habits, lose weight and learn about nutrition. Get these youngsters moving to increase their expenditures of calories. Studies of fat teenagers indicate that they eat no more than thin ones, but their accumulated fat is the result of decrease in exercise. The fat ones seem to remain sedentary even when involved in active exercise such as volleyball.[12]

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[11]Secretary's problem told to author February 18, 1978.

[12]Thomas J. Coates, PhD. and Carl E. Thoresen, PhD., "Treating Obesity in Children and Adolescents: A Review," The American Journal of Public Health 69 (February, 1978): 143.

It is unfortunate that dietary counseling and increase of physical activity seem to be as ineffective in children as in adults. In spite of various kinds of intervention, the foodaholic is on the way to self-destruction in much the same pattern as the alcoholic. A better understanding of obesity and treatment is needed. Perhaps behavior modification techniques that have shown some good results in adults can be applied to obese children with some measure of success as has been shown by initial attempts. The problem is to keep the weight off once it is lost. It seems to inevitably return.[13]

Weight Control

There are a wealth of weight reduction remedies available. You can find them in books, magazines, newspapers, television and by word of mouth--to name a few. None of these methods are effective in the long run. Most of the people who lose weight can't maintain the loss and they gain it back again.

A group program carried out at Carleton University in Ottawa, Canada has been conducted on the premises that sedentary life style is a major factor in obesity and that to retain weight loss and acquire good health the obese must change diet habits as well as enjoy increase in physical activity. Weight loss solely by reduction in calories is seldom permanent. When you count calories you need regular exercise that you enjoy doing to let your body know you are doing something about it.

You should have a diet especially for you; one that is appealing, satisfying and nutritious. Your physician should work with you to be sure

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[13] Ibid., pp. 144-47.

it is right for you calorie-wise. The Canadian project has shown that obesity can be treated favorably by a combination of a low-calorie diet, physical fitness and shared experiences.[14]

About $100 million a year is spent by Americans for diet books and weight reduction devices. Dr. Philip L. White, director of the American Medical Association's department of Food and Nutrition has advised against some fad diets which are nutritionally poor and perhaps even dangerous.[15]

It is apparent that losing weight in this country means shedding pounds with the least effort as fast as possible. Nutritional experts critize the majority of fast weight loss diets for inadequacy of nutrition and failure to provide nutritional information. Furthermore, the weight loss on these fad diets almost always comes back.

Opinion of many nutritionists support the belief that the multi-million dollar business of fad diet books and the like are written not for the well-being of the public but for personal profit. Moreoever, their contents may furnish material that is both deceiving and false.

Let's see what some authorities have to say about the liquid protein diet. Dr. Samuel Bessman of L. A. County-U. S. C. Medical Center says, to be brief, that it can shock a person's system, cause fainting and convulsions--and even possible heart failure. The F. D. A. places blame on the liquid protein diet for contributing to the death by heart attack of ten obese women. However, there are others who say it is safe as a supplement.

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[14] M. M. Kindl, M. D. and Peggy Brown, "Successful Treatment of Obesity," Modern Medicine 45 (September 15, 1977): pp. 49-51.

[15] Englebardt, How to Avoid Your Heart Attack, p. 78.

A final word as to the contents of liquid protein diets; many are made from low cost protein material, including bones, hooves and animal skins. Flavoring masks the repulsive taste of it.[16]

Dr. Jean Mayer, noted nutritionist, contends that it isn't because obese people eat more, but rather that they are less physically active than lean ones. Mayo Clinic studies point out that overeating doesn't necessarily promote obesity. As one increases in age the body requires less fuel because the rate of metabolism decreases.[17]

Most authorities agree that exercise is the key word for treatment of obesity. They point to the races of people who must be active for survival. Fat people are also unfit. The bonus for physically fit persons is less coronary heart disease, hypertension and diabetes. These individuals can not only eat better but they look and feel well--their health is improved. In our affluent society where the accent is on food consumption, we have a difficult time of it trying to deny ourselves of good things to eat. The alternative to obesity then would seem that we must plan to change our sedentary ways. We should select a program of physical activity and "get going."[18]

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[16]Kathleen Mulvihill, "Our Insatiable Appetite for Diets," Los Angeles Herald-Examiner, 18 December, 1977, E-4.

[17]Cantwell, Stay Young at Heart, p. 43.

[18]George V. Mann, M. D., "Obesity--the Affluent Disorder," Medical Tribune 18 (Wednesday, November 2, 1977): 31-34.

CHAPTER 13

PREVENTION BY DIET

With the rising costs of health care it behooves us to take some measures of prevention. There is no reason that we should eat, drink and be merry to excess and then expect our physicians to repair the damage at a horrendous cost. And the cost continues to rise.

Most of the risk factors can be controlled. The major risk factors of atherosclerosis, cholesterol, hypertension, obesity and diabetes as we have discussed in previous chapters can all be controlled by the same means, diet and exercise. The greatest risk factor, smoking, must be dealt with by will power and the desire to live longer. And we can live longer!

Let's keep in mind that change in diet alone will not stem the tide of heart disease, the number one health problem in the United States today. A program of regular exercise must be incorporated into the overall program of revamping our health. Although we will be discussing exercise in the next chapter it will be wise to explain basic reasons for its relation to diet. The rate of metabolism is increased with exercise and in this manner calories are burned up. The benefit of exercise has a lasting effect over a 24-hour period as the increased rate of metabolism is maintained during that length of time.[1]

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[1] Arthur Vineberg, M. D., How to Live with Your Heart, (Montreal, Canada: Optimum Publishing Company, 1975), pp. 88-89.

Recommendations of the AHA

In 1964, the American Heart Association advocated that the American population reduce its total fat consumption and that people should substitute vegetable for animal fats. This, it recommended, was to be accomplished under medical supervision. In 1965, the Association concluded that scientific evidence indicated an appropriate diet over a suitable length of time would maintain a decreased cholesterol level and other blood fats in most individuals.

The AHA urged Americans to eat less of foods high in cholesterol, to reduce if overweight and to begin good dietary habits early in life. By following these recommendations a lowering of the level of blood fats may be accomplished. When good nutrition applies to all members of the family, sound dietary habits with lowered blood fat levels benefits all. Every effort should be made as soon as possible to alter risk factors for coronary heart disease so that the next generation will profit by a reduction in premature heart attacks and death.

All animal fats and foods high in cholesterol cannot be totally eliminated as many important foods contain these fats. The AHA stresses consumption of those foods low in saturated or animal fats such as low fat milk and cheese.[2]

A Sensible Diet

We should modify our diets for our hearts' sakes, but we don't have to take the enjoyment out of eating. The accent will be on nutritious

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[2]Snider, Learning How to Live with Heart Trouble, pp. 57-78.

foods with avoidance of those that are harmful to our hearts. The daily diet should be a balanced diet--one that contains essential nutrients.

Most of us need to be on a low calorie diet since the majority of us are overweight. Beware of fad diets that recommend too much of one thing. These diets are based on quick weight loss which they often accomplish. Quick weight loss is only temporary--mainly water loss--and the weight will soon return. Over a long period of time fad diets with lack of essential nutrients can cause damage with permanent break down of your health.

The diet we select should be personalized as we are all individuals with different requirements. The diet chosen must include adequate amounts of fat, carbohydrates and protein for good health.

Choice of diet should be one that we will be satisfied with over a long period of time--one of high quality and good variety. Fad diets are soon boring. Don't forget that it's important to consume less calories than you will burn off in a day. Along with exercise appetite will be reduced, too.[3]

The Importance of Nutrients

The markets of today have such a large number of food choices that it becomes a confused issue. So many foodstuffs furnish quick meals for those with little time that a sense of nutrition values can be lost. We may not be taking enough time to read the labels and to select wisely; we might be doing ourselves an injustice and harming our lives.

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[3]Englebardt, How to Avoid Your Heart Attack, p. 80.

How carefully we dress and groom ourselves daily. The Americans are well noted for frequent washing--the daily bath. But what about our inner selves? There is a saying, "We are what we eat," and what we eat shows in our looks, our actions and age. The proper balance of food gives us a sense of youthfulness and well-being. With our knowledge of good nutrition and other good health habits we should and can live better and longer. What's more, we can look younger longer.[4]

The word "diet" by itself is a frightening word. We think of it as having to deprive ourselves of the food we like. We have to diet to lose weight--or we have to be on a diet for ulcers. The person who has survived a heart attack has to be on a special diet. Someone is always trying to take the fun out of eating. But diet is really quite simple. A balanced diet means the daily selection of various foods that provide the necessary nutrients for the body's needs. The essential nutrients for daily consumption are: carbohydrates, fats, proteins, vitamins, minerals and water.[5]

Carbohydrates, fats, proteins and water are the most plentiful nutrients in foods. All of the essential nutrients aid the body in growth, internal regulation and energy provision.[6] With some knowledge of nutrition and care in selection of foods we shouldn't have too much trouble in eating ourselves away from heart disease--instead of toward it.

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[4]Selma Chaij Rhys, R. D., "Food and You--An Unlimited Adventure," Life and Health 92 (March, 1977): 18.

[5]Sensible Eating Can Be Delicious, (New York: Standard Brands Incorporated, 1976), p. 4.

[6]Ethel Austin Martin, Nutrition in Action, 3rd ed. (New York: Holt, Rinehart and Winston, Inc., 1971), pp. 70-78.

Saturated Fats vs. Polyunsaturates

The culprit in the diet of the American people is thought to be saturated fat because along with the highest rate of heart disease in the world we also consume more saturated fat than other countries. Saturated fats which raise the cholesterol level are found chiefly in animal products such as meat, butter, egg yolks and cheese. Unsaturated (or polyunsaturated) fats are found mostly in fish and vegetable oils.[7] Most fats are a combination of saturated and unsaturated fats. Saturated fats are predominantly solid at room temperature and these are the ones to avoid: hydrogenated cooking fat, butter, lard and meat fats. In people with atherosclerosis the body and blood fat is made up mainly of saturated fatty acids. In a person relatively free from the disease, unsaturated fatty acids are present in the circulation and tissues.[8]

The liquid oils are largely polyunsaturated and tend to lower the level of cholesterol in the blood. These oils include safflower, soy, sesame and corn oil. Peanut oil and olive oil are of vegetable extraction and are also liquid but they are not to be consumed in great quantity. They are termed monounsaturates and while they do not cause atherosclerosis as quickly as saturates, they do not lower the cholesterol level. Avoid coconut oil for it is highly saturated although it is of vegetable origin. Be wary of labels that contain vegetable oils--they may be saturated.[9]

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[7]Snider, Learning How to Live with Heart Trouble, p. 53.

[8]Adelle Davis, Let's Get Well, (New York: Harcourt, Brace & World, Inc., 1965), p. 49.

[9]Levitas, You Can Beat the Odds on a Heart Attack, p. 50.

Solid shortenings, including lard, should not be purchased. Only oils that are liquid at room temperature should be used in cooking and baking. The best polyunsaturated oils for use are safflower oil and corn oil. Peanut oil, soy oil and cottonseed oil are less beneficial as they are higher in saturated fat content. Mix your own salad dressings that require oil, using safflower or corn oil. Prepare your own mixes for baked goods with recipes that call for oil instead of solid shortenings.[10]

Dietary population studies have evidenced that the type and amount of fat consumption directly affects cholesterol levels. Saturated fats have the tendency for elevating cholesterol 5% to 10%. Monounsaturates appear to have no effect, and polyunsaturates tend to lower the cholesterol level 5% to 10%.[11] These findings may have significant value when we apply them to our daily diet.

A low saturated fat (low cholesterol) diet is merely a plan designed to lower blood cholesterol levels by sensible changes in the choice of certain kinds of foods. It should not be difficult for us to avoid foods high in cholesterol, cut down on saturated fats and substitute polyunsaturates.[12]

Here are some general dietary rules for the selection of foods for your "modified fat diet."

