



“I’M NOT AN ATHLETE BUT I RUN EVERYDAY.”

When my monthly menstrual periods slowly disappeared a few years ago, I didn’t think too much of it. Lots of my friends had similar experiences, so we assumed it was normal. I regret not seeking advice back then...” – 30-year-old recreational runner

Dr. Holly Thorpe, Senior Lecturer of Sport & Leisure Studies, University of Waikato and Maria Bentley, PhD candidate at AUT University & endurance athlete, are the directors of fuelaotearoa.co.nz, a new educational website for female athletes and exercisers. Here they respond to the query.

Firstly, changes in the menstrual cycle is a common concern in female athletes and other exercising women. Research by leading experts at the University of Penn State (USA) has shown that four out of five recreational female runners who ran for two hours or 16 kilometres per week for a year experienced mild reproductive abnormalities. This is sobering because subtle menstrual disturbances are asymptomatic, and thus go unnoticed by female athletes and exercising women. A further study suggests up to 46 percent of similarly trained women may develop amenorrhea (a cessation of menstrual periods). These reproductive abnormalities occur when insufficient dietary energy is available to fuel exercise and all the systems in the body.

So why haven’t I heard of this before?

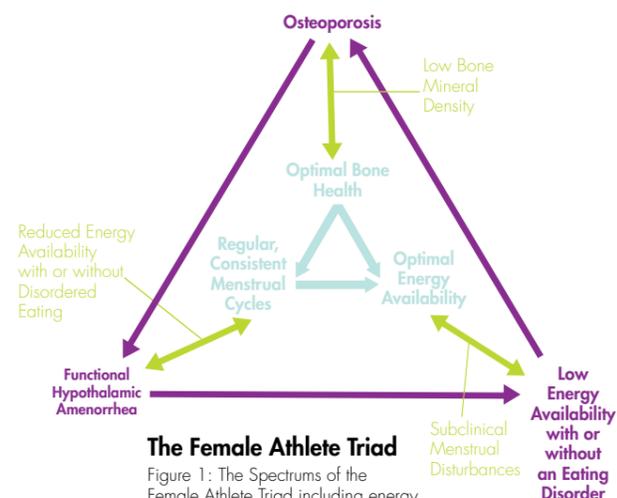
Given the high prevalence of low energy availability, body image concerns, disordered eating and exercise addictions among athletes and exercisers, it is a concern that the potentially harmful effects of energy deficiency in combination with exercise are rarely discussed in the media and by health professionals. Unfortunately, many health providers are not up-to-date on the latest research and do not refer or manage afflicted women appropriately.

Ongoing stigma and misinformation has led to some confusion among exercising women: What happened to my period? Will it impact my chances of having children in the future? What will be the state of my bones in 20 years time? These are important questions, so we developed the Fuel Aotearoa website to make the scientific research accessible to female athletes, exercisers, coaches and parents. Our aim is to empower girls and women to experience the numerous benefits associated with exercise and sport while avoiding the negative consequences of the Female Athlete Triad and energy deficiency.

What is the Female Athlete Triad? How does it relate to exercisers?

In 1992, the American College of Sports Medicine (ACSM) coined the term, “Female Athlete Triad” to illustrate the three risks facing female athletes. The Triad describes the three separate but interrelated spectrums of energy availability, menstrual function and bone mineral density (BMD). Clinical manifestations (see the purple triangle in the diagram) include but are not limited to, disordered eating behaviours, amenorrhea and bone mineral loss, which are detrimental to long-term health

of female athletes and exercising women. For this reason, the Triad is diagnosed in any exercising woman (no, not just thin, elite athletes!) who exhibits signs or symptoms consistent with the pathological end of any one or more of these spectrums (low energy availability, amenorrhea or low BMD).



The Female Athlete Triad
Figure 1: The Spectrums of the Female Athlete Triad including energy availability, menstrual function and bone mineral density exist on a continuum between health and disease.
Image used with permission of Fuel Aotearoa

Refuel for life: What is the importance of Energy Availability?

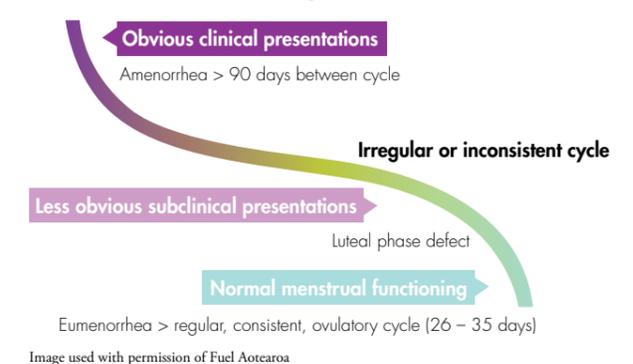
Energy availability is a key feature of the Female Athlete Triad. Low energy availability develops when insufficient calories are consumed to meet the demands of exercise training. If the magnitude or duration of energy imbalance is too large, the body must prioritise calories that are available. That is, energy is drawn away from physiological processes and body systems that are not essential for immediate survival and towards those essential for life. For some women, low energy availability is by accident but for many others, exercising and restricting caloric intake is done with the aim to lose or maintain a particular weight.

