

Behavioral Cardiology — Has Its Time Finally Arrived?

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Abstract

Traditional cardiology has taken a mechanistic approach to heart disease. But the new discipline of behavioral cardiology takes a broader view, concluding that heart disease is not inevitable, but develops largely from unhealthy lifestyles, such as smoking, overeating and physical inactivity, and from psychosocial stress. Physical inactivity and excessive caloric intake are also responsible for the epidemic of obesity, which is associated with a dramatic increase in the prevalence of diabetes. This increase in the incidence of diabetes may, in turn, reverse the recent decline of cardiovascular deaths in the US. A variety of psychosocial stressors have been implicated in the development of cardiovascular disease. These include occupational stress, anxiety, social isolation, hostility, anger, and type A behavior. There is clearly some overlap between these stressors, all of which may affect the heart adversely. Both the lifestyle and psychosocial factors can be altered by behavioral treatment, in which the patient and the practitioner work together. Unfortunately, various barriers can impair the successful implementation of behavioral treatment. These barriers include poor compliance by the patient, lack of skill in providing effective interventions by the health care provider, and lack of incentives within the health care system, particularly reimbursement.

Key Words: Behavioral cardiology, smoking, diet, exercise, stress, depression, anger, rumination, coronary heart disease.

CORONARY HEART DISEASE (CHD) continues to be the major cause of death in this country, and stroke one of the leading causes of disability. Recently, we have seen dramatic technological and genetic advances in the diagnosis and treatment of cardiovascular disease, as exemplified by the increasing use of stents and statins and research breakthroughs in gene therapy. These efforts have focused on the heart and blood vessels, with increasing emphasis on molecular processes that lead to the formation of atherosclerotic plaque and its subsequent rupture. Such effort, which implies that the development of heart disease is inevitable but modifiable with high technology, is fueled by widely quoted figures showing that death rates from heart disease have decreased steadily over the past 30 years

(1). However, it does not address many of the root causes of heart disease. Furthermore, there is no evidence that the incidence of new cardiovascular events has decreased; indeed, for African-Americans it may actually be increasing (1). Thus, the reduction of morbidity is due exclusively to improvements in treatment after the disease is clinically manifest. While these advances are impressive, they are very costly. Health care costs are continuing to increase at a rate faster than that of inflation. One of the most rapidly increasing components is the cost of prescription drugs, many of which are used for treating cardiovascular disease (2). In addition, as the prevalence of childhood obesity continues to grow, the incidence of new cases of heart disease will probably start increasing in the near future: childhood obesity is a predictor of coronary artery disease in young adults (3). There is therefore an urgent need to pursue other ways of preventing and treating heart disease. In this paper we review the role of behavioral and lifestyle approaches to these goals.

What is Behavioral Cardiology?

Behavioral cardiology represents an alternative, and often overlooked, medical view that

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coronary heart disease is not inevitable, but can be prevented. According to this view, the causes of heart disease lie not so much in the heart itself, but in the brain, or more specifically, the mind. There are two general ways that the mind affects the heart. The first is via our lifestyles, and the second is via the effects of psychosocial stresses and how we cope with them.

The concept of behavioral cardiology links these two processes, not only in how they interact to cause heart disease, but also in terms of how they can be altered to modify heart disease once it is present (Fig. 1). Behavioral cardiology is an outgrowth of behavioral medicine, which was first defined at a conference held at Yale in 1977 (4): “Behavioral medicine is the field concerned with the development of behavioral-science knowledge and techniques relevant to the understanding of physical health and illness and the application of this knowledge and these techniques to prevention, diagnosis, treatment and rehabilitation.” Behavioral cardiology differs from the better-known discipline of preventive cardiology in that it takes a wider and more integrative approach. Preventive cardiology focuses on traditional lifestyle risk factors such as smoking and cholesterol, and pays little attention to psychological risk factors (such as anger) or techniques for treating the disease (such as stress management). Another related area, psychosomatic medicine, covers the role of psychological factors in the development of physical disease, but pays little attention to lifestyles or treatment. Thus, behavioral cardiology includes the areas covered by both preventive cardiology and psychosomatic medicine.

