

8134DV

PREVENTING ATHLETIC INJURIES

DVD Version

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Teacher's Resource Book

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MAIN MENU

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► Chapter Selection

From here you can access many different paths of the DVD, beginning with the introduction and ending with the credits.

1. Introduction
2. xxxxx
3. xxxxx
4. xxxxx
5. xxxxx

► Teacher's Resource Book

A file of the accompanying Teacher's Resource Book is available on the DVD. To open the file you need to load the DVD onto a computer that has a DVD-ROM and Adobe Acrobat Reader. Right click on the DVD icon and then double click on the file titled "Teacher's Resource Book."

INTRODUCTION

Sport participation has increased substantially in the last decade, and so has the incidence of sport-related injuries. Today, over six million students are involved in competitive high school sports across the United States. Even more students are involved in organized club sports—baseball, softball, soccer, basketball, football, lacrosse, hockey, cheerleading, volleyball, wrestling and more.

Roughly 50 percent of all sports injuries are minor, causing very little interruption to an athlete's activity. In terms of all sports, the most common injuries are ankle and knee strains and/or sprains. Of course, each sport has its own specific set of injury risks. For instance, American football has historically claimed the highest injury rate, with eight to ten injuries occurring for every 1,000 athletic exposures. This means that between 30 to 35 percent of the players on any high school football team will suffer an injury each season. For female athletes, the most injury-prone sports include soccer and basketball, where injury rates occur in approximately 20 to 25 percent of all individuals on any given team per season.

As teens' sports participation—and risks of injury—rise, it becomes essential for student athletes to learn how to avoid hurting themselves. Certain kinds of injuries can be especially troubling for young growing bodies. For instance, overuse injuries are becoming more common than in previous decades. The NCAA describes overuse injuries as “excessive use of muscle groups that are not conditioned for the intended action and pain and dysfunction result leading to poor performance.” Defined this way, it is obvious that reducing injuries and improving performance are achievable goals.

Most of these overuse injuries come about due to chronic, repetitive motions. In 2003, it is estimated that over 3.5 million overuse injuries occurred in American high school athletes. Over 50 percent of all the injuries suffered by high school athletes are considered to be overuse injuries. That's why it is essential for athletes and trainers to realize that these injuries can be prevented by training and intervention.

Injury prevention includes education. Everyone involved with athletics—from players to parents to coaches and medical providers—needs to clearly understand the steps necessary to prevent injuries. A prime example of this is the new focus on identifying and caring for concussions. Sports concussions and their long-term impact on a player's health are better understood today than ever before.

New findings in concussion research indicate that extensive problems can arise if an injured athlete returns to play before he or she has fully recovered. Several major international organizations, including the International Olympic Committee (IOC) and the Federation of International Football Association (FIFA), now recommend that athletes suffering a concussion not be returned to play on the day that they suffer the concussion regardless of its severity. This recommendation, as well as other advances in the care of sports concussions—such as

the use of neurocognitive testing—allows sports medical providers the chance to more effectively prevent the long-term sequelae of concussions in young athletes.

Clearly, injury prevention is a necessary aspect of any sports participation for all members of the team including athletes, coaches and their parents. With the efforts of all individuals involved with the team, a significant reduction in the overall injury rate in sports is possible and will allow safer and more enjoyable sports participation to occur. The ***Preventing Athletic Injuries*** video and student sheets in this Teacher’s Resource Book will assist your students in learning more about this important topic.

LEARNING OBJECTIVES

After viewing *Preventing Athletic Injuries* and participating in the class activities included in this Teacher's Resource Book, your students will be able to:

- understand what an overuse injury is and explain how to avoid such injuries.
- identify the R.I.C.E. steps in dealing with a sprain or other minor injury.
- recognize the importance of adequate hydration before, during and after a sports event.
- explain the benefits of proper warm-up and cool-down activities in relation to injury prevention.
- identify many items that are useful protective gear for athletes and explain how they help prevent injuries.
- explain what a concussion is and discuss the long-term damage than can arise from inadequate care of concussive injuries.
- appreciate that participating in sports can be a satisfying and healthy life-long effort if precautions are taken to avoid injury.
- realize that athletic success has a mental component as well as a physical one.
- understand the benefits of positive mental imagery.
- recognize the benefit of relaxation techniques in helping athletes cope with the stress of competition.
- learn more about the special dangers that some sports injuries—such as concussions—pose to young athletes whose bodies are still developing.

PROGRAM SUMMARY

Preventing Athletic Injuries opens with high school athletes sharing stories about sports injuries they have sustained. The narrator tells viewers, “For many young athletes, sports are a huge part of their lives and they will push the limits to score the winning goal. But, too often, the glory can come at a price.” Dr. Laura Miele of the Sport Injury Prevention Program in Farmington, Connecticut appears on camera next. She reveals that out of 10 million high school athletes, 6 million are injured each year playing sports. “That’s way too many avoidable sports injuries that can be prevented by following the right guidelines,” the narrator emphasizes. At this point, the title ***Preventing Athletic Injuries*** appears onscreen.

