Needless Restrictions Imposed on Cardiac Patients

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MANY physicians appear to be too strict and particular in the rules of diet and regimen, which they deliver as proper to be observed by all who are solicitous either to preserve or recover their health. The too anxious attention to these rules hath often hurt those who are well, and added unnecessarily to the distresses of the sick. These are the opening sentences of William Heberden's Commentaries on the History and Cure of Diseases, published in 1802, the year after his death. The thought which they convey will serve as a text for the remarks which follow.

Any person with a disorder of the heart or circulation, regardless of its cause or the degree of functional impairment, too often is looked upon as an invalid. His condition is a cause for concern. Accordingly, it is common practice to classify him as unfit to pursue his customary way of living and advise that he follow regulations which, in varying degree, restrict his activities and curtail his pleasures. To consider the basis for some of these restrictions and to inquire into the reasons why physicians are so ready to impose them is the aim of this discussion.

SMOKING

Patients with any form of heart disease usually are advised to abstain from the use of tobacco. Yet it has been our experience that, over a period of years, most of these individuals can smoke moderately without apparent harm. If one may judge by the amount of tobacco consumed, smoking affords a good deal of pleasure to a large number of persons; for many it provides emotional stability.

Numerous studies have been made of the effects of smoking on the circulation. It is doubtful whether the prolonged use of tobacco is a contributing cause to the production of atheromatosis. The more immediate effects can readily be observed. These are due almost entirely to nicotine. In our laboratory it has been demonstrated that, in the individual, the degree of reaction varies directly with the nicotine content of the smoke. Estimation of cardiac work, using the low frequency, critically damped ballistocardiograph, has indicated that tobacco smoke causes relatively little change in the cardiovascular system. There is considerable variability of effect in both normal persons and patients with heart disease, but this depends to a greater extent on individual susceptibility than on the presence of a cardiac disorder. Smoking rarely induces anginal pain, even in patients subject to spontaneous attacks; "tobacco angina" is uncommon. Because of the enjoyment afforded and the feeling of satisfaction obtained, it is our opinion that the majority of patients with inactive forms of heart disease may be permitted to smoke in moderation. Those who are sensitive to nicotine will fare better by abstinence. There are certain conditions in which smoking should be forbidden because any increase in the work of the heart, however slight, is to be avoided. Among these are congestive heart failure, the acute stages of cardiac infarction and active rheu-
matic carditis. No patient with peripheral vascular disease should use tobacco because of its constricting action on the peripheral vessels.2

Stairs

It is traditional that cardiac patients should be cautioned against the ascent of stairs. If this admonition is heeded, it becomes necessary for these persons either to live on the ground floor or to use an elevator. Such arrangements may be difficult or impossible to make and frequently are a source of considerable inconvenience.

It is readily apparent that mounting an ordinary flight of stairs places an added burden of work on the heart and circulation. The factors which determine the importance of such an effort for the patient with coronary heart disease have been the subject of a recent study in which the work of the heart was determined in normal individuals and in patients with coronary heart disease by the use of the ballistocardiograph.3 The results were compared after ascending an ordinary flight of stairs, descending these stairs and walking on level ground for an equivalent distance. Cardiac work, stroke volume, pulse pressure and heart rate were noted.

It was concluded that the ascent of stairs does not greatly increase the work of the heart. In the patient with compensated coronary disease the response is not significantly greater than after descent. It is only slightly greater than after walking for an equal distance on the level. Furthermore, the stress is of relatively brief duration. In the presence of congestive failure or if anginal pain occurs during the exertion, stairs should be avoided. Otherwise, the coronary patient may take them leisurely and preferably at a pace which he finds agreeable; for it was observed that deliberate retardation, like hurry, may augment cardiac work.

