

Overtraining: Undermining Success?

From ACSM's Health & Fitness Journal

July/August 2007

Overtraining. Burnout. Staleness. These are descriptive words used to describe the phenomenon that sometimes affects fit individuals. Overtraining is a major concern with highly active fitness enthusiasts because it is responsible for decreased or impaired performance and increased fatigue, both during training and daily life. Overtraining syndrome (OTS) usually occurs as a result of a training schedule that is dramatically or suddenly increased, lasts for sustained periods, and is performed at high volume and/or intensity without a sufficient recovery period.

What Physiological Factors Are Associated With OTS?

Endurance athletes who train for hours at a time have been shown to have an overactive pituitary gland, which, through a series of biochemical reactions, results in abnormally high levels of cortisol secretion – the “stress” hormone that may impair muscle growth and repair. The human reproductive system may be compromised; women sometimes become amenorrheic (abnormal lack of a menstrual cycle), and men may have decreased testosterone levels. Research experts also note that overuse injuries such as posterior tibialis syndrome, lower limb stress fractures, and tendonitis may occur.

What Psychological Factors Are Associated With OTS?

Mood changes are an early and sensitive marker of OTS. Emotional disturbances usually occur before a noticeable drop in performance and parallel an increased training load. Depression and chronic fatigue represent the most common OTS condition observed in highly fit individuals. Research has shown that clinical depression and OTS have numerous symptoms in common, including changes in neurotransmitters, immune responses, and hormones.

How Does The Body's Immune System Respond To OTS?

A telltale sign of OTS is immune suppression expressed in increased rates of illness (especially upper respiratory tract infections), swollen lymph glands, flu-like symptoms, bruising, and slow healing of scratches and wounds. Although an individual may already be very fit, the catalyst for illness and injury may be the result of two factors: 1) a sudden increase in exercise volume, and/or 2) an abrupt increase in exercise intensity. This period of immunosuppression is referred to as an “open window” because an individual is susceptible to contracting infections or getting injured immediately after and during times of increased mental and physical stress.

The decreased immune function/OTS connection also has been linked to nutritional deficiencies. Failing to eat enough healthy sources of protein, carbohydrate, and fat compromises immune function by not allowing the body to repair itself and recover for continued bouts of exercise.

Recreational athletes who enjoy competing in endurance events or are adamant about daily workouts should be aware that string of illnesses and/or injuries may be linked to OTS. Oftentimes, individuals who are serious about their training may attempt to “work through” and injury or illness, only to prolong symptoms or cause a recurrence.

Does Nutrition Impact OTS?

Many fit individuals who follow a strict training program also adhere to strict dietary regimes. Societal pressures may influence these individuals to limit caloric intake, with the (mistaken) belief that they are maintaining a “sleek physique” and aiding performance in the gym or at the race. However, not sufficiently fueling the body is detrimental to training and recovery and a contributing factor to OTS.

After a hard training session, intramuscular stores of glycogen are depleted, which makes carbohydrate consumption essential. Consuming foods such as a bowl of cornflakes with raisins, a handful of vegetables, a fruit salad, or your favorite pasta dish can quickly replenish glycogen stores. In fact, consumption of sufficient and healthy sources of carbohydrate, protein, and fat is necessary to continually perform at a high level on a daily basis.

Fatigue and injury often occur when energy expenditure continually exceeds caloric consumption and the body is not properly fueled to sustain exercise. Early warning signs include loss of appetite and unnecessary or unwanted weight loss.

What You Can Do To Combat OTS

Research suggests the following ideas maybe helpful in preventing OTS:

1. Keep accurate and detailed records of your training program. This allows you to self-monitor and adjust training volume and intensity depending on your current training status, e.g., feeling great, feeling tired, etc.
2. Eat a healthy diet, drink enough fluid to stay hydrated, and get enough sleep.
3. Openly communicate concerns, both physical and mental, with a family member, friend, or health care professional.
4. Be aware of your emotional health. Job stressors, interpersonal relationships, and other environmental stressors may have a harmful effect on athletic performance. Maintaining health and wellness in all areas of life will help prevent OTS.
5. Overtraining syndrome is most successfully treated with rest and/or meaningful changes in exercise volume and intensity. The amount of rest and decrease in exercise depend on the individual.
6. Highly fit individuals sometimes find complete rest a greater source of stress. Consider “active recovery” activities such as walking, stretching, mind-body classes, and core training.

Physiological Symptoms Of OTS:

- Altered (often elevated) resting heart rate and blood pressure
- Chronic fatigue
- Decreased efficiency of movement and physical performance
- Decreased maximum work capacity
- Frequent nausea/gastrointestinal upsets
- Impaired muscular strength

- Inability to meet previously attained performance standards or criteria
- Increased frequency of respiration
- Insatiable thirst
- Insomnia
- Joint aches and pains
- Lack of appetite
- Lower percent body fat
- Menstrual disruptions
- Muscle soreness and tenderness
- Prolonged recovery from exercise
- Reappearance of previous corrected mistakes

Psychological Function Symptoms of OTS:

- Changes in personality
- Decreased self-esteem and motivation to work out
- Difficulty concentrating during work, school, or training
- Emotional instability
- Fear of competition
- Feeling of sadness and depression
- General apathy
- "Giving up" when the going gets tough
- Easily distracted during tasks