

A 69-Year-Old Man With Anger and Angina

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DR DELBANCO: MR A IS A 69-YEAR-OLD MARRIED, RETIRED government worker with a 27-year history of angina pectoris, often triggered by stress. A father of several children, he lives in Boston and has Medicare and supplementary insurance. He has long received care in Veterans Affairs hospitals, but for the past 2 years, Dr M, a general internist at the Beth Israel Deaconess Medical Center, has been his primary provider.

Mr A developed angina in the early 1970s. Despite medical intervention, he has since frequently developed angina with exertion, such as carrying bundles. In the past, Mr A describes “not getting along too well” with his cardiologist, who “yelled at him” about his excessive weight and felt his chest symptoms reflected panic, rather than arterial disease. He also sought help from a psychiatrist who helped him with depression and sleep problems.

Mr A reported that, in addition to exertion, certain personal interactions predictably caused angina. Most notably, telephone conversations with his son caused him to “boil up” and develop chest pain, and disagreements with his wife frequently led to similar symptoms. A telephone call from a “difficult cousin,” or even a persistent telemarketer, would result in angina. To minimize such episodes, Mr A reported developing a strategy to remove himself from such calls.

In October 1998, he woke with chest pain, which did not subside with sublingual nitroglycerin taken 3 times in short succession. Cardiac catheterization revealed 85% occlusion of the left anterior descending coronary artery, with a second lesion distally exhibiting 80% narrowing. Percutaneous implantation of a stent resulted in marked diminution in his anginal symptoms. Nevertheless, emotionally charged telephone calls continued to provoke angina, although the symptoms are less frequent and milder.

Mr A has a long-standing history of peptic ulcer disease and in 1972 had a hemigastrectomy. Symptoms of dumping led to surgical revision, but he remains intermittently symptomatic. He developed diabetes mellitus as an adult and is now insulin-dependent. Mr A experiences painful peripheral neuropathy, which requires narcotics for pain control, and he has developed diabetic retinopathy. In addition, he has a long history of hypertension, moderate obesity, several episodes of gout, symptoms of asthma, and chronic vertigo due to damage to the vestibular system. Colonic pol-

yps have been removed, and osteoarthritis in his legs requires him to use a cane. He has a long history of depression and anxiety, accompanied by episodes that some of his doctors feel represent panic attacks. He has a 15 pack-year smoking history but has not smoked for many years.

Current medications include isosorbide dinitrate, diltiazem, lisinopril, aspirin, furosemide, nitroglycerin, insulin, carbidopa/levodopa, oxycodone/acetaminophen, trazodone, denatured tincture of opium, calcium carbonate, loperamide hydrochloride, famotidine, meclizine, and multivitamins.

Recent physical examination reveals a mildly obese man who looked quite well, although he was limping and using a cane. The vital signs, including blood pressure, were unremarkable. The cardiac rhythm was regular. There were scattered wheezes, a normal cardiac examination, full peripheral pulses, and findings consistent with degenerative joint disease and peripheral neuropathy. Laboratory findings revealed hemoglobin A_{1c} levels between 6% and 7%, a normal chest film, and an electrocardiogram with diffuse ST-segment and T-wave changes.

MR A: HIS UNDERSTANDINGS AND PERCEPTIONS

Once I used to argue back. Now I don't. I either get up and go into the other room or I grab my keys and I go for a ride, rather than argue anymore. Because I know it bothered me, and I would get chest pains.

Well, as soon as I told that to my cardiologist, he said to me, “You don't have a heart problem. You have panic attacks.” So I told the doctor, I said, “Doctor, I've had both. And I honestly can say I can tell the difference.” Because I was always more scared of the panic attacks than I was of the heart. With the panics, I'd lose my breath and have to

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go outside to get air. If I can't get rid of someone on the telephone, I start to get chest pain, and I take a nitroglycerin. But I asked my psychiatrist if that could be panic attacks, and he said, "Well, what do you think?" I said, "Well, I don't get any breathing problems or any other problems. So I don't think it's a panic attack."