Air Travel

Many persons with known cardiovascular disease choose to travel by air; a considerable number fly from outlying districts or from foreign countries to a medical center for treatment.4a Undoubtedly there are numerous others with unrecognized circulatory conditions who use this means of transportation. During the 20 year period 1930–1949, there have been 91 million revenue passengers flown on all scheduled air routes in the United States. Most of the symptoms of discomfort during flight have been of a minor nature and have been due to airsickness rather than hypoxia. There have been 69 in-flight deaths, of which 49 were attributed to cardiovascular disease. The diagnoses in these cases were: myocardial infarction, 20; acute heart failure, 3; unspecified heart disease, 21; cerebral vascular accident, 5. Cardiovascular disease was also regarded as the cause of death in 14 of 23 persons who died shortly after deplaning. It seems likely that excitement, with the attendant increase in cardiac output, blood pressure and heart rate, was as much responsible for the fatalities as were the effects of altitude.4b

Patients with coronary heart disease and anginal pain tolerate moderate oxygen want without demonstrable harm and, as a rule, without suffering discomfort.4c, d A survey of the literature supports the view that strain of sufficient degree to damage the circulation in compensated cardiac patients does not occur during routine civilian air transport operations which do not exceed altitudes of 8,000 to 10,000 feet. Cabin altitudes with pressurized equipment rarely exceed 7,000 feet. Fatigue following long flights is due primarily to the effects of oxygen want on the central nervous system rather than on the circulation.

It is clear from these facts and figures that flying for the vast majority of cardiac patients may be undertaken without undue risk. The incidence of fatal cardiovascular accidents is exceedingly small and is probably little, if any, greater than might have been observed in this same group of individuals on the ground. Several of the patients, for example, died during physical exertion or after eating a heavy meal in the plane.

There are, however, certain disorders of the heart in which even a slight additional burden placed on the circulation is undesirable. Excitement incident to the trip, delays due to mechanical factors or discomforts resulting from grounding because of weather conditions must
be taken into consideration as well as the effects of mild hypoxia. The important conditions in which air travel is to be avoided are: (1) congestive failure or evidence of a significantly diminished cardiac reserve; (2) active rheumatic carditis; (3) myocardial infarction which has occurred during the preceding three months; and (4) frequently recurring anginal pain, particularly if experienced at rest.

**Work and Exercise**

Most cardiac patients are able to work and, in fact, do so. There are obvious exceptions, such as those with active rheumatic carditis, chronic congestive heart failure or intractable anginal pain. The type and amount of work will vary. The executive can carry on at his desk; severe damage in a manual laborer may necessitate a change in occupation. Selective placement has demonstrated that in many industries, individuals with heart disease can be employed successfully and, for special groups studied, the attendance records have been as good as the national average for all industrial workers. Too frequently men or women in business are advised to curtail their activities to a point at which they can no longer continue to hold the jobs to which they are accustomed and which provide them with a livelihood; sometimes they are urged to retire without adequate reason and often with unhappy results. A radical change in working habits should be recommended only after careful consideration of all the factors involved.

A similar approach is indicated with respect to exercise. For those who are accustomed to exercise and enjoy it, leading a sedentary existence entails a distinct sacrifice. The nature and extent of the pathologic lesions, the estimated hazard involved and the functional capacity of the heart in response to effort serve as guides. In every case, the results of the exercise should be carefully observed and the degree of exertion graduated so that no undue strain is placed on the circulation. Because there is no satisfactory clinical measure of the ability of the heart to perform work, a detailed set of directions cannot be outlined; the patient must be the final judge of his capabilities. Golf, shooting, fishing, riding, swimming and even tennis often may be permitted. Squash, for the majority, is too strenuous. For children and young adults with rheumatic heart disease who are at school or college it usually is advisable not to allow participation in highly competitive sports and games.

**Bedpan versus Bedside Commode**

For many years the impression has prevailed that the use of the bedpan puts a greater strain on the cardiovascular system than does getting out of bed to sit on a commode at the bedside. There have been dissenting opinions; but these have been based entirely on clinical observation, although occasional deaths on the bedpan have occurred. Recently it has been demonstrated that, in terms of oxygen consumption, the energy expenditure during the use of the bedpan is significantly higher than during defecation on the commode.

