

## Restoration and Maintenance of Physical and Psychologic Function in Patients With Ischemic Heart Disease

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At the time of discharge, patients hospitalized for a myocardial infarction or coronary artery bypass surgery should be evaluated to establish their clinical, function and psychologic status. This evaluation should provide the information needed to triage patients regarding a program of medical treatment and rehabilitation. Once these needs are determined, decisions can be made as to how they can be met in the most cost-effective manner. High risk patients or those with major psychologic problems will need to be referred for more extensive evaluation or treatment, whereas the needs of most of the lower risk patients can be met by office-based services or use of community programs.

### Posthospital Evaluation

A comprehensive medical evaluation should occur 3 to 5 weeks after myocardial infarction or bypass graft surgery, which is usually 1 to 2 weeks after hospital discharge. By this time, the acute biologic and psychologic effects of the cardiac trauma and hospitalization have been substantially resolved, and a better assessment of the patient's chronic status can be obtained than an evaluation conducted during hospitalization or at the time of hospital discharge from the hospital. In very high risk patients, especially those with significant cardiac complications, decisions will already have been made on the basis of an in-hospital evaluation to have the patient undergo more extensive evaluation (radionuclide angiography or myocardial perfusion imaging, arteriography and so forth) or treatment (coronary angioplasty, bypass graft surgery, and so forth).

The basic evaluation should include a medical history, physical examination with emphasis on the cardiovascular system, measurement of blood pressure and a 12 lead electrocardiogram. If no medical contraindications exist, a symptom-limited exercise test performed on a motor-driven treadmill or cycle ergometer should be obtained. During the test there should be continuous monitoring of the electrocar-

diogram, and blood pressure and rating of perceived exertion should be measured at least at the end of every stage of the test and at peak exercise (1). On the basis of the patient's medical history, hospital course, clinical status and exercise tolerance, the patient can be triaged into a risk category based on the risk of a major cardiac event occurring during the next year. The details of this procedure have been published by DeBusk, et al. (2).

### Restoration of Sexual Function

**Role of physician counseling.** The development of symptomatic ischemic heart disease frequently produces or aggravates sexual dysfunction and fears for both the patient and the sexual partner. These fears are most prevalent in patients after acute myocardial infarction or cardiac arrest and those patients with unstable angina pectoris or angina on effort. It is important for the physician to discuss sexual function with the patient and partner as a routine part of the rehabilitation or treatment program. The issue should be raised by the physician because patients frequently have questions but are not inclined to bring up the issue.

The rate or sexual dysfunction in the general population above age 45 is quite high with minor or major problems being reported by  $\approx 40\%$  of men (3). The frequency of sexual dysfunction has been reported to increase from 25 to 75% after myocardial infarction, with most problems related to less frequent or less satisfactory intercourse rather than impotence (4). The causes of this increased frequency of sexual dysfunction are multifaceted and complex for some patients, but for others they related directly to the fear, anxiety or depression produced by the infarction, cardiac arrest or surgery. This issue can be addressed by the physician when counseling the patient. Also, the counselor needs to take into consideration the patient's age because impotence becomes more frequent with age, increasing from approximately 40% at age 60 to >75% over the age of 75 years. A recent sex experience and satisfaction history is useful in helping to determine the magnitude of the problem being encountered due to the cardiac disease. Other physical illnesses that have a higher prevalence in cardiac patients can contribute to sexual dysfunction, such as neuropathy

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due to diabetes mellitus, as can alcoholism and a variety of medications.

**Psychologic versus physical factors in sexual dysfunction after infarction.** When an infarction does cause a problem of sexual dysfunction, it is quite often due to a loss of libido. It is assumed that the experience makes the patient feel he is damaged, thus leading to a loss of self-esteem, an increase in depression, fear of a recurrent event or loss of sexual prowess and reduced sexual desire. However, neither the severity of the myocardial infarction or the functional capacity of the patient seem to correlate with the occurrence or magnitude of sexual dysfunction (5).

The demands placed on the cardiovascular system, especially the myocardial oxygen needs, during heterosexual intercourse appear to be quite moderate under most circumstances. The increased myocardial demands are due to the physical activity performed (both dynamic and static) and the psychological involvement. Several investigators have recorded ambulatory electrocardiograms in patients and ambulatory electrocardiograms and blood pressure in healthy subjects during heterosexual intercourse. In most cases peak heart rate ranged from 100 to 130 beats/min, which is 40 to 60% of maximal heart rate achieved during exercise testing (6), systolic blood pressure increased by 40 to 50% (7) and the energy requirement was equivalent to 4 to 5 METS (6,8). Some patients have been shown to have frequent cardiac arrhythmias during sexual intercourse, but their occurrence typically has not been any more frequent than seen in these patients while performing other usual activities (6,9). These data have been collected primarily on male patients, but from the limited data published on female patients, it appears that the cardiovascular responses during sexual intercourse are similar in men and women (8).

