

## Osteoporosis May Occur Prematurely

Osteoporosis refers to low bone mass and fragility of the skeleton. Bone mass of women typically peaks in the mid 20s to 30s. A 20-year-old woman without menses during her critical teenage growth period may have bone mass typical of a 70-year-old woman, predisposing her to stress fractures and fractures later in life.

Adequate nutrition, including a balanced diet, adequate calories, relative number of calories spent during exercise, and proper calcium fosters good bone formation. Calcium requirements for teenage girls and young women with normal menses is 1,200 mg per day. This can be obtained by consuming 3-4 dairy products per day or calcium supplement tablets. Females with irregular or absent menses require 1,500 mg of calcium and 400 mg of Vitamin D per day. Low estrogen levels and other hormonal changes, which accompany irregular or absent menstrual periods, may predispose females to osteoporosis.

## The Female Athlete Triad Can Be Prevented

Proper nutritional practices should be taught to women and girls. Athlete and non-athletes should strive for proper caloric intake while eating a well balanced diet.

Emphasis or pressure to achieve unrealistically low body weight should be avoided by coaches, parents, athletic administrators, and health professionals. Out-of-competition "weigh-ins" should be discouraged. Rules governing sports should be examined and eliminated or revised if they encourage excessive leanness. Individuals working with active women and girls should learn the seriousness of each of the disorders comprising the Triad and recognize warning signs.

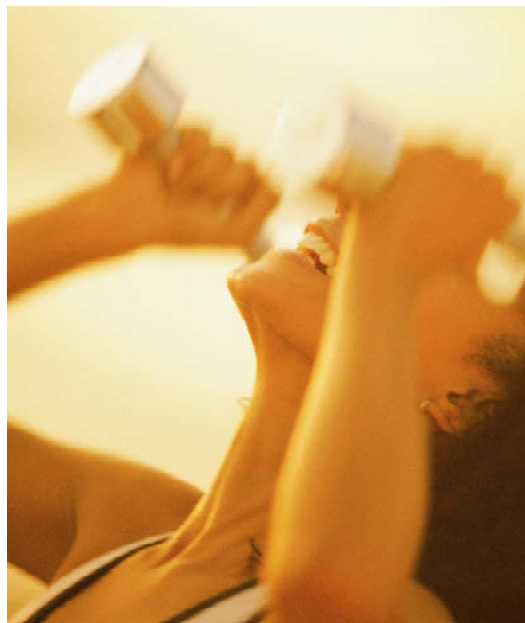
## Early Recognition and Treatment Hastens Recovery

Although individuals with disordered eating or amenorrhea may deny nutritional or health problems and are reluctant to seek care, medical attention is mandatory. An individual may be more likely to seek medical help if the risks of poor nutrition and amenorrhea are explained in a non-judgmental way. An athlete should be reminded

that medical care and proper nutrition may enhance performance.

If an eating disorder or amenorrhea is suspected, the involved individual should be strongly encouraged or required to seek medical attention. If the individual refuses, the concerned coach, friend, or parents should consult with a physician directly.

Treatment of the Triad often requires intervention via a team approach. A physician, nutritionist, and psychologist may need to work with the woman or girl, coaches, parents and close friends. Nutritional monitoring, hormone replacement, and reduced training may be recommended. Early intervention hastens recovery.



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# Female Athlete Triad

## Disordered Eating, Amenorrhea and Osteoporosis



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Active women and girls who are driven to excel in sports risk developing the Female Athlete Triad. Three distinct but interrelated conditions—disordered eating, amenorrhea, and osteoporosis—comprise the Female Athlete Triad. Disordered eating is a range of poor nutritional behaviors. Amenorrhea refers to irregular or absent menstrual periods. Osteoporosis refers to low bone mass and microarchitectural deterioration, which leads to bone fragility and risk of fracture.