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[10]Lamb, Your Heart and How to Live with It, p. 112.

[11]Thomas A. Bruce, M. D., "Atherosclerosis: Update on Presentability," Continuing Education for the Family Physician 8 (February, 1978): 39.

[12]Sensible Eating Can Be Delicious, p. 5.

Do use --

- liquid oil margarine
- vegetable oils
- fish, excluding shellfish
- small amounts of lean meat
- skim milk
- whole grain breads
- whole grain cereals
- low-fat buttermilk
- skim milk cheeses
- macaroni and spaghetti
- soups without fat
- vegetables
- fruits
- almonds and walnuts
- low-fat cottage cheese
- poultry without skin
- low-fat desserts
- sunflower seeds
- pure peanut butter
- sherbet
- low-fat yogurts
- salads with vinegar and oil

Avoid --

- butter
- fatty and organ meats
- Brazil and cashew nuts
- egg yolks
- most cheeses
- chocolate
- gravies
- potato chips
- canned meat
- ordinary margarine
- commercial popcorn
- egg noodles
- whole milk
- cheese
- luncheon meats
- coconut
- sweet or sour cream
- shellfish
- commercial baked goods
- creamed foods
- ice cream
- avocados
- homogenized peanut butter
- bacon and sausage

Use moderately --

home-made baked goods	canned vegetables
canned fruits and juices	frozen fruits
smoked fish	peanuts and peanut butter

Meat, Poultry and Fish

Choose lean cuts of beef or veal and trim all the visible fat before cooking. Use only lean ground beef, preferably ground to order. The leg and loin sections of lamb are leaner. Pork and ham should be used sparingly. It is recommended that all meat be broiled or roasted and eaten only several times a week. Chicken and turkey can be used often as their fat is less saturated than other meats. The skin should be discarded as most of the fat is just under the skin. Avoid fatty meats like luncheon meat, bacon, sausage, spareribs, frankfurters, salami, canned meat, as well as duck and goose. Brains are extremely high in cholesterol. Other organ meats to use in moderation because of their cholesterol content are liver, heart and kidney. However, liver is high in nutrients, especially iron, and should be served occasionally.

Fish is an excellent food in several ways. It is very high in polyunsaturates as well as a good source of protein. It has the advantage of not having been subjected to hormone treatment such as commercially raised beef and poultry. Fish also has about half as many calories per serving as meat. Fish packed in oils, mainly sardines and tuna, are less desirable.

Shellfish, having a higher cholesterol content than other seafood, should be eaten less frequently. Among these are lobster, oysters, clams,

crab, shrimp and scallops.[13] When choosing shellfish it would be well to keep in mind that some are higher in cholesterol than others. Lobster, especially lobster Newburg, is the richest in cholesterol. Crabmeat, shrimp and scallops have less cholesterol, in that order.[14]

Dairy Products

Almost all dairy products are high in cholesterol and saturated fat. Whole milk is extremely high in saturated fat and should be avoided. Select nonfat or skim milk in place of whole milk. The best for use is instant nonfat dry milk. It has all the nutrients of whole milk, is comparatively less expensive and is readily available in your cupboard. It can be used in any recipe which calls for milk. The powder can be used in place of cream in coffee and when the directions on the package are followed, it makes a delicious substitute for whipped cream. When one is harried it provides a quick, nutritious treat for a pesky pet. You say you may not like the taste--but you can cultivate the taste for it as you do for other foods. Instant nonfat dry milk should be prepared properly. Mix it according to directions and chill in the refrigerator, preferably overnight. If there are any family objections, you can get used to it gradually by mixing with lowfat or whole milk. It even helps to keep it in a regular milk container. Soon everyone may prefer it to regular milk.[15]

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[13]Lamb, Your Heart and How to Live with It, p. 115.

[14]Vineberg, How to Live with Your Heart, p. 94.

[15]Levitas, You Can Beat the Odds on a Heart Attack, p. 58.

No butter is allowed on our anti-atherosclerosis diet. According to some television commercials, you can't tell the difference between butter and margarine, at any rate! Margarines are less expensive and most of them are very pleasing to the taste. Soft margarine is excellent as it spreads easily, even when refrigerated. It should not be substituted for butter in cooking, however. A vegetable one would be better, especially in frying as the flavor of soft margarine becomes altered when heated in a skillet.[16] The choice of a suitable margarine can be difficult because they all contain too much hydrogenated oil, even the best of the lot.[17] A good suggestion is to avoid use of margarine. A woman recently told that she hasn't had any margarine--or butter--in her household for over a year. On special occasions she may ask a visiting family member to bring some margarine if they wish to use some.

It will require diligent label reading to determine the choice of margarine for home use. Those made from hydrogenated vegetable oils can be as high in saturated fat content as butter. The labels generally indicate partial hydrogenation, but it is not stated how much, so we have no way of knowing. A good rule of thumb is to look for the least solid at room temperature, which indicates lower saturated fat. The most desirable margarines to look for are those made with corn or safflower oil.[18]

Cheese, except for cheeses made with skim milk should be avoided. Most solid cheeses are high in saturated fat. Cottage cheese made from

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[16]Levitas, You Can Beat the Odds on a Heart Attack, p. 58.

[17]Blumenfeld, Heart Attack: Are You a Candidate?, p. 185.

[18]Lamb, Your Heart and How to Live with It, p. 114.

skim milk is preferable and can be used in many ways. It can be used in such things as dips, salads, lasagna and different casseroles. There are other good cheeses made with skim milk, including hoop cheese, Jarlsberg and mozzarella. Browsing among the cheeses and reading the labels will help you to make a selection. It is also better to choose other than processed cheeses.

Will it come as a surprise that egg yolks are the highest source of cholesterol in our diet? One egg yolk alone contains twice as much cholesterol than the body requires nutritionally per day. Egg whites are a good source of protein and can be used as desired. Cholesterol-free egg substitutes are available on the market that have dubious use, possibly in casseroles and the like. It would be worthwhile to experiment with different brands. Some come in an envelope that is marked as equalling two large fresh eggs which may be used wherever whole eggs are called for. The package also claims that the contents are a nutritious, delicious fresh egg substitute. In any event, nutrition sources interested in heart disease recommend anywhere from two eggs a week to four eggs per week including those used in cooking.[19] What to do with the yolks? It would be hard for a thrifty-minded person to say, "Throw them away." A Registered Nurse, who lives alone, makes scrambled eggs with two eggs and removes one yolk. With the other yolk she makes a small jar of mayonnaise. A thirty-five-year-old neurosurgeon lost his father and brother from heart attacks. He allows himself and his family of wife and five children to drink only skim milk and eat only one egg each per week. Very active and healthy Mrs.

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[19]Levitas, You Can Beat the Odds on a Heart Attack, pp. 58-59.

H., ninety-five-years old and diabetic allows herself one egg a month. She does all her own housework and walks to the market. This lovely little lady claims that a woman who keeps a clean house walks five miles a day.

Fruits and Vegetables

Almost all fresh fruits and vegetables contain virtually no cholesterol. They are high in many essential nutrients, and therefore are recommended for the daily diet. They are rich in vitamins. Some vegetables have an abundance of protein, such as peas and beans. Avocados should be eaten sparingly for, although they are nutritious, they contain only a small amount of polyunsaturates and large amounts of monounsaturates and saturated fats. In addition, they are high in calories--hardly suitable for a weight reduction diet. Olives have equal amounts of saturated and unsaturated fats and should be eaten infrequently. Don't overlook the potato, including its skin, as an excellent source of good nutrition. They are good on almost any diet and are not fattening when you leave out the butter or margarine, sour cream or gravy.

Canned fruits and vegetables are less valuable foods than fresh as many nutrients are lost in the high temperatures of processing. Canned fruits are also usually packed in heavy syrup. Frozen foods are more desirable than canned and when fresh produce isn't available they are suitable--but, all in all, fresh foods are always the best.[20]

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[20]Lamb, Your Heart and How to Live with It, p. 113.

Breads and Cereals

Most breads and cereals are low in saturated fat and consist mainly of enriched, or whole-grain forms of wheat, corn, rye, buckwheat, oats or rice. When shopping for these products it is important to read the labels. You will soon learn the brands that are most nutritious. In general, one should look for whole-grain breads and cereals. Breads made with unbleached or stoneground flour are the best in food value. By careful looking, delicious bread can be found that is composed of several types of grains and has no refined sugar or preservatives added. Breads such as sweet rolls and coffee cake should be avoided. You can bake your own breads, using high quality flours and vegetable oils. The flours, as well as bread made with no preservatives added, should be kept refrigerated to retain freshness and quality.

Dr. Herman Lerner, a general practitioner in neighboring Boston, bakes bread to sell in natural food stores in the surrounding area. His bread is sourdough bread made from organic whole wheat. He sometimes refers to it as the yogurt of breads, and preferably, the wine of breads. The doctor's bread is totally digestible as the sourdough causes all the nutrients to become available to the body. Dr. Lerner had been working with heart disease. Subsequently he realized the relationship of diet to health--believing the American diet somewhat at fault for, notably, heart disease and high blood pressure. The doctor believes in the necessity for repairing the damage which has been done to the health of the Americans.[21]

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[21] "The Doctor Who Bakes Bread," Prevention 30 (January, 1978): pp. 94-95.

The selection of nutritious cereals is another story. The market is flooded with a vast assortment of "empty" cereals. Some taste like fodder. Most are oversugared in order to appeal to the child population. The T. V. commercials are so tantalizing--who can resist? The contents of the package are listed on the label, but these are often confusing as far as sorting out the nutrients. Many believe that most cereals contain the same amount of nutrients, whether or not they are sugared. Dr. Jean Mayer, emminent nutritionist, says that whole-grain cereals do indeed supply protein, iron, B vitamins, trace minerals, vitamin E and fiber--however, some nutrients are absent from cereals of high sugar content. He says these cereals are nothing more than fortified candy. In fact, Dr. Mayer has offered the idea that some breakfast cereals provide less protein than a candy bar. He suggests that cereals with over 50 percent sugar content be called cereal confection or imitation cereal and placed in the candy department.

Granola, believed by many to be more nutritious than some cereals, can be more of a confection insofar as nutrition is concerned. Whether homemade or commercial, granola may be high in calories and comparatively low in protein. Homemade granola may, in fact contain less vitamins than the commercial product due to the addition of vitamins to granola we buy. The truth is, we can save time and money by purchasing a regular high quality cereal which will be just as nutritious, if not more so, than granola.[22]

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[22]Sylvia M. Fagal, M. S., R. D., "Your Body Needs Premium Fuel," Life and Health 92 (April, 1977): 18-20.

Seeds and Nuts

Important nutrients such as natural oils, B vitamins, lecithin and vitamin E are found in nuts and seeds. Sesame seeds, sunflower seeds and pumpkin seeds have more nutritional value when eaten raw. They are wonderful additions to salads and good for pep up when eaten as a snack. Seeds and nuts, including grains, contain not only minerals but factors that increase the body's resistance to disease and prevention of premature aging. They also provide valuable dietary bulk necessary for digestive function and prevention of intestinal diseases such as cancer and diverticulitis. Sprouting increases the nutritional value of seeds. The most commonly used seeds for sprouting are alfalfa, soy, mung and wheat. Sprouts are best eaten raw and are good additions to salads, sandwiches and other foods. They can be added to juices in a blender and can be included in breads, soups or casseroles.[23]

Sprouts are easy to grow and prepare--and they are inexpensive. Sprouting increases the vitamin content of seeds from 10 percent to as high as 1,000 percent. Alfalfa sprouts and bean sprouts can be purchased in markets. It's easy to sprout your own seeds right in the kitchen but be sure to get seeds especially for sprouting--preferably from health stores.[24]

Nutrient value is lost from seeds and nuts when cooked or roasted, therefore they should be eaten in the raw state. A word of caution is

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[23]Airola Paavo, PhD., N. D., How to Get Well, (Phoenix, Arizona: Health Plus Publishers, 1974), p. 185-86.

