

## The Female Athlete Triad: What all Women Runners Should Know

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One of the benefits of training for a marathon is burning extra calories. Indeed, many runners find it difficult to maintain their weight. While a lean physique is regarded by most as synonymous with good health, it is possible for some athletes to become undernourished, to the detriment of their overall health. In female athletes, inadequate intake of calories can have serious hormonal implications. This problem is so commonly recognized that the medical community has a name to describe it: The Female Athlete Triad. Specifically, this term refers to the concurrent findings of inadequate calorie intake, menstrual abnormalities, and bone degradation in some female athletes.

Inadequate eating describes anyone who does not regularly eat enough calories to replace those burned. Sometimes these women display features of anorexia (severe calorie restriction) or bulimia (binging followed by purging behavior). Unfortunately, a higher incidence of eating disorders is seen among athletic women when compared to the general population.

Calorie deficiency can result in menstrual irregularities. Some women experience oligomenorrhea (fewer periods), while others develop amenorrhea (no periods). The complex interaction of hormones required to signal periods are disrupted in the setting of inadequate calorie intake. These women also have reduced estrogen levels, at times as low as post-menopausal women.

Skeletal demineralization (bone break-down) is the third component of the female athlete triad. Normally, bone is continuously formed and broken down, with the end result that overall bone mass remains relatively constant. This balance is influenced by many factors, including estrogen. Because women with the female athlete triad have low estrogen, bone break-down outpaces bone formation. This can result in reduction in overall bone mass, increased rates of stress fractures, and greater susceptibility to fracture after minor trauma.

More recently, cardiovascular risks in these athletes have been recognized. Again, this is thought to be due to low estrogen levels. Estrogen is known to increase good (HDL) cholesterol and decrease bad (LDL) cholesterol. Estrogen has also been found to affect the ability of blood to flow through vessels. The full extent of the cardiovascular risks to these athletes is not completely understood and is a growing area of research.

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The best a female athlete can do to protect herself is to recognize the warning signs of the Female Athlete Triad and see her personal physician if she is concerned. These include:

- Excessive calorie restrictions/dieting or bingeing/purging behaviors
- Fewer, irregular, or absent periods
- A history of repeated stress fractures or fracture from minor injury

We are still learning the full spectrum of health risks associated with the Female Athlete Triad. If you fear that you might be affected, the best way to prevent significant illness is to seek medical attention as soon as possible.



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