## Exercise Promotes Good Health

Physical activity should be encouraged since it promotes health, cardiovascular fitness, bone strength, and longevity. Exercise alone is not a risk for development of the Triad. An energy deficit, in which caloric intake doesn't match energy expenditure, is a risk factor, however.

## External and Internal Pressure May Foster Development of the TRIAD

All women face societal pressure that “thin is in.” Well-meaning coaches, friends, and parents may encourage weight loss by a female athlete due to a misconception that excessive leanness enhances performance. A young woman or girl who is determined to achieve a lean appearance or athletic success may attempt to excel through dieting and exercise. (Such females are typically goal-oriented, perfectionistic, and compulsive.) This misguided approach may lead to disordered eating, menstrual dysfunction, and lower than normal bone mass formation.

Anyone may be affected, but women and girls participating in activities in which leanness is emphasized are at high risk. Gymnastics, ballet, diving, figure skating, aerobics, and running are examples. Sports with weight classifications such as wrestling, rowing, and martial arts may foster disordered eating in athletes, including males.

## Disordered Eating is a Spectrum of Abnormal Behaviors

In response to pressure to lose weight, women and girls may practice unhealthy weight-control methods, ranging from restricted food intake, self-induced vomiting, consumption of appetite suppressants and diet pills, use

of laxatives and compounds to increase urination, to anorexia nervosa and bulimia. Anorexia nervosa refers to weight 15 percent below normal, obsessive fear of fatness, abnormal body image (*i.e.*, a thin person who think she is fat), and amenorrhea. Bulimia is defined as binge eating at least two times a week for at least three months, loss of control over eating and purging (*i.e.*, self-induced vomiting or use of diet pills, laxatives, enemas or excessive exercise to lose weight).

## Some Warning Signs of Eating Disorders Include:

- Excessive leanness or rapid weight loss
- Pre-occupation with weight, food, mealtime rituals, and body image
- Wide fluctuations in weight
- Daily vigorous exercise in addition to regular training sessions
- Stress fractures (*i.e.* microfractures of bones that may progress to complete fractures)
- Yellowing of the skin
- Soft baby hair on the skin
- Frequent sore throats despite no other signs of respiratory illness (self-induced vomiting)
- Chipmunk-like cheek from swollen parotid glands (self-induced vomiting)
- Many dental cavities, foul breath (self-induced vomiting)
- Fatigue, light-headedness, dizziness
- Depression, low self-esteem

## Disordered Eating is Often Hidden

Many girls and women hide or deny their eating disorders due to embarrassment, shame, fear of losing control of their dieting, and their mistaken believe that excessive weight loss enhances performance.

## Performance in Sport, School, and Work May Decline from Disordered Eating

Disordered eating may cause weakness, dehydration, anemia (*i.e.*, low oxygen-carrying capacity of blood), lack of concentration, impaired coordination, frequent and delayed recovery from illness and injuries, and depression.

## Eating Disorders May be Fatal

Eating disorders are serious, chronic medical and psychological illnesses. Individuals with untreated chronic anorexia or bulimia may die prematurely from heart problems, blood electrolyte (*i.e.*, salt) disorders, suicide, or other health problems. In 1994, Christy Henrich, a member of the U.S. gymnastic team died at age 21 from consequences of anorexia nervosa. If these disorders are recognized early, however, treatment may be effective.

## Amenorrhea Warrants Evaluation

An unbalanced diet, inadequate caloric intake relative to exercise level, and perhaps excessive training may predispose females to menstrual abnormalities. Although women and girls may be relieved to not experience menstrual periods, their absence may be dangerous since lack of menstrual periods may be due to a medical disorder and can be associated with osteoporosis.

Any female who hasn't started menstruating by the age of 16, misses three consecutive periods, or has periods that occur at intervals of greater than 35 days should be evaluated by a physician. Before attributing menstrual abnormalities to exercise, other conditions, such as pregnancy, abnormalities of the reproductive organs, or thyroid disease must be excluded. Any female without periods who is sexually active may become pregnant, so contraception should be used if pregnancy is not desired.