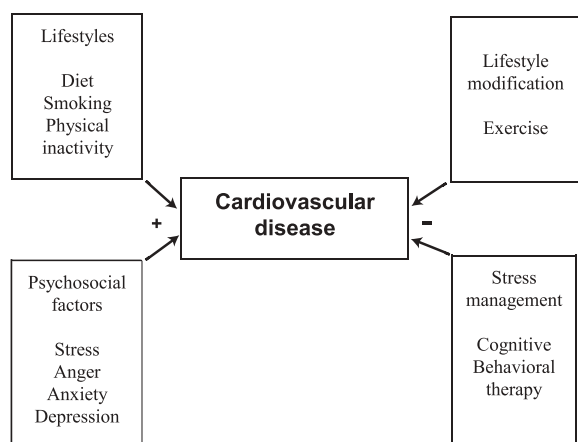


Fig. 1. Ways by which lifestyles and psychosocial factors (left-hand panels) can affect the development of cardiovascular disease, and how they can be modified (right-hand panels) to treat it.

Because behavioral cardiology covers such a wide range of disciplines, and also because medicine is becoming increasingly sub-specialized, no one person has the expertise to master the entire field of behavioral cardiology. Its approach, therefore, differs from that of most other areas of medicine in that it is essentially interdisciplinary, and typically involves an active collaboration between physicians, psychologists, nurses, and dietitians, with the cardiologist as the “gatekeeper.”

Lifestyle and Heart Disease

The three biggest risk factors for atherosclerotic cardiovascular disease — cholesterol levels, smoking, and blood pressure — are all influenced by the way we choose to live. Smoking is of course purely behavioral in origin, although physiologic processes come into play to establish an addiction. And both cholesterol level and blood pressure are influenced by what we eat and how much we exercise. In an assessment of the causes of death in the US in 1993, McGinnis and Foege (5) estimated that approximately 50% of all deaths (the majority of which are due to heart disease) were attributable to behavioral or lifestyle factors, including tobacco and alcohol use, poor diet, and physical inactivity. Another example of the impact of lifestyles on the development of coronary heart disease is provided by the Nurses’ Health Study, which is a prospective study of nurses in the US (6). In a 14-year follow-up of 85,000 nurses, it was found that women who adopted one or more characteristics of a “healthy” lifestyle (i.e., not smoking, not drinking, exercising regularly, not being overweight, and/or following a good diet), had an 83% lower risk of developing heart disease than women who did not do any of these. Unfortunately, only 3% of the nurses actually adopted all of these healthy lifestyles. The major lifestyle factors are summarized below.

Smoking

Smoking kills more than 400,000 Americans every year, and more than half of these deaths are due to cardiovascular disease and stroke. The economic cost of tobacco smoking has been estimated to be more than \$50 billion annually. Smoking is responsible for about 30% of cardiovascular morbidity and mortality (7). It more than doubles the incidence of coronary artery disease, and increases mortality by 70%

(8). It also reduces the effectiveness of costly interventions such as coronary angioplasty, after which, when compared with nonsmokers, smokers have twice the risk of death or a recurrent myocardial infarction (MI) (9). The risks associated with smoking are almost completely reversible after a person quits (10); smoking cessation has been shown to be one of the most cost-effective interventions in the whole field of medicine (11). Despite this, health insurance rarely reimburses people who enter programs to quit smoking.

Dietary Factors

Dietary factors have a substantial impact on the development of CHD. The total cholesterol level in the blood is the most extensively studied risk factor, and while genetics plays at least a partial role, there is considerable evidence that the intake of saturated fat is also an influence. In a study done in 40 countries, it was found that there is a close and linear correlation between saturated fat intake, blood cholesterol, and the death rates from coronary heart disease in each country (12). On the other hand, several other dietary factors have been correlated with low CHD incidence. These include fiber, nuts (13), fish (14), and grain (15). The Mediterranean diet, which is low in saturated fat and cholesterol, and high in fruits, vegetables, and grains, has been shown in both observational and experimental studies to be associated with a low incidence of CHD (16).

