

The Adolescent Female Athlete's Battle Against Injury

Richard J. Carey, MS, ATC/L, *Column Editor*



I have seen and worked with female athletes at the high school level for the past 20 years. The female sports program at my school includes volleyball, swimming, tennis, cross-country, gymnastics, badminton, indoor and outdoor track, basketball, softball, soccer, and more recently, girls participating in wrestling. Besides the traditional sports, I have also worked with girls in cheerleading, pom poms, and the school's dance company, eurythmics.

All in all, the female sports and performing groups comprise 60% of the total athletic participation. Consequently, many have ended up in the athletic training room requiring health care.

In this article, I am *not* bashing female sports. I am simply pointing out that females who are unconditioned and who participate in sports have a higher injury rate than males. That has been my experience. Young men and women who are equally conditioned for their activities will not injure themselves as readily.

Men and women have the same number of bones and muscles, but women's body structure generally differs as follows:

- Smaller bones
- Smaller joint surfaces
- Shorter stature
- Narrower shoulders
- Weaker arms
- A lower center of gravity
- Lordosis is more common
- Relaxed joints (esp. at elbows and knees)
- More pes planus (flatfeet)

I'd like to address how the structural differences in the female pelvis and knee can cause injury. The typical female pelvis is wider. This causes the hips to move more during exercise and is one reason why females can dance the hula and swing a hula hoop much easier than males.

Common complaints involve the low back where muscle strains and spasms occur to the erector spinalis muscle group. Another common complaint in young women is apophysitis of the anterior inferior spine of the ischium (AISI) due to the outward strain of the abductor and quadriceps muscle group origins.

"Hip snapping" is also common and is associated with pain during running. Strengthening the pelvic girdle including the abductors, abductors, quadriceps,

and hamstrings will help lower overuse injuries in female adolescent athletes.

Knee problems are more frequent in female than in male athletes because of the following reasons: (a) prevalence of genu varum ("knock knees") and genu recurvatum ("back knees"); (b) an increased angle between knee and pelvis (Q angle); (c) flat patellae (kneecaps); (d) shallow grooves in the femur for the patella to glide; and (e) the fact that their feet are directly under the body's center of gravity. The two most common complaints are to the anterior knee area and the patella itself.

Coupled with these anatomical differences are low strength in the quadriceps muscle group, especially the vastus medialis, and poor fitting athletic shoes.

Therefore the strengthening program should focus on the inner quadriceps musculature. Wearing antipronation athletic shoes and ensuring an adequate warm-up of 10–15 min will reduce the likelihood of anterior knee pain when exercising.

The second complaint concerns the patella itself. In females, the patellar groove in the femur is



usually shallow, causing the quadriceps tendon to pull the patella laterally when contracting. Continuous extension causes the patella to develop an irregular tracking problem which subsequently causes the hyaline cartilage on the underside of the patella to rub off. The result is the softening of said cartilage and pain to the athlete. This condition is known as chondromalacia.

Treatment includes physician confirmation of the condition and a rigorous quad strengthening program with a period of rest from exercising. For female athletes

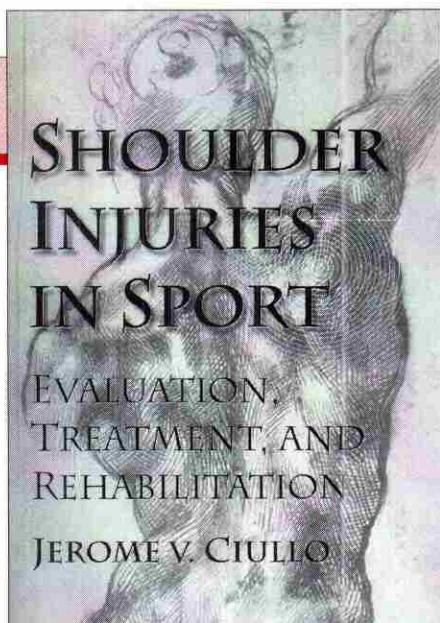
who can still participate with minimal pain, prepractice ice massage therapy (7–10 min) is recommended prior to running.

I recommend a commercially made open-patella knee brace with extra internal padding laterally to keep the patella tracking properly during running. Or, a C-shaped 1/2-in. foam rubber pad can be placed on the lateral border of the affected patella and secured with a 3-in. elastic wrap so that knee range of motion is not compromised. At the end of a workout, a 15- to 20-min ice pack should be applied.

A complication of a patella tracking problem in female athletes is a dislocating or subluxating patella, especially while running corners on indoor and outdoor tracks and cross-country courses.

For first-time occurrences, contraction of the quadriceps with knee extension can easily reduce the patella; ice packs can then be applied. If the athlete experiences continual subluxing of the patella, and bracing and exercise programs are not effective, an orthopaedic referral would be recommended.

An integrated approach that meets the needs of the entire medical team



1996 • Cloth • 304 pp • Item BCIU0651
ISBN 0-87322-651-8 • \$55.00 (\$82.50 Canadian)

This is the first book to take an integrated approach to the assessment, repair, and rehabilitation of shoulder injuries. Nowhere else will sports-medicine and family-practice physicians, physical therapists, and athletic trainers find a reference covering the spectrum of therapy, diagnostic tests, surgery, and rehabilitation.

This unique reference focuses on methods of analysis and treatment that have been tested, used, and found successful in clinical settings for treating shoulder injuries. Many modified techniques, such as subacromial endoscopy and A/C-joint resection, are described for the first time. Moreover, the book includes 365 photos and 103 medical illustrations that help clarify surgical procedures.

Part I covers the analysis and diagnosis of shoulder injuries. Part II discusses assessment and treatment of specific shoulder injuries. The principles of shoulder rehabilitation are covered in Part III.

The author's analysis of shoulder structure and function also will help physical therapists, athletic trainers, and team physicians gain a better understanding of this part of the anatomy.



Human Kinetics

The Information Leader in Physical Activity
<http://www.humankinetics.com/>

1219

Prices subject to change.

Place your credit card order today! (VISA, AMEX, MC)
TOLL FREE: U.S. (800) 747-4457 ■ Canada (800) 465-7301
OR: U.S. (217) 351-5076 ■ Canada (519) 971-9500
FAX: U.S. (217) 351-1549 ■ Canada (519) 971-9797