All husbands and wives have problems—nobody could ask for a better wife. She does everything for me. But she's a woman that has to be right all the time. And she's not always right. She's wrong. But see, the only difference is now I don't act like years ago. Now I know she's wrong, but I just let her think she's right.

Sometimes when I talk to my son, he gives me advice and this all boils up in me, and I get so nervous. Then I start to get the chest pain. When I'm talking to him, he's talking, and then I hold the phone out here away from my ear, and then I go, "Yeah." And I put the phone out here. And then I go, "Yeah." I realized doing that I was better off. So then I thought it would be better just to get rid of him. Sometimes I say the doorbell is ringing—any little excuse. That's when I tell him I have to go to the bathroom, and I'll call him back. And I hang up, but I don't call him back. Don't get me wrong—he's a wonderful son. He loves me. He calls me every day. It's just that he doesn't know it bothers me. I wonder if Dr Williams knows an easy way for me to get around it—I don't want to hurt my son by telling him he's getting on my nerves.

DR M: HIS UNDERSTANDING AND PERCEPTIONS

Since last fall when Mr A was admitted, I've been more vigilant about asking him about symptoms that he might be having. When he gets angry, in particular, when dealing with his son, the angrier he gets, the more that he tends to experience chest pain. To the extent that he's been able to recognize that, I think he has developed some coping mechanisms.

Mr A is only one of my patients with clear-cut angina related to emotional stress or anger. I think many patients develop angina in moments of anxiety. Attempting to explore some of the psychosocial underpinnings of what might be triggering symptoms helps a lot in finally being able to treat it. If you just concentrate on putting a patient on antianginal medications and never try to figure out what is triggering it, you're probably doomed to failure.

AT THE CROSSROADS: QUESTIONS TO DR WILLIAMS

What is the evidence for a relationship between anger and hostility and angina or myocardial infarction (MI)? What are the physiologic mechanisms for this connection? Does psychological intervention affect this relationship? Do drugs, such as β -blockers, "blunt" a mind-body connection? What is the impact of individual or group therapy, or self-directed learning? What training is needed to provide an ad-

equate intervention for patients at risk? What do you recommend for Mr A?

DR WILLIAMS: Mr A presents a daunting array of medical, psychological, and social problems that have clearly taxed both his and his medical caregivers' coping abilities for 3 decades. At age 40 he underwent a 75% gastrectomy to stem bleeding ulcers. His postoperative course was complicated by what sounds like a cardiac arrest, and over the ensuing 29 years he has needed sublingual nitrates to control exertion- and emotion-induced chest pain. He has diabetes complicated by gastroparesis and a neuropathy associated with lower extremity pain sufficient to require oral narcotics. Vertigo has been a major problem in recent years, impairing his capacity to manage the ordinary activities of daily life, such as driving his car. In addition to these physical conditions, he has also suffered from depression and anxiety with panic attacks. Last October he needed angioplasty with placement of a stent to correct an "85% blockage in the main artery," which did afford him the satisfaction of telling his formerly doubting cardiologist that "I really did have a heart problem after all." And, although his angina is much improved since then, he continues to develop chest pain when angered or upset during interactions with his son or others—situations that he manages by taking "a nitro" and terminating the interaction by making an excuse, such as telling the other person he needs to go to the bathroom.

Before addressing the questions posed for this Clinical Crossroads with respect to how we can help Mr A and his doctor manage his overall clinical situation, I cannot pass up the opportunity to first celebrate his tenacity in dealing with this multitude of problems over the past 3 decades. Yes, he has a lot of physical and psychological problems, but when I see him on the videotape talking about his problems, I don't see someone who is defeated or beaten down by all this, but a feisty 69-year-old gentleman who notes with some relish that he was right and his cardiologist was wrong about the reality of his heart problem! So congratulations to you, Mr A, and to your doctors, for hanging in there and managing all these conditions as well as you have over these many years. It will be in this context—suggesting ways you and they can do even better over the next 30 years—that I will be making my recommendations today.