Obesity

In 1998 the American Heart Association first defined obesity (17) as “a major modifiable risk factor for coronary heart disease ... on a par with cigarette smoking, physical inactivity, and high blood cholesterol.” One of the reasons why obesity is so important is that it is associated with a cluster of risk factors, including dyslipidemia, diabetes, and hypertension, which when they come together make a lethal combination, particularly in women. While studies of twins have documented the importance of genetic factors (18), the major causes of obesity are excessive caloric intake and inadequate physical activity, both of which are features of the contemporary American lifestyle (19). The prevalence of obesity has increased markedly in the US and other countries over the past 20 years: in 1978 one-fourth of Americans were overweight (as defined by a body mass

index [BMI] between 25 and 30 kg/m²), while in 1990 one-third were overweight (19). The latest figures from the Centers for Disease Control and Prevention (CDC) show that 60% of all Americans are now overweight (20). Similarly, the prevalence of obesity (defined as a BMI > 30 kg/m²) has increased from 12% in 1991 to 19% in 1999 (20). It has been estimated that 300,000 deaths per year are attributable to obesity, accounting for nearly 10% of national health costs (20). The epidemic has its roots in childhood, and can be attributed both to physical inactivity, such as the number of hours per day spent watching television (21), and to caloric intake, such as the amount of sweetened soda drinks consumed (22).

Exercise

Physical inactivity is widely recognized as a major risk factor for cardiovascular disease, and numerous studies have shown that even mild exercise can reduce the probability of morbid events, and even increase longevity. In the results from the Honolulu Heart Study, the risk of coronary heart disease was twice as high for men who walked less than a quarter of a mile per day than for those who walked at least 1.5 miles (23). Only 22% of adults engage in 30 minutes or more of light-to-moderate exercise five or more times per week (the amount recommended for cardiovascular benefit) (24).

Psychosocial Risk Factors and Coping Strategies

The mind also influences heart disease, through the effects of stress and the way in which the body copes with it. An individual experiences psychological stress, which is perceived as the signal of a threat to well-being; stress is thus the end result of an interaction between the source of the stress and the individual. In general, an individual feels incapable of fully controlling an undesirable event before it is perceived as stressful. The effects of stress on the body depend not only on how a person perceives stress, but on the person's response in coping with it.

CHD is much more common in people who are least well off. This is an almost universal finding that relates not only to cardiovascular disease, but also to other chronic diseases. This has been shown in populations as diverse as civil servants in the UK (25) and urban communities in the US (26). These gradients persist

even after controlling for traditional lifestyle-dependent risk factors such as smoking, cholesterol, and blood pressure. More impressive, they are still present after adjusting for traditional markers of socioeconomic status, such as education and income. Social isolation may be a contributory factor (27).

A variety of manifestations of chronic stress have been proposed as possible cardiovascular disease risk factors; these include depression, anger/hostility, type A behavior pattern, and anxiety. While each of these factors is theoretically distinct from the others, they frequently overlap in the same individual. This has to be taken into account when reviewing the evidence supporting their roles in the development of heart disease (28).

Stress

In a Canadian public survey, stress was mentioned as a major factor causing heart disease more frequently than high blood pressure and high lipids (29). However, the scientific investigation of stress as a cardiovascular risk factor has been limited by problems of definition. Stress is essentially a subjective phenomenon, and while some environmental occurrences are universally regarded as being stressful (such as earthquakes), others (such as public speaking) may be very stressful for some people, but not for others. For the layperson, stress may be associated with work and family, social isolation, and the occurrence of recent, acute and chronic life events.

Work stress, which may be defined as a perception of low control over one's work environment coupled with high work demands, has been a reliable and consistent predictor of hypertension (30) and carotid atherosclerosis (31), as well as cardiac events and death (32). Of the two components of work stress, demands and control, the latter appears to be more important, since low job control, by itself, has also been found to predict future cardiac events (33). Family stress has been less well studied, but has been found, for women, to be relatively more important than work stress for predicting recurrent coronary events (34).

Social isolation (having few friends, family, or significant others) and perceived lack of social support have consistently been found to predict acute myocardial infarction and cardiac death. As noted by Rozanski et al. (35), the relative risks in 15 recent studies indicate a three-fold increase in mortality risk for patients with

cardiovascular disease who are socially isolated and/or perceive poor social support.

Acute mental stress (such as from the sudden loss of a loved one or after an earthquake) has consistently been shown in epidemiological studies to provoke silent myocardial ischemia and to predict increased cardiovascular disease incidence and death (36).

Depression

Depressive symptoms and depressive disorders predict cardiac recurrence and mortality, in cardiac patients, with relative risk ranging from 2.6–7.8 (37, 38). These risk ratios remain even after controlling for all other known predictors of myocardial infarction recurrence, and depressive symptoms predict MI recurrence in a dose-response fashion. Thus, there is considerable evidence that a cardiac patient who is depressed is at substantially higher risk for a future cardiac event. The causes for this are not clearly understood, but may include disrupted diurnal rhythms of hormonal and metabolic processes, autonomic imbalance, and poor compliance with prescribed medications (39, 40). It is not known whether treating depression will reduce this risk.

