

TIRED OF BEING TIRED

Exercise as a Treatment for Chronic Fatigue Syndrome

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LEARNING OBJECTIVE

- To gain a better understanding of the latest information and recommendations for exercise in people with chronic fatigue syndrome.

Key words:

Deconditioning, Depression, Quality of life, Activity management, Cognitive behavioral therapy

Chronic fatigue syndrome (CFS) is the term currently used for a condition characterized by persistent debilitating fatigue, not relieved by rest, and not accounted for by any specifically identified medical or psychiatric condition (2). CFS was first formally defined by the U.S. Centers for Disease Control and Prevention (CDC) in 1988, and revisions of the definition were published in 1994 and 2003 (6,13). There are no universally accepted laboratory tests for CFS, so diagnosis is based on patient symptoms and exclusion of other medical conditions. As a result, people with CFS often wander through the medical system, moving from physician to physician for several years before receiving the diagnosis. This prolonged process often causes a person with CFS to develop a distrust of medical professionals and skepticism for traditional medical treatments.

CFS is viewed as a subset of chronic fatigue (unexplained fatigue of ≥ 6 months' duration), which is treated as a subset of prolonged fatigue (fatigue lasting ≥ 1 month) (2,13). A person with unexplained chronic fatigue can be diagnosed with CFS if they meet the criteria described in Table 1.

To diagnose a client with CFS, a physician must exclude all other conditions that may precipitate similar symptoms. Conditions that often exclude a

CFS diagnosis are hypothyroidism, sleep apnea, hepatitis B or C, major depressive disorder with psychotic or melancholic features (including bipolar affective disorder, schizophrenia, delusional disorders, dementia, anorexia nervosa, and bulimia nervosa), alcohol or other substance abuse within 2 years of the onset of chronic fatigue, and severe obesity (body mass index, ≥ 45) (2,13). To exclude all of these conditions, a person with CFS must endure countless laboratory tests and diagnostic procedures. When formulating an exercise treatment plan for a person with CFS, fitness professionals must appreciate the long, exhausting, and frustrating journey their client has taken before receiving the CFS diagnosis.

WHO, HOW MANY, AND HOW MUCH

The CDC reports that at least 1 million Americans have CFS, and that CFS afflicts more people than

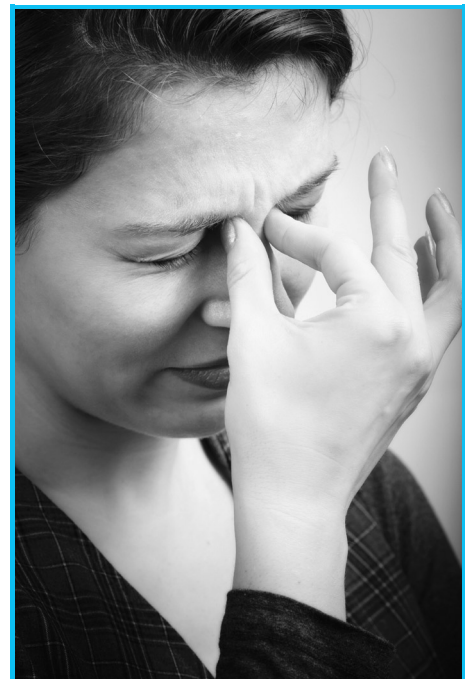


TABLE 1: Criteria for CFS Diagnosis

- Clinically evaluated unexplained persistent or relapsing chronic fatigue of new or definite onset (*i.e.*, not lifelong) that
 - is not the result of ongoing exertion
 - is not substantially alleviated by rest
 - results in substantial reduction in previous levels of occupational, educational, social, or personal activities
- The concurrent occurrence of four or more of the following symptoms*:
 - substantial impairment in short-term memory or concentration
 - sore throat
 - tender lymph nodes
 - muscle pain
 - multijoint pain without swelling or redness
 - headaches of a new type, pattern, or severity
 - sleep that is not refreshing
 - postexertional malaise lasting more than 24 hours

* These symptoms must have persisted or recurred during six or more consecutive months of illness and must have predated the fatigue.

multiple sclerosis, lupus, lung cancer, or ovarian cancer (2). The number of people with CFS could actually be much greater than 1 million. The CDC estimates that less than 20% of Americans with CFS have been diagnosed (2). The economic impact of CFS is significant. Of the people diagnosed with CFS, 25% are unemployed or are on disability, resulting in an estimated \$9.1 billion lost in productivity each year. On average, a family affected by CFS loses about \$20,000 per year in income.