Are Anger and Hostility Associated With Angina and MI?

The initial observation of an association between higher scores on a hostility scale from the Minnesota Multiphasic Personality Inventory and more severe coronary atherosclerosis in a cross-sectional study¹ and increased coronary heart disease (CHD) and all-cause mortality in 2 prospective studies^{2,3} engendered a large body of research on the role of hostility as a psychosocial risk factor. A recent comprehensive review⁴ of this body of research concludes that the psychological trait of hostility—characterized by a cynical mistrust of others, a low threshold for anger, and the aggres-

sive expression of this anger⁵—is a risk factor not only for CHD but for virtually any physical illness.

However, it has become increasingly clear in recent years that hostility is not the only psychosocial characteristic that is “coronary-prone,” or health-damaging generally. Thus, depression, whether viewed as subclinical psychological predisposition or a clinical disorder, has been shown to be associated with increased risk of CHD⁶ or all-cause mortality⁷ in healthy people, as well as increased risk of dying in CHD patients.⁸ Another negative emotion, anxiety, has also been found to predict increased CHD risk.⁹ Similarly, social isolation (the lack of emotionally supportive relationships) predicts increased CHD and all-cause mortality¹⁰ as well as a poor prognosis in CHD patients.¹¹ Job stress, whether defined as demand-control or effort-reward imbalance, has also been shown to increase CHD risk in healthy people,¹² though an impact on prognosis in CHD patients has not been confirmed.¹³ Finally, lower socioeconomic status also predisposes healthy people to increased CHD risk and all-cause mortality¹⁴ and leads to a poorer prognosis in CHD patients.¹¹

These psychosocial risk factors do not occur in isolation but tend to cluster in the same individuals and groups. Thus, working women who report high job strain also are characterized by increased levels of hostility, anger, depression, anxiety, and social isolation.¹⁵ When psychosocial risk factors do co-occur, their impact on mortality is compounded.¹⁶

This clustering of psychosocial risk factors is well-illustrated in Mr A. He has a history of both depression and anxiety disorder, which could have contributed to his angina symptoms via increased sensitivity to bodily sensations. He reports that his relationships with his wife, son, and a cousin are not as emotionally supportive as he would like; in fact, his interactions with them and others are frequently a source of distress and anger—the latter suggesting he may have a tendency toward hostility as well. This latter point requires a bit of amplification. To say that a person has a “hostile personality type” should not be interpreted as an indication that the patient is mentally ill or a bad person. Twenty percent of the normal population has this personality type to a degree sufficient to cause physical health problems.^{2,5}

In addition to physiologic mechanisms that might account for these mind-body effects that act on health over the long term, the emotion of anger can have a direct effect on angina and risk of MI. When CHD patients keep a diary of physical and mental activities during ambulatory electrocardiogram monitoring, both high intensity physical exertion and mental activities leading to anger or other negative emotions are of equal potency in triggering ischemic episodes, whether silent or accompanied by angina, with strenuous physical activity and intense anger being the most potent triggers.^{17,18} Among patients undergoing exercise testing, angina develops sooner and lasts longer among those

Table 1. Characteristics Linking Hostility and Other Psychosocial Risk Factors With Increased Disease Risk and Adverse Outcomes

Behavioral characteristics
Cigarette smoking
Alcohol consumption
Increased energy intake
Biological characteristics
Increased sympathetic nervous system function
Reduced parasympathetic nervous system function
Increased or dysregulated hypothalamic-pituitary-adrenal axis function

who are depressed.¹⁹ Mr A’s chest pain during distressing interchanges with his son and others are typical of this sort of triggering of symptoms.