Although some sports are intrinsically more dangerous than others, every sport carries its own risk for injury. Some injuries are obvious right away. “It was terrible pain and I just remember falling on the ground and screaming,” says Katrina, a high school athlete. Onscreen text tells viewers, “*Pain shouldn’t exist during an activity. Pain should never rate higher than a 3.*” Dr. Miele explains that even a small injury, if not permitted to heal completely, can become serious enough to end an athlete’s sports career.

An onscreen message flashes, “*Concussions account for almost 1 in 10 sports injuries.*” Images of head scans and x-rays appear. The narrator explains that one of the problems with concussions is that it is hard for athletes and coaches to quickly ascertain whether a concussion has actually occurred. “*Concussions can happen when an athlete takes any type of blow to the head,*” viewers learn. Concussions are most common in high-contact sports such as football, ice hockey, rugby, soccer, lacrosse, field hockey, skiing or snowboarding. Concussions occur when the brain moves roughly within the skull. The narrator states, “The brain cells fire all at once—much like a seizure. When athletes don’t recognize the signs of seizure and return to play, they risk second impact syndrome, which can cause the brain to swell, the brain stem to shut down and respiratory system to fail.”

Half of all sports injuries are preventable if athletes learn to warm up properly and follow a conditioning program to strengthen their cores. The narrator explains, “Knee injuries are a huge problem for athletes, particularly damage to the anterior cruciate ligament, or ACL.” Having a strong core helps prevent knee and ACL injuries. Katrina, the basketball player, describes the precise moment that her own knee injury occurred. Female athletes are most at risk for ACL injuries because, compared to men, their hamstrings and quadriceps are weaker and their ligaments are looser. Core strengthening also helps athletes to distribute their weight properly and improves overall balance.

Viewers next hear advice about things that athletes should NOT do. “*Don’t put too much focus on one sport,*” an onscreen graphic states. Playing several sports allows athletes to use different types of muscles and rest during the off-season. Dr. Miele explains, “You may be trying to get better at that sport, but that strategy could backfire.” This is because overuse injuries can occur if an athlete continues to use the same muscles repeatedly.

PROGRAM SUMMARY CONTINUED

A diagram of the human body appears onscreen. Graphics point out various potential injuries such as broken bones, sprains, pulled or torn ligaments and dislocations. The narrator says, "Although knee and head injuries get the most attention, other body parts are vulnerable as well. Wrists and ankles can be broken, sprained or strained." Groin injuries, stress fractures and rotator cuff injuries are also possible.

However, many injuries can be avoided with the right training. The video switches to a conditioning class in progress, where athletes are learning how to train safely and effectively. Dr. Miele explains, "This class is a combination of knee injury prevention and performance enhancement, speed agility, resistance training. We retrain the muscles to help with jumping, landing and their lateral movements. The combination where that comes in was to assist them with conditioning so as to help quicken their feet." She tells viewers, "To be a successful athlete, you need to put all the pieces to the puzzle, and one of the first pieces is not just warming up properly but definitely to involve some kind of preventive techniques."

The words "*Rest, Nutrition and Hydration*" appear onscreen. These are three important injury-prevention components for athletes. The narrator shares tips on how critical sleep is, as well as days of rest without exercise. "Many athletes may think the more they train, the better they'll play. This is a misconception. Rest can make you stronger and prevent injuries of overuse, fatigue and poor judgment," viewers learn.

"Never take chances by playing without your safety gear," the narrator states. Safety gear includes helmets, mouth guards, braces and pads. The narrator also points out that following the rules of the game will keep an athlete safe. "Rules exist for a good reason—to keep you and your teammates in the game and to avoid injuries."

Next, the video shows footage of cheerleaders and news headlines related to cheerleading accidents. "More than half of the injuries causing paralysis or death in girls' sports happen in cheerleading accidents," says the narrator. Research indicates that several reasons for such accidents. "Cheerleaders have a higher rate of pulled and strained muscles than gymnasts. Many cheerleader injuries happen when someone falls or is dropped on a hard floor—which can result in back and neck injuries." The narrator continues to explain other ways that cheerleading injuries can occur. Viewers also hear from Evan, a cheerleader who stresses the importance of safety equipment.

"In addition to the right equipment, athletes need the right attitude," the narrator says. "Anxiety can compromise an athlete's safety and performance, speeding up the heart and slowing down the muscles." Dr. Miele agrees. "When the body is stressed, the muscles tend to tense up and athletes can incur an injury." Athletes should treat their injuries seriously and not try to play through the pain. Viewers are told that the R.I.C.E. technique (rest, ice, compression and elevation) can be used on minor injuries.