[24]Linda Clark, Secrets of Health and Beauty, (New York: Pyramid Publications, 1969; Pyramid Books, 1976), p. 113.

needed about overuse of nuts and seeds. They are rich in both calories and unsaturated fat. To avoid the use of eating too many at one time it's a good idea to purchase them unshelled and, when eating for snacks, shell as you eat. Peanuts, cashews and Brazil nuts are rich in monounsaturates and saturated fat and should be avoided. Almonds, pecans and walnuts are the best of the nuts since they are high in unsaturated fat. Coconut and especially its oil are to be avoided because of the high content of saturated fat.[25]

Desserts

High on the list for atherosclerosis and heart disease are baked goods bought in markets or bakeries. Most bakeries use saturated fats. Purchased ready-to-use products and packaged mixes fall into the same category of saturated fat items. The best way to know what you are eating in the line of pastries, cookies and pies is to bake your own, using cooking oils for shortening. Don't forget to exclude coconut in baking. Chocolate is rich in saturated fat, too, and should be avoided. Cocoa powder is a good substitute in many recipes.

Packaged puddings are relatively low in fat content and when made with nonfat milk are acceptable desserts on an anticoronary diet. Gelatin desserts made with unflavored gelatin, a good source of protein, are flavorful and nutritious. Ice cream, high in fat and high in sugar content is NO on our diet for health. If you must eat ice cream, some ice milks and sherbets are lower in fat and delicious, in addition. You may consider the possibility of a homemade ice cream made with nonfat milk,

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[25]Lamb, Your Heart and How to Live with It, p. 121.

unflavored gelatin, egg whites and fruit.[26] Angel food cake, candies without chocolate, jams and jellies and marshmallows are satisfactory as far as fat content is concerned--if you can afford the extra calories. The ideal dessert is fresh fruit. The servings may be varied by combinations of fruits topped with nuts or complimented with lowfat cheese.

Sugar and Spice?

Our population consumes more than 100 pounds of refined sugar (white and brown) per person per year. We know heavy sugar consumption adds to obesity, which in turn, can lead to diabetes. We also know that eating sweets leads to tooth decay and periodontal disease. Sugar contributes to atherosclerosis--especially in combination with saturated fats. And we know that atherosclerosis leads to heart attack. Dr. John Yudkin of the University of London discovered that men who have recovered from heart attacks had consumed twice as much sugar as men of the same age without heart disease.

Some authorities have the opinion that too much sugar in the diet leads to hypoglycemia. Dr. U. D. Register, Loma Linda University, notes a correlation between high sugar intake and lowered resistance to disease. This has been particularly described for children who eat excessively of sweets. Hyperactive children have returned to a normal state after relief from their "addiction" to sugar. What a shame, so many of our American children must be treated medically and psychologically when, in reality their problem stems from their sugar habit.[27]

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[26] Ibid., p. 117-8.

[27] Lydia Sonnenberg, "What's for Dessert?", Life and Health 89 (June, 1974): pp. 30-31.

In truth, the body requires sugar for energy--but it receives all it needs from the conversion of carbohydrates to sugar, or from the sugar in fruits and vegetables. It's the refined sugar forming the bulk of our sugar consumption that is the guilty one. Do you believe that seventy percent of the sugar in our diet is concealed in processed foods? That's right--just read the labels and you will be surprised to find how many foods contain sugar that, heretofore, you didn't realize did. For instance, canned peas and catsup contain sugar.

In January of 1977, the Senate Select Committee on Nutrition and Human Needs recommended that Americans reduce their sugar consumption by 40 percent. In view of the adverse things we have just said about sugar, it seems like sound advice.[28]

Reaching for the Salt

The human body needs salt as well as it needs sugar, but here again, we use salt to excess. Our regular diet provides 10 to 25 times more salt than the body needs. We have a bad habit of salting our food before tasting it. Dr. Jean Mayer cautions that people forget salt is more than a seasoning. Sodium and chloride--the composition of salt--are essential nutrients. Dr. Mayer states that these, together with body water and other minerals are necessary for the support of the body's internal equilibrium.[29] But our diet alone without the addition of salt provides all we need. Dr. Mayer suggests, not the elimination of all salt from our

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[28]Jane E. Brody, "Sugar: Villain in Disguise?", Readers Digest 111 (October, 1977): pp. 163-65.

[29]Darla Welles, "Reaching for the Salt Is a Bad Habit," Lancaster (Calif) Antelope Valley Press, 2 March 1978, sec. 3, p. 27.

diets, but that we cut down on the amount we use. It's all in the matter of getting used to less salt--foods taste just as good. And if they don't taste just as good, we may not do so much overeating. We can substitute other things to flavor our food. Herbs such as thyme, bay leaves, marjoram and sage help bring out food flavor. Other additives like onions, garlic, celery seeds, pepper, paprika and mustard are equally as good. Dill weed, curry powder and wine vinegar can also be used to spark up an otherwise seemingly dull dish.[30]

Dietary Fiber

Interesting reports from an English study imply an inverse relationship between dietary fiber intake from cereals and coronary heart disease. The study, conducted on middle aged men, showed that those with highest consumption of cereal fiber had the lowest rate of CHD. This connection was found in cereal fiber only--it did not apply to fiber consumed from vegetables, fruits and nuts. Neither did it apply to consumption of refined sugar. Those with high energy consumption and greater intake of polyunsaturated fats also had the lowest occurrence of CHD. These findings correlate with several authors' hypothesis that the decrease in cereal fiber in our diet may have relationship to the rise in heart disease in this country.[31]

It was in the early 1800's that refinement of flour began. White flour was more in demand among wealthy people who could afford the higher

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[30]Jean Mayer, A Diet for Living, (New York: David McKay Company, Inc., 1975), p. 146-7.

[31]"Diet and Heart Disease Revisited," Practical Cardiology 4 (January, 1978): p. 11.

prices. Dark bread was considered bourgeois and was for consumption by the lower classes.

Refining and processing of flour removes valuable fiber--otherwise known as bran or bulk. Although it is not digested nor absorbed, there are diseases related to the lack of it. Among the best known of these diseases are heart disease, as we have mentioned, and intestinal problems such as cancer, gallstones, appendicitis, hemorrhoids and diverticulitis.

Fiber is residual material from plants that is not broken down during the process of digestion. It is undigestible, unabsorbable, and remains unchanged while passing through the digestive tract. It is found only in grains, fruits and vegetables and it is not found in dairy products and meat.

Again, we can point our fingers to industrialization for having developed the skill for removal of fiber from our food.

You may be wondering just how fiber influences disease--what happens when the fiber content of foods is low? Fiber affects cholesterol. In the first place, a high fiber diet is probably low in cholesterol. Bile salts, the end products of cholesterol, are bound by fiber and thus, are not reabsorbed, but eliminated from the body. Therefore, new bile salts are synthesized to take the place of those which were attached to fiber and lost through excretion. This process lowers the total cholesterol value, which consequently may slow the development of atherosclerosis. Fiber causes food to pass faster through the intestinal tract, reducing the opportunity for food to be digested and absorbed. This helps explain why high-fiber foods help prevent obesity--and gallstones and other diseases of the intestines.

To some, foods with more fiber are superior to sweets. We can learn to satisfy a sweet tooth with sweet vegetables and fruits. We should avoid low fiber foods such as dairy products and meat. Avoid white flour --as well as white rice. Use whole grains that have bran left in them. Whole grains have 12 to 14 percent bran content.

Some commonly used foods that have a high fiber content are:

wheat germ	shredded wheat
bran flakes	unpared apples
dried apricots	dried figs
raw prunes	raspberries

Others are:

artichokes	ripe olives
peas	all the beans

Also included are:

hazel nuts	almonds
pecans	sunflower seeds
sesame seeds	popcorn[32]

Garlic - Fact or Fallacy?

Folk medicine has long extolled the virtues of the lowly garlic clove. But now we may be taking its powers of prevention and healing more seriously in the light of new advancements in the studies on garlic. By regularly including garlic in our daily diet we can provide a twofold benefit to our bodies. We learned in an earlier chapter that when our arteries are so

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[32]Gary W. Langston, M. D., "Fiber--Victim of Progress," Life and Health, 92 (February, 1977), pp. 25-27.

plugged up with fatty deposits the blood flow becomes slowed, the platelets become "sticky" and clots are easily formed. Researchers have found garlic to have a predisposition for increasing the fibrinolytic activity of the blood. In other words, garlic has a significant ability for dissolving clots.

We have talked about reversal of atherosclerosis. Can it be true that garlic does this? If we can believe the researchers, then it is indeed so. Experiments with animals have produced evidence of fat deposits in arterial disease having been reduced by about half when garlic was administered. Other experiments have shown similar results. A study in Libya found a small amount of crushed garlic cloves in the daily diet of healthy men reduced both cholesterol and triglyceride levels after only three weeks.

Garlic has been claimed as a miracle food in that it can be responsible for all sorts of remedies from cleansing the system to rejuvenation of failing sex life. One proven cure that I know of is the case of my associate's husband. After exhausting all known hemorrhoid treatments, he finally tried a recommendation--a garlic clove suppository. Miraculously, it worked. Occasionally, he now gently reminds his wife, "Honey, bring home some garlic next time you go grocery shopping."

We just can't lose with garlic in any form--it even retains its beneficial qualities when cooked. And if you or someone close to you finds garlic breath objectionable, garlic oil capsules can be purchased--thus eliminating unpleasant after effects. With a little ingenuity, we can

easily include garlic in many of our recipes with the assurance that it is advantages to our health.[33]

Not Pickles!

This is going too far, you say. Surely, you can't be expected to believe that eating dill pickles will lower cholesterol levels. Well, they do say that heart attacks may be prevented by eating dill pickles with your meals. How can we explain that? Pectin, a substance found in vegetables and fruits, seems to act very much in the same manner as fiber when it works in combination with aluminum. Dr. Joseph Nagyvary of Texas A & M University says that experimentation indicates pectin and aluminum together bind the bile acids and are excreted instead of absorbed.

Aluminum, present in dill pickles, gives them their crispy texture. Dr. Nagyvary says the aluminum content of our diet is the world's lowest --probably because we don't use as many aluminum cooking utensils. Other countries also use more baking powder, which contains aluminum. In this country, we consume about 10 milligrams of aluminum a day whereas people in other countries eat from 500 to 1,000 milligrams. A normal sized dill pickle may contain around 200 milligrams.[34] Sweet pickles contain aluminum, too--look for alum on the label. Don't eat too many dill pickles if you are limiting salt intake and go easy on the sweet pickles for they contain sugar.

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[33]John Feltman, "The Heart Likes Garlic," Prevention 30 (March, 1978): 100-108.

[34]Glenn Singer, "Eating Dill Pickles May Prevent Heart Attack," National Enguirer, (December 20, 1977), p. 15.

Yogurt

We Americans think of yogurt as a relatively new concoction, when in reality, it is centuries old--and has always been regular fare for the Europeans. It has been favored for its medicinal qualities and believed to bring about miracles. Legend has it that an angel gave Abraham the recipe--he lived to be 175. It was thought to be food of the gods in India and Persian women used it as a beauty treatment.[35]

A beautiful woman, known worldwide, has written her beauty secrets in a nationally circulated magazine, stating her best claim to beauty was creaming her face nightly with yogurt. Her skin no doubt received the beneficial effects of calcium, protein and the acid composition of this "beauty aid."[36]

Elie Metchnikoff, Russian scientist and Nobel Prize winner, was responsible for the promotion of yogurt. Noting the long life of the native Bulgarian and that yogurt was the principal food item in the diet, he isolated Lactobacillus bulgaricus--the bacteria responsible for yogurt's characteristic flavor. He believed yogurt to be the miraculous food responsible for longevity.

