# FEMALE HEALTH S WELLNESS

A Guide for Parents & Coaches to Equip the Female Athlete with Strategies to Help Reach Her Performance Goals

### EXPLORING THE FEMALE ATHLETE TRIAD





### R2P: OUR MISSION

The participation of females in sport has significantly increased over the past 50 years, with current participation levels at an all-time high. It is estimated that 42.7% of high school athletes alone are female, competing in sports at the local, state, national and international levels.

With the increase in female participation in sports, more research has been allocated to sports medicine and sports science for women in the areas of strength and conditioning, nutrition, body composition and injury prevention and rehabilitation than ever before. Training the female in sport has transitioned to a performance-based model, allowing women in sport to continue to improve and set records year after year.

However, with the increased participation of females in sport comes the increased incidence of disorders particular to women, known as the Female Athlete Triad (FAT). While females in competitive solo sports, such as cross-country, figure skating and gymnastics, are most likely to be affected by the Female Athlete Triad, females in all sports are susceptible to disordered eating and other undesirable behaviors.

Our mission at R2P is to provide a resource to parents and coaches about the Female Athlete Triad and equip the female athlete with strategies to help reach her performance goals.





### **SPORTS INJURIES & FEMALES**

With the increase in female participation in athletics comes an increase in female sports injuries. While men and women are both susceptible to sustaining an injury in sport, not all injuries are the same and can affect women differently than men. For example, females are more susceptible to sustaining an ACL injury, patellofemoral joint dysfunction and stress fractures than their male counterparts. And, on average, research suggests that the incidence of injury in sports is higher for women than men.

While the research is still inconclusive on why the gender gap in sports injuries occurs, there is speculation that female anatomic and physiologic qualities and the incidence of the Female Athlete Triad can contribute to increased rate of injury in females.

#### **Anatomic and Physiologic Qualities**

Anatomic: Females are typically smaller than males, and on average, have wider pelvises and narrower shoulders than males. A wider pelvis may contribute to increased risk for injury in women secondary to the Q-angle and joint biomechanics. Females also typically have lower muscle mass composition in comparison to males, with smaller muscle fibers on average, secondary to prevalence of estrogen and absence of testosterone in comparison to males. However, it is important to note that female anatomy is a small part of the puzzle of female sports injuries and does not mean the athlete will sustain an injury based on biomechanics alone.

**Physiologic:** Women and men have a similar proportion of fast- and slow-twitch muscle fibers and can make similar gains in relative muscle mass when controlled for weight. However, current research data suggests that females typically have a 10% deficit in aerobic capacity in comparison to males, likely secondary to smaller hearts and lungs and decreased blood volume and capacity. Studies also suggest that women have a lowered maximal anaerobic threshold than males.



### **SPORTS INJURIES & FEMALES**

#### RED-S (Relative Energy Deficiency in Sport) & the Female Athlete Triad (FAT)

Relative Energy Deficiency in Sport (RED-S) is the result of insufficient caloric intake in relation to excessive energy expenditure that can result in alteration to the body's physiological systems. This low-energy condition can affect metabolism, menstrual function, bone health, immunity, protein synthesis, and cardiovascular and psychological health. While RED-S typically affects females, males can also experience RED-S and subsequent hypogonadism and impairment of bone health.

#### **Clinical symptoms of RED-S can include:**

- Disordered eating
- Fatigue
- Hair loss
- Cold hands and feet
- Weight loss
- Increased healing time for injuries
- Increased incidence of bone fracture
- Cessation of menses
- Low self-esteem and depression



FEMALE HEALTH & WELLNESS



# FEMALE ATHLETE TRIAD

The Female Athlete Triad (FAT) is now incorporated within the entire RED-S framework but specifically focuses on the female athlete. The FAT is a continuum of three interconnected health issues:

- Energy Availability
- Menstrual Function
- Bone Health







### ENERGY AVAILABILITY

The central concept of RED-S is energy availability, which is defined as dietary intake minus exercise energy expenditure normalized for fat-free mass. In other words, this is the number of calories remaining after the calories used for exercise have been removed.

Think of this concept like a bank account - the athlete starts the day with a certain dollar amount in their account and must allocate money to their sport, but also their activities of daily living. The goal would be for the athlete to have either money remaining in the account at the end of the day, or at the minimum, end the day at zeroed-out balance.

One of the main drivers of RED-S is disordered eating, a term used to describe a range of irregular eating behaviors typically characterized by low energy intake or low energy availability. Eating disorders that are energy-deficient most commonly include anorexia nervosa and bulimia nervosa.