PROGRAM SUMMARY CONTINUED

The narrator also points out certain warning signs that shouldn't be ignored, such as joint pain, tenderness, swelling, reduced motion, weakness, numbness and tingling. Viewers hear now from Matt, a high school quarterback who suffered a serious knee injury. "I chose not to get surgery after the season and then the following year came back but had some struggles along the way... I ended up tearing a few more ligaments in my knee," he says. Matt's decision to wait led him to endure serious surgery and intensive rehab therapy.

Depression is common among injured or sidelined athletes. "The worst part of sitting out of the season is watching your friends play and just knowing you're not a part of it," says Jalen, a high school athlete. Negative emotions can actually interfere with recovery and slow down the healing. "It's very important for athletes to realize that there's a huge mental component to healing from an injury," says Dr. Miele. One method that helps is to visualize yourself back on the field playing again and believing it will happen.

As the video draws to a close, viewers hear from each of the athletes once more. "I don't want to be known as the guy who's always getting hurt," Jalen says. Katrina remarks, "I think the number one thing athletes can do to prevent injury is to be cautious and be smart about what you're doing." Dr. Miele adds, "I want athletes to understand that prevention is the best medicine." The narrator tells viewers, "For most young athletes, this ounce of prevention is worth the incredible rewards they get from participating in the sports they love."

STUDENT ACTIVITIES

Name: _____

ACTIVITY 1A

PRE/POST TEST

- 1.** Out of 10 million high school athletes, approximately how many suffer sports injuries yearly?
a) 500,000
b) 1,000,000
c) 3,000,000
d) 6,000,000
- 2.** Concussions account for approximately one out of every ____ sports injuries.
a) two
b) five
c) ten
d) twenty
- 3.** What percentage of sports injuries are preventable if athletes learn to warm up and strengthen their cores?
a) 25 percent
b) 50 percent
c) 75 percent
d) 100 percent
- 4.** What can happen to someone suffering from second impact syndrome?
a) The knee ligaments can be so severely injured that surgery is required.
b) The brain can swell and the respiratory system can fail.
c) The ribs can become crushed from excessive weight.
d) The arch of the foot can become deformed.
- 5.** Which of the following is NOT a way for athletes to prevent sports injuries?
a) warming up thoroughly before a game or practice
b) staying hydrated with plenty of liquids
c) wearing appropriate protective gear
d) avoiding vigorous stretching or flexing exercises
- 6.** Which of the following can help prevent knee injuries?
a) staying five pounds below your optimal weight
b) developing your core strength
c) adding padded insoles to your athletic shoes
d) consuming at least 100 mg of vitamin C daily
- 7.** Athletes need to eat a balanced diet every day which should include a mix of:
a) protein, carbohydrates and fats.
b) protein, minerals and lipids.
c) protein, soluble fibers and vitamins.
d) fats, vitamins and minerals.
- 8.** More than half of the injuries causing paralysis or death in girls' sports occur as a result of:
a) cheerleading accidents.
b) gymnastic competitions.
c) horseback riding events.
d) field hockey games.
- 9.** The R.I.C.E. approach to minor injuries refers to:
a) respond, investigate, control and examine.
b) repetitions, isolation, conditioning and exertion.
c) release, inhale, consume and eat.
d) rest, ice, compression and elevation.
- 10.** Which of the following statements is false?
a) Depression, anxiety and tension can interfere with an injured athlete's healing process.
b) Cool-down exercises after practice are not nearly as essential as warm-ups before practice.
c) Signs of concussion include confusion, memory loss and pupils that are unequal in size.
d) It's best for athletes not to limit themselves to one single sport.

The Answer Key appears on the next page.

Name: _____

Answer Key

1. d
2. c
3. b
4. b
5. d
6. b
7. a
8. a
9. d
10. b

Name: _____

According to the Centers for Disease Control, "**Concussions account for almost 1 in 10 sports injuries.**" Here is your opportunity to find out more about these dangerous injuries. Research one of the topics from the list below and write a brief paper on your findings. You can gather information at your school or local library or on the Internet. Use a *Resource Tracker* to keep track of your sources.

The Physiology of Concussions

What is a concussion? What happens inside the skull during a concussion? How many concussions occur in the U.S. each year? What are the special risks for young athletes whose brains are still developing? What is Second Impact Syndrome and how does it differ from a concussion?

The History of Concussion Research

New scientific research is revealing that concussive injuries sustained in an athlete's youth can actually persist for years, causing cumulative brain damage and, in extreme cases, symptoms similar to Alzheimer's disease. Investigate the latest discoveries in this ever-growing area of research.

Around the World

Are athletes from other countries experiencing a similar rise in concussion rates, compared to the United States? Investigate an assortment of sports that are played worldwide, such as soccer, hockey, lacrosse, football, tennis, etc. Which sports are responsible for the most concussions, according to statistics? What conclusions can you draw about concussion rates in different countries?

Lives on the Line

Investigate the story of a real athlete (professional or not) whose career or life was shortened because of a concussion. Identify the warning signs of concussion that may have been overlooked. How many athletes die each year because of complications from concussions?

