



# Pediatric and Adolescent Sports Medicine Update

3rd Quarter 2012

## The Female Athlete Triad

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Athletic activity and sports participation by females has increased dramatically over the last few decades. The number of girls involved in sports has risen from very low levels to numbers that nearly match the number of boys. With increased participation by females, some special disorders in female athletes have been recognized. One of these potential problems is called the Female Athlete Triad. This is a serious problem that can have long term effects on the body and in extreme cases can even be fatal.

**What is it?** The Female Athlete Triad is actually three different problems that are associated with each other:

1. disordered eating, 2. menstrual disturbances, and 3. stress fractures or bone loss.



**Symptoms** of the female athlete triad may include disordered eating, fatigue, hair loss, cold hands and feet, dry skin, noticeable weight loss, increased healing time from injuries, increased incidence of bone fracture, and cessation of menses. Affected females may also struggle with low self-esteem and depression.

### How does the female athlete triad occur?

- (1) **Disordered Eating:** Female athletes often experience significant external or internal pressure to either maintain or lose body weight. They may use a variety of techniques to limit caloric intake such as dietary restrictions, fasting, binge-eating, purging, the use of diet pills, diuretics, enemas or the use of laxatives or diet pills. Some athletes simply do not eat enough calories to account for the amount of energy used during exercise. They experience "low energy availability". A lack of energy prevents the body from carrying out its normal functions such as menstrual periods or bone maintenance. By restricting their diets, athletes worsen the problem of low energy availability.
- (2) **Menstrual Disturbance:** When there is inadequate energy available, the hypothalamus does not secrete the proper amount of gonadotropic hormones. These hormones play a role in stimulating estrogen release from the ovaries. Without adequate levels of estrogen, the menstrual cycle is disrupted. Exercising intensely and not eating enough calories can lead to decreased estrogen. As a result, a female athlete's periods may become irregular or stop altogether.
- (3) **Stress Fractures/Osteopenia:** A lack of estrogen, as discussed above, results in poor bone strength, a condition called osteopenia. Bones can become very brittle and more susceptible to fractures. Females who restrict their diet also may not be getting enough Vitamin D and calcium which can further weaken the bone. It is very important that females in their teens and twenties maintain good bone health. If the optimum levels of bone mass are not developed during these critical years, the individual may develop irreversible osteoporosis at an early age. Individuals with weakened bones often experience fractures, most commonly to the lower extremities, spine, and pelvis.



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**Who is at risk?** The Female Athlete Triad is most often seen in those involved in activities that emphasize a lean appearance or low body weight such as gymnastics, ballet, figure skating, swimming, diving, and distance running. Also at risk are those who participate in sports that have "weight classes" such as taekwondo, judo, and wrestling. Emotional stressors may also contribute to development of this disorder. Young women entering college often develop this condition. They are often far from home and are separated from their family and friends who have supported them in the past. They may be under a lot of pressure to perform in their sport and in the classroom.

**What can be done?** The health related issues concerning the female athlete triad are serious and can lead to health issues if not addressed appropriately. An athlete who develops the Female Athlete Triad should be treated using a multi-disciplinary approach by physicians, dietitians, and mental health providers. Trainers and coaches should also be involved in the management of the problem. An evaluation with a gynecologist is recommended for menstrual disturbances. An evaluation with a psychiatrist may be needed if there is an associated eating disorder. Treatment includes nutritional counseling and limitation of exercise.



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