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THEME: PREPARING FOR FALL SPORTS

Pre-Participation Physical Examinations

by Brent Rich, M.D., ATC



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Before sports participation, almost all student athletes are required to undergo a pre-participation physical exam (PPE). It is important to understand that the purpose of the PPE is not to disqualify or exclude student athletes from competition, but to help maintain the health and safety of the athlete in training and competition. There are three primary and three secondary objectives of the PPE.

Primary Objectives:

1. Detect conditions that may predispose the athlete to injury.
2. Detect conditions that may be life-threatening or disabling.
3. Meet legal and insurance requirements.

Secondary Objectives:

1. Determine general health.
2. Counsel on health-related issues.
3. Assess fitness level for specific sports.

Although there is some disagreement among health professionals as to the necessary frequency and timing of the exam, the PPE is generally a formal requirement prior to participation in high school, college and professional sports each year. The qualification of the health care professional who performs the PPE is based on practitioner availability, clinical expertise and individual state laws, but the training of M.D./D.O. physicians usually makes them the best qualified to perform the exam. The exam may be performed in an office-based or a station-based setting, depending on the number of exams to be performed, cost and privacy needs. Either method has advantages and disadvantages, and may be tailored to the individual situation.

The content and extent of the exam should include a medical history and a physical exam. A complete medical history to review past injuries, surgeries or illnesses, medication usage, signs or symptoms (especially during exertion) and drug allergies should be obtained. An interim history should be obtained for follow-up PPEs on a regular basis. Detailed history questionnaires may be used, depending on the situation. The physical exam should always include a measure of height, weight, visual acuity and vital signs (blood pressure, pulses). The extent of the examination of the head, ears, nose and throat, lungs, cardiovascular system, abdomen, genitalia, skin and musculoskeletal system varies and may be customized depending on the sport.

If concerns are identified during the PPE, determining clearance for participation should be undertaken with the following principles in mind:

1. Does the concern place the athlete at increased risk for injury?
2. Is another participant at risk for injury because of the problem?
3. Can the athlete safely participate with treatment (such as medication, rehabilitation, bracing, or padding)?
4. Can limited participation be allowed while treatment is being completed?
5. If clearance is denied only for certain sports or sports categories, in what activities can the athlete safely participate?

ACSM FIT SOCIETY

AMERICAN COLLEGE OF SPORTS MEDICINE
LEADING THE WAY

Letter from the Editor

by Dixie Thompson, Ph.D., FACSM

Welcome to the Summer 2009 issue of the *ACSM Fit Society Page*! Summer is in full swing, but it's never too early to start thinking about fall sports and how your kids — and you — can prepare.

Sports are best enjoyed when they're done safely, so we'll discuss concussions, pre-participation examinations, and heat injuries and how to prevent them. We'll also give tips on good sportsmanship and how to be a respectful fan.

Enjoy the rest of your summer!

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Pre-Participation (continued from page 1)

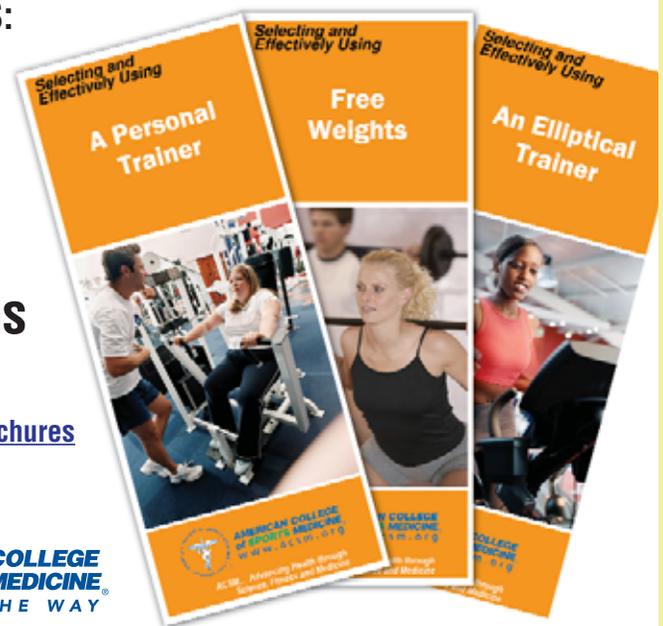
Restriction from participation must be made based upon the best objective medical evidence, and should be determined with the cardiac and aerobic demands of the proposed activity in mind. An understanding of the strenuousness of the activity in relation to the physical limitations is crucial. If clearance is denied, recommendations for correction prior to participation should be communicated, and a follow-up evaluation should be scheduled. If acute illnesses or correctable conditions are resolved prior to the sport season, clearance should be given.