Anxiety

There have been relatively few investigations of the relationship between anxiety and cardiac disease and recurrence (38, 41, 42). Most studies of anxiety disorders have examined the increased mortality from cardiovascular disease in psychiatric patients known to have some type of anxiety disorder (43, 44), although some recent studies have found a positive relationship between anxiety and sudden cardiac death in cardiovascular disease patients (38, 41, 42). However, anxiety symptoms were not associated with MI recurrence in these studies. Rozanski and others (35, 45) hypothesize that anxiety disorders and the associated symptoms may cause an alteration in cardiac autonomic tone through impaired vagal control or reduced heart rate variability, or both, thereby causing increased risk of sudden cardiac death for cardiac patients.

Type A Behavior Pattern

Friedman and Rosenman (46) first proposed, in 1959, that a constellation of competitive, hostile, time-pressured behaviors comprise

a personality trait (“Type A”) that predisposes patients to cardiovascular disease. Although early studies found this to be the case, several more recent studies did not (47). Many theorists have suggested that hostility, or the tendency to view others with suspicion and skepticism, may be the toxic component of the Type A behavioral pattern, and that this component should be evaluated independently for its predictive value for cardiac patients. Four small studies of cardiovascular disease patients have found that a high level of hostility is associated with more rapid progression of atherosclerosis, more ischemia, a faster rate of restenosis after angioplasty, and a higher probability of recurrent MI (48–51).

Anger

Anger is becoming almost a national obsession. In the past few years we have seen the introduction of terms such as “road rage,” “air rage,” and “going postal.” Anger management programs have become a part of the rehabilitation of criminals, despite a complete lack of evidence of their efficacy. However, there is evidence that episodes of anger may trigger acute myocardial infarcts (52). Moreover, anger expression style has been implicated as an independent risk factor for hypertension and cardiovascular disease. Recent investigations have shown that “anger-out” (expressing your anger explosively and outwardly) is positively associated with adverse cardiovascular outcomes (53). “Anger-in” (suppressing angry feelings) has been found to be positively associated with heart disease for women (53) and with elevated resting blood pressure for both men and women in general (54). Thus, expressing anger outwardly (but in a destructive manner) and keeping it in and brooding over it are both potential risk factors.

Rumination

Many sources of stress, such as anger-provoking events, are short-lived. However, it is possible for adverse emotions to affect a chronic process such as cardiovascular disease. Brief episodes of anger or other negative emotions can lead to sympathetic nervous system arousal and the acute rupture of an unstable atherosclerotic plaque — but most people are exposed to such events relatively infrequently. One way by which the effects of such events may be prolonged is by rumination or brooding

long after they have ended. There is evidence that this process may sustain the elevated heart rate and blood pressure that accompany the actual stressful incident (55). Worry and rumination have been associated with occurrence of a second MI (56), and have been associated with decreased heart rate variability and decreased vagal tone, which is an independent risk factor for coronary events (57).

Barriers to Implementing Behavioral Approaches to Prevention and Treatment

The roles of behavioral and psychosocial factors in the causation of heart disease are often belittled. Similarly, behavioral approaches to treatment and prevention are often ignored. It is easier, for example, to write a prescription for a statin drug than it is to counsel the patient about diet, and admittedly, the medication is often more effective. Even with drug treatment, however, there is a big gap between the care that is prescribed and what is actually achieved. A classic example is the control of hypertension: despite the availability of numerous powerful medications, blood pressure is adequately controlled in fewer than one-third of the patients (58). And the availability of medications to treat some of the cardiovascular risk factors does not remove the need for additional, non-drug forms of treatment. An example of the potency of behavioral treatment comes from the Oslo Study, in which men at high risk for coronary heart disease who were randomized to lower their fat intake and stop smoking had a nearly 50% reduction in heart attacks compared to a “usual treatment” group (59). The problem is thus not that behavioral change is ineffective, but that it is difficult to achieve and to sustain, and most physicians have little training in implementing it.

Collaborative management is a basic issue in the treatment of behavioral and lifestyle factors. Heart disease is usually chronic, and its successful management thus requires a long-term collaboration between the patient, the physician and the other health care providers. Some of the barriers to successful implementation of recommended lifestyle changes are summarized in the Table. These can be loosely categorized as relating to the patient, the provider, or the health care system, and they extend across four broadly defined domains, i.e., environmental factors, cognitive factors, emotional/motivational issues, and behavioral factors.

