



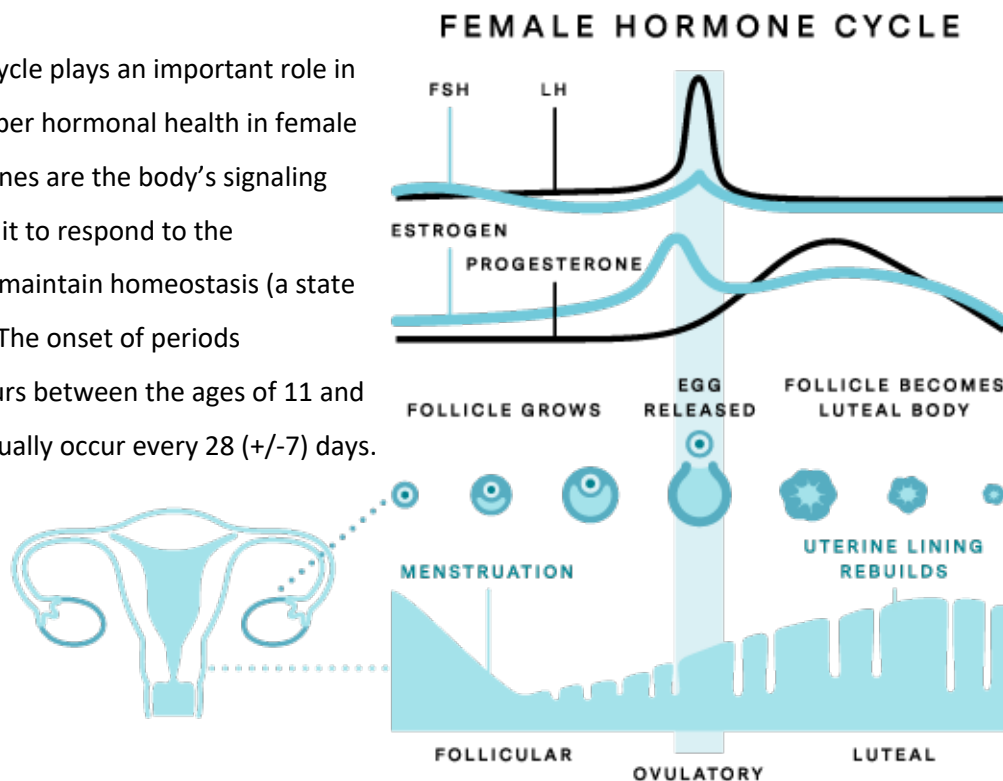
# FEMALE ATHLETE HEALTH INITIATIVE

Presented by Sportsmetrics™ and Cincinnati SportsMedicine Research and Education Foundation

## Hormonal Health for Female Athletes

What athletes need to know for their health and athletic performance

The menstrual cycle plays an important role in maintaining proper hormonal health in female athletes. Hormones are the body's signaling system allowing it to respond to the environment to maintain homeostasis (a state of equilibrium). The onset of periods (menarche) occurs between the ages of 11 and 13 and cycles usually occur every 28 (+/-7) days.



When female athletes **don't have enough energy** left for their body's normal functions (as a result of over-training or lack of proper nutrition), it **disrupts their hormones**. This disruption causes a cascade of negative effects that lead to issues such as menstrual dysfunction, decreased bone density leading to stress fractures, and energy deficiencies due to inadequate dietary intake.



## Menstrual dysfunctions defined

**Primary amenorrhea**- no menarche by age 15 years

**Secondary amenorrhea**- absence of three consecutive cycles post-menarche

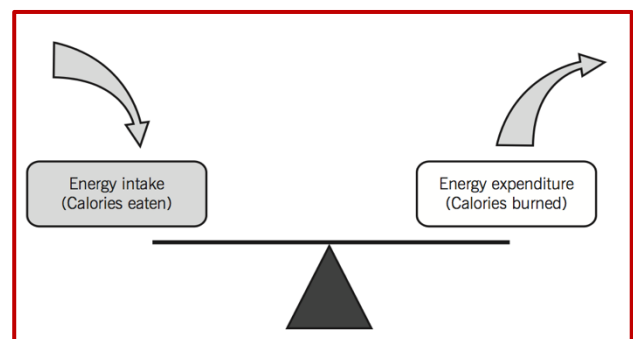
**Oligomenorrhea**- a cycle length greater than 45 days