How does energy availability affect the menstrual cycle?

If female athletes and exercising women do not have sufficient energy available for adequate hormonal production, it can affect their menstrual cycle. The severity of abnormalities ranges from subtle or non-observable changes to irregular and inconsistent cycles with the most severe presentation being complete loss of menstrual cyclicity.

Other factors such as genetics and life-stress can also contribute to the development of energy-related menstrual disturbances. And, it is important to note that body weight and fat, per se, do not mediate the development of menstrual disturbances in exercising women. Indeed, amenorrhea is observed in exercising women who have body fat levels the same or even higher than their peers with regular menstrual cycles. There is much individual variation between women, exercising women should be aware of their own unique energy requirements and avoid comparing themselves to others.

Continuum of the Reproductive Disturbance



I’ve heard the word before but what exactly is Amenorrhea?

Amenorrhea is the most extreme of energy-related menstrual disturbances and is characterised by constant low levels of estrogen and progesterone that completely suppress the various stages of the ovulatory cycle. Put simply, it refers to hormonal changes that cause a cessation of the menstrual cycle.

Amenorrhea can be classified as primary or secondary. Primary amenorrhea refers to girls whose menstrual cycles have not begun by age 15 years, and secondary amenorrhea refers to previously menstruating women who have an absence of menstrual periods for greater than 90 days.

Exercise without adequate energy availability can affect the menstrual cycle. However, there are various other causes of amenorrhea including pregnancy, pituitary gland tumours, chronic stress, and polycystic ovarian syndrome. Diagnosis is a complex process and we encourage women to seek professional advice if they have observed changes in their menstrual periods.

What about bone health?

Chronic low energy availability can have a direct negative effect on bone mineral density (BMD) via effects on various metabolic and ovarian hormones, and also insufficient intake of nutrients, vitamins and minerals that are important for maintaining bone health. It is important to note that BMD may not be fully restored in exercising women when nutritional and hormonal status is once again optimised. Thus, chronic low energy availability poses a significant threat to the long-term health of exercising women by increasing the risk for fractures and premature osteoporosis.

Did you know that 99 percent of women’s peak BMD is attained by our early 20s? The opportunity to further increase BMD is very limited after this time. Thus, the adolescent and teenage years are a particularly important time for optimising bone mass and strength through nutrition and weight-bearing exercise. Coaches and parents have a responsibility to ensure young female athletes and exercising women are not experiencing an energy deficit, primary or secondary amenorrhea, and that they are conducting sufficient weight-bearing exercise.

What are some of the signs and symptoms of low energy availability and Female Athlete Triad?

- Loss of lean muscle mass
- Decreased resting metabolic rate
- Decreased immune function
- Gastrointestinal disorders
- Dehydration due to laxative abuse
- Tiredness and fatigue
- Depression
- Irregular or absent menstrual cycles and infertility
- Increased risk of musculoskeletal injuries and stress fractures
- Decreased bone mineral density
- Early onset osteoporosis
- Increased cardiovascular disease risk factors
- Impaired exercise training and sport performance
- Problems sleeping
- Often restricting food intake
- Constantly striving to be thin
- Eating less than needed in an effort to improve performance or physical appearance
- Cold hands and feet
- Macro and micro-nutrient deficiencies

What can I do to minimise the risks?

Most importantly, if you are concerned about changes in your menstrual cycle, you should consult with your GP or a health professional. Our website offers a list of nutritionists, endocrinologists, psychologists and sports doctors who are working with women across the country on these issues.

- We also encourage you to take a proactive approach toward your own relationship to exercise, food, and your body:
- Make sure your body has enough calories to “fuel” and “refuel” your daily exercise. It is very difficult to know what is needed, so it is advised to get advice from a sports nutritionist to design a balanced and healthy nutrition plan. Keep a journal of your exercise practices, nutrition and menstrual cycle.
- Your menstrual cycle is a good indicator of health. If your period disappears for three or more consecutive cycles, consult your GP and ask them to recommend a specialist for further advice.
- Try to listen to your family or friends if they express concerns about excessive weight loss, or disciplined exercise regimes. Sometimes family and friends see things you don’t, and most often they are expressing their concerns because they love you.
- While exercising and dieting might be important for maintaining or achieving the body you want today, try to think about the long-term health of your bones and reproductive system. Ask yourself – do you still want to be able to walk, run, or dance, well into your old age? Might you want children one day?

See fuelaotearoa.co.nz for more information on the Female Athlete Triad, energy deficiency, and how it relates to recreational exercisers. Holly and Maria are available to provide educational seminars to groups of female athletes, exercising women and coaches.