Female Athlete Series
The Adolescent Athlete

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Healthy challenges

Juggling schoolwork and sports might seem overwhelming to a young athlete, especially while she's forming friendships and adapting to new social challenges.

Fortunately, research shows that for adolescent females, there is a strong link between participation in athletic activity and healthy self-esteem. This can have countless positive effects on academics and other personal accomplishments throughout young adulthood. Furthermore, when athletic activity begins during adolescence, it can become a healthy springboard for years of competitive playing.

Building strength

It's easy to focus on cardio activity and neglect strength training. Strength training can be viewed as daunting, and there is often the fear of developing bulky muscles. **However, a proper strength-training program can help adolescent female athletes become stronger and healthier and prevent future injuries without necessarily adding bulk.**

Adolescents should spend 20 to 30 minutes two to three times each week building strength under safe, monitored instruction. Adolescent athletes should only consider increasing weight and repetitions when they have achieved correct form and technique, and they should avoid Olympic lifting until they reach physical and skeletal maturity.

There are a few ways to strength-train:

- **Functional strength training** integrates muscle groups used for activities of daily living and sports-specific moves, and can be particularly helpful for preventing injuries and enhancing sports performance.
- **Neuromuscular training** focuses on the communication between the nervous system and muscles, which can enhance an athlete's balance and dynamic joint stability and reduce the risk of injuries like ACL tears. Exercises such as plyometrics, agility drills and even skipping, like when you were a child (stepping from one foot to the other with a hop or bounce), can help!

ACL injuries

Girls are five times more likely than boys to tear their ACL. Programs that focus on jumping and landing mechanics, strengthening and stretching key muscle groups, and improving agility and proprioceptive responses can reduce ACL injuries dramatically.

For more information about reducing the risk of ACL injuries, see our Female Athlete Guide to ACL Injuries at bostonchildrens.org/femaleathlete

Stress urinary incontinence

Female athletes who participate in high-impact sports can experience involuntary urination. Though it might seem like an embarrassing topic, it is not an uncommon issue. Weakness, fatigue and overuse of the structural supports of the pelvis (muscles, tendons and ligaments) can make some girls more prone to urinary leakage. A combination of core stabilization, targeted stretching and strengthening of the pelvic floor muscles (e.g., Kegels) can help.

Female athlete triad

The female athlete triad is the interrelationship among three health issues: energy availability (proper nutrition), menstrual function and bone health. **Ideally, female athletes get enough quality calories to account for their daily activities and exercise, normal monthly menstrual cycles and healthy bone density.**

However, because poor caloric intake and over-exercise can lead to low energy availability (possibly leading to loss of menstrual cycle and low bone density), female athletes should take special care to treat their bodies well, with good nutrition and proper training.

To learn more, see our guide for the Female Athlete Triad: Staying on track at bostonchildrens.org/femaleathlete

Menstrual cycle and sports

Menstrual cycles can give us a lot of important information about our overall health, including whether we're getting the proper nutrition, if we're training too hard, or whether our bones are getting what they need.

Though menstrual cycles may sometimes feel like a hindrance, most normal, healthy cycles shouldn't get in the way of competing, and research shows that performance stays about the same during menstruation. **Though some evidence suggests that female athletes land jumps slightly differently depending on where they are in their cycle, good form and strength training can help prevent problems from occurring. Existing research even suggests that exercising during menses can soothe cramps and PMS symptoms.**

For most girls, the onset of their periods occurs between the ages of 11 and 13, and approximately 98 percent of girls get it before they are 15 years old. Cycles usually occur every 28 days, and some cramping and bloating may occur.

To learn more, see our Female Athlete Guide on Menstrual Cycles at bostonchildrens.org/femaleathlete

Bone health

Healthy athletes typically have a higher bone mineral density than those of sedentary individuals, but excessive exercise and over-training can leave female athletes with a negative energy balance, ultimately putting their bone health and their reproductive health at risk.

Fortunately, healthy eating habits and careful attention to training regimens can keep female athletes growing in the healthiest way possible, while also keeping them in top shape for years ahead.

To learn more, see our Female Athlete Guide to Bone Health at bostonchildrens.org/femaleathlete

Nutrition

In sports that emphasize slender bodies, like gymnastics, ice-skating, running and dance, female athletes can feel more self-conscious about their weight and how it affects their performance. **It's important to know that no matter how competitive you are, unhealthy eating habits and excessive exercise can be damaging both mentally and physically and can result in irregular menstrual cycles and lower bone mass.**

Female athletes should eat plenty of vegetables, fruits, whole grains, healthy fats and protein, as well as iron, calcium and vitamin D on a daily basis.

For more information about ensuring optimal nutrition, see our Female Athlete Nutrition Guide at bostonchildrens.org/femaleathlete

Iron deficiency

Female athletes and vegetarians are at a greater risk for iron depletion, causing fatigue and reduced endurance. Because of this, girls should pay special attention to their iron intake.

Some examples of iron-rich foods include fish, red meat, spinach, beans and chicken (dark meat more than white meat). The iron found in meat is easier for our bodies to absorb, but vegetarians can find iron in iron-enriched grains, dried fruits, spinach, tofu and beans. Consuming iron along with vitamin C can help aid in nutrient absorption.

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Reviewed by Bridget Quinn, MD, Boston Children's Hospital
This sheet is part of the Female Athlete Series, which is a suite of educational materials to help female athletes live the healthiest lives possible while competing. For more materials on enhancing athletic performance, call 617-355-3501 or visit bostonchildrens.org/sportsmed