Name: _____

ACTIVITY 3B
RESOURCE TRACKER

Title of book or article:

Title of book or article:

Author(s):

Author(s):

Published by/website address:

Published by/website address:

Copyright date:

Copyright date:

Subject covered:

Subject covered:

Quote(s):

Quote(s):

Notes:

Notes:

Name: _____

THE DANGERS OF DEHYDRATION

Dehydration is dangerous for anyone—and it’s especially dangerous for an athlete. When we sweat, we lose essential fluids and minerals that our bodies need to function properly. Drinking water or other hydrating beverages is essential to ensure an athlete’s optimal performance.

PART ONE: Consider what could happen to an athlete who doesn’t pay enough attention to hydration. Perform research on the Internet or at your school library to answer the questions below. Ask your teacher for a copy of the *Water and Dehydration* fact sheets to help you learn more.

What is the definition of hydration?

Name at least two roles that water plays in the function of the human body.

What is the definition of dehydration? Name at least three symptoms of dehydration.

Describe what might happen to an athlete who does not stay adequately hydrated during a competition.

Is any one sport at a higher risk for dehydration than others are? Explain your answer.

PART TWO: Using the *Recommended Fluid Intake for Athletes* fact sheet, calculate your own sweat rate and determine how many ounces of fluid your body typically needs to replenish after an hour of strenuous exercise or sports participation.

Name: _____

ACTIVITY 5

**MENTAL IMAGERY AND
RELAXATION TECHNIQUES**

Sometimes athletes become stressed or nervous about their performance. Helping athletes learn relaxation techniques is an important way to help them alleviate stress and cope with sport injuries. But relaxation and mental imagery techniques aren't useful only for healthy athletes—injured athletes often rely upon these techniques to mentally prepare themselves to return to active play.

Mental imagery means that you imagine seeing yourself performing your athletic task perfectly. First, you want to see yourself going through all of the motions, pretending to hear and see the crowd. Try to visualize everything around you and focus on what you need to do in order to succeed. See yourself doing it!

Tips for Mental Imagery

- Try thinking in pictures rather than words.
- Look at pictures or videos prior to using imagery.
- Stay in a quiet, relaxed and calm environment to avoid distractions.
- Keep a focused yet relaxed attention while using imagery.

In the space below or on a separate sheet of paper, create a mental imagery scenario that you could use to get ready for a big game or to psyche yourself up while you heal from an injury. Use personal details that will be meaningful to you. There is no right or wrong way to create an encouraging mental scenario—as long as it helps you visualize yourself being successful at your sport!

Consult the *Sports Psychology FAQs* and *Relaxation Techniques for Athletes* fact sheets for more information.

Name: _____

Plenty of teens are involved in athletic pursuits—whether they play on a team, at the local YMCA or just for fun. Being physically active is important for everyone, and the choices are unlimited—tennis, swimming, track, skateboarding, bicycling, and plenty of others!

For this activity, work in groups of two to three students to develop a presentation that you can share with your classmates and teammates. Choose one of the topics presented in the video and investigate it further.

Your goal is to learn as much as you can about your topic and then find an interesting, memorable way to present it to your peers so that they can get the most out of sports without risking injury to themselves or others.

Sample topics include:

1. warm-up and cool-down exercises
2. the importance of stretching
3. hydration—why, how and when?
4. how to avoid overuse injuries
5. creating your own conditioning program
6. what you should know about safety equipment
7. how to strengthen your core
8. R.I.C.E. treatment for minor injury
9. mental imagery—why is it useful for athletes?
10. the special risks related to knee injuries

Your presentation can take any of these forms:

- a text pamphlet
- a poster or graphic organizer
- a PowerPoint presentation
- a brief (three-to-five minute) video documentary
- a hands-on tabletop display with props

FACT SHEETS

Name: _____

More American teens are competing in sports than ever before. Sports help young people keep their bodies fit and feel good about themselves. However, all sports have some risk of injury. In general, the more physical contact in a sport, the greater the risk of injury. Keep these injury-prevention tips in mind as you embark on any sports activity.

- Don't try to do too much too soon. If you're not accustomed to exercising or training for a particular sport, start out slowly and work up to more intense activity.
- Always take a few minutes for warm-ups and stretches before exercising. Some light activity will prepare your muscles and increase your flexibility.
- Learn the proper technique for sports and weight training. Always have a spotter helping you while lifting weights. Strict rules against headfirst sliding (baseball and softball), spearing (football) and body checking (ice hockey) should be enforced.
- Avoid dehydration by drinking plenty of fluids before, during and after exercise or play. Don't wait until you feel thirsty to drink. You'll know you're hydrated enough when your urine is light yellow.
- Make sure to take breaks during long exercise sessions and games. Brief rest periods help reduce injuries and prevent heat exhaustion.
- Take at least one rest day each week to let your body recover.
- Wear the right gear. Players should wear appropriate and properly fit protective equipment such as pads (neck, shoulder, elbow, chest, knee, shin), helmets, mouthpieces, face guards, protective cups and/or eyewear.
- Strengthen muscles. Conditioning exercises before games and during practice strengthens those muscles that are most heavily used in play.
- Stop exercising **immediately** if you feel any pain.