Each case should be evaluated individually. Understanding the value of participation should guide the practitioner in determining a suitable approach for clearance.

By working with a physician, the majority of athletes can safely enjoy the benefits of sports.

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Q&A

By Anthony Luke, M.D., FACSM

Q: Every year, I'm required to take my son to our doctor to get his sports physical exam. Is it really necessary?

A: The pre-participation physical exam (PPE) is required yearly in most states for school sports and also in many cases for competitive sports outside of school. The exam is designed to identify life-threatening conditions and the medical and musculoskeletal problems that may affect a child's safe participation in selected sports. The PPE is mandated by school districts to make sure that children receive the appropriate screening by a trained medical professional where even a knowledgeable coach or athletic director would not be qualified to make this health safety assessment. The exam should ideally be done at least six weeks before the start of the athlete's try-outs or pre-season, so that any problems identified can be assessed further and the athlete can possibly be cleared for participation in time for the start of the season. It is important to note that the PPE in North America comprises history and recommended screening physical exam maneuvers. There is a standard PPE endorsed by several leading health organizations, including the American College of Sports Medicine, that outlines specific questions to ask and physical conditions to check. Unfortunately, since we are dealing with preventive medicine, there are limitations to the effectiveness of detecting unknown conditions with the present exam. Nevertheless, it is valuable to have your young athlete meet with a physician regularly at each year and stage of life, as there are different issues and health risks to check for. Physicians should continually seek to improve the tools and techniques we use in order to optimize the PPE, and it's important to make sure your doctor reviews the latest health information. If you take your car in regularly for a checkup, don't you want to make sure the mechanic reviews a comprehensive checklist to make sure your car doesn't break down? In the same way, parents and athletes need to take an interest and active role in getting the best preventive health care possible. Remember, the PPE is for the safety of your child!

Q: I've had several bad ankle sprains and want to get ready for my basketball season, which starts this fall. What can I do to reduce my chances of spraining this year?

A: Ankle sprains are one of the most common sports injuries seen in the sports medicine doctor's office. If sprains don't heal well or injuries are repeated, the ligaments may not recover well enough to keep the ankle stable. In order to return the ankle to a normal state, most sports specialists

(continued on page 6)

Preparing for and Playing in the Heat

by Mary Nadelen, M.A., ATC



When athletes train during the warm summer months, it is important for them to be prepared for the environment in which they will be training and playing.

Heat illness is an inherent risk when exercising in hot conditions and can affect even the best-conditioned athlete. There are a number of different categories of heat illness that can cause harm to an athlete. Failure to respond to an athlete in distress by removing them from activity, cooling their body and giving them fluids can result in severe dehydration and, in extreme conditions, death.

Exercise-associated muscle (heat) cramps are painful, involuntary muscle contractions most often caused by dehydration, electrolyte imbalance and fatigue.

Heat syncope, or light-headedness, is usually seen at the end of a race or after an individual stands for a long period of time after completing a physical activity. The possible weakness, dizziness and fainting experienced during heat syncope can be attributed to pooling of blood in the extremities.

Exercise (heat) exhaustion should be suspected in an athlete whose performance rapidly declines and who lacks the ability to continue exercising. The athlete may experience extreme thirst; dizziness; headache; profuse sweating; weak and rapid pulse; and gray, cool, clammy skin.

Exertional heat stroke is an elevated core temperature to a level (104° F) that causes organ failure. This condition is life-threatening unless promptly recognized and treated.

Confusion, disorientation, profuse sweating, hot, red skin, hyperventilation, loss of balance, rapid pulse and possible loss of consciousness are all signs to look for in an athlete suffering from heat stroke.

