

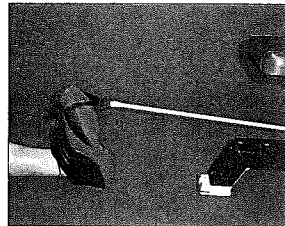
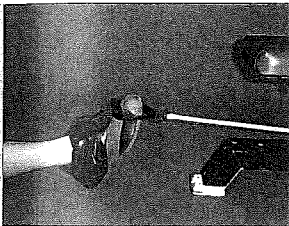


## Preventing Shin Splints

### Prevention

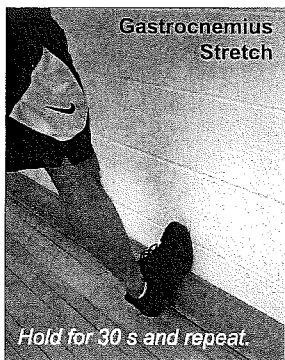
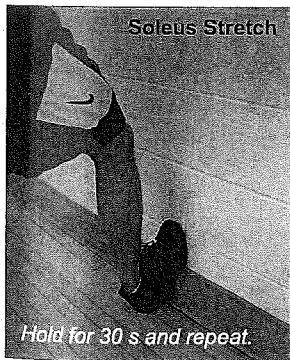
- **Limit running on hard surfaces.** Running on a variety of surfaces will force your supporting leg muscles to strengthen.
- **Join a running club.** Increasing mileage too quickly places excessive stress on the tibia. Proper training programs and technique are important. Guidance on this matter can be gained by joining a running club.
- **Seek medical treatment.** If you experience symptoms, seek medical attention to prevent future problems.
- **Address muscle imbalances.** Tight calf muscles and weak tibialis anterior muscles can decrease your ability to absorb forces.
- **Avoid biomechanical misalignment.** Anything from your toes to your head can affect the way you run.
- **Wear proper well-cushioned shoes.** Shoes that are worn or that don't fit properly should be replaced. Running shoes should be used for running, not basketball or tennis shoes.
- **Stay hydrated.** Water is a key lubricant that permits bones, muscles, and connective tissues to slide against each other.
- **Apply ice.** Even if you do not feel discomfort after the activity it is important to ice.

### TIBIALIS ANTERIOR EXERCISE

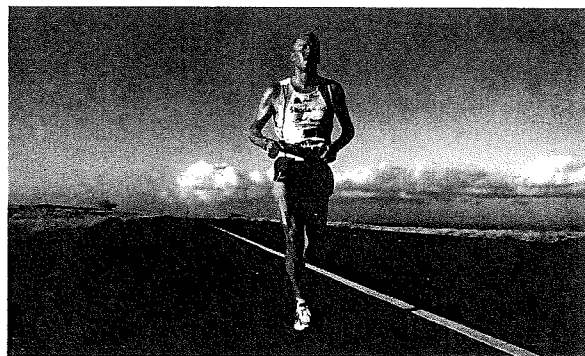
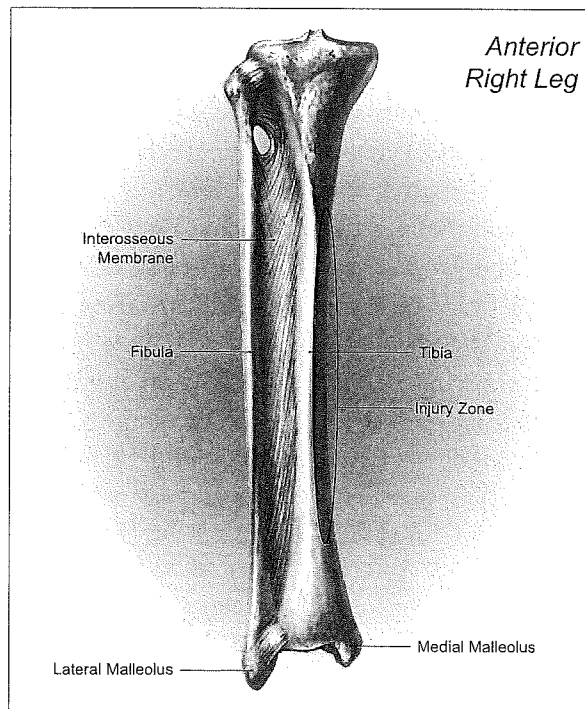


- (1) Use a weight or exercise tubing.
  - (2) Begin the exercise with your foot pointed away.
  - (3) Begin with the ankle in plantar flexion (point toes down).
  - (4) Slowly dorsiflex your ankle (point toes up).
- \* You should feel the muscle in front of your shin contracting.  
\* Perform 15-20 reps x 3 sets, three times a week.