SOURCE: American Academy of Pediatrics, <<http://www.healthychildren.org/English/health-issues/injuries-emergencies/sports-injuries/pages/Sports-Injury-Prevention.aspx>>

Sprains and Strains

A **sprain** is an injury to a ligament—a stretching or a tearing. One or more ligaments can be injured during a sprain. A ligament is a band of tough, fibrous tissue that connects two or more bones at a joint and prevents excessive movement of the joint. Ankle sprains are the most common injury in the United States and often occur during sports or recreational activities.

A **strain** is an injury to either a muscle or a tendon. A muscle is a tissue composed of bundles of specialized cells that, when stimulated by nerve impulses, contract and produce movement. A tendon is a tough, fibrous cord of tissue that connects muscle to bone.

Growth Plate Injuries

In some sports accidents and injuries, the growth plate may be injured. The growth plate is the area of developing tissues at the end of the long bones in growing children and adolescents. When growth is complete, sometime during adolescence, the growth plate is replaced by solid bone. The long bones in the body are the long bones of the fingers, the outer bone of the forearm, the collarbone, the hip, the bone of the upper leg, the lower leg bones, the ankle and the foot. If any of these areas become injured, seek professional help from a doctor who specializes in bone injuries in children and adolescents (pediatric orthopedist).

Repetitive Motion Injuries

Painful injuries such as stress fractures (where the ligament pulls off small pieces of bone) and tendinitis (inflammation of a tendon) can occur from overuse of muscles and tendons. These injuries don't always show up on x-rays, but they do cause pain and discomfort. The injured area usually responds to rest. Other treatments include R.I.C.E. as well as crutches, cast immobilization or physical therapy.

Heat Injuries

Playing rigorous sports in the heat requires close monitoring of both body and weather conditions. Heat injuries are always dangerous and can even be fatal. Children perspire less than adults do, and they require a higher core body temperature to trigger sweating. Heat-related illnesses include dehydration (deficit in body fluids), heat exhaustion (nausea, dizziness, weakness, headache, pale and moist skin, heavy perspiration, normal or low body temperature, weak pulse, dilated pupils, disorientation, fainting spells) and heat stroke (headache, dizziness, confusion, and hot dry skin, possibly leading to vascular collapse, coma, and death). These injuries can all be prevented with proper hydration and avoiding sports activities during the hottest times of day.

Name: _____

Warm-up and cool-down exercises are two key components of a balanced conditioning program for athletes. When done properly, warm-ups and cool-downs (including flexibility stretches) will allow athletes to have more productive workouts and improved performance. Warm-up and cool-down exercises also help prevent sports injuries.

A typical warm-up routine should:

- include some light exertion such as running or jumping rope in place for five to eight minutes
- incorporate a dynamic warm-up including stretches or light plyometric exercises that assist with body flexibility
- raise heart rate and core body temperature
- loosen up muscles
- activate the nervous system
- prepare the body for a more strenuous, intense workout

Cool-down exercises are a necessary component for all exercise routines, because they help the body to recover from the high intense practice of a workout program. During exercise, the athlete's heart rate is elevated, there is increased blood flow to the muscles and overall the body is physiologically aroused. A cool-down helps the body gradually reduce heart rate and core temperature. It's also an excellent opportunity to practice injury-preventing stretches and routines.

Name: _____

A concussion is typically caused by a severe head trauma during which the brain moves violently within the skull, sometimes hitting the skull itself. A concussion may or may not include loss of consciousness.

Anyone who receives more than a minor bump on the head should see a doctor to rule out more serious injury. If you receive a concussion while playing sports, ***stop immediately***.

Symptoms may last days, weeks or sometimes months. Recovery times will vary from individual to individual.

The best treatment for a concussion is rest—take it easy for several days until all symptoms go away. Avoid bright lights and loud environments. If there was a loss of consciousness, seek medical attention to determine if there are lasting effects.

Signs and symptoms of concussions:

- balance problems
- blurry or double vision
- changes in personality
- clumsiness
- confusion or “fogginess”
- dazed appearance/behavior
- difficulty concentrating
- dizziness
- fatigue
- feeling groggy
- headache
- irritability
- loss of consciousness
- memory loss or difficulty
- nausea
- sensitive to light or noise
- slowed response to questions
- sluggishness

Consider these statistics:

- There are 1.6 to 3.8 million sports concussions per year. It is believed that many concussions go undiagnosed and are under reported.
- 65% of all sport concussions come from football injuries.
- Among non-helmeted sports, soccer is the number one sport for concussions.
- U.S. female high school soccer players suffered almost 40% more concussions than males did.
- Studies show that high school athletes take longer to recover from concussion than older athletes.

What Is an Overuse Injury?

The NCAA describes overuse injuries as “excessive use of muscle group(s) that are not conditioned for the intended action and pain and dysfunction result leading to poor performance.”