It wasn't until around 1930 that yogurt became known in this country, and at that, not well received because of its sour taste. Not too much later--in the late 1940's--it became more popular when fruit was added. Statistics show about 11 percent of the population was consuming

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[35]"Yogurt," Consumer Reports 43 (January, 1978): 7.

[36]Clark, Secrets of Health and Beauty, p. 105.

yogurt in 1976. It is now the fastest growing dairy product in the country.[37] Perhaps if yogurt had a more pleasant sounding name its rate of consumption would increase more rapidly.

In Chapter 5 we referred briefly to the Maasai tribe in Africa, whose yogurt diet is seemingly responsible for their low heart attack rate. Although their diet is abundant in cholesterol because of the yogurt made from cow's milk which is the mainstay of their dietary habits, the Maasai have low cholesterol levels and heart attacks are practically unknown. A study has been made to determine if there is a substance in yogurt that could account for low cholesterol production. The reports of the research project indicate the presence of a component in yogurt which inhibits the enzyme that regulates the manufacture of cholesterol.[38]

Several other claims have been made for yogurt, the wonder food. It is believed to help restore normal intestinal bacteria after deterioration from prolonged use of antibiotics. It is also a proclaimed remedy for diarrhea and constipation.

Mr. D., a young man of twenty five, can well attest to the value of yogurt as a laxative. From the time of his birth he had been plagued with constipation problems, at times so severe he visited his doctor. On one occasion he was examined for acute appendicitis. All known remedies for his chronic condition were no help. Recently, he sampled some of his mother-in-law's yogurt and discovered that it was indeed able to work

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[37]"Yogurt," Consumer Reports, p. 7.

[38]"Clinical Trends," Practical Cardiology, p. 8.

miracles. Mr. D. finds this remedy so effective that he needs to eat yogurt only upon the occasion of his visit to his in-laws.[39]

Yogurt is available in supermarkets and health food stores--the most desirable, of course, is made with low fat milk. It comes in all kinds of flavors to choose from. New is frozen yogurt, available in different styles from cups to cones. One fast-food place has been observed selling frozen yogurt, 98 percent fat free, made with all-natural ingredients and simply delicious tasting flavors. You may like to try making your own yogurt--the consistency and flavor will probably have more appeal. Besides, it's cheaper to make your own and you will be assured of live bacteria in the culture instead of the possibility of being pasturized after culturing.

There are many ways to include yogurt in the diet. It can be made into salad dressings, used in recipes calling for sour cream and served as a light dessert--especially the frozen variety. Yogurt is also a good between meal snack. Be careful not to cook yogurt for the beneficial bacteria are destroyed in the process.[40] Don't despair if you find you just cannot develop a taste for yogurt. Lactobacillus acidophilus tablets containing a cultured strain of the viable bacteria can be purchased at health stores.

Water

Offhand, who would think of hardness or softness of drinking water having anything to do with disease of the heart and blood vessels? Studies

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[39]Author's acquaintance with Mr. D.'s problems.

[40]Clark, Secrets of Health and Beauty, p. 105.

in the United States and other countries point out the fact that those states using soft water have a higher incidence of heart disease than states who drink hard water. What is that certain something in the water that influences the blood vessels and heart--and in particular, hypertension?

Dr. Henry Schroeder of Dartmouth Medical School has proposed the possibility of trace metals being at fault. Trace amounts of some metals such as zinc and copper are essential to life. According to Dr. Schroeder, soft water is not only deficient in vital metals, but contains another, cadmium--dissolved in soft water from water pipes. Greater amounts of cadmium have been found in hypertensives than in normal subjects.

Another theory offered by the World Health Organization's Cardiovascular Disease Unit is the lack of minerals in some geological areas where rocks which provide the minerals are deficient in some elements. Mortality rates from cardiovascular disease are increased in these environments where rocks are geologically older and poor in minerals.[41]

We ought also to think about the water we are drinking--mainly in ecological terms and today's pollution. Hopefully, none of us are drinking distilled water because of its total lack of minerals. Extensive drinking of distilled water may rob our bodies of mineral reserves, resulting in certain diseases, including heart disease. A good example of how much minerals are needed by the body is the Hunzakuts, believed to be the world's healthiest people. For 2,000 years they have been drinking water so abundant in minerals that it appears milky.

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[41]Galton, The Silent Disease: Hypertension, pp. 68-70.

If you are in any doubt as to the quality of drinking water in your area, it would be best to buy bottled spring water. Whatever water you buy, be certain that it is mineralized.[42] It's also possible to have your drinking water in the area tested for "hardness." You may get an idea as to how hard your water is by how much soap it takes to wash dishes and for use in the washing machine. If you soften your water, soften only the hot water used for washing.

An interesting story about soft water comes from a friend, Mrs. P., whose home was for sale and she was showing it to a prospective buyer. The interested party remarked about the lovely big plant in the foyer. Mrs. P. told about the trouble she had with keeping a plant there and it was the third replacement. After the second plant had succumbed, her husband expressed the idea that since their home had a complete water softening system, maybe something to do with the water didn't agree with the plant. When Mrs. P. brought home a new plant she obtained nonsoft water from outside for the plant and it was thriving. The visitor ventured to remark that perhaps the water Mrs. P. and family were drinking would have the same effect on their bodies as it did on the expired plants. Water softening companies should be advised and pass on this information to their customers.

Vegetarian Diet

The degree of vegetarianism is not known--probably because of different kinds according to strictness, in addition to those beginning the diet

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[42] Airola, How to Get Well, p. 195.

and either dropping out or poor adherence to it. In all probability there are perhaps some tens of thousands of practicing vegetarians in this country.

You have no doubt read something about vegetarians, but unless you were seriously interested, you may not have given much attention to it. There are different reasons for choosing meatless diets. Some are religion-based while others have firm beliefs in using the land for vegetable and fruit production rather than raising animals for food. There are people who have the opinion that meatless diets are not only cheaper but more healthful. Many young people today can be found in health food restaurants eating "soul" food. It is their way of life--spiritual nourishment. Fad vegetarian diets can be found in cults, which can be extremism, leading to nutritional deficiency.[43] Finally, I suspect, you will find an occasional person using vegetarianism as an attention-getter. This person would probably like to be thought of as "weird," disdaining to sit at the table with the rest of us, but sits apart crosslegged with his bowl of rice and chopsticks.

Those persons choosing to be vegetarians must proceed with caution for it takes nutritional knowledge and good planning to satisfy the palate and avoid the pitfalls of poor nutrition.

A strictly vegetarian diet is low in fat and consequently, lower in calories. It can help in reducing dietary saturated fats and cholesterol as well as assisting with weight control. Prospective vegetarians need to realize that some of the essential amino acids may be missing in this

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[43]"Going Vegetarian? Be Careful!", Changing Times 31 (November, 1977): 31.

kind of diet and they must know which combinations of foods will give them the proper balance. The amino acid deficiencies are not significant when a good variety of plant proteins are combined with legumes or nutritional supplements. Skim milk is a valuable aid in a vegetarian diet. A great deal of care should be used when exposing a growing child to a vegetarian diet.[44] Children and pregnant women need more dairy products like cheese and eggs.

The Seventh-Day Adventists, who restrict meat in their diet, are ovo-lacto vegetarians in that they include milk and eggs in their dietary regimen. Protein studies show the Adventists are included among those with a lower cancer rate. The most important reason is that they are vegetarians. The conclusion of the study was the number one factor responsible for the low incidence of cancer is lack of meat. Excess protein in the diet breaks down to ammonia which is a carcinogen. Fat does, too, and meat has 40 percent fat. We need only 20 grams of protein in a day. The American diet consists of 90-100 grams a day--far too much.[45]

The Adventists likewise have less heart disease than the majority of the population. They also avoid other risks such as smoking, alcohol and caffeine. Their diet probably includes more fiber.

A strict vegetarian, who is uninformed can get into trouble with a lack of vitamin B_{12} in the diet. A study of British vegetarians showed that a number of them had an incurable disease, degeneration of the spinal

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[44]"The Editor Answers. . .," Nutrition in Perspective 1 (October, 1977): 2.

[45]Paavo Airola, PhD., lecture, "Nutrition--the Foundation for Holistic Health," in Los Angeles, California, January 14, 1978.

nerves, due to a deficiency of vitamin B_{12}. This nutrient is missing from an all-vegetable diet.

A final word about the all important protein in the vegetarian diet. The best vegetable sources are legumes, seeds and nuts. The soybean is the most complete vegetable protein. Good combinations of amino acids to remember, whether or not we are vegetarians are corn tortillas with beans and wheat bread with peanut butter.[46]

Contradictions

In all fairness, we must have a look at differences of opinion concerning dietary fats. Unsaturated fats combine with oxygen more easily than saturated fats. Free radicals, produced during the oxidation process, are believed by some investigators to cause continual irritation in the walls of the arteries--leading to diseases such as high blood pressure, cancer and atherosclerosis. The production of free radicals may also contribute to the process of aging while robbing the body of its natural antioxidant, Vitamin E. This vitamin is essential for healthy blood vessels, heart, as well as other muscles.

If this is true, are we to proceed with the polyunsaturated diet advocated by the American Heart Association? And what do others have to say about it? The AHA repudiates the relationship between unsaturated fats and free radicals, thus adhering to their recommendation of a low cholesterol, high in unsaturated fat diet.

The difference of opinion arises from the fact that the American Medical Association and the American Academy of Sciences advise a diet

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[46]"Going Vegetarian? Be Careful!", Changing Times, pp. 32-33.

low in saturated fats for only those individuals at risk--namely young males with high cholesterol levels or those with family background of heart disease.

In the light of the cancer and heart disease threat, we need to inform ourselves on measures that counteract the effectiveness of oxidized fat and the production of free radicals. BHT, a food preservative used to preserve freshness has been shown, by experimentation, to be an excellent antioxidant. Look for it on food labels. We can add years to our lives by increasing antioxidants in our diet and the sooner we start the better. The best available source is vitamin E nature's antioxidant. The loss of this wonderful vitamin in the refining process of foods is another mark of modern industrialization. The best sources of vitamin E are wheat germ and capsules or tablets. The controversy is how much to take. The American Medical Association and the Food and Drug Administration say that it is nontoxic. Authorities differ in recommended dosages, anywhere from 100 I. U. to 1,000 units daily. The benefits of Vitamin E are numerous, therefore it would be wise to include it in our daily routine.[47]

Future Dietary Trends

Stanford Research Institute (SRI) has made a study predicting trends in the food system of the United States. Some findings show that the trend is for people to eat out more often rather than cooking and eating at home. The report indicates a direction away from food that requires

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[47]Ruth Winter, Ageless Aging, (New York: Crown Publishers, Inc., 1973), pp. 82-85.

much work in preparation at home and a movement toward more highly processed foods.

Tom Veblen, Director of Food and Agriculture Industries for SRI, says a shift toward consumption of beef, poultry and chesse as protein sources is forecast. There will be a trend away from use of eggs, flour, milk and cereal products. Corn and artificial sweeteners will increase in popular use.

The researchers of SRI also found that the public is becoming more food safety conscious and increasing consumption of "health" foods.[48]

Some of these indications are bad news. It is you and I, the consumer who are setting these trends. We know there is not much good to be said for artificial sweeteners and eating away from home can be difficult as far as adhering to a low fat and nutritious diet. Highly processed foods are certainly not recommended for sensible eating.

The food industry responds to consumer demands. It is up to us as consumers to demand and receive healthful and well-labeled foods that have been simply prepared.

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[48]"Food Consumption Trend," Lancaster (Calif) Antelope Valley Press, 23 April 1978, sec. 1, p. 4.

CHAPTER 14

PREVENTION BY EXERCISE

We know from previous chapters that no one thing alone will halt atherosclerosis and prevent heart attack. Exercise does wonderful things for the body in general and it plays its part along with good nutrition and elimination of risks by retarding the advancement of atherosclerosis and avoidance of heart attack.