TABLE
Barriers to Implementation of Behavioral Changes

Environmental	Cognitive	Emotional/Motivational	Behavioral
1. Patient			
Lack of access to care	Lack of knowledge	Lack of motivation, set prevention / health as low priority	May be unskilled in behavior change methods
Social/cultural factors fast food sedentary lifestyle smoking ethnic food preferences	Low self-efficacy (confidence in the ability to effect changes)	Fears of giving up habits, behavioral "crutch"	May have few healthy methods of stress reduction
Lack of social support for change	Limited acceptance of personal risk	Stigma of "mental health" diagnosis or treatment	
		Failure to change successfully may lead to shame, demoralization	
2. Physician			
Time constraints	May lack knowledge of possible interventions	May feel overwhelmed or demoralized about own effectiveness, fatalistic	Limited skills in behavior change, physician-delivered counseling
Definition of problem	May perceive methods to be ineffective	May feel frustrated with patients	May have limited skills in identifying and treating anxiety, depression and stress-related illness
Few incentives	Not in area of expertise, "not my organ system"		
May not have providers available for referral			
3. Health care system			
Few office system supports	Behavior change is the patient's problem	Short-term financial pressures	
Not included in quality / accreditation standards	Health promotion focus limited, mostly self-help	Insurers perceive subscribers as fickle, frequently change health plans, fear they will pay for service, then not reap cost savings in long term	
Poor/no reimbursement for behavior change, nutritionist services		Cost-containment strategy is to restrict access	
Mental health carve-outs may prevent coordinated care within system			

The Patient

Getting patients to engage in behavior change, such as improving diet, losing weight, and exercising, is hindered by several barriers. Many physicians assume that patients are aware of the need for such changes and that they are likely to act in accordance with that awareness. However, it has long been recognized that knowledge alone does not provide sufficient motivation to change behavior (60). One fundamental problem is that intervention studies commonly produce improvements that only last for a few weeks to a few months, but that by one year there is almost always some degree of relapse. An example from the Trials of Hypertension Prevention (61), in which patients were

asked to reduce their weight or their salt intake, is shown in Fig. 2.

The basic issue is, how do we persuade people to change behavior patterns that are usually deeply ingrained and which, at least over the short term, confer some reward? Merely providing the patient with information and instructions has yielded disappointing results. The causes for the lack of success are complex. They include the fact that patients are trying to make and sustain behavior changes in an environment that rarely makes those changes easy. The fact that obesity is an endemic problem in the US is largely a function of the availability of cheap "convenience food" that is high in fat and calories, coupled with urban and suburban environments that discourage physical activity as an in-

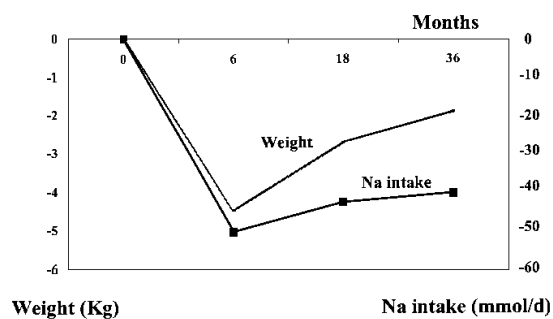


Fig. 2. Typical time course of behavioral interventions. For both weight loss and reduced sodium (Na) intake, there is a good response at 6 months, much of which is lost by 36 months. Data plotted from trials of hypertension prevention.

tegral part of everyday life. Add to this, work environments that are frequently unfriendly to physical activity and which require longer and longer work weeks. Such environmental factors create an atmosphere that offers little social support or encouragement for those individuals trying to make healthy lifestyle changes.

Another fundamental issue concerns the attitudes and motivation of the patient. Patients may have a general awareness that certain behaviors are unhealthy for some people, but may not appreciate their own personal risks. For example, patients may know that smoking is unhealthy, but may believe that the extent of their exposure is not a health problem, particularly if there are some long-lived relatives who smoke or had smoked. Others may have minimized the importance of their own risk behaviors, or placed a relatively low priority on changing these behaviors. Other patients may be demoralized because of previous failed attempts to change their behavior and may, therefore, have little confidence in their ability to make that change. There is ample evidence that people with low "self-efficacy" (self-confidence about their ability to cause change), are extremely unlikely to try to change their behavior (62). Other emotional and motivational issues of patients have to do with being afraid to give up habits that they rely on to cope with the stress in their lives. A final attitudinal and emotional barrier involves the enduring stigma associated with diagnoses of anxiety or depression, and accepting treatment for those problems. There is considerable evidence that many people are far more accepting of treatment for anxiety or depression when the treatment is integrated into their medical care (63).