An **overuse injury** occurs when too much physical stress is put on a part of the body—usually because of a repeated action. Athletes who play a single sport year-round are especially susceptible to overuse injuries. Overuse injuries are also common in sports where a repetitive motion is required for long periods without rest.

Common Overuse Injuries Include:

- shin splints
- swimmer’s shoulder
- Little League elbow
- stress fractures
- rotator cuff tendonitis
- patellofemoral malalignment
- spondylolysis

Symptoms include pain and inflammation of the affected area.

Treating an Overuse Injury:

The best way to treat an overuse injury is by taking a break from the activity that caused the problem. This can mean taking several weeks or months off from your sport, depending on your doctor’s advice. Cross-training by participating in different activities can help by giving your injury chance to rest while allowing you to exercise.

Do not “play through the pain” if you have an overuse injury—this may cause the problem to worsen.

The Role of Water in Our Bodies

Water helps our bodies regulate many things—body temperature, digestion and more. Among the important roles that water plays in the human body, consider these:

1. Transportation

Water assists in the movement of oxygen, glucose and fat into our muscles. Water also removes waste products such as CO₂ and lactic acid from our working muscles. Water is a big component of urine. Dark urine indicates dehydration (more waste products and less water).

2. Body temperature regulation

Water is essential in order for our bodies to maintain a body temperature of 98.6 degrees Fahrenheit. When the body overheats, it regulates itself by sweating. Sweating means that the water in the body absorbs heat from the working muscles and brings it to the surface of the skin for evaporation, thus cooling down the muscles and body core.

3. Digestion

Water is an important component of saliva and gastric juices, and aids in digestion of the foods that provide fuel to our bodies.

4. Lubrication

Water naturally lubricates our bodies' joints, organs and tissues.

The Importance of Hydration

Athletes need to consume liquids—stay hydrated—for optimal performance. Dehydration creates a drop in blood volume, causing an increase in heart rate to compensate for the decreased blood supply to working muscles. Muscle cramps, dizziness and fatigue are symptoms of dehydration and can increase the risk of injury.

Inadequate fluid intake can have powerful negative side effects. Athletes can lose between 1 - 3 liters of sweat per hour of exercise. Inevitably, as a player's body weight drops due to dehydration, athletic performance also declines. Even a small drop in body fluids (1% or 1.5 pounds in a 150-pound person) can impair an athlete's performance by 1 - 2%. For example, if not adequately hydrated, a runner who can typically do a mile in 8 minutes will add 10 seconds to his or her performance.

The best gauge of an athlete's hydration status is the color of his or her urine. The urine should be a pale yellow color. Athletes should strive to have this color urine all the time—not just before a sports event.

This fact sheet is continued on the next page.

Name: _____

Symptoms of Early Dehydration:

- headache
- dizziness
- nausea
- vomiting
- dry mouth and eyes
- loss of appetite
- heat intolerance
- exhaustion or fatigue
- dark colored urine with strong odor
- muscle cramps
- weight loss
- irritability

Symptoms of Advanced Dehydration:

- difficulty swallowing
- heat stroke
- clumsiness
- sunken eyes
- delirium
- inability to urinate

Name: _____

**RECOMMENDED FLUID INTAKE
FOR ATHLETES**

Believe it or not, athletes need to train themselves to drink enough fluids before, during and after exercise. Why? Because intense exercise tends to blunt a person's awareness of thirst. An athlete's fluid needs are directly linked to his or her energy expenditure. In other words, the more energy you expend, the more fluid you need—even if you don't feel thirsty.

Your personal sweat rate, genetics, body size, degree of acclimatization, weather conditions, and the length of event will all have an effect on your energy expenditure. Due to these variables, it's helpful to calculate your own "sweat rate" so that you can follow the recommended fluid intake for athletes below.

Know Thy Sweat Rate

1. Weigh yourself nude before exercise.
2. Exercise for an hour, keeping track of how much you drink.
3. After exercise, strip down, dry yourself and weigh yourself again.
4. Subtract your post-exercise weight from your pre-exercise weight and convert to ounces (1lb = 16 ounces).
5. Add to this total how much you consumed during exercise. This is your hourly fluid loss.
6. To determine how much to drink every 15 minutes or so, divide your hourly fluid loss by 4.

Example:

Pre- weight: 144
Fluids consumed: 16 ounces
Post weight: 143
Total fluid losses: 32 ounces

Divided by 4 = 8 ounces every 15 minutes to meet needs.

This fact sheet is continued on the next page.

Name: _____

**RECOMMENDED FLUID INTAKE
FOR ATHLETES**

Recommended Fluid Intake for Athletes

For every pound (16 ounces) that is lost during exercise, an athlete should drink 20 - 24 ounces of fluid to replace lost fluids. It's essential that an athlete replace **more** than is lost, because in addition to sweating, other fluid losses occur during normal metabolic activities—breathing, etc.