Let's look at some of the benefits a <u>regular</u> program of exercise may do for us:

reduces cholesterol level	increases blood volume
strengthens the heart	helps control diabetes
improves circulation	improves muscle tone
reduces hypertension	promotes collateral circulation
combats obesity	aids thyroid function
relieves emotional stress	retards aging
induces better sleep	enhances sex life
increases lung capacity	helps low back pains
helps control appetite	relieves fatigue
improves heart efficiency	alleviates depression
lowers triglyceride levels	improves stress tolerance

How can we miss with all these contributions to the improvement of our overall health? Besides, exercise is free. We don't have to buy expensive gadgets that will be shoved in closets or put into an already

overstuffed garage. It's better if we rely on just ourselves--in that way we can exercise wherever we are and at any time.

Some Viewpoints on Exercise

Dr. Paavo Airola, world-famous nutritionist, tells us that exercise is more important than nutrition. In fact, he maintains that it's better to eat junk foods and exercise a lot than to eat healthful foods and have no exercise. Oxygen is the most important thing for our bodies and we can't get it by just sitting here. He says if we don't exercise we are wasting our time. More important than nutrition and exercise combined, Dr. Airola states, is state of mind.[1]

Contrary to many beliefs, the medical world has come to realize that plenty of rest and avoidance of any physical effort by the person who has had a heart attack can cause adverse effects and perhaps another heart attack.

A study by the Coronary Drug Project has revealed that vigorous exercise may not only benefit persons who have suffered heart attacks but help them from having more heart attacks or possible death from one. Although the reports showed deaths and repeat attacks occurred less often among those postcoronary patients who exercised, it appeared that smoking nullified the advantages gained by strenuous exercising.

Some say that part-time exercise is more detrimental than none but surveys among British civil service workers with sedentary jobs showed that those workers who exercised on the weekend had fewer abnormal ECG tests.

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[1]Airola, lecture, "Nutrition--the Foundation for Holistic Health."

Kenneth H. Cooper, M. D., founder of the Aerobics Center in Dallas, conducted a physical fitness study on 3,000 men which showed an inverse relationship between fitness and some of the more important risk factors --for example cholesterol and obesity.[2]

There is conflict of opinion over whether exercise is all that important. There are doctors who do not advocate exercise and believe it may even be injurious. They are probably among those doctors who don't exercise anyway. Dr. Carlton Fredericks, noted nutritionist, author, and popular speaker, admits freely to his lack of exercise--with tongue in cheek? He has been known to say that when he feels like exercise he lies down until the feeling goes away.[3]

The late Dr. Paul Dudley White, renowned cardiologist who died at age 87, advocated exercise during one's whole life. A proponent of hiking and bicycling, he said, "Hard work never hurt a healthy heart."

A prime example of what diet and exercise can accomplish is the remarkable achievements of Nathan Pritikin's protege, 89-year-old Eula Weaver. She was so disabled from arthritis, heart disease and high blood pressure that she needed help in order to walk across the room. Mr. Pritikin, Director of the Longevity Research Institute in Santa Barbara, California programmed Mrs. Weaver's diet and exercise schedule when she was 82. Her nearly fatless diet was very restricted. Slowly the walking exercise evolved into jogging and running; which has led to winning six

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[2]"Risk Factors in Heart Disease," Medical World News 18 (October 31, 1977): 45.

[3]Carlton Fredericks, PhD., lecture "Differences in Human Nutritional Needs and Tolerances," Los Angeles, California, January 14, 1978.

gold medals for running in the Senior Olympics. Pritikin credits her diet mostly, which consists of 10 percent fat, 10 percent protein with the remainder in carbohydrates. The diet had no cholesterol with restriction of salt. He ascribes 10 to 20 percent of her extraordinary improvement to her strenuous exercise.[4]

Let's look in on Eula Weaver and see how a day in the life of a Senior Olympics champion is spent.

Early every morning she walks several blocks to Lincoln High School from her apartment in Santa Monica, California. There she jogs a few miles and when it rains she pedals her exercise bicycle for 10 miles and runs about her apartment for 15 minutes. She works out several times weekly at a Jack LaLanne studio nearby.

This diminutive lady has a goal in mind. She wants to be healthy and live to be 100 and she wishes to help the elderly by showing what they can do to keep themselves out of wheelchairs.[5]

We don't take this business of exercise seriously. If we did, we would all be out on the road, bumping into each other. We wouldn't have to worry about smog because our cars would sit idle while we walked or bicycled to work. Dr. Zenonas Danielevicius has made a strong statement that we should all heed. In an editorial in the Journal of the American Medical Association he wrote, "Physical inactivity should be fought as

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[4]Alton Blakeslee, "Most of Us Don't Wear Out, We Rust Out Says Doctor," Lancaster (Calif.) Antelope Valley Ledger-Gazette, 17 March 1977, p. 6.

[5]Elaine Woo, "Life After 85? Couldn't Be Better," Los Angeles Herald Examiner, 15 January 1978, F-2.

much as crime in the streets, and as a disease as serious as cancer and tuberculosis."[6]

You might say the running Tarahumara Indians of northern Mexico "run for their lives" as death from cardiovascular disease is unheard of among those people. They run all their lives, beginning as soon as they can walk. The Tarahumara quite frequently serve as means of transportation because they can outrun donkeys--by arriving at the destination quicker with their cargo. Picture these Indians, if you will, hunting animals by pursuing their prey for days until the animal becomes exhausted and collapses. The Tarahumara's recreation consists of running games. For instance, they have kickball races during which they kick the ball around the rugged land in which they live. Running is their way of life.[7]

Dr. David Shepro, who is an authority of microvascular research, says vigorous exercise increases lung capacity and causes us to look and feel better. Best of all, it saves the heart 100,000 beats a week. He says exercise will lower blood pressure and improve the heart's efficiency. Dr. Shepro's recommendation for fitness is at least four hours a week of stressful exercise. And by exercise he doesn't mean sports that won't do anything for your cardiovascular condition such as golf and tennis. Some of the best sports, he says, are running, jumping rope, climbing stairs or swimming. Dr. Shepro, a professor at Boston University, states that fitness means your body has reserve power to tolerate and recover from daily insults upon it such as junk foods. He cautions that fitness is

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[6]Blakeslee, Antelope Valley Ledger-Gazette, p. 6.

[7]Levitas, You Can Beat the Odds on a Heart Attack, p. 136.

slow to acquire but very easy to lose--so once we start our regular exercise program, we have to keep at it for the remainder of our lives.[8]

What Kind of Exercise?

For the purpose of understanding different kinds of exercise and how they affect the body and which ones we should choose it will be necessary for us to review the various forms of exercise and their effects. Two general types of exercise that we experience in our everyday lives are commonly known as isometric and isotonic. Most muscular exercise we indulge in on a daily basis involves a mixture of both kinds. The cardiovascular response to each of the varied exercises is different and we will examine each type separately.[9]

Isometrics

Isometric exercises mean those exercises in which muscles are briefly tensed in opposition to other muscles or to a stationary object. They are static exercises that involve little or no motion and there are all kinds of them for different muscles of the body. For instance, you can press the right fist into the palm of the left hand for a count of ten and slowly release. Then repeat with the other hand. Do this ten times. This firms and lifts the bustline. Now, tense the muscles of the buttocks for a count of ten and repeat ten times. This firms and lifts sagging muscles there. All right, now standing with legs slightly apart, try pressing the

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[8]"Good Health and Fitness Explained," Lancaster (Calif.) Antelope Valley Press, 27 November 1977, Sec. 2, p. 19.

[9]Michael M. Dehn, M. S., and Charles B. Mullins, M. D., "Physiologic Effects and Importance of Exercise in Patients with Coronary Artery Disease," Cardiovascular Medicine 2 (April, 1977): 365.

knees together and you will notice how the thigh muscles tighten up. One more. Suck in the stomach muscles and hold for ten counts. If you are coordinated well enough you can do all four of these exercises simultaneously ten times to a count of ten in no more than a minute's time.

This kind of exercise has been a fad and popular with Americans because of their limited time for such things. Why, one need not even take time because they are so easy to do while waiting in line at the supermarket--no one will be the wiser. However, you have to be careful about your concentration showing. I know a woman who said she could always tell when her mother was doing her exercises by the expression on her face. I know of another acquaintance who does hers while driving back and forth to work. She firms the muscles under the chin by pressing the right hand and the right side of the head together and releasing. Then she repeats with the other hand.

Isometric exercises do strengthen the muscles but they do nothing for the heart and lungs. They would be satisfactory to do in addition to other exercises that improve the circulatory system and heart. Tension of the muscles in this kind of exercise promotes increase in arterial pressure without similar response in heart rate and cardiac output. Less blood instead of more penetrates the muscles. Isometric exercises cause a pressure load on the heart among other things and besides not being beneficial to the heart and lungs, they can be detrimental to individuals with heart problems or the elderly.[10]

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[10]Norman Brachfeld, M. D., "Exercise and the Heart: A Rational Approach to Cardiac Rehabilitation," Primary Cardiology 3 (July/August, 1977): 15.

In fact, individuals with heart disease have been known to develop irregularities of the heart probably provoked by rapid changes in blood pressure and heart rate caused by isometric exercise. Because of reports such as these, persons with known or suspected heart disease should avoid isometric exercises.[11]

Isometrics aren't all that bad and at least some good can be said of them. These exercises may be used by those patients confined to bed by infirmity. Muscles which might otherwise atrophy can be kept in tone. The astronauts also can employ isometrics when venturing into space when other kinds of exercises are out of the question due to cramped quarters or the problem of weightlessness.[12]

Isotonic Exercise

Isotonic or dynamic exercises produce muscle contraction and movement. They comprise mostly calisthenics such as push-ups and sit-ups, in addition to weight lifting and mild sports such as horseshoes, archery and shuffleboard. These exercises are good for maintaining muscle tone and body condition and they are superior to isometrics but they aren't the conditioning and training exercises we are looking for because they do little for our heart and lungs. Isotonics may be good for warm-up exercises but there again, we have to be careful with some of them. Certain exercises can strain muscles.[13] Deep knee bends can be injurious to the

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[11] Dehn and Mullins, Cardiovascular Medicine, p. 367.

[12] Cooper, Aerobics, p. 17.

[13] Ibid., pp. 19-20.

knees, for example, and foreward bends to touch your toes may harm the back muscles.

Aerobics

Kenneth H. Cooper, M. D., responsible for inspiring many people in this country toward physical fitness programs has taught us the meaning of aerobics. He has received the Distinguished Service Award of the President's Council on Physical Fitness and Sports for his contribution toward influencing the lives of millions of Americans.[14]

Aerobic exercises are those that involve increased blood flow to the large muscle masses, requiring the heart to pump more blood, with an increase in heart rate. This kind of exercise encourages deep breathing, bringing in more oxygen to the lungs to meet the demand for it. The heart becomes stronger with the abundant oxygen supply for nourishment. Fewer strokes are needed to pump an increased volume of blood. Fitness or endurance is improved rapidly when oxygen consumption is increased.[15]

It should be pointed out right now that aerobic exercises are rhythmic and repetitive and must be sustained for prolonged periods during which time the muscles used are receiving an adequate supply of oxygen. The exercise is aerobic if it can be performed for several minutes without significant fatigue or shortness of breath. Running, bicycling, jumping rope and swimming are some of the exercises that help get air into the

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[14]"President's Council Honors Kenneth Cooper," The Physician and Sportsmedicine 5 (December, 1977): 12.

[15]Cooper, Aerobics, p. 22.

lungs. Sprints and dashes, whether running or swimming are not aerobic as they can be maintained for only a very short period.[16]

Choosing Your Exercise

How much and what kind of exercise to indulge in varies with the individual and you should consult your doctor as to what your body is capable of withstanding. Your physician will help you plan your program after he has assessed your overall health, especially your cardiovascular condition.