A final set of patient barriers involves having limited skills in methods of effectively

changing behavior. There is a large body of scientific knowledge proving the effectiveness of certain approaches to behavior change, many of them based on social learning theory (62), but these methods of self-management are generally not taught in the public education system, and the layperson's grasp of them may be very limited (i.e., magazine articles or self-help books). For most people, these techniques work best when some coaching or professional assistance is provided. Similarly, many people lack effective stress management skills, or the methods they use to manage distress are behaviors that put their health at risk (e.g., excessive eating, alcohol intake, smoking).

The Provider

Physicians often take a negative attitude concerning the behavioral changes that they can effect through brief counseling. This attitude may be the single greatest barrier to implementing behavioral interventions. This barrier is maintained, for most physicians, by a lack of training in the use of brief counseling interventions, since such techniques have been taught at medical schools and in postgraduate programs only recently. There is abundant evidence from studies over the past 15 years that meaningful change is attainable after a brief physician-delivered intervention. Yet, without experience with such interventions, physicians are likely to feel ill-equipped to handle behavioral issues, and with such a low sense of self-efficacy they are not likely to attempt to counsel patients. In the subspecialty setting, the physician may also perceive that addressing the patient's behavior is out of his or her area of interest and expertise (this is even more the case for depression or other emotional disorders).

Another barrier is the environment in which the doctor-patient encounter occurs. There is an increase in time-constraint pressure felt by all practicing physicians, particularly those in the primary care setting. In addition, there are few incentives for physicians to take the time to address these issues. Information systems that would support the physician and other providers in prevention activities, or help prompt physicians to inquire about and intervene with behavioral risk factors are rarely in place. There is evidence that without such office system support, even well-trained physicians make little impact on their patients' behavior (64).

The Health Care System

The numbers and costs of invasive cardiac procedures are staggering. According to the latest figures from the American Heart Association, 539,000 coronary angioplasties were performed in 1998 in the US, a nearly 200% increase from 10 years earlier, at an average cost of \$20,000 per procedure (65). Concern about the rising costs of health care is widespread, but the emphasis has almost always been on rationing the supply of health care, as opposed to reducing the demand. A seminal article by Fries et al. described a number of ways by which the need and demand for health care could be reduced (66). Several studies (67, 68) have documented that unhealthy lifestyles increase health care costs; self-management intervention programs can lower the use of medical services; and worksite-based health promotion programs can decrease the costs of both outpatient and inpatient visits.

It is ironic that our current health care system reimburses patients for expensive invasive procedures such as coronary angioplasty, but will not pay for smoking cessation programs (or in many cases, for medications such as bupropion), even though there is ample evidence, quoted above, that patients who continue to smoke have approximately twice the risk of a recurrent MI or death, and that quitting smoking is one of the most cost-effective interventions in the whole medical field. A recent survey of managed care organizations found that only 25% provided full coverage for nicotine replacement therapy and 18% for bupropion (69), despite the fact that both are recommended as standard treatments by the US Public Health Service guidelines (7),

There is a long-standing assumption in the health care profession and the insurance industry that the patient's health-related behavior is his or her own problem to solve. Reimbursement for nutritionist services has historically been extremely limited, with exceptions made for some services for patients with diabetes and hyperlipidemia. Managed care organizations, despite an initial promise to focus more on preventive services, primarily involve themselves in health promotion for the purpose of marketing to attract younger and healthier subscribers. The benefits most often take the form of some level of discount for commercial weight-loss or health-club memberships. Such services are clearly not adequate for patients who need help with addressing multiple risk factors.

The managed care industry's attitude toward preventive health services is apparently driven by their conviction that patients change insurance plans frequently and that the managed care organization that will have to pay for the preventive services (e.g., smoking cessation) will not capture the savings if the patient changes plans. Their focus is on a same-year cost savings, in line with their focus on near-term profits in a highly competitive business environment. Very few preventive or educational services meet this one-to-two-year savings criterion, and those that have been implemented have been primarily in disease management services (e.g., asthma, congestive heart failure) for patients whose poor management might lead to frequent emergency department or inpatient visits.

