



## **Female Athlete Triad**

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### **Abstract**

*Women's participation in exercise and also elite level sports has grown substantially in the last three decades. A knock on effect from this would also be the interest of young girls in sports and keeping fit in general. Younger girls who take to sport and activity at a younger age reap the benefits of being healthy and also grow in confidence about their appearance. Couple that with the work being done by both Title IX and the Amateur Sports Act who are the driving forces behind promoting equalization of the number of women in competitive sport, it appears that these laws have produced a high level of participation of women at the high school and college levels.*

**Keywords:** Female athlete triad, Sports medicine, Female athletes.

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### **INTRODUCTION**

Women's participation in exercise and also elite level sports has grown substantially in the last three decades. A knock on effect from this would also be the interest of young girls in sports and keeping fit in general. Younger girls who take to sport and activity at a younger age reap the benefits of being healthy and also grow in confidence about their appearance [1]. Couple that with the work being done by both Title IX and the Amateur Sports Act who are the driving forces behind promoting equalization of the number of women in competitive sport, it appears that these laws have produced a high level of participation of women at the high school and college levels [2]. This increase in activity may also have its downfalls if not correctly monitored. The increase in physical activity can put excessive and harmful stress on the female physiological system, a claim backed by evidence as far back as 1980 where 'Female Athlete Triad' was first termed [3]. Although it was not formally defined as the triad of disordered eating, amenorrhea, and osteoporosis as the female athlete triad until 1993 [4]. Furthermore, the American College of Sports Medicine (ACSM) updated the 1993 statement on the triad. They placed the emphasis on decreased energy, with or without disordered eating, as the initiating problem in female athletes, which in turn leads to menstrual irregularities and negative effects on overall Bone Mineral Density issues (BMD) [5].

#### ***Disordered eating***

Athletes need to keep in shape can lead to a battle with themselves to eat right or even not to eat at all to keep within certain weight levels for competition. Each athlete has their own idea on their body image which is multi-faceted and includes perceptual, attitude and behavioral aspects unique to them [6]. In my view, this is what makes it such a hard condition to the flag. So what do we know about disordered eating?

#### ***Anorexia nervosa***

This is where the athlete will starve themselves to lose weight, typical characteristics of this athlete will include a distorted body image, a strong denial pattern, and perfectionism [5,7]. Signs of this type include amenorrhea, minimal subcutaneous fat, bradycardia, and orthostatic hypotension muscle loss, dry hair and skin, and lanugo hair [8].

### ***Bulimia nervosa***

While having some similarities with anorexia nervosa, like the desire to be thin and a distorted body image. The patient's body weight during the illness is usually at or above normal, they are usually aware of their condition and crying out for help [9]. The condition itself can be defined by binge eating, followed by some type of purging (getting sick, laxatives). The causes of binge eating may include inappropriate food restriction, overt hunger, and stress [6].

### ***Eating disorders not otherwise specified (EDNOS)***

I feel it is very important to mention this type due to the many and complex reasons eating disorders begin. It is important to understand the etiology of eating disorders. It's very important to know that a disordered eating behavior doesn't supply them with an adequate amount of calories for the amount of energy used during exercise [10]. Noted that meal skipping and training, as usual, will lead to a caloric deficiency that starts the unhealthy physiological stress on the body.

### ***Amenorrhea***

When an athlete doesn't fuel themselves with enough energy the physiological maintenance, growth and reproductive systems become compromised [5].

Primary amenorrhea is defined as no menstruation by the age of 15. Secondary amenorrhea is defined as not having menstruation for more than 3 months in the setting of a previous monthly cycle [11]. Functional hypothalamic amenorrhea characterized by the lack of menses due to the suppression of the hypothalamic-pituitary-ovarian axis in the setting of no identifiable anatomical or organic disease and is the most likely cause of secondary amenorrhea in female athletes [12]. There is also oligomenorrhea, which is characterized by having fewer than nine cycles per annum. Menstrual irregularities are directly related to BMD [13].

### ***Osteoporosis***

The World Health Organization defines osteoporosis as BMD greater than 2.5 standard deviations below the mean of a normal young female. Due to the effects of disordered eating and amenorrhea, athletes are at high risk of osteoporosis. This is caused by a decreased level of estrogen that in turn affects BMD [14]. It is very important in adolescent years to increase BMD as by the age of 18 women have peaked and will lose approximately one percent per year thereafter [15]. The most concerning issue when a young athlete presents with amenorrhea is that she may already have lost the bone mass accumulated during adolescence which will be detrimental to avoiding injury as she becomes older [8]. In severe cases, a 20-year-old can present with the BMD of a 60-year-old woman [16].

The take-home message must be the link between the degree of weight loss and duration of amenorrhea coupled with an eating disorder being directly related to BMD issues, each stage affects the other and can't be ignored [17].

### ***Prevention***

Early detection is crucial when dealing with athletes who show signs of FAT. The Preparticipation Physical Examination (PPE) is widely regarded as the best way to screen athletes [18]. This is usually paired with a medical history form and is an excellent way to screen for red flags related to the triad [19]. The screening is also seen as a good way to build a relationship with the athlete. Any screening form should have some gynecologic history and a nutritional section. The gynecologic component should include questions like the age of menarche, menstrual history, length and frequency of periods [16].

The nutritional component should consist of questions relating to the person's desire to lose weight, current weight/weight behavior, questions or fears of disordered eating behavior themselves and diet and weight history [6]. Additional questions may include the history of any stress fractures [20].

## **CONCLUSION**

In my view, all stress fractures should be cross-referenced with any other red flags in the questionnaire and at that point an interview should be conducted in a friendly and safe environment of qualified professionals.

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