Acute episodes of intense anger are associated with a 2-fold increased risk of MI during the 2 hours following the episode.²⁰ Among persons with lower educational levels, this risk increases more than 3-fold.²¹ Such episodes of intense anger are estimated to be responsible for at least 36 000 (2.4% of 1.5 million) MI in the United States each year.²²

Physiologic Mechanisms Mediating Mind-Body Effects on Health

Both hostility and depression are associated with alterations in autonomic balance and hypothalamic-pituitary-adrenal axis function that could account for at least some of their health-damaging effects (TABLE 1). When anger is induced in laboratory studies,²³⁻²⁵ for example, persons who score high on the same hostility scale that predicts increased risk of CHD and all-cause mortality exhibit larger sympathetic nervous system (SNS)–mediated cardiovascular responses than low scorers. Hostile persons also show increased SNS activation during everyday life, as documented by larger increases in daytime urinary epinephrine excretion²⁶ and down-regulation of lymphocyte β -adrenergic receptors.²⁷ Similarly, increased SNS outflow has been documented in patients with major depression.²⁸

Parasympathetic function is reduced in both hostile and depressed persons. Laboratory research²⁹ has shown decreased parasympathetic antagonism of SNS effects on myocardial function in highly hostile subjects. Both hostility³⁰ and depression³¹ are associated with decreased parasympathetic function during ambulatory electrocardiogram monitoring.

Increased and dysregulated hypothalamic-pituitary-adrenal axis function has long been known to accompany depression.³² Persons with a hostile personality have also been found to exhibit increased hypothalamic-pituitary-adrenal axis activation, both in ambulatory³³ and laboratory²⁵ conditions.

Biologic changes similar to those documented in depressed and hostile persons are also present in persons who are socially isolated or exposed to high demand–low control jobs or life situations. For example, persons reporting low social support have increased urinary catecholamine excretion.³⁴ Persons in high-strain jobs exhibit³⁵ increased am-

bulatory blood pressure and increased left ventricular mass index—both likely the result of chronically increased SNS function. Working women with young children living in the home—clearly a high demand–low control situation—show greater 24-hour urinary cortisol excretion than working women without children at home.³⁶

Psychosocial risk factors are also associated with increased behavioral and physical risk factor levels. Two large-scale studies, 1 prospective³⁷ and 1 cross-sectional,³⁸ each involving more than 5000 subjects, found hostility to be associated with increased cigarette smoking, alcohol consumption, body mass index, 24-hour energy intake, and cholesterol:high-density lipoprotein ratio. Hostility has also been found to predict increased incidence of hypertension.² Increased smoking³⁹ and alcohol consumption⁴⁰ also are well documented in depression. Persons with low social support are less likely to succeed in smoking cessation⁴¹ or to adhere to a prescribed medical regimen.⁴²

These biobehavioral characteristics probably increase risk through a variety of biologically plausible pathogenic mechanisms⁴³; eg, via excessive cardiovascular arousals that promote atherogenesis due to mechanical injury of arterial endothelium or alterations in immune functions that reduce ability to promote adequate healing following such injury. Adams⁴⁴ proposed that effects of biobehavioral factors on the cellular and molecular biology of the monocyte-macrophage system may be the mediators in the final common pathway at the cellular or molecular level.

In addition to these biobehavioral mechanisms that act over the long term, laboratory studies show more immediate physiological effects of anger that are biologically plausible triggers of acute CHD events. When CHD patients are engaged in a personally relevant, emotionally arousing speaking task during radionuclide angiocardigraphy, the frequency and size of regional myocardial wall–motion abnormalities are similar to those induced by exercise and more severe than those caused by a more neutral mental challenge like mental arithmetic.⁴⁵ Moreover, CHD patients who exhibit mental stress–induced decreases in left ventricular ejection fraction are 2.8 times more likely to experience a cardiac event over up to 5 years of follow-up than patients without declines in left ventricular ejection fraction.⁴⁶ In another study, when CHD patients recalled a recent event that made them angry, left ventricular ejection fraction fell more than 5%.⁴⁷