Athletes especially at risk for developing a heat illness are individuals who are overweight, dehydrated, under-conditioned or very muscular. Those who practice during the hottest times of the day (usually 10 a.m. – 5 p.m.) and who are not acclimated to the environment, have to wear protective equipment (helmet, shoulder pads) or have a history of heat illness are also at elevated risk.

There are several factors that should be addressed to improve an individual's tolerance to warm environments and to prevent heat illness from occurring. Maintaining hydration by matching fluid intake with water lost through sweat is one of the most critical factors in preventing heat illness. Athletes should be instructed to drink water throughout the day (at least half of their body weight in ounces), before practice (7-10 oz. 20 minutes before exercise), during practice (8-10 oz. every 15 minutes), within two hours after practice (24 oz. for every pound lost) and on successive days.

If an athlete is training for periods longer than 90 minutes, an 8-10 oz. sports drink can be consumed to replace electrolytes lost through sweat. Fluid should be easily accessible and in abundance throughout the training session and should not contain caffeine, carbonation or alcohol. An athlete's level of hydration can be monitored by observing the color of his or her urine, which should be clear to light yellow, and by monitoring pre- and post-practice body weight. Body weight taken before and after training sessions can be used to determine if adequate amounts of fluids are being consumed (to replace fluids lost through sweat) between training sessions and to determine if unsafe (greater than 2 percent of body weight) weight loss has occurred during the training session.

Heat acclimatization or practicing in the environment the athlete will be playing in will allow the body to adapt to the warm environment, which will improve performance and heat tolerance. Athletes should progressively increase the intensity and duration of their training sessions over a 10-14 day period to become fully acclimated to their environment. Initially, training sessions should last 15-40 minutes for the first couple of days and can progress to a two- to four-

hour training session by day 14. An individual properly acclimated should be able to train in the warm environment for one to two hours at an intensity equal to competition.

Choosing clothing and equipment that is light-colored, loose-fitting, and moisture-wicking will help keep an athlete cool. As the temperature increases, athletes should minimize the amount of clothing and equipment (helmet, shoulder pads) worn. The body's ability to cool itself through the evaporation of sweat decreases significantly as the amount of equipment worn increases. Athletes who must wear protective equipment should allow time to start training in shorts and T-shirt and gradually add equipment each day as their bodies acclimate.

Exercising at the right time of day and at the right temperature can also help decrease the chance of heat illness. The risk for developing heat illness is extremely high when the Wet-Bulb Globe Temperature is greater than 82° F (28° C). At these temperatures, athletes should consider rescheduling their training session for another day or moving it to early morning or late evening to avoid the hottest period of the day. If competition must occur in a hot, humid environment, proper hydration must be strongly encouraged and precautions such as longer and more frequent water breaks, removing equipment during breaks and taking breaks in cool, shaded areas must be taken to prevent heat illness.

Being aware of these precautionary measures and preparing for the demands a warm environment can put on the body will help decrease the frequency and severity of heat illness in athletes.

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Being a Good Sport (Spectator): A Quick Guide for Parents

by Lars Dzikus, Ph.D.; Jeffrey T. Fairbrother, Ph.D.; and Leslee A. Fisher, Ph.D.



Many parents have witnessed outstanding sport parenting behavior as well as disrespectful and disruptive behavior at youth sport events. Overzealous parents may feel they have their child's best interests at heart when they try to encourage or challenge him or her. Here are a few guidelines that will help us all be good sports spectators. Your child will have more fun and may even perform better as a result!

Don't be a bully

Make sure to control your emotions. According to the Government of Alberta, bullying behaviors in sport include needless yelling and screaming, constant blaming of athletes for mistakes, making unreasonable demands concerning performance, repeated insults and put-downs, repeated threats to remove privileges, intimidation, and physical violence. Avoid these and similar behaviors. Educate others by having your child's team adopt an abuse prevention program and anti-bullying policies. You can create a motivating and emotionally supportive environment at sporting events by modeling good behavior.

