A Realistic Approach to Exercise for CFS Patients

By J. Mark VanNess, PhD, Christopher R. Snell, PhD, and Staci R. Stevens, MA

Drs. VanNess and Snell are professors with the Department of Sport Sciences at the University of the Pacific. Ms. Stevens is an exercise physiologist and chair of the Workwell Foundation, an organization specializing in helping people cope with chronic illness.

Since chronic fatigue syndrome (CFS) is characterized by debilitating malaise and the inability to perform physical activity, it is often assumed that patients should begin an exercise training regimen to increase their ability to function. However, the ability to generate energy through aerobic energy pathways appears to be dramatically impaired in CFS patients and post-exertional malaise can extend for days. Because of this, aerobic-type exercise may be inadvisable for the CFS patient.

This presents something of a problem, as the patient's inability to exercise leads to further deconditioning. Practitioners are often contradictory concerning exercise for persons with CFS: some recommend aerobic exercise in an effort to recondition the patient, while others decry any physical activity because of the negative impact on their patients. This raises questions concerning the etiology of what is essentially a cycle of deconditioning for CFS patients and what, if anything, can be done to reverse the worsening of symptoms many patients have when they exercise.

There are a number of theories on why CFS patients are unable to perform even the simplest of tasks without becoming fatigued. Several studies indicate moderately reduced oxidative capacity in CFS patients, which may provide an important clue to the origins of this fatigue.[1]

Our own research has shown significantly lower exercise duration and peak oxygen consumption in a subset of CFS patients positive for the RNase L enzyme compared to CFS patients negative for the enzyme.[2] Presence of the RNase L enzyme is believed to be connected to an immune system dysfunction that may interrupt energy production, reducing aerobic work capacity.[3]

Any reduction in aerobic work function due to impaired oxidative function may lead to an abnormal reliance on anaerobic energy pathways during exercise. Therefore, what may be an aerobic exercise regimen for healthy individuals could actually be an anaerobic activity for CFS patients.[4]

Even activities of daily living, like vacuuming, may exceed the limited aerobic capacity of CFS patients. The rapid onset of fatigue and extended recovery time following physical activity may be explained as an expected reaction to intense anaerobic activity.

Our research shows significantly impaired oxygen consumption levels (according to AMA guidelines) in persons with CFS during treadmill exercise tests. Although the subjects' volume of inspired air during exercise is normal, the oxygen they were able to use from that air was diminished.[5] These findings suggest that exercise testing could be used to both diagnose and assess the level of disability in CFS patients.

A possible solution to this problem may be to prescribe exercise for CFS patients with the acknowledgment that performance will rely heavily on anaerobic metabolism. This means avoiding extended periods of aerobic activity and alternating short periods of resist-

ance exercise or stretching with frequent rest breaks.

Therapeutic exercise designed from this perspective aims to increase strength and improve flexibility rather than reconditioning the aerobic system. Such a program would have the added goal of reducing muscle pain, improving cognition and providing a sense of accomplishment and well-being.

If exercise is to prove beneficial for CFS patients, it is important that the exercise prescription is one they can accomplish. This means starting slowly, gradually increasing the intensity, and most important, allowing adequate time for recovery between sessions. The following guidelines are intended as general recommendations for CFS patients without other health conditions. It is advisable for patients to perform these exercises under the guidance of a qualified physical therapist or exercise physiologist sensitive to the needs of patients with CFS.

Clinical guidelines

Appropriate exercise for CFS patients is exercise that they recover from. Therefore, the main goal of the program is not to develop aerobic exercise capacity, but rather to increase the patient's ability to utilize anaerobic energy systems and then to recover in a reasonable length of time.

It is also important that exercise programs be developed based on CFS patients' present abilities, not on what they were able to do prior to having the disease. Range of motion exercises, such as lying hamstring stretch, lateral bends, and lower back stretchers, can improve flexibility, decrease joint pain and enhance overall functioning. Light resistance exercises, such as modified push-ups, step-ups, and flex-knee crunches, can help to maintain and build strength.

Each exercise session should be comprised of very brief periods of activity (30

(continued on page 8)

CARDIOPULMONARY EXERCISE TESTING IN CFS PATIENTS

Severity of Impairment	*VO_2max ml/kg/min	# of patients	Group VO_2 ml/kg/min	Exercise Duration (min)
None to Mild	>20	43	23.4±0.4	13:29±0:24
Mild to Moderate	16-20	22	18.4±0.3	10:23±0:33
Moderate to Severe	10-16	12	13.6±0.4	6:03±0:45
Severe	<10	1	8.0±0	1:22±0

** Note: The study includes 87 CFS patients. The highest VO_2 (maximal oxygen consumption) was used for determining impairment and patients were grouped accordingly. The data are mean ± standard errors. All patients met the CDC case definition for CFS, but only 40% would be classified as having greater than "mild" functional impairment. The highest maximal oxygen consumption of any of the patients in the study was 29.5 ml/kg/min, very close to what normative data predicts the average maximal value to be of the entire group.*

A Realistic Approach to Exercise for CFS Patients

(continued from page 5)

seconds or less) followed by at least 1 minute of rest or until complete recovery is achieved. Total periods of activity in a single session should not exceed 20 minutes.

A guiding principle to any exercise regimen is the necessity of allowing adequate time for recovery so that anaerobic metabolites, such as lactic acid, are removed to facilitate further exercise. If excessive fatigue ensues, decrease the number of exercises or their duration.

Determining whether a CFS patient has benefited from exercise requires a different assessment approach than with individuals suffering from other illnesses. A return to pre-morbid fitness levels may not be possible for CFS patients, but improvement is possible. Practitioners, therefore, should have a clear picture of a patient's pre-exercise condition (not pre-morbid condition) and compare it to post-exercise accomplishments, such as whether patients can now independently perform tasks like vacuuming, doing the laundry, washing the dishes, etc., on a daily basis, with shorter rest periods and without relapse, may be just as important as counting how many times they can perform a particular exercise or assessing their cardiovascular condition.

References

1. McCully K et al. Impaired oxygen delivery to muscle in chronic fatigue syndrome. *Clin Science*. 1999; 97: 603-608.
2. Snell CR et al. Comparison of maximal oxygen consumption and RNase-L enzyme in patients with chronic fatigue syndrome. *JCFS*. (In press.)
3. DeMeirlier K et al. A 37kDA 2-5A binding protein as a potential biochemical marker for chronic fatigue syndrome. *Am J Med*. 2000:108: 99-105.
4. Clapp L et al. Acute effects of thirty minutes of light-intensity, intermittent exercise on patients with chronic fatigue syndrome. *Phys Therapy*. 1999; 79(8):749-756.
5. VanNess J M et al. Exercise testing in patients with chronic fatigue syndrome (CFS)—Diagnostic tool? *Fed Amer Soc for Exp Bio J*. 2000:14(4): LB41. ■