Stereotypically, many health care professionals believe that CFS is a disease that primarily affects white, middle-class, well-educated women. CFS does appear to occur in women four times more frequently than men and occurs most frequently in

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people aged between 40 and 59 years; however, CFS can afflict people of any race, sex, age group, or income level (2).

Do People With CFS Get Better?

CFS seems to follow a cyclical course with alternating periods of increased symptoms and well-being. Although the exact number of patients who recover is unknown, the CDC estimates that 40% to 60% of people with CFS report a partial or complete recovery (2). There also is some evidence suggesting that chances of improvement are better the sooner a patient begins treatment.

How Are People With CFS Typically Treated?

Medical treatments for people with CFS typically focus on the reduction of severity of symptoms. Because specificity and severity of symptoms vary widely between patients, treatment approaches are tailored to meet the specific needs of the individual

TABLE 2: Typical Treatments Used to Treat Patients With CFS

Treatment	Potential Implications to Exercise Professional
Pharmacological therapy	Specific effects of each pharmaceutical agent on acute responses to exercise and weight management should be reviewed. Prescription medications are used to treat specific patient symptoms and can be quite varied between individuals. Typical classes of drugs used include but are not limited to corticosteroids, immunoglobulins and interferons, antiviral, psychostimulants, cholinesterase inhibitors, and antidepressants.
Sleep hygiene	Frequency and timing of exercise interventions should be modified to support positive sleep hygiene behaviors.
Dietary management and nutritional supplements	Patients with CFS should pursue a typical healthy balanced diet and are often encouraged to avoid caffeine, alcohol, and sugary foods. The use of “fad diets” and nutritional supplements that are untested or unjustified should be avoided because they may worsen symptoms.
Activity management	Implementation of a regular exercise program may appear to be contradictory to advice provided by other health professions to moderate physical activity to prevent exacerbation of symptoms. Patients with CFS should be educated that gradual increases in physical activity will have a positive impact on their symptoms.
Cognitive behavioral therapy (CBT)	CBT is delivered by a mental health provider to identify negative beliefs and behaviors in an effort to replace them with positive healthy behaviors. Efforts should be made to communicate with the mental health provider to ensure that the exercise environment is supportive of these strategies.
Alternative approaches	Alternative therapies to treat CFS are abundant and varied. Specific therapies used by people with CFS should be reviewed to ensure that they are not limiting the benefit of or negatively impacting the exercise intervention.

Exercise as a Treatment for Chronic Fatigue Syndrome

patient (2,15,19). Symptoms that seem to be the most debilitating and, as a result, are most frequently treated in patients with CFS include sleep problems, muscle and joint pain, cognitive dysfunction, headaches, sore throats, gastrointestinal distress, orthostatic instability, depression, and allergies (2,15). Treatment approaches often used to address these symptoms include, but are not limited to, pharmacological therapy, sleep hygiene, dietary management, nutritional supplements, cognitive behavioral therapy, graded exercise therapy, activity management, and numerous alternative therapies. Fitness professionals need to appreciate the unique implications of each of these approaches when developing an appropriate exercise intervention for a person with CFS Table 2.

What Happens When a Person With CFS Exercises?

Exercise testing is not usually a routine part of evaluating a person with CFS because there are no clearly unique responses to exercise in this population. Individual responses to exercise testing in clients with CFS vary quite a bit (1). For example, Sargent and colleagues (14) found no differences between people with CFS and controls in maximal oxygen uptake or lactate metabolism. In contrast, some investigators have described people with CFS to have a 10% (7) to 50% (4,18) lower maximal power output than control subjects. The consensus of most investigators is that people with CFS generally have at least mild reductions in both peak oxygen consumption ($\dot{V}O_{2\text{peak}}$) and absolute ventilatory threshold (1,2,7,13). This reduction in exercise capacity may be a result of CFS itself or caused by the deconditioning that accompanies a reduction in activity level that accompanies CFS. Although there are occasional reports to the contrary, the consensus of findings from studies of clients with CFS is that cardiac, pulmonary, muscular, metabolic, immune, and endocrine responses to acute exercise are similar to those seen in normal individuals with profound deconditioning (1,3,10,17). The symptom of fatigue is therefore viewed as being “central” (neurological) in nature.

Although exercise testing does not establish a CFS diagnosis, exercise testing may be requested as part of a client’s evaluation in an effort to exclude other conditions, such as cardiovascular disease. Exercise testing also may be used for designing an individualized exercise program for clients who have a diagnosis of CFS.

As mentioned previously, people with CFS who have experienced symptoms for a long period (>6 months) are very likely to have been inactive for a similar period and undergone significant deconditioning. As a result, protocols used to evaluate fitness should be modified to start at a lower than normal intensity and progress at moderate rates. For example, protocols initiated at work rates below 2 METs and increasing 0.5 to 1 MET per stage have been effective (8,16).