Help children keep winning in perspective

Kids enjoy learning new skills and getting better at them. They also enjoy having fun

while learning. If winning is the only goal, second place is failure. This sets children up for disappointment, and if children feel like losers, they are bound to quit. Striving to win is not bad for children if we model how to keep winning in perspective. Together with your child, you can set achievable process and performance goals that focus on skill development. Set process goals like, "Reach with your hands and keep them together" when blocking in volleyball. Set performance goals like, "Try to block three times more (or another realistic goal) in every game between now and mid-season." Even elite athletes are in control of their sport process and performance goals and are not in control of winning; for example, even when they break a world record, someone else may have run faster in that race. On game day, let the children enjoy the process of playing and interacting with each other. During competition, calling attention to any type of goal may actually have a negative influence on performance. After a game, make sure your child feels loved and appreciated regardless of the outcome. Avoid asking, "Did you win?" Rather ask, "What was fun today?" or "Did you keep the ball close to you when you dribbled?"

Cheer! Don't instruct

When you instruct your child during a game, there is a good chance s/he will change her/his behavior to comply. This can be problematic for at least two reasons. First, any instruction regarding technique may direct the child's attention to aspects of her/his performance that should be completed automatically. Performance in sports involving throwing, striking and kicking objects can be degraded when a player directs attention inwardly. For example, when hitting in baseball, your son or daughter will probably be better served by focusing on the movements of the pitcher and ball rather than on his or her swing technique. Comments such as "swing harder" or "keep your elbow in" may actually hurt your child's performance. Second, when you offer instruction, you effectively put your child in the position of switching back and forth between two different tasks. The first task involves the response to the cues in the game (e.g., catching a ball) and the second task involves responding to your instruction. Such switching can cause a decline in performance. Let your child focus on the task at hand and leave the instruction to practice sessions or post-game discussions.

Blend in with the crowd

An increased level of stimulation often accompanies participation in competitive sports. Such stimulation increases result in a narrowing of perception, increasing the

likelihood of distraction or failure to note information that is relevant to performance. Because of familiarity with your voice, your child may be more susceptible to distraction when s/he hears it. In addition, when you single your child out, s/he may feel the pressure of additional scrutiny, which can further heighten arousal and negatively impact performance. If you direct your cheering toward a single child, try to do so when there is a natural break in the attention demands of a sport.

Conclusion

Following these guidelines will help children (and parents) enjoy youth sports for a long time. Showing support in this way will increase children's enjoyment of sport and potentially improve their performance. For more advice on positive sport parenting, see [ACSM's Youth Sports page](#), the American Sport Education Program, the Association for Applied Sport Psychology, and the Government of Alberta's Bullying Prevention in Sports program.

Sport-Related Concussions

by Tracey Covassin, Ph.D., ATC, and Robert Elbin, M.A.



Sport-related concussions continue to be a serious public health concern, as approximately 1.6 to 3 million concussions occur annually in the United States. Recent studies have shown increases in the prevalence and incidence of concussion in both high school and college athletes. Approximately 8.9 percent of all high school athletic injuries are concussions, while incidence rates for college athletes range from 5 to 7.9 percent. This article will provide a general overview of the

signs, symptoms, management, and treatment of sport-related concussion.

Definition of a Concussion

A concussion occurs when an athlete's skull contacts another object (i.e., an opponent, the ball, or the ground,) or comes to an abrupt halt (as in whiplash), causing the brain to rebound off of, or twist up against, the inside of the skull. These shearing forces can damage blood vessels that cause swelling and bleeding in the brain. Neurons can also be damaged, which impairs the brain's ability to transmit important information from one area of the brain to another. This damage causes the concussed athlete to experience a wide variety of symptoms and cognitive difficulties.

Signs and Symptoms of a Concussion

A concussed athlete may present a wide variety of symptoms and impairments (See table). A common misconception regarding concussive injury is that an athlete must experience loss of consciousness in order for a concussion to be diagnosed. However, several studies suggest that fewer than 10 percent of athletes who sustain a concussion actually experience loss of consciousness, whereas headache, dizziness, confusion, and disorientation are reported more often by concussed athletes.

Signs and Symptoms of Concussion

Amnesia	Confusion
Headache	Decreased appetite
Loss of consciousness	Tinnitus
Nausea	Slurred speech
Poor attention	Double vision
Dizziness	Fatigue
Irritability	Anxiety/depression
Intolerance to loud noise	Sleep disturbances
Intolerance to bright light	Emotional disturbances

How to Prevent a Concussion

Unfortunately, there is no surefire way to prevent a concussion from occurring; however, steps can be taken to reduce the chances of sustaining this injury. First, athletic equipment should meet recommended standards for safety. All helmets should be thoroughly inspected, re-conditioned, or replaced every year to ensure they meet safety standards set by the National Operating Committee for Safety in Athletic Equipment.