Factors to consider include such things as age, sex, physical condition, your recreational preferences and how enthusiastic you are about such a plan. Everything should be programmed toward the provision of a practical, safe, individualized exercise schedule.[17]

Whatever is your choice of exercise it should be one that you will enjoy and can be done on a regular basis. You may even want to include a second type of exercise so that you will always have a routine to fall back on. You may, for instance, like to bicycle ride for several miles before going to work in the mornings. On lunch hours or when it's too cold or too windy for bicycle riding you can walk briskly instead. These two exercises, by the way, are mild and safe exercises for almost everyone. Walking should be included because you don't need equipment and you can do it most anywhere--as long as it's brisk and of 15-30 minutes duration. Walking is a good means of exercise for overweight individuals.

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[16]Harold L. Karpman, M. D., and Sam Locke, Your Second Life, (Los Angeles: J. P. Tarcher, Inc., 1975), p. 244.

[17]Dehn and Mullins, Cardiovascular Medicine, p. 370.

The question of whether to jog or not should be viewed with seriousness. Sudden death have occurred while jogging and besides, it's hard on the knees. Sudden, severe exercise should not be indulged in. Proceed slowly, gradually increasing your efforts. And don't forget, that outdoors in the fresh air away from traffic fumes is the best place for exercise.[18]

An advocate of fresh air exercising, R. W. Holderby, M. D., says our daily exercise should be sufficiently strenuous that we begin to perspire in order to "burn the sludge out of our blood." We can achieve this state by walking.[19]

How to Start Exercising

Let's begin by making a list of aerobic exercises that we can select from. Remember, whatever we choose should be one or two exercises that we feel comfortable with and can be done easily on an every other day basis.

Some aerobic exercise to choose from:

brisk walking	jumping rope
running	swimming
bicycling	jogging
running in place	stationary cycling
some forms of dancing	hiking

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[18]Vineberg, How to Live with Your Heart, p. 106-107.

[19]Clark, Secrets of Health and Beauty, p. 220.

A few sports that require continuous action:

rowing	basketball
handball	ice skating
cross-country skiing	hockey
roller skating	singles tennis
soccer	squash

Say that we have made our selection. Before we start out haphazardly, there are a few things we need to know about. The exercise of our choice must be done to a certain intensity if we are going to receive benefit from it. We also need to know if we are going at it too strenuously. There is a way to figure it out and it is quite simple to do.

We'll begin by learning to take the resting pulse. Looking at a watch with a second hand, place a finger on the pulse on the inside of your wrist or on the pulse on either side of your throat. Count the number of beats that you feel in exactly ten seconds. Then multiply by six to get the number in a minute. So if you count twelve beats in ten seconds, your pulse rate, which is the same thing as heart rate, is then 72. You have 72 heartbeats per minute. Most normal people have a resting pulse between 60 and 80 beats. Now is a good time to start keeping an exercise record. Make a chart or write it in an exercise diary. You may be surprised at some differences in rates later on in your exercise program.

Now, our exercise must be vigorous enough to raise this resting pulse to a certain number of beats, but not to exceed that limit for the sake of your safety. The limit we are aiming for is called target rate or threshold level. The maximum heart rate is calculated by subtracting your age

from the number 220. If you are 50, that would give you a maximum rate of 170. But you can't expect to attain the maximal rate right away. A heart rate of 75% to 85% of your maximam rate is a safe measure to use as a threshold or target rate. A 75% target rate for a fifty-year-old would be 128 heartbeats per minute. If the exercise is to be beneficial, the target rate must be reached at least three times weekly and held for a minimum of ten or up to 30 minutes. The exercise sessions should be conducted at least on alternate days.

After exercising, your pulse should drop below 100 and on its way to normal within ten minutes. Abnormalities such as nausea, dizziness or chest pains during exercise are signals to stop and rest. Perhaps you have been pushing yourself too fast or on the other hand, you may need more medical evaluation.[20]

The objective of aerobic exercise is to exceed the resting heart rate by a sufficient amount in order to receive benefit from the exercise. The idea is to pursue this objective by increasing intensity of the exercise in various stages until the maximum heart rate is attained.

After choosing the exercise and learning about pulse and target rates we are ready to begin. But we still have some important things to learn.

The plan of any exercise training program should consist of three stages: warm up, work out, and cool down. The warm-up phase is a preparation period involving three to five minutes of moderate activity, such as walking and calisthenics, gradually increasing in intensity. Persons

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[20]"Are You Getting the Right Kind of Exercise?", Changing Times 32 (January, 1978): 34-35.

over 45 years of age and cardiac patients should warm up for 5 to 10 minutes. The warm up is for gradual increase in circulation and heart rate without putting too rapid a strain on the cardiovascular system.

After warming up, exercise vigorously maintaining your target rate for 10 to 30 minutes, depending on the intensity of the exercise. The duration, intensity and frequency of exercise must correlate in order to receive the most benefit from it. If the exercise is strenuous enough to induce perspiration and some fatigue, the shorter interval of time is sufficient. When the exercise is less intense, the duration as well as the frequency should be increased for compensation. Intensity of exercise above the target rate or duration beyond 30 minutes probably do not result in additional aerobic benefit. During the workout and just afterwards it is important to take your pulse to check on the target rate. Pause only long enough to take the pulse for ten seconds as the pulse drops rapidly upon cessation of exercise. Again, we will remember that every other day or three to five times a week basis is ideal. The benefit of more workouts than five times weekly is doubtful.[21]

Always finish your exercise period with a cool-down stage--similar to warm-up, but in reverse procedure. The cool-down, by 5 to 10 minutes of walking or moderate exercise, is a time for readjustment of the circulation. Gradually diminishing the intensity of exercise helps prevent pooling of blood in the legs, which can cause faintness and arrhythmias by reducing blood supply to the brain and heart.

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[21]Dehn and Mullins, Cardiovascular Medicine, pp. 370-77.

You will realize after several months of exercise training that your exercise will gradually have to become more vigorous to maintain your target rate. You are becoming conditioned as your heart rate is slower now --indicating the benefit of exercise. According to research, a 15 to 20 percent increase in cardiovascular fitness is reached in approximately seven months.[22]

Precautions

Proper shoes and clothing are essential for comfort as well as health. A good running or jogging shoe is superior to tennis shoes. Clothing appropriate to the weather should be worn.

Avoid outdoor exercise when the humidity is high or during extreme hot or cold temperatures. You should wait at least an hour after a meal before exercising.

If you don't feel well or are excessively fatigued, it's not a good idea to exercise. Never push yourself unduly and stop if you have any symptoms peculiar to heart or circulatory problems.

Stay away from hot showers, steam baths and saunas after exercising. A tepid shower can be taken after a cool-down period of at least 20 minutes.[23]

Supervised Programs

Although the ideal way of exercising is by yourself in your own way, sticking with the program on a routine basis can be the worst problem

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[22]"Exercise and Your Heart," Consumer Reports, 42 (May, 1977): 258.

[23]Dehn and Mullins, Cardiovascular Medicine, pp. 384-85.

confronting the would-be participant. There is often more incentive for regular exercise when an individual belongs to an exercise program. The most highly recommended groups are medically supervised. These are especially advantageous to the cardiac patient who feels more secure in this type of atmosphere. In these programs, the participant is assured of being monitored and of receiving instructions for the proper rate of exercise. He will even receive first aid if necessary.[24] The local chapter of the American Heart Association can tell you if such programs exist in your area. The YMCA offers a physical conditioning program and sometimes at no cost to senior citizens. You may even find a weight loss program in combination with nutritional education at your local YMCA.

Does Exercise Increase Longevity?

We really don't know for sure if our lives are prolonged by regular exercise but all the accumulated evidence points in that direction. There is less heart disease and fewer heart attacks among the physically fit. Exercise reduces all the risk factors for heart disease--except smoking. Physical activity certainly improves the quality of life. Have you noticed that more doctors are exercising? I know of a physician who runs 8 miles daily. He says he wants to see his youngest child grow up.

The physical fitness fad is growing in this country. All ages and people from all walks of life are getting into the act. About two-thirds of the adult population are involved in some form of exercise, including sports. What is the reason? Perhaps publicity about the staggering heart attack rate and sedentary lifestyles is partly responsible. Too, people

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[24] Ibid., p. 378.

are finding out how much better exercise makes them feel. Whatever the cause of the sudden burst of activity, we may realize a drop in untimely deaths and an increase in longevity.[25]

If you have become weary--and it seems wearisome--of all the do's and dont's we have talked about throughout all these chapters, then you may find the poem by Roger Starr, staff member of the journal, Emergency Medicine, amusing.

"Don't get excited, don't run, jump, or frisk.
Play everything cool, man--your heart is at risk.
Neglect your profession although you adore it
(With type A behavior, oh brother, you're for it).
Ignore all your problems, stay constantly pensive,
Because if you don't, you'll end up hypertensive.
Stop eating butter; cholesterol rises.
And eggs are as bad, just as full of surprises.
Fats that are saturate are diabolic.
Triglycerides zoom and you soon wax embolic.
Toss out all your smokes or you're doubly stung:
Not just in the heart, boy, but smack in the lung.
Eschew all those sweets, you'll get hyperglycemic
(Or maybe it's hypo--there's grounds for polemic).
Lay off that rich diet, forget the martinis,
No pastries, potatoes, no blintzes or blinis.
They all make you fat, to your ticker's great dread...
Oh hell, let's forget it--you're better off dead."[26]

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[25]Diana S. Woodruff, Ph.D., Can You Live to be 100?, (New York: Chatham Square Press, 1977), p. 138-9.

[26]"Reducing the Risks," Emergency Medicine, p. 31. Written permission given for use of poem.

CHAPTER 15

CONCLUSION AND RECOMMENDATIONS

Today I made an observation which brought home the fact that more than ever a well-planned program of diet and exercise is badly needed in any community. A friend with a sedentary job has just begun her sixth try of a weight losing diet which is accompanied by daily shots. Yesterday at the start of her dietary program she was in a state of near collapse during the second day of a two-day fast. She stated that she must follow the diet regimen exactly or she would gain instead of lose weight. At noontime today she set out her lunch which consisted of a container with perhaps two quarts of water and about a dozen unappetizing looking yellowish-brown protein capsules. Presently she said to me, "You don't approve of this do you?" My reply was that it was not my way of losing weight. I suggested that if she walked an extra half hour daily up to eighteen pounds could be lost in a year while maintaining her regular diet. Hastily she exclaimed, "But that's not enough! I want to lose 40 pounds in a few months." I reminded her that she has never been able to keep off her fast weight loss and she agreed that it was true.

My friend is not the only one on a diet. The woman we spoke of in an earlier chapter who possesses unwanted weight

because her financial status allows her only inexpensive starchy foods is also on a diet -- a rice diet. Just recently another acquaintance reminded me of the high protein, low carbohydrate diet she tried six months ago. She became ill during this time and had to take a medical leave of absence from her work. This woman is still not entirely well and she blames the diet.

When will the American Public wake up and realize fad dieting-with no accompanying exercise-is so much poppycock? Fad diets are a menace to society and can become downright hazzardous to an individual's health. The only persons benefiting from such advocacy are those who write books on the subject and those who market products for diets, such as liquid protein.

The public needs to be educated in ways of correction by proper diet and exercise. There is very little of the right kind of information for readers in comparison to the fad material flooding the market.

At best, the public is hard to educate in matters pertaining to health when it comes to preventive measures. When it's too late and illness has struck is the time we wish we had done something about it sooner.

The need for physical activity is stressed by the American Heart Association Committee on Stress, Strain, and Heart Disease, who has said that inclusion of the consistent lack of exercise to the list of risk factors associated with cardiac heart disease is an eventuality. The committee suggests that

hard work may compensate for cardiac risk factors. Studies indicate that persons who regularize their physical activity have a tendency to live longer than those who don't. Even those individuals who have endured a heart attack and recovered are able to maintain and benefit from regular exercise.