**Functional hypothalamic amenorrhea**- absence of menses, commonly associated with exercise and stress

*MENSTRUAL DYSFUNCTION IN ATHLETIC WOMEN GENERALLY PRESENTS AS  
SECONDARY AMENORRHEA OR OLIGOMENORRHEA.*

## Energy intake and expenditure

Hormonal and metabolic abnormalities caused by an inadequate diet can result in a reduction in sugar utilization, mobilization of fat stores, slowing of metabolic rate and a decreased production of growth hormone. In short, if your body doesn't take in enough carbohydrates (sugars), you begin breaking down the healthy parts of your body such as your bones in order to try and handle the stress that high level athletics has on your body.



**Estrogen, Progesterone, and Testosterone** are three very important hormone in the human body. Estrogen increases uptake of calcium into blood and deposition into bone, while progesterone facilitates the actions of estrogen through multiple complex mechanisms. Testosterone also helps by stimulating bone formation and calcium absorption.

Athletes with prolonged oligomenorrhea or amenorrhea lasting for *at least six months* should undergo bone density evaluation to assess their bone health.



## The IOC consensus statement: beyond the Female Athlete Triad—Relative Energy Deficiency in Sport (RED-S)

Margo Mountjoy,<sup>1</sup> Jorunn Sundgot-Borgen,<sup>2</sup> Louise Burke,<sup>3</sup> Susan Carter,<sup>4</sup> Naama Constantini,<sup>5</sup> Constance Lebrun,<sup>6</sup> Nanna Meyer,<sup>7</sup> Roberta Sherman,<sup>8</sup> Kathrin Steffen,<sup>2,9</sup> Richard Budgett,<sup>9</sup> Arne Ljungqvist<sup>9</sup>

### The International Olympic Committee Consensus Statement on the Female Athlete Triad and Relative Deficiency in Sport breaks female athlete health down into three risk categories:

#### High risk: no start red light

- ▶ Anorexia nervosa and other serious eating disorders
- ▶ Other serious medical (psychological and physiological) conditions related to low energy availability
- ▶ Extreme weight loss techniques

#### Low risk: green light

- ▶ Healthy eating habits with appropriate energy availability
- ▶ Normal hormonal and metabolic function
- ▶ Healthy bone density as expected for sport, age and ethnicity
- ▶ Healthy musculoskeletal system

#### Moderate risk: caution yellow light

- ▶ Prolonged abnormally low % body fat
- ▶ Substantial weight loss
- ▶ Decrease in expected growth and development in adolescent athlete
- ▶ Abnormal menstrual cycle
- ▶ Menarche >16 years
- ▶ Abnormal hormonal profile in men
- ▶ Reduced bone density
- ▶ History of 1 or more stress fractures
- ▶ Physical/psychological complications
- ▶ Prolonged relative energy deficiency
- ▶ Disordered eating behavior negatively affecting other team members
- ▶ Lack of progress in treatment and/or non-compliance



## Seeking treatment

Some female athletes seek pharmacological intervention to manipulate their hormones with the use of hormonal contraceptives. While this may restore menstruation, this DOES NOT treat the underlying energy availability and bone health issues.

### Talk with your doctor if...

- *If you are experiencing any irregularities in your periods*
- *If you have had fluctuations in your weight due to your sport*
- *If you have a restrictive diet*
- *If you have or have had a stress fracture in the past*

Diagnosis and treatments should be performed by a health care professional. Diagnosis and treatment will be different for every athlete depending on their risk factors. If you or an athlete you know is at risk, talk with your doctor to find resources in your area.

#### Sources:

De Souza, Koltun, Etter, & Sourhmayd, Curr Osteoporosis Rep, 2017

Elliott-Sale, et al, IJSNEM, 2018

Gemimiami, Boston Children's Hospital Female Athlete Series: Menstrual Cycle

Mountjoy, et al, Br J Sports Med, 2014

Joy, Van Hala, Cooper, American Academy of Physicains, 2009

Sticker, Hoogenboom, Smith, JSPT, 2015



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