People with CFS often expect to experience an increase in symptoms after completion of a single exercise bout (16). This

Tips for Determining Workload During Exercise Testing to Evaluate Aerobic Fitness:

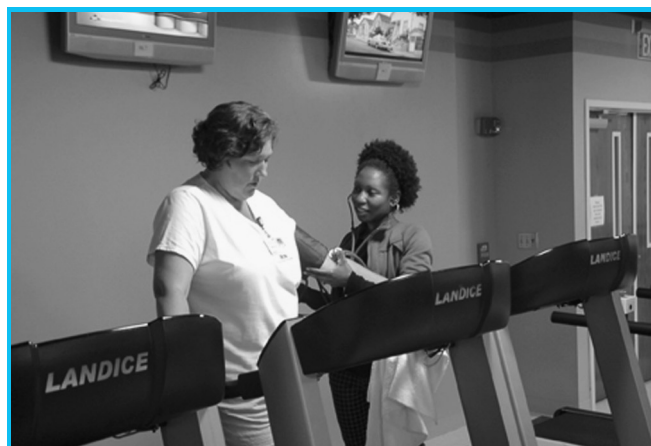
- Initial workload should be below 2 METs
- Increase workload 0.5 to 1 MET per stage
- Consider using shorter stages with small increases in workload (e.g., 1-minute stages with a 5 W increase each stage) or linear increases in workload throughout the test (e.g., 5 W per minute increase during cycle ergometry)

perception has been supported by some researchers that have documented increases in symptoms and reduction of cognitive function in people with CFS several days after completion of a single maximal exercise test (15). The exercise practitioner should closely evaluate the necessity of strenuous evaluatory tests in the CFS population before implementation of the test. When developing a relationship with a person with CFS, an exercise practitioner may want to consider the use of several familiarization sessions using very low levels of exercise intensity and duration before implementing a more traditional fitness evaluation protocol. Exercise practitioners also should avoid a maximal exercise test because all of the information essential for exercise prescription in this population can be obtained during a submaximal exercise test. This approach will help the exercise practitioner develop trust with the client who has CFS and build confidence that the client will not experience any extraordinarily negative consequences as a result of exercise.

Exercise Training for Treatment of CFS

The increase in symptoms after exercise in patients with CFS is called the “push-crash” phenomenon. The push-crash phenomenon is not well understood and attempts at exercise conditioning in this population may be frustrated by this circumstance. A successful

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exercise prescription will accommodate for potential setbacks and focus on the long-term benefits of regular exercise. Despite the potential for an initial aggravation of symptoms at the onset of an exercise program, an overall improvement in symptoms has been reported in clients with CFS who participate in an exercise training program. Interestingly, the physiological and functional changes seen in CFS clients after exercise training are relatively modest, whereas improvements in perceived outcomes (e.g., quality of life) can be dramatic (7,8,12,15). For example, Pardaens and colleagues (11) found peak $\dot{V}O_2$ to be unchanged, whereas quality of life was improved in CFS patients exercising two to three times a week at 60% of heart rate reserve. Most of the substantive improvements in patients with CFS are seen when appropriate exercise training is combined with effective medical management, education, and cognitive behavioral therapy (CBT) (5,17).

In reality, little is known about the clinical effect of exercise training in people with CFS (5,17). As a result, general recommendations regarding exercise programming for all clients with CFS are difficult to make. Exercise practitioners should consider that reports of clinical improvement resulting from exercise conditioning could reflect a systematic bias, in that clients who do not tolerate exercise may be underrepresented in such studies and therefore not fully reflected in the outcome measurements. To date, however, there does not appear to be any evidence of adverse outcomes from prospectively studied exercise trials in clients with CFS (5).

For clients who wish to start an exercise program, the following general guidelines offer a conservative approach to exercise programming that takes into account some of the unique difficulties characteristic of patients with CFS (8,20):

- The goal of exercise programming in this condition should be, first and foremost, to prevent further deconditioning that could compound the disability of chronic fatigue. Clients and trainers alike should resist the temptation to adopt a traditional method of training aimed at optimization of aerobic capacity and should focus instead on modest goals of preventing progressive deconditioning.
- Clients should be warned that they might feel increased fatigue in the first few weeks of an exercise program.
- Exercise generally should be initiated at very low levels based on the client's current activity tolerance. As a consequence, rating of perceived exertion (RPE) should be the primary means to determine exercise intensity in clients with CFS.
- Aerobic exercise should use a familiar activity, such as walking, that can be started at a low level.
- Flexibility exercises may be prescribed to preserve a normal range of motion.
- Strength training should focus on preservation of levels of strength commensurate with daily living activities and should attempt to avoid activities and intensities that induce delayed-onset muscle soreness (DOMS). Specifically, activities that

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require eccentric muscle contraction should be avoided or minimized to limit DOMS as a result of exercise training.