Most patients dislike the bedpan and many resent using it. The sitting or squatting position, with the feet lower than the abdomen, is the natural posture for defecation. With proper help, to swing the legs over the side of the bed and sit comfortably on a commode is certainly easier and pleasanter than to attempt to balance on a metal container uncertainly supported by a wobbly mattress. For the patient in shock after cardiac infarction or for one so weak that he cannot readily sit upright, the bedpan is necessary; otherwise, taking into account comfort, degree of effort and esthetic satisfaction, the commode is to be preferred.

**Diet**

During recent years increasing attention has been given to the importance of dietary regulation in the treatment of certain cardiovascular diseases. Of these, the three most important have been atherosclerosis, particularly as it involves the coronary arteries, congestive heart failure and hypertensive vascular disease.

The Low Fat, Low Cholesterol Diet. The presence of cholesterol in varying amounts in the lesions of atherosclerosis leaves no doubt that this substance is concerned in the production of the degenerative process. However, the nature of the role that it plays and the mechanisms responsible for its deposition in the
intima of the arteries are far from clear. There has been a tendency to stress the relatively high level of cholesterol in the serum of patients with coronary heart disease; but it has become apparent that the cholesterol-phospholipid ratio is of greater significance than the level of cholesterol alone. A special class of cholesterol-bearing lipid and lipoprotein molecules likewise have been studied by means of the ultracentrifuge and their presence in excessive numbers has been pointed to as the characteristic feature of the blood in individuals predisposed to atheromatous lesions.

Restriction of cholesterol and fat in the diet has been recommended as a means of arresting the disease and it has even been intimated that the process might be reversed. But the effects on intimal lipid deposits are not known. In order to diminish significantly the cholesterol content of the serum or lower the number of large cholesterol-bearing lipid molecules by dietary restriction it is necessary, in most cases, to cut the intake to extremely low levels. Vegetable as well as animal fats must be rigidly controlled. Since acetate precursor for synthesis is readily available in dietary protein and carbohydrate as well as in fat, restriction of preformed cholesterol can have only a limited effect. The factors which influence the rate of synthesis remain to be determined; it seems possible that elevation of cholesterol may be due to loss of power of the body cells properly to metabolize it, as occurs in normal persons. This would indicate an inherent metabolic defect. Certain it is that in many patients with proved atherosclerotic lesions, the level of cholesterol and the number of larger lipid molecules in the serum may be within the normal range.

The production of atherosclerosis in dogs, rabbits and chickens has afforded a method for study which is yielding valuable information, but because the conditions of the experiments are so far removed from those existing in man, the results thus far cannot be applied directly to human pathology.

The low fat, low cholesterol diet is not interesting. It eliminates from the menu such items as egg yolk, whole milk, cream, butter and vegetable as well as animal fats. These are the staples of good cooking. Until more specific knowledge is available and more convincing evidence has been adduced that such drastic limitation will prevent or retard the development of arterial degeneration it seems unnecessary, and indeed unwise, to institute this type of regimen in patients in whom the disease has made itself manifest. To inflict it upon a large segment of the population because certain changes are found in the blood which it is believed predispose to atheroma is indeed premature prophylaxis. The cause of atherosclerosis in man remains obscure, but the attack on the problem has been initiated. Development of rational therapeutic procedure must wait for further knowledge.

Salt.8 It is standard practice to prescribe a diet low in sodium in the treatment of congestive heart failure and its value has been demonstrated by years of experience. The mere presence of a cardiac disorder, however, is not an indication for the institution of a low salt diet. This seems obvious, but not infrequently the chore of providing saltless food is placed needlessly on a member of the family and the patient is obliged to partake of meals which lack flavor.

In the presence of congestive failure, sodium restriction may be of varying degree; it is not always necessary that it should be as nearly absolute as possible. In the milder cases food may be served as ordinarily seasoned in the kitchen but no salt is added at table and salty items are omitted. These include ham, bacon, salted fish, salted nuts, potato chips and olives.