Second, athletes need to be taught proper tackling and heading techniques used in sports such as football and soccer, as both these sports have high incidence of concussion. Football players must be taught the dangers of the "spear" tackle (i.e., using the helmet as a battering ram). The National

Athletic Trainers' Association recommends football coaches mandate two educational sessions each year (e.g., pre-season and mid-season) for proper tackling techniques. Soccer players should make sure they use proper form to head a soccer ball as improper heading may increase the chances of sustaining a concussion.

Third, athletes, coaches and parents need to be educated on the signs and symptoms of concussion. Sports medicine professionals often rely on athletes to tell them if they are experiencing concussion symptoms. However, many athletes do not know the signs and symptoms of concussion, which cause many concussions to go undetected. Athletes who continue to play while concussed are at risk for more catastrophic injury (e.g., second-impact syndrome) if they sustain another concussion before recovering from the first one. This second injury can lead to persisting symptoms that can last for months, and can even be fatal in rare cases. Therefore, coaches, athletes and parents should not underestimate the seriousness of concussion, as athletes may often feel pressured to return to play prematurely.

Concussion Management

The initial management of concussion begins by addressing the ABCs (airway, breathing, circulation) of life support. If the athlete is unconscious, one must assume a neck or spine injury until proven otherwise. When a spinal injury has been ruled out, the extent of symptoms such as head and neck pain, dizziness, confusion, and amnesia must be determined. If the athlete has any signs and symptoms of a concussion, he or she should not return to play and should be referred to a physician. If you are not sure if an athlete has suffered a concussion, follow this motto: "When in doubt, sit them out!"

Concussion Treatment

Concussed athletes should also be regularly monitored for any signs of deterioration and receive a full medical evaluation following injury. The recommended return-to-play process includes:

1. No activity, complete rest
2. Light aerobic exercise such as walking or stationary cycling, no resistance training
3. Sport-specific exercise and progressive addition of resistance training
4. Non-contact training drills
5. Full-contact training after medical clearance
6. Game play

If concussion symptoms reappear, the athlete should revert back to the previous asymptomatic stage and resume the progression after 24 hours. These guidelines

allow for a more individualized approach when returning an athlete back to competition from concussion.

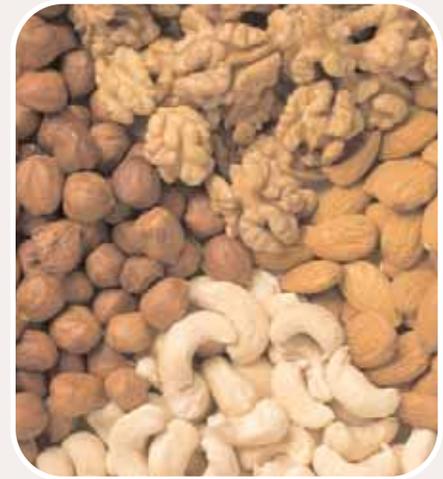
Conclusion

In summary, each sport-related concussion should be treated individually. Concussions can be a serious injury if mismanaged, but with proper education and precautionary measures, concussed athletes can experience a full recovery and return to participation.

THE ATHLETE'S KITCHEN:

Nuts and Athletes: Love 'em or Leave 'em?

by Nancy Clark, M.S., R.D.



Athletes often have a love/hate relationship with nuts. They love them, but try to stay away from them. "I don't dare keep a jar of cashews in my house. I'd end up eating them all and gaining weight," complained one rower. Although she knows nuts are healthful and good for her, the over-ruling perception is nuts are "so fattening."

While nuts are indeed a calorie-dense food, the good news is nut-eaters are not fatter than people who avoid nuts. That's because nuts are satiating; that is, they stay with you and keep you feeling "fed." A medium-sized handful of nuts (150 to 200 calories) for an afternoon snack often ends up being lower in calories than the 100-calorie pack of crackers that leads to another and yet another 100-calorie pack because you are still hungry. Snacks like crackers, pretzels and rice cakes fail to keep you satiated because they lack fiber, protein, and fat — and that's what nuts have to offer.