- The progression of exercise activity should focus primarily on increasing the duration of moderate-intensity activities in preference to increasing exercise intensity. Identification of the appropriate magnitude of progression from one exercise session to the next is the most challenging aspect of exercise programming for individuals with CFS. Clients should be “coached” to not overexert themselves on days when they are feeling well and to reduce their exercise intensity when their symptoms are increased.

Some specific suggestions for exercise programming in people with CFS are provided in Table 3.

TABLE 3: Suggestions for Exercise Programming of People with CFS

Mode	Goal
Aerobic Large muscle activities (walking, rowing, cycling, swimming)	Prevent deconditioning Maintain functional abilities Return to desired occupational/social activities
Resistive Large muscle groups (Theraband, light dumbbells)	Similar to aerobic exercise
Intensity/Duration/Frequency	Progression
Aerobic: RPE 9-12/20 (intensity not main focus) 3 to 5 days per week 1 to 2 times per day	5 minutes per session up to 60 minutes per session Be prepared for setbacks
Resistive: Below point of the muscle to fatigue 3 to 5 days per week Once per day	As tolerated Expect a slower rate of progression Avoid symptoms of muscle soreness

Exercise as a Treatment for Chronic Fatigue Syndrome

An alternative and supplementary approach to traditional exercise training in people with CFS is the use of activity management (3). For this approach, the client establishes a baseline record of cognitive and physical activity, daytime rest, and sleep. The client is then instructed to gradually and systematically increase their activities above baseline in an effort to improve functional abilities. The client also is counseled to spread out the difficult or demanding tasks in an effort to avoid the push-crash phenomenon. An important aspect of this approach is to educate the client that implementation of prolonged or complete rest periods during the day to offset small increases in symptoms is counterproductive and may lead to increased loss of functional abilities.

When using activity management, people with CFS should (9)

- Understand that activities have physical, emotional, and cognitive components
- Keep a diary that records cognitive and physical activity, as well as rest and sleep behavior
- Establish baseline levels of activity and identify patterns of overactivity and underactivity
- Prioritize activities
- Set goals to gradually increase activity
- Plan daily activities to balance activity, rest, and sleep
- Spread out difficult or demanding tasks during the day or week
- Divide activities into small achievable tasks
- Monitor activity to avoid a boom-and-bust cycle
- Regularly review activity levels and goals
- Be prepared for and manage setbacks/relapses

THE LITTLE THINGS

People with CFS often experience depression. Although depression is an important issue that must be addressed appropriately when working with people with CFS, it is now clear that depression itself does not precipitate the disease process (2,19).

As previously mentioned, because CFS is often misunderstood by health professionals, many clients with CFS may be frustrated and disillusioned with the medical community. The creation of a supportive and understanding environment is important to give the person with CFS the best chance to improve.

Pharmacological treatment of people with CFS is usually focused on the reduction of the most prominent symptoms. Because specific symptoms vary widely between individuals, the classes of medications typically prescribed to people with CFS are quite diverse. People with CFS may be prescribed analgesic, antidepressant, gastrointestinal, immunosuppressive, endocrine, sleep aids, stimulants,

and muscle relaxant agents (2,13). The exercise professional must appreciate all of the important implications of these medications when developing an exercise treatment plan for a person with CFS.

During the course of their disease, many clients with CFS have learned to cope with their symptoms by planning their activities to “budget” their energy. Providing advanced information to the client with CFS about what they can expect when attending exercise testing or training sessions can be effective in minimizing stress and optimizing the potential for success.

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CONDENSED VERSION AND BOTTOM LINE

Chronic fatigue syndrome (CFS) is a complex and poorly understood disease process. CFS is a diagnosis of exclusion, and people with CFS may bounce around the medical system for prolonged periods before receiving a diagnosis. In general, people with CFS respond to acute exercise in a fashion similar to that seen in severely deconditioned individuals. If pushed too hard, people with CFS may experience a “push-crash” phenomenon, and their symptoms may be greatly exacerbated. As a consequence, any exercise plan should take into account the possibility of a very low level of initial exercise tolerance and expect a slower than normal rate of progression. Despite these limitations, an appropriately applied exercise intervention can have a significant impact on the physical abilities and quality of life of a person with CFS.