Drastic limitation of salt intake in heart failure is not entirely without its dangers, particularly when combined with the continued administration of a mercurial diuretic. There may result serious disturbances in electrolyte metabolism and these, in themselves, may prevent satisfactory diuresis. A patient may become refractory to a mercurial because of the development of hypochloremic alkalosis or of sodium depletion. Correction of electrolyte balance will usually permit of continued administration of the drug with good effect. A routine system for treating heart failure by means of salt restriction, digitalis and a mercurial is to be frowned upon; no routine is ever sound therapeutic procedure. When loss of fluid is ex-
xtreme or when the usual measures fail to initiate diuresis chemical control is advisable.

Limitation of salt intake has been employed also in the management of patients with hypertensive vascular disease. Its value is still a matter of controversy. There is reason to believe that there exists a disturbance of salt and water metabolism in this condition and controlled studies have suggested that in some patients blood pressure levels may be slightly lowered by extreme restriction. Blocking of the pressor activity of the adrenal cortex has been postulated as a possible mechanism for the depressor effect of low sodium diets.

There is, at present, inadequate information concerning the influence of prolonged and rigid salt deprivation on the natural history of hypertensive vascular disease. Its course is variable and is influenced by many factors as yet imperfectly understood. Many persons with elevated blood pressures, particularly women, live long and actively. It seems unlikely that salt restriction is the most important aspect of management. Additional basic facts concerning etiology must be revealed before it seems fair practice to place the burden of continued marked salt restriction on patients who suffer from a disease of which hypertension is only one manifestation and which may continue for many years. As a practical measure, moderate curtailment, as outlined, may properly be advised. The cation exchange resins have not yet been studied sufficiently to be certain of their effectiveness or harmlessness.

Rice. The monotony of a diet consisting largely of rice is self-evident. In certain patients with advanced hypertensive cardiovascular disease strict adherence to this regimen for several months has been followed by improvement in some of the symptoms and signs; in others a fatal outcome appears to have been hastened because of inanition, uremia or the occurrence of a vascular accident in the heart or brain. The rice diet is sometimes useful in tiding a seriously ill patient over a critical period, as the Karell milk diet is often helpful in the acute stage of congestive failure. Prolonged use of rice, even with limited additions, requires strength of character possessed by relatively few; and it is questionable whether the ultimate good accomplished is worth the sacrifice.

Deviation of the Electrocardiogram from the "Normal"

An absolute value cannot be assigned to any biologic measurement. This principle is applicable to the electrocardiogram. There is no standard pattern; there is a range of normal variation. Too often a slight deviation is considered to be sufficient reason for making a diagnosis of heart disease and, in the absence of symptoms or other signs, a program of restricted activity is outlined. Cardiac invalids are thus created and it is extremely difficult, even with the most cogent arguments, to erase the idea of heart disease after it has been once inscribed on the memory. The electrocardiogram does not measure the functional capacity of the heart; it may show the scars of healed lesions which do not interfere in any way with ordinary or even unusual activity. Marked abnormalities are frequently consistent with a normal way of life, as illustrated in the following account.

Case Report. A business executive was first seen in 1930, at the age of 47 years. He complained of mild substernal pain unrelated to exertion. Since youth he had well-marked kyphoscoliosis which was the result of poliomyelitis. At the time of the initial visit (21 years ago) the heart was found to be moderately enlarged. The blood pressure was 136/76.

Between 1930 and 1946, the patient led an active life as president of a large business organization. In 1946, he suffered an attack of cardiac infarction, from which he made a good recovery. After a suitable interval he was able to resume his business life and is still the board chairman of his corporation. The heart increased somewhat in size; the blood pressure remained within the range of normal. There were never signs or symptoms of cardiac insufficiency.

A large series of electrocardiograms has been made. In 1930 only left axis deviation was present. In 1934, the P-R interval had increased to 0.24 second. Following the attack of cardiac infarction there developed complete auriculoventricular heart block together with the pattern of right bundle branch block, and, at times, numerous ventricular premature beats occurred. The complexes underwent frequent changes with the ventricular rate remaining usually at 36 to the minute. In 1949 auricular fibrillation appeared and has persisted. There has
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been no essential change in the form of the ventricular complexes during the past two years (fig. 1).