The physical activity of an individual could be taken into consideration when it comes to such things as evaluations for disability and workmen's compensation.

Considering the risk factors involved in coronary heart disease, the committee advocates that educational programs on stress, strain and heart disease from different points of view be offered to physicians, lawyers, insurers, employers, union representatives, and workmen's compensation administrators.[1]

Exercise for Managers

The word is getting around about the benefits of regular exercise-and it is reaching the top echelons in many organizations. A Harvard investigation shows that 64 percent less heart attacks resulted from the expension of 2,000 exercise calories each week. Some other studies indicate the benefits of regular physical activity such as increase in productivity and reduction of stress--it brings body awareness into focus and improves sexual enjoyment.

Exxon Corporation has studied the influence of exercise on the functional effectiveness of managers. A medically

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[1]"Hard Work May Offset Cardiac Risk Factors", p. 7.

supervised program-operating during working hours-has a complete physical fitness program for high-level Exxon executives in New York. A personalized program for each executive is determined from a thorough physical examination - which is important because strenuous exercise extending over a long time may create adverse effects in those individuals with potential heart problems.

The findings of the Exxon program showed overwhelming improvement in managerial function. It showed increase in executive ability to work longer and more efficiently - besides feeling well both physically and mentally.[2]

Companies are coming to realize the value of a physically fit employee. When a firm is faced with hiring a new executive, the slender and healthy appearing individual may have the edge over his otherwise-appearing competition. Many companies are paying for membership of their employees in health clubs. Added benefits to the firm sponsoring such membership is the combination of exercise with business and a way for the employee to work off built up tension. Investment in management should begin with investment in the health of the executive. Membership in health clubs is on the increase. A wide variety of exercise programs are generally available and often offer

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[2]"Joggers Make Better Managers", The Effective Manager, Vol 1 No 10 (July 1978): 7-8.

other attractions such as food services and toiletries. One health center sends attendance and progress reports to the employer.[3]

How sad to learn of the death of a brilliant executive who, in his mid forties, was struck down by a heart attack. This man had made many valuable contributions to his firm and many on the agenda were yet to come. The newspaper account said that he had no history of heart problems. Surely a person with a healthy heart and circulatory system is not subject to a heart attack. We have shown in an earlier chapter that atherosclerosis is a silent killer and may evince no fore-warning. The untimely passing of this man was tragic. He was needed by the community, his wife and children. Could it have been prevented?

Pope Paul VI, Administrator of the Roman Catholic Church, is dead of a heart attack at age 80. Possibly he had served his lifetime. But, again, he may have had a few more productive years left.

Preventive Medicine is the only way to avoid the high cost of medicine today; and it is the best way to help us live longer. It is the best way to help us feel better as we live.

A physically fit administrator recently remarked that he feels so good he never needs stimulants such as coffee,

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[3]Michelle Bekey, "L.A. Health Clubs: Slim Waste Can Mean Fatter Wallet", Los Angeles Herald Examiner, 23 July, 1978, B-1.

tea or alcohol. What a marvelous way to feel. This man, who has not yet reached the age of 40, has been on a diet and exercise program for ten years.

The rate of heart attack has declined in the past few years--possibly because knowledge of its prevention is reaching the people--you and me. The mushrooming growth of the fast food enterprises sees the addition of salads and salad bars. Customers are standing in line for the alternative to the greasy french fry. At least one of these restaurants of the fast food industry provides disposable place mats on which is printed educational information on the value of nutritional salads and some humorous tips on exercises. Since more and more people are eating out, this subtle process of nutritional education is teaching the masses in a better manner than enticement by a flood of reading matter.

Holistic health centers are springing up across the country. These places are designed to promote health and well-being of the mind over body as a whole. Here, the individual may learn what causes illnesses and how to prevent and overcome them.

This country seems to be responding to the realization of the need for self-help. With the ever rising cost of medical care we must look for ways to improve our health and cut the cost.

CHAPTER 16

MANAGEMENT OF A PHYSICAL FITNESS PROGRAM

In order to devise a well-planned physical fitness program it would be wise to study and apply some principles of management to the endeavor for the purpose of establishing a good foundation for such a procedure. Then the operator as well as the participant will benefit far more than if one sets out in a haphazard manner.

Planning

The making and the acceptance of a structured program for diet and exercise will revolve around the most basic managerial function, planning. For, in order to submit a good plan, it must be decided what will be done and how it will be done. Also, who is going to do it. The execution of the program will depend on how well the manager of such a program has planned and considered alternatives for the direction he intends to take. The planner will establish the goals for his program and how to attain them. Without such a plan, adverse elements of management such as inefficiency and loss of time and money could be the end result.[1]

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[1]Harold Koontz and Cyril O'Donnell, Principles of Management: An Analysis of Managerial Functions, 4th ed. (New York: McGraw-Hill Book Company, 1968), pp. 81-82.

The nature of the plan must be flexible enough to suit the organization or group to which it will be offered. Will it be proposed to an organization for its employees or will it be presented to a group of insurance personnel for their education?

Whatever directions planning takes, the objectives of improvement in diet and increase of programmed physical activity should be kept uppermost in mind. If the planner loses sight of his goals the purpose of his plan most assuredly will go awry. Besides, planning lays the groundwork for the objective of the program in mind. The plan will be in jeopardy if it is inefficient.[2] If the cost of the physical fitness program outweighs the returns from the investment, the financial end of the program is lost. If the exercises to be performed are not correct and of proper endurance for the individual, that portion of the program is wasted. If diet counseling is inadequate or not tailored to the rules of prevention of disease and health improvement, that segment of the program founders. If the diet and exercise program is not sufficiently monitored, the benefit to the participants is negligible. These elements must be adeptly tied into the program in order to make it an efficient plan.

Marketing the Plan

Much rests on the substance of the plan because, upon completion everything depends on whether or not the plan is

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[2]Ibid., p. 84.

salable, or in fact it doesn't sell, the plan must be revised to make it more palatable. The plan that is submitted to the prospective buyer must, first of all, indicate how well the buyer will profit from its use. A physical fitness program introduced into an existing medical facility may be more important as far as attracting new patients than monetary rewards. On the other hand, if the plan is to be offered for a group employee operation the employer will be mainly interested in how much it will cost and how his employees will benefit from such a program. The plan must be tailored to the needs of the individuals or organizations to which it will be offered and can be a source of failure if this is not taken into consideration.

Creation and delivery of the physical fitness proposal should be designed to promote and distribute satisfying services to potential customers. You have to be 80% sure your plan will sell and you need a 20% level of confidence. Would you buy the plan yourself? It's not the customer's needs to consider as much as what satisfies the needs. We aren't concerned with selling a product, we're selling a service. And you have to sell yourself before you can sell someone else. The easiest way to market the plan is to put yourself in the situation. You have to spend money, take chances and make mistakes. Don't ever ignore any possibility.[3]

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[3]Mark Reynolds, M.A., Lecture on Marketing; Lancaster, California, August 3, 1977.

Acceptance of Change

During the development of a fitness program the element of change must be taken into consideration. A number of organizations may resist change, including the addition of a diet-exercise program. An establishment that is subjected to frequent change will be more inclined to be interested in your program than one who seldom changes its policies.

Change creates trauma and brings about resistance to change. However, change is a creative process and is a necessary factor in a changing world. Change is also constant and inevitable. It is essential for the survival of a business. The program planner must understand change and that it means opportunities. The physical fitness program must be presented in the light of the buyer's attitude toward change. A proactive person initiates change and when you convince others to accept your plan you are inducing them to change.[4]

Change will be more acceptable under certain circumstances. When the prospective buyer of your plan understands it and when he helps adapt it to his particular circumstances, giving him the impression that he has had a part in creating it, he will be more acceptable to change. He will also be more acceptable when he shares in the benefits of the program which have been created by change.[5]

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[4]George W. Gooche, M.A., Lecture on Change; Lancaster, California, November 9, 1976.

[5]Koontz and O'Donnell, Principles of Management:, pp. 221-2.

Can You Forecast?

You won't be able to forecast how long it will take to put your plan into effect or to whom you will sell it until you know what sort of things it takes to reach your objectives. Data must be assembled. Perhaps you don't know exactly how to go about gathering the facts. When you have established your goals, data gathering is less difficult. If facts are accumulated before the goals have been set, you may not have acquired the right kind and they will then be useless.

On the other hand, if facts are gathered too late and your plan has already been formulated--and perhaps presented--you may run into trouble by having to make revisions. Worse yet, your plan may seem inefficient and be rejected.[6]

Inside-out Planning

When a program planner chooses impractical goals he is subjecting his plan to possible failure. Implementation of the plan follows the planning stage during which time the goals have been established. Unfortunately the planner may not view the participants of the physical fitness program or the sponsoring organization in terms of their needs and capabilities. He may, in fact, be so engrossed in the implementation of his plan that he overlooks consideration of relating the goals to the human aspect.

The inside-out approach has been used advantageously for many situations and organizations--including the health and welfare field. This type of planning utilizes careful analysis

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[6]Neely D. Gardner, Effective Executive Practices, (Garden City, New York: Doubleday & Company, Inc., 1963), p. 131.

of the requirements and services available to the personnel concerned. Only after the planner is satisfied that his plan meets human needs, does he think about salability and seek to market it. If, for any reason, the goal seems undesirable, the plan may be rejected or amended until a workable goal is attained.

The value of inside-out planning is that it is formulated to the capabilities of people and their confidence in doing things. If an organization can bring about opportunities for service and demonstrate that it can produce good results, it will create a market by a job well-done. This approach can be highly important to the planning of a physical fitness program in that more regard is placed on the occurrence of the project than on whether or not it should occur.[7]

Education of the Consumer

The physical fitness planner should never lose sight of the fact that he and the participants will be engaged in preventive health education. Public Health Educators have a dismal time of encouraging better health practices to an uninterested public. Any amount of advertisement and coercion seems to fall on deaf ears and unseeing eyes. When an individual is told a certain thing is bad for his health, he keeps on doing it anyway. "So What?" he says. "I feel great, so how can a bad health habit hurt anything?"

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[7]David W. Ewing, The Human Side of Planning. Tool or Tyrant? (London: The MacMillan Company, 1969), p. 91.

The health care industry has been remiss by concentrating on treating sick minds and bodies and neglecting the patient's education of health maintenance.

Now, today, with the soaring cost of medical services the consumer of health care is beginning to realize that he had better do something about it.

The consumers of the present are dissatisfied with the quality of health care they receive in relation to what they expect. If the Medical World were less mindful of its status and had more regard for its purpose, the consumer would have better comprehension of what is happening in the industry today. The consumer, in most instances, does not know what services he is paying for. He doesn't know the quality of service he receives and if the service is even necessary. Is it any wonder that the public is alarmed over the continual rise in health care costs when it is difficult to perceive if there is any accompanying rise in the quality of health care?

The public needs more and better education in health affairs. Health care has become a right and the maintenance of health must become a lifetime habit in our world today. Health education in the lower levels of the public education system is given very low priority. Here is where the teaching of healthful eating and exercise habits should begin.[8]

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[8]James O. Hepner and Donna M. Hepner, The Health Strategy Game, (St. Louis: The C.V. Mosby Company, 1973), p. 35.

The education that the planner of a physical fitness program provides will consist of two kinds. First, the planner needs to show the consumer the need for his program and how it will affect his health. When the consumer understands the benefits of the program and has accepted the invitation to enroll, the nature of teaching changes. The reception of the enrolled individual also changes. He is convinced the program is good for him and he is prepared to learn and do all the things the program advocates for his well-being. It is essential that this education be of the highest quality in order that the goals of the program be attained.

