

Let's Get Physical

Exercise Guidelines for Cardiac Patients

Even the simplest physical activities can increase the quality of life for cardiac patients.



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Research and clinical experience in the field of cardiac rehabilitation have demonstrated that regular exercise can impact positively on a patient's exercise capacity, energy levels, cardiac symptoms, and adherence to other aspects of risk factor modification in this high-risk population.¹⁻⁴ It is a very important adjunct to the ongoing medical therapy that attempts to influence morbidity and mortality.

Many patients are deconditioned relative to the normal population, either because of an habitually sedentary lifestyle, or as the result of an acute ischemic event or interven-

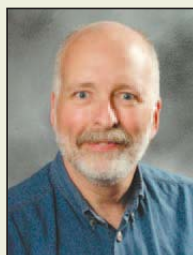
In this article:

1. What is the right mode, frequency, duration and intensity of exercise in cardiac patients?
2. What are some of the special considerations when prescribing exercise?

tion.^{2,4} The restoration of, or improvement in, fitness levels through regular exercise results in a lower myocardial oxygen demand due to the lowering of heart rate and blood pressure in response to a given workload. This leads to improved energy levels and decreased dyspnea and ischemia.^{3,4}

Patients are now given an initial set of guidelines for exercise after a cardiac event, but normally these guidelines are, by necessity, ultra low-risk and low-intensity. They still leave the family physician answering patients' questions on the types of exercise and on the fre-

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quency, length and intensity of these exercise sessions. These components (mode, frequency, duration and intensity) need to be addressed in an exercise prescription.

The exercise prescription

The mode. The mode of exercise should be individualised and is dependent on the patient's preferences, previous exercise experience, the availability of exercise equipment and any limiting associated medical conditions (*i.e.*, COPD, orthopedic problems, *etc.*). The most common type of exercise is walking, but aerobic activities, such as bicycling, jogging, running, rowing, and swimming (some of which can be used with stationary exercise equipment) can be pursued as well. Resistance training has been studied in cardiac patients and is now considered safe if prescribed with specific guidelines regarding workloads, breathing and rest periods.^{2,3,5,6}

The frequency. The frequency of exercise should be a minimum of three times a week and is best prescribed with a day or two of rest each week, especially in patients with Type A personalities.^{5,6}

The duration. The length of exercise sessions can vary, but the bare minimum should be 30 minutes, with five minutes of warm up and five minutes of cool down.^{3,5,6} In a training session, the patient should exercise enough to place stress on the cardiovascular system, but not enough to cause undue symptoms or expose the patient to cardiovascular problems. There should also be enough exercise to modify the cardiovascular response over time, thus achieving similar levels of exertion with less workload for the heart. This can be accom-

plished by sustaining a degree of exertion over the entire training session (continuous training) or interspersing periods of more intense exertion with shorter periods of much less exertion (interval training). The latter technique will prolong the total session because 30 minutes of sufficiently intense exercise are still required to achieve the training goals. Interval training is most useful for older patients or for those with very low initial exercise capacity.

The intensity. The intensity of exercise is the most complex aspect of the exercise prescription. This is best measured by the patient's heart rate response to exercise. To achieve the appropriate intensity level, a target heart rate (THR) needs to be used. An alternative, for patients with special circumstances, is advising them to exercise to a rate of perceived exertion (RPE), a self-rating scale for the degree of effort achieved.^{3,5,6}

In terms of intensity in the initial stages of an exercise program, a conservative prescription would be 20 to 30 beats above the resting heart rate (10 to 20 beats if taking rate-controlling medications, *i.e.*, beta

blockers and calcium channel blockers), while at the same time adhering to the "talk test" (the patient should be able to carry on a conversation easily with someone else while walking).

A more formal THR for exercise intensity can be constructed from a symptom-limited maximal stress test, usually conducted on a treadmill and according to a standard protocol, under medical supervision. This THR will be modified by knowledge of the patient's exercise ability, age, weight, motivation, non-cardiac limitations, extent of disease, presence of left ventricular dysfunction, appearance of ischemia or dysrhythmias and/or adverse

Interval training is useful for older patients, but a minimum of 30 minutes of exercise is still required.

Table 1

Borg Rate of Perceived Exertion (RPE) Scales

10 Grade Scale		15 Grade Scale	
Grade	Symptom Modality	Grade	Symptom Modality
0	nothing	6	
0.5	very, very weak	7	very, very light
1	weak	8	
2	light	9	very light
3	moderate	10	
4	somewhat strong	11	fairly light
5	strong-heavy	12	
6		13	somewhat hard
7	very strong	14	
8		15	hard
9		16	
10	very, very strong	17	very hard
		18	
		19	very, very hard
		20	

For most patients 3-6/10 or 13-15/20 will suffice.