Without specific advice many patients wait for as long as 3 months after their infarction to resume sexual intercourse. For moderate to low risk patients, this delay is not necessary and probably can be reduced to no more than 3 to 4 weeks with proper evaluation and counseling. However, the medical team should not rush the situation because a successful encounter is much more important than an early encounter.

*Advice to consider in the counseling of cardiac patients regarding sexual intercourse should include the following issues.*

- An exercise tolerance test performed with the sex partner in attendance can help increase the patient's and partner's efficacy for sexual activity.
- If the patient has a symptom/sign free exercise tolerance of at least 6 METS, sexual intercourse probably can be safely performed.
- For those patients that have had major problems with sexual dysfunction before their ischemic heart disease, they should be advised to consult with a therapist specializing in sex counseling.
- Consider the potential effects of the medications the patient is taking on sexual function. Of special concern are the antihypertensive drugs such as guanethidine, methylopa and beta-receptor blockers and digoxin. Data are not available on the effects of calcium channel blockers on sexual function.
- Myocardial work probably can be decreased by having the patient take the bottom position during intercourse. However, if this is too unnatural for the partners it may lead to ineffective performance and failure.
- Patients should be advised to avoid large meals and large amounts of alcohol for several hours before intercourse to reduce the workload on the heart and increase the likelihood of success.
- If cardiac symptoms do occur during intercourse, especially angina pectoris or unusual shortness of breath, prescription of a non-lipophilic beta-blocker or sublingual nitroglycerin should be considered.

### Enhancement of Return to Work

For many younger men, one of the major traumas of being diagnosed as having ischemic heart disease is the threat of loss of employment and a significant reduction in earning power. On the other hand, some patients who have been dissatisfied with their employment situation take advantage of the retirement opportunity provided by an infarction or surgery even though they could safely return to work. Despite some of the determinants of return to work not being under the control of the physician, a concerted effort should be made by the medical team to facilitate an appropriate occupational outcome for each patient. Such an effort needs to determine the medical prognosis of the patient, establish his or her function capacity and then provide appropriate advice to the patient, spouse and employer, if appropriate, regarding the medical issues of employment.

**Role of symptom-limited stress test.** When return to work issues are being considered, the same general approach for establishing medical prognosis should be used (2). The initial step after the clinical assessment in determining if the patient has the function capacity for a specific job is the performance of a symptom-limited exercise test. If the patient has a symptom and sign free exercise tolerance of >6 METS, he or she can safely withstand the physical component of most jobs held by men and women over age 45. In fact, a symptom-limited treadmill exercise test appears to provide a near maximal work load on the myocardium in low risk patients with good function capacity. In these patients, myocardial oxygen demands produced by static exercise, combined static plus dynamic exercise and dynamic exercise plus food do not exceed those experienced during treadmill exercise alone (10). For this reason symptom-limited treatment testing can clear these patients for employment without job simulation testing or on-the-job evaluation by ambula-

tory monitoring. Patients with a low function capacity (<4 METS) on treadmill testing or who cannot increase heart rate >120 beats/min off medications or demonstrate a sustained decrease in systolic blood pressure during exercise probably have poor left ventricular function. These patients respond poorly to sustained static exercise and may need special evaluations before returning to any job requiring lifting or carrying >10 to 15 lb. (3.5 to 5 kg) or pushing and pulling moderate to heavy objects.

**Role of ambulatory ECG monitoring.** If the job contains a major psychologic stress component and there is some question regarding the patient's capacity to handle this stress, 2-channel ambulatory electrocardiographic monitoring can be performed to detect arrhythmias or silent ischemia. Also, recent developments now allow ambulatory blood pressure to be recorded under a variety of conditions, but still not during activity more vigorous than walking.

**Role of patient counseling.** Once an appropriate evaluation is completed, the next step is to effectively transmit the results to the patient and spouse. Very specific guidelines should be given to the patient and an opportunity provided to have questions answered. In low risk patients, an occupational evaluation and counseling 3 weeks after infarction decreased the interval from infarction to return to work from an average of 75 to 51 days (11). Patients who returned to work early experienced no increase in late medical complications, had lower medical costs and earned a higher salary during the first year of recovery than patients not receiving the evaluation and counseling.

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## Perspectives, Epilogue and Caveat

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Those monitoring the declining incidence of premature death from coronary heart disease in the United States and other selected affluent societies throughout the world cannot escape the conclusion that a large part, if not a major part, of the decline is due to modification of individual behavior and control of identifiable risk factors (1). Only recently has it become accepted that adverse, modifiable life styles contribute to the initiation and progression of coronary heart

disease in large segments of society. Such influences were labeled as "disturbances of human culture" (2).

Stamler and others (3) reported in 1958, the long-term progressive increase, beginning in the early decades of this century, of the mortality from the disease, particularly in middle-aged white men. It had been generally considered that atherosclerotic heart disease was an inevitable aging phenomenon. However, by 1962, Stamler was able to report that "the overwhelming evidence indicates that the disease is multifactorial in causation, with diet as a key essential etiologic factor, accounting for the occurrence of coronary heart disease in the middle-aged populations of the econom-

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