Thanks to persuasive advertising, many athletes (and coaches) believe that commercially prepared electrolyte or sports drinks have advantages over water. These drinks do provide some replacement for the salts and sugars that are lost with vigorous exercise. However, they may be high in sugar, which can sometimes cause cramps, nausea and diarrhea in athletes. Water is usually the best choice.

If you do want to drink something other than water, check out this recipe:

Homemade Sports Drink Recipe

Mix together:

- 2 cups water
- 1/8 teaspoon salt
- 2 oz. orange juice
- 2 tablespoons sugar

Each 8 oz. serving provides 60 calories, 15g CHO, 144mg NA, 55mg K.

Athletes need a balanced diet that includes a variety of foods. This is important to improve athletic performance and maintain a healthy body. An athlete's daily training diet should include the following amounts of these types of foods:

Carbohydrates should provide 55% to 75% of total energy (calories).

Carbohydrates include foods such as breads, cereals, grains, pastas, vegetables and fruits. Carbohydrates provide 4 calories per gram.

Proteins should provide 15% to 20% of total energy (calories).

Protein-rich foods include meats, fish, poultry, tofu, dairy foods, legumes, eggs and nuts. Proteins provide 4 calories per gram.

Fats should provide 25% to 30% of total energy (calories).

Common fats include oils, butter and margarine. Fat is also in many protein-rich foods. Fats provide 9 calories per gram.

Proteins

Some athletes may need extra protein. Total needs rarely exceed 1 gram per pound of body weight per day. Keep in mind the following:

- Protein or amino acid supplements have not been shown to enhance muscle development, strength or endurance.
- Excess protein is either burned for energy, converted to fat or excreted.

Fluids

Athletes are at increased risk for dehydration (lack of adequate body water) and heat illness. This risk is greatest in hot, humid weather during long and intense activities. Use these guidelines to ensure that you get enough fluids during physical activity:

- Never restrict fluids for any reason. Make sure that drinks are available at all times.
- Failing to take in enough fluids and calories may lead to early fatigue, irritability or a sudden drop in performance.
- Plain water is the best drink for most athletes. Carbonated or caffeinated drinks should not be consumed.
- Athletes should drink water every 15 to 20 minutes during activity.
- Thirst is not a reliable guide to the need for water. An athlete may become dehydrated long before he or she feels thirsty.

SOURCE: "Sports Shorts," The American Academy of Pediatrics, <<http://www.healthychildren.org/English/healthy-living/sports/pages/Nutrition-and-Sports.aspx>>

Name: _____

**OPTIMAL NUTRITION
FOR INJURY RECOVERY**

Good nutrition is necessary to help your body heal and recover from an injury. Follow these tips to give your body the nutrients and vitamins that will help you heal completely.

- Eat wholesome foods first. Instead of swallowing a handful of assorted pills that “claim” to aid in recovery, reach for some colorful vegetables and fruits. Tomatoes, cantaloupe, kiwi, spinach and peppers taste great and are full of vitamins and minerals that are necessary for healing.
- Vitamin C is essential in recovery because it helps the body manufacture new connective tissue. Foods rich in vitamin C include broccoli, oranges, strawberries, red peppers, grapefruit, cantaloupe, papaya and baked potatoes.
- Vitamin A, which is found in sweet potatoes, mango, carrots, spinach, red peppers and papaya, assists in bone development, immune function and cell growth.
- Zinc is essential for wound healing and can be found in meats, seafood, sunflower seeds and almonds.
- Anti-inflammatory foods—such as red grapes, berries, garlic, eggplant, olive oil, salmon, curry powder, nuts and just about any fruit or vegetable—can assist with the healing process.
- Foods high in calcium are beneficial not only during recovery, but should be consumed on a daily basis for strong bones. Dairy products are excellent sources of calcium. Some non-dairy sources include sardines with the bones, chickpeas, almonds, broccoli, tofu, spinach and dried figs.
- Do not severely restrict your intake when you are injured. Listen to your body. Eat when you are hungry and choose foods that promote healing, such as the ones listed above.
- Snack ideas: Mozzarella sticks, apple with peanut or almond butter, berry smoothie, trail mix or veggies with yogurt dip.

Athletic activities are not only fun—they also improve physical fitness and reduce stress. But whether you're involved in cheerleading or facing a fastball during a baseball game, participating in sports puts you at risk of injury. Safety precautions are necessary for all athletes! Wear proper, well-fitting equipment to protect yourself. These are some of the most important pieces of safety gear.

Helmet

- Helmets protect you from head injuries—and can even save your life. Choose a helmet that's designed specifically for the sport you're playing. For example, a ski helmet isn't appropriate for bicycling, and vice versa.
- Make sure your helmet fits snugly on your head. It shouldn't wobble, feel loose or shift when you move your head.
- Helmets are essential for bicycling, baseball, softball, football, hockey, skateboarding, skiing, snowboarding and more.