Modified from Pollock and Schmidt, Heart Disease and Rehabilitation (3rd ed.), the AACPR Guidelines for Cardiac Rehabilitation and Secondary Prevention (3rd ed.) and the ACSMHK Guidelines for Exercise Testing and Prescription (5th ed.).

symptoms or signs with stress testing, and the expected outcome (*i.e.*, return to activities of daily living, the workforce, etc.). This testing is done with the patient's usual medication to assess the impact of medical therapy on the THR. The THR is calculated using a formula that takes a percentage of the difference between peak heart rate (PHR) achieved and resting heart rate (RHR) and adds that to the resting heart rate ($\%[\text{PHR}-\text{RHR}]+\text{RHR}$). This percentage is set somewhere between

How to calculate target heart rate:

$$\%[\text{PHR}-\text{RHR}]+\text{RHR}$$

PHR=peak heart rate
RHR=resting heart rate

50% and 80%, and takes into account the above factors.

An alternative to THR as a measure of exercise intensity is the RPE. The most common scale for RPE was devised by Borg and comes in two forms: one graded 0 to 10, the other graded 6 to 20 (Table

1). All patients need to be instructed on how to use one of these scales before exercising, but it is more useful in the elderly and in those patients with pacemakers or cardiac transplantation. RPEs of 3 to 6 out of 10 or

Practice Pointer

General instructions for patients undertaking exercises:

1. Dress appropriate to climate and mode of exercise. Loose clothing is preferable.
2. Avoid extreme temperature.
3. Maintain adequate hydration; have a light snack two hours before exercise.
4. Avoid stimulants in the two hours before exercise.
5. Don't exercise after a meal or if suffering from an intercurrent illness.
6. Don't exercise if any important change in symptoms has occurred; be sure to take all medications as scheduled.
7. Look for undue symptoms, such as excessive fatigue, dyspnea, palpitations, light-headedness, chest discomfort. If any occur, stop; if symptoms resolve promptly, resume cautiously; if persistent or recurrent, seek medical attention.

13 to 15 out of 20 are the usual ranges used.

Preferably, patients will have a THR based on a stress test, but they need to recognise that this THR may have to be modified when new medications are used or dosages changed. Also, over time the THR will need revision if there are new symptoms, events or interventions. In any case, THR should be assessed by an annual stress test.

Special considerations

There are some special considerations in exercise practice for elderly cardiac patients, as well as for those with pacemakers, significant left ventricular dysfunction, cardiac transplantation, and peripheral arterial disease.^{2,3,5,6}

The elderly often have significant orthopedic problems and have age-related lower peak exercise heart rates. Often non-weight bearing exercise (i.e., recumbent stationary bike) and the use of interval training are necessary. In addition, exercising on alternate days allows sufficient recovery from fatigue and muscle soreness, factors which can influence motivation.

Pacemakers, including those that are rate responsive, require some modification of the exercise prescription due to the low heart rate response. The Borg RPE scale is useful here, especially with fixed rate pacing. The intensity of exercise may need to be modified as well, depending on the extent of underlying organic heart disease.

Those patients with significant left ventricular dysfunction often have a reduced heart rate response to exercise along with lower cardiac output and stroke volume. The best guideline for them is

often a combination of THR and RPE.

Cardiac transplant patients have higher resting heart rates and blunted heart rate responses to exercise (related to cardiac denervation). The impact of immuno-suppression on renal function, blood pressure and muscle strength have implications for post-transplant patients. In this group, a combination of RPE and THR may be used.

Peripheral arterial disease imposes its limitations on the exercise prescription by limiting ambulation due to claudication, often long before any cardiac limitations. Yet, exercise just short of, or to the point of, bringing on symptoms is thought to be beneficial for the enhancement of collateral circulation. In this setting, a lower intensity of exercise over a longer period will eventually achieve results while a THR based on claudication threshold is used.


Some normalcy, please!

The other issue regarding exercise and cardiac patients is the question of when to resume cer-

Practice Pointer

When prescribing exercise consider special guidelines for patients:

1. Of advanced age.
2. Wearing a pacemaker.
3. Having significant left ventricular dysfunction.
4. Having had a cardiac transplant.
5. Suffering from peripheral arterial disease.

tain work-related activities, as well as whether it is safe to return to certain leisure activities. Work-simulation studies in a monitored setting can be helpful, if available. An alternative is to consult tables constructed by exercise physiologists regarding the metabolic equivalent (MET) of various work and leisure activities, expressed as multiples of the resting oxygen uptake (3.5 ml O₂/kg/min). All stress-testing protocols are also expressed in MET equivalents, allowing for a reasonable prediction of a patient's ability to undertake such activities. Of course, any advice given should be accompanied by caution to watch for symptoms and not to push beyond limits. It is helpful if the patient has a personal heart rate monitor to use the THR as a guide. 

Take-home message

Advances in the management of cardiac patients also includes more knowledge of exercise and its role in recovery. Hopefully, we can not only add life to years, but also add years to life ^{4,7}

References

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Sounds of Silence - Hearing Loss

Does a hearing problem cause you to feel frustrated when talking with members of your family? Do you have difficulty understanding someone speaking in a whisper? An audiologist can help. Hearing loss occurs gradually as people age, sometimes even going unnoticed.

If you suspect a problem, contact an audiologist — a professional trained to evaluate and treat people with hearing disorders.



Check the yellow pages or visit our web site to find a speech-language pathologist or audiologist near you:
www.caspa.ca