A second group of reimbursement barriers arises because the specialists in behavior change are often psychologists or other mental health professionals. Mental health services are usually listed separately and assigned to subcontractors for management. Despite the name "behavioral health" applied to many of these programs, the incentives in this part of the industry are designed to reduce psychiatric inpatient costs, and there is no motivation for the managed care industry to approve behavioral or psychological services aimed at saving money for or improving quality of life for medical patients. An additional, related barrier is that mental health contracts are often negotiated separately from medical system contracts. This makes it more difficult to coordinate care within a system and can limit the feasibility of collaborative multidisciplinary care.

Behavioral Approaches to Preventing and Treating Heart Disease

Specialized Behavioral Medicine Interventions

Two theoretical models have improved the science of behavior change. These are the Stages of Change models, i.e., Prochaska's Transtheoretical Model (70) and the Social Learning Theory Model of Bandura (62). The stages of change models are concerned with a person's state of readiness to change and the fact that different barriers to change predominate, depending on the patient's attitudes toward making the change. Thus, while one addicted smoker may be ready to quit, another may have no such desire or intention and may

not even be contemplating change. Suggesting nicotine replacement would be a potentially effective strategy for the first patient, but is almost certain to be unsuccessful for the second, who might respond better to a conversation about her knowledge and beliefs about whether smoking is a health risk for her. The stages of change models offer two advantages over previous health belief theories: (a) First, they emphasize the fact that adopting a new health behavior is a process, not an event, and that there are milestones along the way to change. They promote the view that if we (as providers) can help a patient move from “not thinking about change” to “actively considering it,” then we have accomplished something important. (b) Second, the change models also help to effectively identify likely barriers to change by asking a few brief questions. This allows the physician to focus on the issues most likely to influence patient attitudes and behavior in the long run. It is worth noting that many earlier interventions that attempted to change behavior failed because they did not consider the person’s stage of change, but instead implicitly regarded all persons as being at the “action” stage. Matching the intervention to the person’s stage of change has been shown to improve the likelihood that the intervention will be successful (71).

The social learning theory model has given rise to behavior change methods that include cognitive, interpersonal, and environmental influences on behavior (62). Basic components of this approach include self-monitoring (e.g., keeping food diaries) and self-analysis of behavior; self-management (including stimulus control of external cues); replacement of less desirable behavior (e.g., consumption of high-fat foods) with more desirable behaviors; and reinforcement of desirable behaviors (60). Stress reduction strategies may also be incorporated. One of the central concepts thought to influence behavior change of all kinds is “self-efficacy” (72), which refers to the person’s degree of confidence in their ability to gain control over specific behaviors, such as eating and dieting. Increased self-efficacy has been found to be a critical element in motivation to engage in healthy behaviors (72). A broad range of cognitive-behavioral techniques have been combined to form the basis of most comprehensive, empirically validated treatment packages for smoking cessation, weight management, stress reduction, anger management, exercise promotion, and treatment of depression and anxiety disorders.

Physician-Delivered Interventions

Recognizing that not every patient needs or has access to a specialized behavioral treatment for risk factors, a number of investigators have “boiled down” the basic principles of behavioral counseling for health behavior problems and instructed physicians and other providers in the medical setting in these techniques.

Not surprisingly, the best established example of a behavior that “needs” to be modified is smoking. The message is simple: don’t smoke. A meta-analysis of interventional studies (69) showed that when compared with no counseling, 1–3 minutes of physician advice on quitting increased the quit rate by a factor of 1.3 (from a spontaneous quit rate of 11% to 14.4%), while 4–30 minutes raised it by 1.7 (to 18.8%) (73). Although these numbers may seem small, the health consequences of a few additional people quitting smoking are so enormous that this intervention is one of the most cost-effective in clinical medicine (73). Despite this, a recent survey of office visits showed that counseling about smoking was given in only 3.8% of visits, and about diet in 20% (74). Behavioral treatment of other risk factors such as high lipids is inevitably more complex — we cannot say “don’t eat” to a patient with an elevated cholesterol level. Nevertheless, the big issues here, as shown by numerous studies, are motivation and relapse prevention. Physicians’ utterances generally carry weight with their patients, and since they usually meet on a regular basis, continued counseling has the potential of helping the patient maintain the behavior change.

