



The Female Athlete Triad is a group of three interrelated medical conditions often observed in physically active girls and women.

THE FEMALE ATHLETE TRIAD

Problem One: Low Energy Availability And Low Energy State

Food provides the body with the necessary energy for cellular maintenance, thermoregulation (temperature control), growth, locomotion, reproduction, and sports performance. Adequate energy is needed for bodies to perform basic, life-sustaining functions, but professional athletes require additional energy to execute the demands of training and competition. Many athletes, by intent or not, do not consume an adequate amount of energy to match the demands placed upon their bodies. These athletes live in a “low-energy state.”

Energy Availability:

- Defined as the energy required to meet everyday demands and is determined by food intake minus energy used in exercise.

Low Energy State:

- Results in fatigue, poor recovery, inadequate healing, frequent mood fluctuations, and/or lack of improvement despite training.



Female athletes with high energy demands may be unaware that they are in an “under-fueled” state, where the gas in their engine is running close to empty due in part to missing meals (i.e. not eating a proper meal after a late match finish), poor nutritional recovery practices (i.e. do not eat or under-eat after matches and practices), avoidance of fat or following a fad diet (i.e. avoidance of certain foods for ‘popular’ reasons, not due to a diagnosed medical reason), chronically dieting, or losing too much weight too fast.

These symptoms often result in poorer competition outcomes, disordered sleep, altered moods, irregular menses, and potential bone compromise. Treatment includes a multidisciplinary health care team approach, assessing bloodwork, determining energy intake, and providing guidance on the steps required to restore energy levels to compete at an optimal level.

Problem Two: Abnormal Or Absent Menses

Low energy availability from under-eating or an eating disorder will directly disrupt the reproductive system. This system is controlled by the pituitary or ‘master gland’. The pituitary gland identifies when the body has low energy availability and alters the signals that regulate egg production and the menstrual cycle. Changes to the menstrual cycle include lowered levels of estrogen (female hormones). Estrogen is responsible for regulating the menstrual cycle but also plays an important role in bone formation. An athlete may notice that her periods become irregular or are completely absent. This may be the only sign that there is a problem.

Abnormal Menses Is Characterized As:

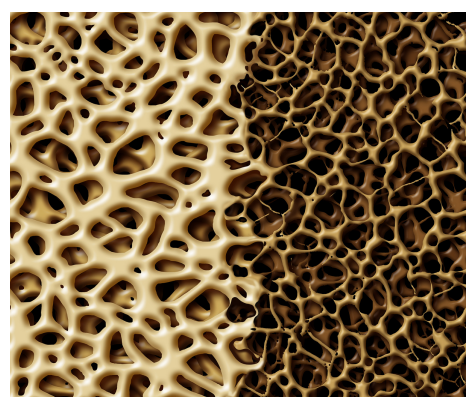
1. Not starting the menstrual cycle by age 16 OR
2. Three or more months in a row with NO period OR
3. Less than 5 periods a year



Problem Three: 'Old Bones In Young Women And Stress Fractures

Both nutritional (low energy availability= problem one) and hormonal factors (menstrual changes = problem two) lead to impaired bone mineralization and development during the active growing years (ages 15-30 years). This may cause:

- Insufficient bone mass or bone density (osteoporosis)
- Bones cannot be remodeled (shaped and strengthened to manage exercise and load)
- Bone cells cannot be replaced (to repair and strengthen bones).



These problems can lead to stress fractures and “weak” or osteoporotic bones (low bone density) in young women. Bone loss is worsened by an overall energy deficiency and insufficient amounts of important nutrients such as Calcium and Vitamin D. Athletes most likely to develop the Female Athlete Triad are those who have created a low energy state due to:

- Under-fueling- Not eating enough due to constant dieting, following food fads, missing meals, and/or eliminating specific foods or food groups
- Eating Disorders- Characterized by irregular eating habits and severe distress or concern about body weight or shape.
 - Symptoms may include:
 - Obsession with calories or fat/carbohydrate content of food
 - Constant weight fluctuations
 - Body dissatisfaction: untrue belief that changing body size/shape will result in being a better or happier athlete
 - Body dysmorphia: distorted perceptions of body size and shape
 - Unhealthy eating behaviors, such as “strict” dieting, fasting (not eating any solid food), or switching from periods of overeating and fasting
 - Binge eating and purging behaviors (such as self-induced vomiting, use of supplements, or excessive exercise) to lose weight
 - Avoidance of social functions, family, and friends (to avoid food or protect eating rituals)

Recognition of the Triad:

- An athlete does not have to have all three components of the Triad to be at risk for health problems.
- Pay attention to early warning signs, such as irregular or absent periods, injuries like stress fractures, inconsistent dietary habits, and intrusive or constant thinking about weight or body size and physical appearance.
- If any of these symptoms are present, seek help from your medical doctor, or consult healthcare professionals who can help guide you for assessment by a team that includes a nutritionist, medical doctor, and qualified mental health professional.