The existing evidence suggests that psychosocial risk factors do not themselves lead directly to increased risk of disease and death. Rather, their health-damaging effects are probably mediated by the behavioral and physical and biological characteristics that co-occur with the psychosocial risk factors (Table 1). I have proposed^{48,49} that reduced function of the neurotransmitter serotonin in the central nervous system could be responsible for this clustering of psychosocial risk factors and health-damaging biobehavioral characteristics in the same individuals and groups, such as those with lower socioeconomic status. Further support for such a role

of brain serotonin systems comes from research showing that a polymorphism of the promoter region of the gene that encodes for the serotonin transporter is associated with a tendency to experience increased levels of negative emotions.⁵⁰

All of the physiologic mechanisms just described are biologically plausible contributors to Mr A's clinical problems over the years, in terms of both the slow progression of his coronary atherosclerosis and the acute precipitation of chest pain episodes. I would speculate that the episode that woke him at 4 AM last October and led to his angioplasty and stent placement likely occurred during an episode of rapid eye movement sleep, which is known to be associated with increased SNS arousal. The combination of increased catecholamines and cortisol to be expected with his anger, anxiety, and depression may also have adversely affected his glucose control.

Prevention and Treatment Through Psychological Interventions

Group-based behavioral interventions targeting psychosocial factors have already been shown to improve prognosis in both CHD^{51,52} and cancer.^{53,54} These encouraging results make a strong case⁵⁵ for large-scale clinical trials of psychosocial interventions. The National Heart, Lung, and Blood Institute is currently supporting just such a trial—the Enhancing Recovery in Coronary Heart Disease (ENRICH) study, the first large-scale, multicenter, randomized clinical trial of a psychosocial intervention, in this case targeting depression and social isolation with the goal of reducing morbidity and mortality in CHD patients.⁵⁶

Additional applications of behavioral interventions appear beneficial in patients who, like Mr A, have multiple disorders that may not be life threatening but nonetheless cause suffering and are costly. In the Hawaii Medicaid study,⁵⁷ patients who were high utilizers of medical services were randomly assigned to 1 of 3 groups: no mental health treatment, traditional one-on-one psychotherapy for up to 50 sessions over a year, or a highly structured group-based intervention consisting of no more than 8 sessions of training in various coping skills. Compared with the other 2 groups, both of which showed *increased* medical costs during the year following randomization, the patients randomized to the structured group intervention showed a *decrease* of 15% to 20% in costs for medical-surgical services.

The successful intervention programs described above can be synthesized as follows (essential elements listed in TABLE 2):

- Group settings are more efficient than one-on-one approaches, enable patients to learn from one another, and serve as a powerful source of social support.
- Proven principles of *cognitive behavior therapy* and *behavior therapy*, along with *social skills training*, enable patients to gain “hands-on” practice in the use of skills they can use to handle stressful situations and the resulting negative emotions they need to face.

- Some form of reducing autonomic arousal, such as meditation or progressive muscle relaxation, in combination with the increased awareness of symptoms that comes with use of the cognitive behavior therapy skills enables patients to decrease troubling thoughts and emotions and blunt potentially dangerous physiologic hyperarousal.

- Treatment is usually limited to a fixed number of sessions, often no more than 6 to 8, during which each skill to be mastered is presented in a manualized, protocol-driven format that enables each patient to learn how to practice and apply the skill to actual problems that he or she is currently encountering at work, home, or play.

One approach^{58,59} that incorporates these elements trains people to improve their skills in several areas: awareness of negative thoughts and feelings, evaluation and management of negative thoughts and feelings, assertion and problem solving, and communication skills and empathy to enhance positive and supportive relationships with others. A hostility reduction intervention based on these approaches was used in a small-scale randomized clinical trial of post-MI patients.⁶⁰ Compared with patients randomized to usual care, those receiving hostility reduction training showed significant decreases in both hostility and blood pressure at the end of the 8-session workshop, benefits that were maintained or increased 2 months later.