### CALF MUSCLE STRETCHES



- (1) Begin with your knee bent while standing.
- (2) Maximally dorsiflex your ankle until you feel a stretch.
- (1) Begin with your knee straight while standing.
- (2) Maximally dorsiflex your ankle until you feel a stretch.



the cortical bone. X-rays and possibly bone scans are therefore needed to properly diagnose a stress fracture.

## Injury Prevention

Not every injury can be avoided, but if you take the necessary precautions and make note of preventative factors, it is possible to develop a viable plan for injury prevention.

## Protective Equipment

It sometimes takes a serious injury or a mountain of clinical evidence to wake people up to the risks associated with certain activities. For example, professional hockey players (including goalies) used to play the game without protective head gear. Today, helmets and face masks are mandatory. The use of helmets in many sports such as in-line skating and cycling has also received greater attention in recent years, and rightfully so. The consequences of participating in such activities without the proper head gear can be debilitating and even fatal. Injury prevention, however, goes far beyond knowing the risks and preventative factors; knowing is not doing. It is up to you to take advantage of whatever safety equipment is available for the activity in which you participate (Figure 8.10).

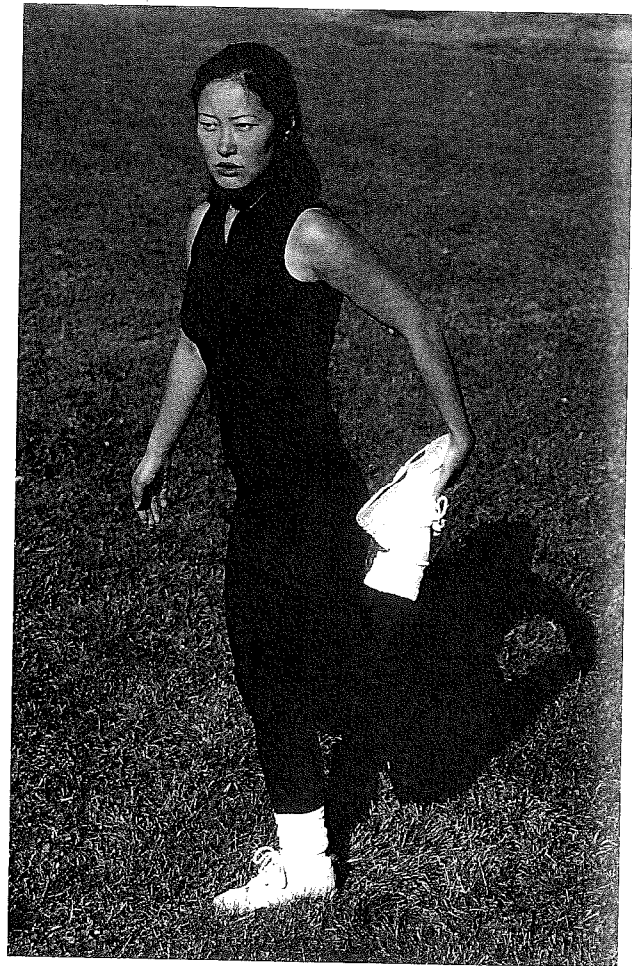


**Figure 8.10** Here is someone who is properly protected and ready to have fun.

## Warming Up and Cooling Down

Most athletes perform some type of warm-up before training or in preparation for an event, including stretching, light jogging or other aerobic activities, and sport- or activity-specific motions. Warming up helps an athlete prepare optimally (physically and mentally) for a competition or workout (Figure 8.11). Most research advocates a thorough and well-planned warm-up to not only improve performance but also to help prevent injury.

The issue of cooling down is overlooked by many athletes. After completing a long and tiring workout, many people are content to sit down and rest to allow their bodies to recover. This may lead to muscle stiffness, a condition that may make you



**Figure 8.11** Stretching not only prepares your body but also your mind for physical activity.



more prone to injury the next time you take to the field or court. A short cool-down period removes lactic acid and other products of metabolism from the muscles and tissues, further reducing some of the stiffness and tightness that is often felt the next day. The cardiovascular system may also benefit from a gradual cool-down period since the abrupt lowering of an elevated heart rate is not ideal. So the next time you finish a long workout, don't just hit the showers; instead, walk a few laps and do some light stretching.