Mouthguard

- Mouthguards protect your mouth, tongue and teeth. Buy one at a sporting goods store or visit your dentist to get one fitted.
- Wear a mouthguard during contact sports like basketball, football, wrestling, hockey and boxing.

Eye protection

- Plastic glasses, shields and goggles protect your eyes during certain activities. Choose eye protection made from polycarbonate, a strong plastic.
- Never wear regular eyeglasses while playing sports. Get prescription polycarbonate glasses or contacts instead.
- For sports like football, hockey and baseball, choose a helmet with an eye shield. Wear goggles for racquet sports, skiing and snowboarding.

Wrist/knee/elbow guards and pads

- Wrist, knee and elbow guards protect you from cuts, bruises and fractures. Wear guards when skateboarding or in-line skating.
- Many sports require specific pads (like shoulder pads for football and shin guards for soccer). Ask your coach and doctor what pads are recommended for your sport.

This fact sheet is continued on the next page.

Name: _____

Athletic supporter

- Athletic supporters (also called protective cups) shield the groin and testicles. They are essential for males playing contact sports like hockey or football.
- Females should wear a supportive sports bra during athletic activity to prevent injuring the ligaments in the breasts.

Footwear

- Wear shoes designed specifically for your sport. Sports like football, softball and soccer require cleats, while activities like tennis or bicycling have their own type of footwear.
- Replace worn-out shoes. Basketball shoes that have lost their grip can make you fall on the court, and running shoes without arch support could damage your feet.

Name: _____

Some injuries can be treated right away and heal quickly. Others take time and medical care to fully heal. When it comes to minor injuries to soft tissues (joints or muscles), one of the first treatments recommended by experts is called R.I.C.E.

This acronym stands for:

R_{est}

I_{ce}

C_{ompression}

E_{levation}

Rest the injured body part. Reduce or stop using the injured area for 48 hours. If you have a leg injury, you may need to stay off it completely.

Ice should be applied to the area to reduce pain and swelling. Put an ice pack on the injured area for 20 minutes at a time, 4 to 8 times per day for several days. Use a cold pack, ice bag, or a plastic bag filled with crushed ice that has been wrapped in a towel.

Compress the injured ankle, knee or wrist by wrapping with an elastic bandage. This will help reduce swelling. Compression can be done with bandages such as elastic wraps, special boots, air casts and splints. Ask your doctor which one is best.

Elevate the injury above the level of the heart. Use a pillow to help elevate an injured limb.

NOTE:

More serious injuries might require physical therapy to fully heal. A physical therapist will work with you to strengthen the injury and recover full range of motion. You might also need to wear a brace or guard while the injury is healing.

Many athletes experience day-to-day pressures that can affect their state of mind and performance. They may worry that they will disappoint their teammates, coaches or peers, or they may fear failure and injury.

Sports psychologists are professionals who work to help athletes overcome their fears and stresses. Their role is to help athletes enhance their performance by improving their mental and emotional well-being.

How do sport psychology consultants help athletes?

- They educate coaches, athletes, physical therapists and certified athletic trainers about basic psychological techniques that may contribute to enhance performance.
- They work directly with athletes helping them to cope with stresses and improve their athletic performance.
- They help athletes overcome their anxieties and stresses about their performance.
- They assist athletes in coping with injuries and career transitions.

What can athletes do to build their own self-confidence?

- Choose a highly skilled role model to emulate—someone you know or someone in professional sports who you admire.
- Use mental techniques such as positive self talk and mental imagery
- Be physically ready! Nothing can build your self-confidence like preparation. Learn from your past mistakes, listen to your coach's instructions and keep yourself in excellent physical condition.
- Never forget that participating in a sport should be fun!

What is mental toughness and how do you get it?

- Mental toughness means physical AND mental readiness.
- Being mentally tough is the ability to consistently perform at your best, regardless of the competitive circumstances.
- Mental toughness training will help you increase your ability to handle all different kinds of stress.
- The key is to learn how to recover from stressful events.
- It is also staying positive in all aspects from emotionally to mentally to the self talk generated in your own thoughts.
- Be physically ready, and keep yourself in excellent physical condition.

Name: _____

There are many different ways to relax. The most useful technique will vary from one person to another. Examples of relaxation techniques include the following:

Relaxation Techniques

- Relaxing breathing
- Muscle relaxation
- Distractions: find a distraction that takes you away from the pressure of constant thought of competition.

Mental Training/Imagery

- Also known as visualization, mental imagery or mental rehearsal
- Can be used to alleviate stress, reduce pain or to improve performance
- You should picture yourself performing athletic tasks in games and competitions, first as yourself and then as a spectator.
- Get into a comfortable position in a quiet environment.
- Create a motion picture in your mind of performing a task perfectly.

Progressive Muscle Relaxation

- This is one of the most common methods used to help athletes relax.
- The routine consists of a series of muscle contractions and relaxations.
- A muscle group is tensed at 100% effort for about 5 seconds and then relaxed for about 20 seconds.
- The athlete should also concentrate on rhythmic, deep breathing.

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