I believe that Mr A is already using some of these coping skills. When he decides not to challenge his wife, even when he's convinced she's wrong on a given issue, he is probably telling himself that the situation is not that important for him or that it would not be worth it for him to make the effort to change his wife's position on the issue. On the other hand, he appears to be less satisfied with how he is handling his relationship with his son, whose all-knowing attitude and tendency to tell Mr A what to do about his medical problems continues to make him angry, resulting in chest pain. It could be helpful for Mr A to get some training in assertion, to enable him to let his son know that he'd just as soon not get the medical advice. Mr A cares about his son, who also has coronary disease at a young age, and is concerned about hurting his feelings—a laudable degree of empathy on Mr A's part. With some coaching and reassurance that, done right, assertion needn't alienate the person to whom it's directed, Mr A might be able to succeed in getting his son to stop giving him medical advice—an outcome that could enable Mr A to enjoy his son's company more, rather than having to worry about becoming so upset that his chest pain comes back.

Recognition of the value of such psychological or behavioral interventions is not currently widespread in the medical community. As Dr M indicated, I believe that most physicians who are engaged in daily patient care are prepared to accept research evidence of the sort reviewed above. However, these services are rarely covered by existing medical insurance, and those in a position to decide what services are covered for any patient population must also become aware of such evidence. In general, managed care organizations and

Table 2. Essential Elements of Successful Behavioral Intervention Programs

Group setting
Cognitive behavior therapy principles
Social skills training
Means of reducing physiologic arousal (eg, meditation, muscle relaxation)
Limited-time, protocol-driven format with practice of skills
Homework

health maintenance organizations have been resistant to any new interventions that they perceive will cost additional out-of-pocket dollars now, even with the prospect of savings down the road. But as the potential savings to be realized from reductions in the “supply” of medical services, eg, by decreasing access, are exhausted, there is likely to be a growing realization of the need to reduce “demand” for medical services, a need that can be met by behavioral interventions of the sort described above, especially as large-scale clinical trials document the clinical benefits and cost savings.

Once instituted, group-based interventions that enable patients to use the coping skills needed to prevent illness and manage it better can be provided by professionals with a wide range of clinical backgrounds, including psychologists, social workers, nurses, and others with good “people skills.” At a cost of perhaps \$250 to \$500 per participant, the cost of delivering this type of group-based training is not prohibitive, especially when one considers the potential benefits and cost savings.

Some evidence suggests that, in addition to psychological interventions, there may be a place for drugs, such as β -blockers, in blunting the mind-body connection. The increased risk of MI during the 2 hours following an episode of intense anger was reduced by 35% among those who were regular users of aspirin.²⁰ The morning peak in MIs appears to be attenuated among those taking β -blockers.⁶¹ At least 1 multicenter trial is currently under way evaluating the impact of a serotonin reuptake inhibitor on prognosis in depressed post-MI patients.⁶²

Based upon what I have heard from Mr A and Dr M, as well as the behavioral medicine research on hostility and other psychosocial risk factors, I can offer the following advice to them.

Recommendations for Mr A:

- Keep your sense of humor, especially your ability to laugh at yourself and your own foibles.
- Stay as feisty as you are!
- Keep using the deflection strategies that appear to be helping you avoid conflicts with your wife and others and the anger and chest pain they would produce.
- Consider trying assertion to get your son to cut down on the medical advice. It might go something like this: You're telling me I should be taking more of this medication. Now I know you're only concerned about my health and are trying to help. (This empathetic “stroke” lets your son know you don't doubt his good intentions.) But I need to let you know it makes

me nervous to hear this kind of advice. So could you try not to give me advice about what medications to take? It would mean a lot to me if you could do this for me!

- Celebrate how well you've handled your medical and psychological problems this far in your life.

Recommendations for Dr M (and Other Physicians With Patients Like Mr A):

- Continue to appreciate Mr A's success in managing his many problems and let him know about your appreciation.