While most young female athletes will not be clinically diagnosed with an eating disorder, some can develop habits such as fasting or food avoidance behaviors to maintain a lean body type. By restricting their diets, females with eating disorders create a system of low energy availability - in other words, the bank account is starting low, and the athlete is chronically overdrawing from the account.





### MENSTRUAL FUNCTION

When the energy bank account is over drafted, the body starts to shut down non-essential functions, such as menstruation, to prioritize essential functions such as heart, lung and digestive function. The cessation of the menstrual function, known as amenorrhea, can be categorized into 3 different categories:

- 1. Primary Amenorrhea (no menarche by age 15)
- 2. Secondary Amenorrhea (absence of 3 consecutive cycles postmenarche)
- **3. Oligomenorrhea** (a cycle length greater than 45 days)

All are abnormal and if an athlete is experiencing these, should contact a Medical Doctor for further evaluation.



### FEMALE HEALTH & WELLNESS



### **BONE HEALTH**

Poor nutrition coupled with limited estrogen availability secondary to amenorrhea can lead to low calcium and vitamin D intake and ultimately, decreased bone density. This loss of bone mineral density makes the athlete increasingly susceptible to fractures and delayed healing times.

Bone mass typically peaks between the ages of 18-25 in females, so females that have low bone mineral density in their youth may have detrimental consequences in regards to osteoporosis later in life. Females already have a higher risk of stress fracture in comparison to males, especially in track-and-field athletes and military recruits.

Increased risk coupled with poor nutritional intake and limited energy availability significantly increases incidence of fracture and protracted recovery times.

With the increase of female participation in sport on the rise, it is important for healthcare professionals, parents, and coaches to be able to recognize possible signs or behaviors that might indicate an athlete is struggling with one of these health concerns.

In addition, female athletes should be educated on dietary guidelines for optimal health and wellness, in addition to sleep and stress hygiene strategies to ensure that energy availability is high.





## **DIETARY GUIDELINES FOR SPORT**

Because RED-S occurs as a result of low dietary intake in relation to high energy expenditure, the athlete either needs to increase dietary intake to match energy expenditure levels, or decrease energy expenditure levels to match dietary intake. Very simply put, calories in must be the same as calories out. Here are some simple strategies to help ensure that athletes are meeting their caloric needs:

#### **Track Food Intake and Energy Expenditure**

There are a variety of apps out there to help track energy intake and expenditure, such as MyFitnessPal. Sometimes, athletes are not aware of their food choices, serving sizes, or energy expenditure levels until seeing it formulated in front of them.

However, these apps should be used with caution, especially in female athletes, because they can become addictive and foster an unhealthy obsession with food intake and serving sizes. It is best to consult with a registered dietician (RD) before using these apps for proper nutrition and usage.





### **DIETARY GUIDELINES FOR SPORT**

### Avoid Excluding Whole Food Groups or Following Fad Diets

Every year, there is a new diet trend that circulates throughout society, with claims of increased performance or composition. Typically, these trends are short-lived and as an athlete, it is important to eat a well-balanced diet full of various food groups. Of course, if the athlete has allergies, food intolerances or other health conditions that require a special diet, follow what has been recommended by your MD or RD.

### Optimize Macronutrient use for Muscle Development and Performance

The three major macronutrients are proteins, carbohydrates, and fats. Typically, female athletes should aim for:

- 1g protein/kg of body weight
- 5-8g carbohydrates/kg of body weight
- And fill the rest of their calories for the day with fats.



This is just a general guideline, however, and it is recommended that the athlete consult with a registered dietician before making drastic changes to her diet.

#### Maintain Caloric Intake During Injury

When an athlete sustains an injury, her activity level can drastically reduce. As a reaction, the athlete may reduce caloric intake due to decreased energy expenditure. However, it is important to maintain adequate caloric intake, even while injured, to help aide in recovery and optimize the healing process.



### **DIETARY GUIDELINES FOR SPORT**

#### **Use Carbohydrates and Proteins to Your Advantage**

It can be beneficial to increase carbohydrate intake on heavier training days, especially when training exceeds more than 2-3 hours at a time. Framing workouts with heavier carb/protein meals before and after workouts can help to optimize recovery. In addition, eating a protein-rich snack before bed can also assist in overnight protein synthesis. However, as mentioned above, it is always recommended that athletes consult with a registered dietician first before changing their diet in order to ensure that their nutrition strategies are both safe and appropriate for their level of training.