For a long time this man has been sexually impotent and apparently has derived satisfaction from ballroom dancing. Although spinal curvature is marked, he is extremely graceful and is well known in the night clubs of New York as an accomplished performer. He has been permitted to continue with dancing and with his business, and

Fig. 1. Electrocardiogram of male, 68 years old, five and one-half years after cardiac infarction. It shows the pattern of complete auriculoventricular heart block, right bundle branch block and auricular fibrillation. The ventricular rate is 36. The patient was not taking digitalis.

has been able to carry on both without discomfort. Early in 1951, he took a trip to South America and travelled 10,000 miles by air. On his return, he stated that he never felt better in his life.

The form of the electrocardiogram would lead one to pause before sanctioning such activity. Up to the present, the patient has had five years of full and happy living without evident harm to his condition. His wife and brother have been aware of the possible risk involved and have approved of the course followed.

any measure which seems to give promise of amelioration or cure. Too often he is neither sufficiently critical of what appears to be a new advance nor familiar with the reasoning which led to its proposal. (2) He is eager to fulfill the expectations of the patient. The ailing individual usually expects that modifications in his usual regimen will bring about improvement in his condition and is disappointed if he is told

WHY DOCTORS YIELD

There are numerous reasons for the doctor's readiness to impose restrictions on the cardiac patient. Among them are these: (1) He is dealing with a group of conditions the causes of which, for the most part, are unknown. In his desire to serve his patients, he seizes eagerly on
to continue precisely as has been his custom.

(3) He aims to protect himself from criticism. If restrictions are imposed on the patient and these are not heeded, no blame can be placed on the doctor should the course be unfavorable or should the patient die. Conversely, if improvement occurs, this is ascribed to having followed the advice given. (4) A great deal of pressure is exerted by the laity. Professional science writers for the daily press and the popular magazines, lacking medical training and on the alert for what they consider to be "news," are prone to report unproved theories and poorly controlled observations as established facts. The lay public, avidly looking for aid in the treatment of conditions for which honest physicians offer no certain hope of cure and too little in the way of effective therapy, is not in a position to exercise critical judgment. If the physician does not subscribe to what are considered the latest innovations, he is labeled ultraconservative or old fashioned. With characteristic insight, George Bernard Shaw appreciated the situation and stated it crisply in the preface to his play, The Doctor's Dilemma: "The doctor may lay down the law despotically enough to the patient at points where the patient's mind is simply blank; but when the patient has a prejudice the doctor must either keep it in countenance or lose his patient." Under such circumstances, at the expense of additional time and effort, the physician should assume the role of educator as well as healer.

SUMMARY AND CONCLUSIONS

A plea has been made for a more generous viewpoint on the part of the physician in planning a therapeutic regimen for the patient with heart disease. Reference has been made particularly to smoking, ascent of stairs, travel by air, work and exercise, use of the bedpan, diets low in fat, cholesterol and sodium, and deviations of the electrocardiogram from the standard pattern. Limitations in all phases of living should be gaged according to the status of the individual and not on a routine basis. It should be the aim of the physician to permit the greatest amount of activity and pleasure which is consistent with the best interest of the patient; for the neurosis induced by unjustified restrictions is often more damaging in its effects than the disorder for which they are prescribed. And a diagnosis of heart disease, once implanted in the mind, is truly difficult to uproot, even though later proved to be false.

Recently it has been estimated that elimination of the cardiovascular-renal diseases would increase the expectation of life at birth almost 10 years for white men and 9 years for white women. Attainment of such an ideal goal is desirable but unlikely. Our span of life is limited both by our own ignorance and by forces which are now, and probably always will be, largely beyond our control. In making regulations for the cardiac patient, as well as for others who are ill, the viewpoint should include a sense of practicability and realism. It is our function as physicians to promote the health of those who come to us for help; in our zeal to prolong life let us not, without good cause, lessen their joy in living.

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