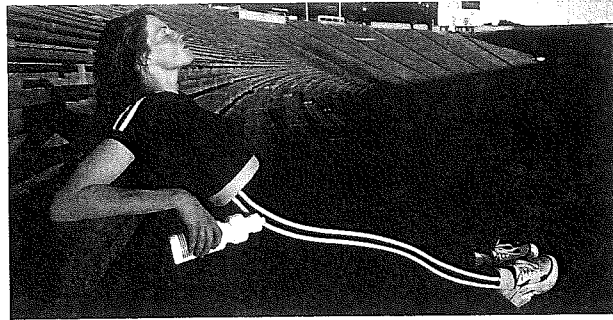
## Keeping Fit and Flexible

As the saying goes, "use it or lose it." Seasonal athletes are well aware that training doesn't really end with the end of a competitive season. Sometimes the most important gains are made in the off-season. A fit athlete obviously has fewer adjustments to make at the beginning of a season than an athlete who is out of shape. The off-season is a time not only to develop and refine technical skills but also to maintain physical fitness (including strength, flexibility, and endurance). Most athletic injuries occur as a result of placing demands on a muscle or other tissue that is simply not prepared to withstand these demands.

The preseason claims many injury victims because many athletes do not stay in shape all year round. Some studies have shown that strength can be maintained with as little as one or two workouts a week at 90 percent of capacity. Fewer workouts are required to maintain aerobic capacity, so no excuses should be made for losing too much in the off-season.

## Eating and Resting to Avoid Injury

Most athletes will agree that diet and rest play a major role, not only in enhancing performance but also in keeping the body well-tuned for injury prevention. In order to function most effectively, the body must be fed the proper nutrients and must receive adequate rest. Not meeting these conditions inevitably opens the door to potential



**Figure 8.12** Resting and feeling a sense of accomplishment after a hard workout.

problems. Adhering to nutritional guidelines can prepare you for the stresses of physical exertion, and lower your risk of sustaining an injury (see Chapter 11 for details on nutrients, hydration, and pre-event meals).

Because training and competition involve putting forth great physical effort, muscles need rest from these physical demands to recuperate for the next training or competitive session (Figure 8.12). Muscles forced to endure heavy demands when inadequately rested may snap (literally) under pressure. Overtraining can be just as detrimental to your performance as not training enough (see Chapter 9).

Inadequate sleep may lead to mishaps that could have been avoided with proper rest and alertness. It is up to each person to discover what amount of sleep is best for him or her – there is no set number of hours that applies to everyone.

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## Summary

With more people participating in sport and physical activity for health, fitness, and fun, avoiding injury is a notable concern. Injuries occur based on the biomechanical properties of tissue, and where they are subjected to loads that exceed their elastic region.

Strains and sprains are common injuries. A strain occurs when muscle or tendon tissue is stretched or torn, and a sprain results when a ligament or the joint capsule is stretched or torn.

Another frequent sport injury is a contusion, or bruise, which occurs when a compression force crushes tissue. In a dislocation, either complete or partial (a subluxation), the joint surfaces come apart.

Bone fractures may be simple or compound. A simple fracture stays within the surrounding soft tissue, whereas a compound fracture protrudes from the skin. Overuse injuries are often the result of repeated microtrauma to the tissues. Examples include stress fractures, tendonitis, and bursitis. One potentially dangerous sport injury is a concussion, an injury to the brain that usually develops from a violent shaking or jarring action of the head.

Fortunately, we can train our bodies to make our tissues stronger and more resistant to defor-

mation. We can also wear protective equipment, warm up and cool down before and after our activities, and make sure we perform the skill with good form in order to reduce our likelihood of injury.

No matter how hard we try to prevent them, injuries will always occur. The healing process begins immediately after injury and consists of three overlapping phases: the inflammatory response phase, the fibroblastic repair phase, and the maturation–remodeling phase. Many health care professionals have dedicated their lives to help us deal with problems resulting from injury. Doctors and various therapists can take us through treatment and rehabilitation programs that will help us return to our previous activities if not beyond.

## Key Words

Anterior cruciate tear

Bending

Bursitis

Complete dislocation

Compound fracture

Compression

Concussion

Contusion

Cryotherapy

Deformation

Elastic region

Fibroblastic repair phase

Inflammatory response phase

Lateral ankle sprain

Lateral epicondylitis

Load

Maturation–remodeling phase

Medial epicondylitis

Partial dislocation

Patellar tendonitis

Plastic region

Positive training effect

PRICE

Proprioception

Rehabilitation

Shear

Shin splints

Shoulder impingement

Simple fracture

Sprain

Strain

Stress

Stress fracture

Subluxation

Tendonitis

Tension

Torsion

Treatment

Ultimate failure

Yield-level point

## Discussion Questions

1. Define the load–deformation curve and use it to describe any injury.
2. What is the role of training with respect to injury prevention?
3. Describe the complications associated with pain medication.
4. What is the difference between a sprain and a strain?
5. What should you do immediately after an injury?
6. Compare and contrast a dislocation and a fracture.
7. Name and describe three overuse injuries.
8. What is the difference between bursitis and tendonitis?
9. How do you distinguish between a stress fracture and shin splints?
10. What are the benefits of warming up and cooling down?