An example of the effectiveness of brief physician counseling is provided by the WATCH (Worcester Area Trial for Counseling in Hyperlipidemia) study (64). Physicians allocated to two intervention groups attended a 3-hour training program. The intervention consisted of either physician counseling alone (average time 8 minutes per patient) or counseling in combination with an office support program (handouts and the provision of dietary assessment questionnaires for the patients while they were in the waiting room). After one year, patients in the counseling-plus-office-support-group had lost 2.3 kg more than the “usual care” (control) group ($p < 0.001$), and lowered their LDL cholesterol by 3.8 mg/dL ($p = 0.10$).

Thus, there is ample evidence that health care providers can and should use behavioral

techniques to improve self-care as a treatment for chronic illnesses such as heart disease. These techniques include “contracting” with the patient to reach specific goals, evaluating the patient’s readiness for self-care, breaking self-care tasks into small, manageable steps, and providing personalized feedback to the patient; self-monitoring of health-related behaviors; enlisting social support; and checking the patient’s commitment to key tasks. One of the first tasks is to define the problems clearly. Physicians are usually concerned with such items as poor compliance and unhealthy behavior, while patients are more concerned about symptoms and emotional distress. Few physicians ask patients to identify the biggest problems they face in managing their behavior or illness.

Health Care System Interventions

Given the lack of training in behavioral techniques and the severe time limitations of cardiologists, the solution to this dilemma ideally should be a team approach. Behavioral interventions tend to require relatively large amounts of time, but a lot can be achieved by persons whose training and time is less costly than that of physicians. These may include nurses, psychologists, dietitians, and social workers, who bring the advantage of additional knowledge and skills to the patient-care process. While such team management is by no means routinely provided, there are examples of it in a variety of health care settings. The separately assigned mental health arrangements indicated previously have been discarded by some of the best of the staff-model HMOs (e.g., Group Health Cooperative of Puget Sound, Kaiser of Northern California). In their place have come integrated models of care which include one full-time equivalent behavioral/psychiatric specialist (usually a behavioral psychologist) for every 5 primary care physicians. Most routine psychological and behavioral services are integrated with medical services, while subspecialty services are reserved for the management of patients with chronic and severe psychiatric problems (75). Likewise, multidisciplinary management is being implemented in certain groups of chronically ill patients (e.g., those with asthma, CHF, hypertension, diabetes) in innovative methods of care in staff-model HMO health systems (76). The challenge is to figure out how to implement such approaches in the discounted fee-for-service reimbursement environment in which most physicians find themselves.

Information system advances (e.g., electronic medical records, computerized flow-chart systems, hand-held computer devices) may assist providers as they come online, with an ability to track risk-factor status over time, and provide ready access to counseling algorithms and patient-education materials. Initiatives such as the “Improving Chronic Illness Care” model sponsored by the Robert Wood Johnson Foundation support the dissemination of such resources in community health care systems (77). This technical support includes: information systems for tracking patient data and decision support for clinicians; health care delivery design; and resources to support self-management and behavior change among patients.

On a policy level, much remains to be done. The general lack of reimbursement for behavioral forms of treatment, including smoking cessation, implies a double standard on the part of the insurance companies. Any intervention, be it therapeutic or preventive, should be safe and effective. Third-party payers have never suggested that a coronary bypass operation should be reimbursed on the grounds that it will save the company money in the future. And yet the argument that they use for not reimbursing a smoking cessation program is precisely that — it will cost the company money. Changing this paradoxical situation will require action on many fronts: at the grass roots level by patients; by health care professionals; and ultimately, by legislative action.

Conclusions

The field of cardiology has made great strides in the past decade. The advances that have received the most attention are high-tech innovations in diagnosing and treating heart disease, such as ultrafast computed tomography (CT) scans and coronary artery stents. There is no question that these procedures have saved lives and reduced morbidity for a substantial number of people. At the same time, we have no evidence that the incidence of CHD is decreasing. In fact, it may well increase in the future. It seems clear that technology by itself will not solve the problem of CHD. Gains have also been made on the equally important but less glamorous front of behavior change. While inserting a stent in the patient’s coronary artery undoubtedly represents a remarkable and valuable achievement, reducing the need for such a procedure altogether by getting people to improve their diets, quit smoking, exercise, and manage their stress would represent no less a milestone.

Utilizing a team approach, cardiologists can make recommendations and referrals for such changes a core part of their treatment regimens.

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