- Practice your listening skills when he's telling you about how his cousin tries to one-up him on the medical malady front (or how he knows more about his heart than his cardiologist): Keep quiet until he finishes the story. Use body language that shows you're interested in what he has to say. When he finishes talking, tell him what you've heard him say. Be prepared to be changed by what you hear.

- When your practice administrator tells you you're spending too much time with your patients, practice assertion yourself and tell him or her you feel frustrated at not having enough time to provide your patients with the kind of care you believe they need.

QUESTIONS AND DISCUSSION

MR A: I read Dr Williams' book a couple of times and got a lot of advice from it. I feel good. I thank God that things are going the way they are, and I appreciate that I'm going to be 70 years old. I never thought I'd make it this long. I'm happy.

A PSYCHIATRIST: There was an article recently about anger and the fact that it's a myth that getting anger out really helps.⁶³ Is it anger and hostility, control or lack of control, hopelessness and helplessness vs being assertive that we're talking about? In other words, is it that there's nothing wrong with being angry, it's what you do about it?

DR WILLIAMS: The article you cite⁶³ provided some of the study subjects with the opportunity to act out their aggression, by 2 minutes of punching away at a punching bag, after they had been made angry by unusually harsh (bogus) feedback about an essay they had written. Compared with similarly angered subjects who were not given the option of punching, those who punched the bag were far more aggressive toward an opponent in a reaction time contest afterward. So the catharsis theory, which maintains that if you are angry it's better to express it, get it out, doesn't hold up to experimental testing. Acting on anger leads to even more aggression. Furthermore, our research⁶⁴ has found that men who say they "get it out"—eg, by endorsing Minnesota Multiphasic Personality Inventory items to the effect that when they are angry they show it—at age 25 are more likely to be dead by age 50 than those who do not endorse items showing that they express their anger. So there is something wrong with being angry: whether you keep it to yourself or let it show; if you have a lot of anger day in and day out, you have a significant increase in risk of premature mortality.

And lastly, I would say it's a mistake to focus on whether it's anger and hostility, control or lack of control, or hope-

lessness and helplessness that is damaging to health. Among working women, our research¹⁵ shows that those who report lack of control are also more hostile and angry as well as more anxious and depressed. It's not a question of which negative emotion or attitude is health-damaging. They all are, and they tend to cluster in the same individuals and groups, such as those with lower socioeconomic status.

A PSYCHIATRIST: There is a strong tendency among some therapists today to encourage the expression of anger. Could you comment?

DR WILLIAMS: As I indicated in response to the previous question, there is solid research that people who "express" their anger are more, rather than less, likely to be more aggressive later and have a higher death rate when followed up 25 years later. The simplistic advice, "when angry, let it out," is unlikely, therefore, to be of much help. Far more important is to learn how to evaluate your anger and then to manage it, based on the outcome of that evaluation. One way to do this is, when angered, to ask yourself 4 questions: (1) Is this situation important to me? (2) Are my thoughts and feelings appropriate to the objective facts? (3) Is this situation modifiable, so that I don't have to have this anger? (4) Would it be worth it, when I consider my needs and the others in this situation, to take the action necessary to modify the situation? Based on established principles of cognitive behavior modification and as part of a comprehensive program designed to help people manage negative emotions and improve relationships with others, this sort of approach will help people evaluate and manage their anger better, while reducing the types of interpersonal conflicts that generate anger.

AN INTERNIST: I wanted to ask you about interventions. At an earlier *Clinical Crossroads*,⁶⁵ David Spiegel from Stanford suggested that cancer patients who had group therapy intervention lived longer and did better. Herbert Benson has argued for many years that people who do the "relaxation response" seem to do better on a variety of medical outcomes. You have shown us that the kind of intervention you've outlined also has better outcomes. Is there similar physiology going on here, or do you think there are different mechanisms?