#### Hydrate, Hydrate, Hydrate!

About 60% of the body is water, and our blood is made up of 90% water. In one hour of exercise, it is estimated that the body loses approximately a quart of water. Studies show that on average, athletes only replenish 30-60% of the water lost during exercise. If athletes want to perform their best, it's important to get that water intake up and stay hydrated. **A general recommendation for water consumption for athletes is 0.5 - 1 ounce of water per pound of bodyweight per day.** 







### **SLEEP FOR RECOVERY**

Healthy sleep patterns are not only important for athletic performance, but also for physical and mental health. It is recommended that athletes from ages 6-18 years get anywhere from 8-12 hours of sleep a night.

Unfortunately, student-athletes are a population that is at high risk for improper sleep habits due to the demands of school, sport and other activities. Sleep hygiene is just as important as physical and nutritional hygiene and should be emphasized as an important pillar for athletic development. Here are some tips to ensure better sleep quality and proper recovery in athletes:

#### Maintain a Consistent Bedtime Throughout the Entire Week

It is not uncommon for athletes to stay up later and sleep in longer on the weekends than during the school week. Unfortunately, these irregularities in sleep patterns can disrupt the body's circadian rhythm, and negatively impact general recovery. **Get on a schedule and try to keep sleep/wake times as consistent as possible.** 

#### Avoid Light Exposure from Technology in the Evenings

Studies show that the blue light from technology can disrupt sleep patterns and make deep sleep harder to achieve. The general recommendation is to **turn off electronic devices 30 minutes to 2 hours prior to going to sleep.** 



### **SLEEP FOR RECOVERY**

#### Limit Caffeine Intake

Caffeine has a half life of about 5 hours - for example, if a person consumes 60 mg of caffeine, he or she will have 30 mg of caffeine remaining in the body after 5 hours. **Caffeine can affect both the ability to fall asleep and sleep quality**, especially when taken in the afternoon or evening.

#### **Reduce Fluid Intake Before Bedtime**

As mentioned earlier, hydration is important for recovery. However, make sure that fluids are **consumed during the day and are tapered off before bedtime** so that sleep remains uninterrupted.

#### Keep Naps Under Control

Naps can be a strategic way to regain energy during the day as long as they are kept relatively short and limited to early afternoon. However, taking longer naps later in the day can be detrimental to sleep quality.





### **STRESS & MENTAL HEALTH** THE IMPACT ON THE FEMALE ATHLETE

The most common mental health issues in the female athlete are related to anxiety and depression. Studies have found that solo-sport athletes (dancers, runners, etc.) are most prone to anxiety disorders due to a lack of formal team support. Researchers have concluded that sports that have a team component are more protective against mental health disorders secondary to the support of working with a team to achieve a common goal in competition and due to the availability of athletes that may be experiencing similar life events.

#### Here are some strategies to help mitigate stress as an athlete:

#### Set a Schedule

Most athletes are required to dedicate 5 or more days of their week to training and competition each season. Coupled with school and other commitments, the athlete can feel stress about fitting all of their responsibilities into one day. Setting a consistent schedule can help mitigate that stress and help the athlete feel organized in control of her schedule.

<u>Limit Social Media</u> While there is currently limited research on the impact of social media on female athletes, the most current literature suggests that social media exerts a negative impact on athletes. Social media can impact general productivity and have a detrimental effect on body image and self-esteem. Aim to limit the amount of time on social media and remember that social media does not always equate to real life.



### **STRESS & MENTAL HEALTH** THE IMPACT ON THE FEMALE ATHLETE

#### **Practice Mindfulness**

Mindfulness, or meditation, has recently been studied and concluded to have markedly positive effects on the performance and well-being of athletes. Mindfulness can help the athlete process emotions and give her a sense of "calm" while maintaining a busy schedule.

If an athlete is having difficulties with mental health disorders such as anxiety or depression, talking with a mental health therapist or sports psychologist can be helpful in providing strategies to mitigate issues related to sports and life that drastically impact athletic performance. Mental development is just as important as athletic development for success in sports, and consulting with a mental health professional can be an important tool for athletes to utilize.



### FEMALE HEALTH & WELLNESS



### **SUMMARY**

The female athlete in sports is becoming more popular than ever, and participation is expected to continue to rise.

Improving athletic performance is not limited to just being good at a sport - it also includes establishing healthy nutrition, sleep, and stress management practices. Being an athlete is a full-time job that requires fulltime attention to health habits to make sure the athlete is performing at her best.

Adopting strategies to ensure that the athlete is treating her body the best way that she can will not only improve her performance in both sport, but also in life.

For further information please visit Rehab2Perform.com or contact one of our Physical Therapists if you would like to learn more about the Female Athlete Triad (FAT) or Relative Energy Deficiency in Sport (RED-S).