Flexibility of the Plan

If the principle of flexibility is applied when devising a program of diet and exercise, the chances of failure and losses are minimized. A rigid plan could produce disastrous results. Imagine offering the same program to a group of Senior Citizens that has been offered to the employees of a business firm! The ultimate of inefficiency would be to draw up a plan for one group and put it in to action, then start all over again and work out another plan for a different group. With some forethought, inherent flexibility can and should be included in all planning procedures. In any event, then, foreseen as well as unforeseen conditions can cause plan alterations with minimum waste.[9]

[9]Koontz and O'Donnell, Principles of Management:, p. 224.

Are We Ready to Organize?

Once the process of deciding on the objectives and how to reach them is completed, the plan is ready to be put into operation. In review, let's look back to see whether we have included the basic principles of planning--what, how, when, where and who. Have we taken into account such things as services to be offered and equipment needed for such services? Have we set up schedules and procedures for implementing them? Have we thought of locations and what personnel will be needed? The more ideas we have projected into the planning stage, the less risk of incurring errors that may crop up later.[10]

A physical fitness plan is likely to be less complex than a more formal plan for a larger operation. It can be thought of in terms of a mini business. The planning will be less detailed and can be suited to short or intermediate-range terms. Your plan should include, however, the basic principles that have already been discussed. For any plan to succeed, it must always include a budget. The probability of the success of the program increases with good planning. We also realize while planning that we are primarily interested in the welfare of others as well as profitable gains and increase in community leadership for ourselves.

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[10]Eugene J. Benge, Elements of Modern Management, (New York: AMACOM, 1976), pp. 38-39.

Organization

The definition of organization can be lofty in wording, but what it means in plain terms, is implementation of the plan in a methodical manner. Organization is subdividing the work and assignment of duties to people who are all working for the same objective. An important aspect of organization is that it helps to keep the plan running in a smooth manner. An organization chart is a diagram which shows job titles and where they stand in relation to authority. Any organization can have one--no matter how small. It is a visual aid in the process of organizing. Job descriptions state explicitly what functions are expected of the people doing the work. Organization is based on principles of definite goals and work specialization with personnel working toward a common goal under authority according to responsibility.[11]

It may be difficult to understand what there is to organize in such a small business operation. But remember, you intend for it to grow--and the same principles will apply to begin with as well as later in the game. There will be many things to organize besides work such as time, equipment, employees, and almost anything you can think of.

The most important thing to organize to begin with will be your time. If you waste your time on useless conversation, unproductive work, trying to find something you've misplaced--equipment or papers--you're losing money from your investment.

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[11] Forrest H. Frantz, Successful Small Business Management, (New Jersey: Prentice-Hall, Inc., 1978), pp. 337-38.

These things are time-wasters and have no part in good organization. They are also not trivial since most people who fail at business attempts do so because of lack of attention to such details. Those are the people who neglect their businesses for personal pleasures like fishing and vacations. And there are those people who fail to show up for appointments. Repetition of something that has already been done is also wasting time. Again, spend your time getting your plans into productive operation.[12]

Staffing

The individual who begins the small business venture of a physical fitness program may wear several hats on the organization chart at the outset. But eventually the solution and employment of more help takes place. Records of interviews and potential employees must be kept. The employees you select must be chosen with care as they can be your most valuable assets. A qualified, personable and highly motivated employee can ensure the success of your business venture. You will have to decide on an adequate salary, keep records of time worked and see that the paycheck is delivered on time.

A program of this nature will most frequently be incorporated into an established business. There, some of the services of the existing employers may be utilized. For example, a medical facility's physician and a nurse may overlook the monitoring of the medical aspects of the plan.

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[12]Ibid., p. 12-13.

The cost of personnel will be one of your greatest expenses. Thus, employees must be recruited with a great care. After the application blank has been completed, an interview gives you and the job seeker a chance to learn about each other and the work expected of him.

What kind of people are you going to look for to fit your job descriptions? Very often highly trained individuals are less motivated to peak performance and expect more considerations and pay than the inexperienced person who is learning a new job. It can be worth the time and effort to train the enthusiastic newcomer who very well may reward you with efficient work as well as long-term employment.[13]

During the interviewing of applicants you could be missing a good bet if you insist on binding yourself to selecting an employee to fit the job description. Peter Drucker, world renowned management authority, says one could go on and on looking for the right person to fit the job. He believes you should look for what an individual can do rather than what the work requires. It's a mistake to compare your applicants to the job description to see who fits. The job should not be thought of as easy to fill just because it is a small job. Every job is important and requires strength whether large or small. In fact, the job description may have to be changed to accomodate the abilities of your potential employee.

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[13]Ibid., p. 359-61.

[14]John J. Tarrant, Drucker: The Man Who Invented The Corporate Society, (New York: Cahners Books, Inc., Warner Books Edition, 1976), p. 103.

Directing the Program

The diet and exercise plan has been structured. You have organized the business and staffed it. You are now ready to do the work with the help of your newly hired employees. You are not only going to direct your personnel but you will be directing yourself as well. It may be more difficult to direct yourself than it is to direct them. You can show them what, how and when. You can stand back and see how well they are functioning. But what about yourself? It's hard to tell whether you are performing well, how you can improve and how to eliminate errors. Directing requires other things besides telling your workers what you expect of them. Besides training, supervising and motivating, directing requires an employer who has an understanding nature. He must be tactful and able to handle delicate situations diplomatically. The ability to direct is reflected in the results produced by the workers you have hired--whether they be part-time employees or special services. The director will soon find that as his group of workers increases, his skills in directing the work increase in importance.[15]

Organization makes it easier for the accomplishment of tasks. But there is more to it than planning and organization. Under your direction, the workers become informed as to what they are to do. You also tell them how and when to do it. Directing includes being prepared to make changes if the work

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[15]Frantz, Successful Small Business Management, pp. 13-14.

is not accomplished as planned--or if it is being done inefficiently. Directing also calls for a person who must see that problems created on the job are solved. Directing includes helping with problems that originate away from work--perhaps some personal problem of the worker at home. By counseling and guidance you hope to correct the problem that has arisen, for if you do not get it solved you may continue to have an unhappy worker who performs inefficiently. Problem solving requires a good listener and sometimes all that is needed is for the other party to speak out and get his anxieties off his mind.

Your employees will receive direction more effectively when they have respect for you. The manner in which you give orders and your approach to counseling will make the difference in the attitude of your employee toward you. In most instances the key to respect is to avoid being critical.[16]

As the planner proceeds to put his plan into action he soon finds that he has become a manager who is engaged in the function of directing. Dealing with people, he quickly learns they are not interested in the goals of his business. They have their own goals. In order to encourage the workers to work toward a common objective it is necessary to employ effective methods of leadership. He must think of relating to his employees in terms of such things as orientation, motivation and communication.[17]

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[16] Ibid., 341-43.

[17] Koontz and O'Donnell, Principles of Management: p. 553.

Earlier methods of getting the job done resorted to forcefulness and harsh treatment. Later, monetary rewards were used to entice the worker toward increased production. Then more humanistic techniques became the vogue. These approaches had consideration for the employees interests and objectives. The manager became interested in what motivated the employee and in what light he viewed his boss. Now the emphasis is on what motivates workers. The concept is that employees perform well in a pleasing environment, have participation in management, can achieve personal objectives and obtain job satisfaction.[18]

Controlling

Controlling is the means to ascertain how well your plan is working and the correction of deviations that have occurred so that the goals of the plan can be attained as scheduled.

Control is generally thought of as having to do with financial matters, accounting and budgeting because these factors lead to profit. The conditions leading to profit are what must be controlled. There are the daily functions of the business, comprising such things as a drop in business volume, defective equipment and poor performance of employees - such as slipshod record keeping. When you control all of the areas contained in your plans it follows that your goals including growth and profit can be easily attained.

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[18]Frantz, Successful Small Business Management, p. 341.

In a mini business such as a physical fitness program controlling will be less formal than in a large business. A simple way to locate and correct problems is by use of a checklist. Periodic checks of supplies, equipment and records can be valuable aids in locating those variances that can cause loss in expenses, time and profit.[19]

How Will Management Suit You?

The five basic functions of the manager are planning, organizing, staffing, directing and controlling. How about your attributes? Do you have what it takes to embrace these responsibilities? Do you have leadership qualities that are needed for success in a business venture?

Success is generally met by the person with a positive attitude. If you are optimistic about most of your serious undertakings it is a good indication that faith in your program will see you through.

How high is your self-confidence level? Do you believe yourself capable of planning and implementing a physical fitness program--or will you get cold feet along the way and drop the whole thing? If you have belief in your ability to plan a new project, sell the idea and execute the program, you are off to a good start.

There are some individuals who have great ideas but never seem to get them off the ground. If you know what your goals are and make plans accordingly and then do it, success could be just around the corner.

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[19]Ibid., 343-44.

Are you overly sensitive? This quality has no place in the managerial position. Cultivate a deaf ear toward criticism from well-wishers, such as friends, neighbors and relatives. Avoid accepting unwanted help by those who could do more harm than good.

Be as well informed as you can about your project. Obtain as much reading material as possible. Make notes and save clippings in an orderly fashion. While you are at it, study material on how to improve yourself and your outlook on life. You must be liked and respected as a person in order to succeed in any business venture.

Do you have a competitive nature? It has been said that successful business persons are competitive in all their undertakings. They love to compete in all sorts of competitive sports. If competition is in your makeup it may give you a head start in the business game.

Starting a physical fitness program needn't be as great a risk as some business ventures. It could very well be launched while holding down another job. Or you could work it part-time. You may want to give up your other job as you progress. But then, you may want to hire more help instead. You will be using all the skills you can muster but how sweet the satisfaction that comes with success.[20]

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[20]Lyn Taetzsch, Opening Your Own Retail Store, (Chicago: Henry Regnery Company, 1977), p. 190-93.

ASSESSMENT

I have written this work with several reasons in mind. From an administrative standpoint, the basic knowledge and how to apply it is essential for a person who intends to be a leader in the manner of developing a health program in the community. The extensive research with resulting written material, in addition to my four trimesters of Health Care Administration studies should well qualify me for this type of leadership. My further plans are to attend a training program for leaders on health conditioning with emphasis on diet and exercise stressing that a change in living habits can reverse the effects of heart disease. I should have no qualms on entering this field with this solid background. There is great need for health leaders of this type to educate and counsel the people of this country who are sick as a result of poor diets and sedentary living. E. Cheraskin, M.D., says, "Health is the fastest growing failing business in the United States." I want to be part of the movement toward corrective programs for this nationwide problem.

The education that I have embraced can be expanded to health and fitness programs for employees. Jess A. Bell, president of Bonne Bell, Inc., cosmetics firm in Lakewood, Ohio, was recently honored by the President's Council on Physical Fitness and Sports for one of the finest programs of this type in the United States.

Health Education, Community Health and Public Health were part of my trimester studies. My interests in these led me to membership in the Antelope Valley Health Planning Council, the American Public Health

Association and the Health Systems Agency. Participation in these organizations has enhanced the direction my interest has taken me in health care administration areas.

Some other rewards I have received from this research and writing include the improvement in my professional relationship with the physicians and other employees because I have become knowledgeable in areas other than my own. This knowledge has given more depth to my work area, too. I have prepared and given counsel on two occasions where the problem bridged my laboratory profession and diet and exercise programs. It was an excellent combination and the experience was highly successful.

Faculty Sponsor, George Gooche, has stated that a Master of Arts in Health Administration should include, in addition to administrative qualities, philosophical and humanistic attitudes with dedication and concern for the needs of society.

This work demonstrates a keen interest in health education and my ability to plan and manage an innovative approach to a specific health problem. It shows the way I chose to demonstrate one area, stating the problem with remedial measures.

It also shows management of a personal approach to prevention of a specific problem and it shows demonstrative ability in organizing chapter outline and contents.

I therefore request that this written project be evaluated in the light of my needs and desires for its application to my education as a whole and to my own life experiences. I have further intention of hoping to publish it as a book, serving to educate and help other people.

Gail A. Fraser

April 27, 1978

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