DR WILLIAMS: We don't know with certainty what physiological mechanisms account for the benefits of these interventions. The commonality of negative emotions, risky health behaviors, autonomic imbalance, and increased hypothalamic-pituitary-adrenocortical axis activation—all of which may be driven by low central nervous system serotonin function, as I noted above—among persons with a tendency toward hostility, depression, social isolation, and job strain suggests that effective behavioral interventions will affect these mechanisms. Decreased blood pressure⁶⁰ and increased natural killer cell activity³³ in 2 behavioral intervention studies are consistent with this view.

A PSYCHIATRIST: The affective state of the mind continues during the night, and 25% of MIs occur at night. During this

rich affective state, there is very little control on the part of the individual. Is there evidence of a carryover in hostile individuals, if their dreams tend to be more associated with anger?

DR WILLIAMS: It's a fascinating question and one that could be studied by seeing if there is a correlation between dream content and hostile personality type. Mr A's episode last October came during sleep. As you know, rapid eye movement sleep—dreaming sleep—may have almost a sympathetic storm.

AN INTERNIST: One of the issues that you didn't mention is the triggering effect of outbursts of anger. Can you conceive of a way to evaluate whether your approach to dealing with anger will have an effect of avoiding potentially triggering events?

DR WILLIAMS: There is a small, randomized trial⁶⁰ that adapted our approach to train post-MI patients how to manage their anger. Compared with those randomized to usual care, patients who received this training showed reduced anger expression during a structured interview at the end of the training, and this change was maintained when the patients were reevaluated 2 months later.

AN INTERNIST: Do you think when we recommend exercise, we should distinguish between competitive sports vs training programs?

DR WILLIAMS: I think competitive sports, if you have this kind of hostile, competitive personality type, might cause you more trouble than straight aerobic activities like jogging or exercycling. We hostile types do get bored, however, just pedaling away on the exercycle; so having a good, hopefully relaxing, book to read as you pedal might be a good idea. Of course, there are group-oriented sports, such as cycling or hiking, that provide the benefits of social support and lack of boredom along with the benefits of exercise.

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UPDATE

A 45-Year-Old Woman With Premenstrual Dysphoric Disorder, 1 Year Later

AT OBSTETRICS AND GYNECOLOGY GRAND ROUNDS in May 1998, Barbara L. Parry, MD, discussed the diagnostic criteria for premenstrual dysphoric disorder (PMDD), along with its relationship to other psychiatric disorders.¹ Ms V, the patient, had disabling symptoms of mood swings, irritability, and depression prior to her menses since menarche. Over the years, physicians prescribed several medications and recommended dietary modifications, vitamins, and exercise, none of which provided consistent relief. For 9 months in 1996, Ms V took fluoxetine, which improved her symptoms of PMDD, but caused troubling adverse effects so that she stopped taking the medication. Dr Parry explained the importance of a careful medical history and stressed that any underlying conditions be addressed before treating PMDD. For patients who meet the criteria for PMDD after 2 consecutive cycles, Dr Parry recommended counseling and other treatment strategies, such as stress reduction, vitamin supplements, or medications including selective serotonin reuptake inhibitors, hormones, and anxiolytics. For Ms V, Dr Parry suggested trying a se-

lective serotonin reuptake inhibitor other than fluoxetine, such as sertraline or paroxetine, to diminish the symptoms of PMDD and possibly avoid the adverse effects Ms V experienced with fluoxetine.

MRS V, THE PATIENT

Life is pretty normal, and I haven't had any extra stress. My PMS (premenstrual syndrome) had been pretty good, but in the last 6 months it's become worse. The symptoms have been creeping back again. My period was 10 days early a month ago, and I had a day when I couldn't stop crying. I don't know whether I'm entering a new phase in my life, maybe menopause. I am just living with the symptoms because I don't like taking medication. Otherwise, I'm doing fine.

Erin E. Hartman, MS
Jennifer Daley, MD

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