A study with overweight teens highlights this point. The students were part of “The Family Lifestyle and Over-weight Prevention Program” in Houston. The teens were given a healthy after-school snack to help improve the quality of their diet: nuts and peanut butter along with fruits and vegetables (such as apple slices with peanut butter, baby carrots dipped in peanut butter, trail mix with peanuts and dried fruits). These snacks replaced the former popular choices of chips and snack cakes. The kids lost weight and kept it off — and, equally important, they liked the snacks.

When the afternoon munchies strike, I invite you to “go nuts” (in moderation) and observe the benefits of eating a handful of nuts. You may discover you are less hungry for a longer period of time.

If you are afraid the “handful” will turn into a “jarful,” remember the best way to take the power away from a “trouble food” is to eat it more often. That is, if you end up overeating nuts (or any food, for that matter), you may be thinking, “I just blew my diet by eating some almonds, so I might as well eat the whole jar to get rid of them. Then, I can get back on my diet.”

The solution to this problem is to change your relationship with nuts and acknowledge you like them: “I enjoy nuts so much, I’m going to eat them more often — at every meal and snack!” That way, you eliminate your fear of being denied of this favorite food. You won’t have to eat the whole jar, because another jar will be waiting in the pantry. While this might sound scary to overeaters, the reality is, after three days of eating nuts at every meal and snack, you likely will be content to cut back to enjoying nuts once or twice a day (or week) and they will no longer have power over you.

Which nuts are best?

Ok, so now that I have convinced you to include nuts in your sports snacks (and meals), you might be wondering about the best kinds of nuts to eat. The answer is each type of nut offers its own special health benefits. Almonds have a little more fiber than cashews; walnuts have a little more polyunsaturated fat than hazelnuts; peanuts have a little more vitamin E than walnuts — but no one nut is distinctly superior to another one. So, rather than get caught up in trying to choose the “best” nut, simply buy a variety of nuts for a variety of nutrients, flavors, and health-protective attributes. Try these variations:

- Slivered almonds on your morning cereal
- A peanut butter and banana sandwich at lunch

- Trail mix with cashews and dried fruit in the afternoon
- Walnuts in your dinner salad.

What’s so healthy about nuts for athletes?

Nuts offer far more than just calories. They are filled with hard-to-get nutrients that are often processed out of refined foods. Nut eaters tend to have a diet with overall higher nutrient quality. Nuts offer magnesium, niacin, vitamin E, copper, and manganese, as well as other phytochemicals that are health protective, like resveratrol (reduces heart disease).

If you are enjoying nuts as a recovery food after a hard workout, be sure to eat some carbs along with the nuts. While the protein and (healthful) fat in nuts abates hunger and helps build muscles, only carbs (re)fuel your muscles. Some carb/protein nut combinations include: peanut butter + banana; nuts + dried fruit; almonds + (packet of instant) oatmeal.

Calories in Nuts

An ounce of nuts—a woman-size handful or 1/4 cup— offers about 150 to 200 calories. Here’s how nuts compare:

Nut	Approx. # per oz.	Calories per oz.	Calories per nut
Almonds	28	170	6
Cashews	23	160	7
Macadamia	27	200	8
Peanuts	30	160	5
Pecans	15	200	13
Walnut	14	185	13

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recommend a good therapy program that improves the strength and balance of the muscles around the ankle joint. Proprioception refers to the body’s ability to sense the position and movements of limb and joints relative to one another. Ankle proprioception can be improved by doing activities on one foot as well as by using balance tools like waffle disks or balance boards. In one study from 2006, researchers demonstrated that a randomly selected group of high school soccer and basketball players were able to reduce their rate of ankle sprains by 38 percent with at least four weeks of a balance training program. Another successful method to reduce ankle sprains is the use of an ankle brace during high-risk sports like basketball or volleyball. Several studies have demonstrated that ankle braces reduce the number of ankle sprains by around 50 percent, even in individuals who have previously experienced sprains. Therefore, the best combination to prevent ankle sprains in your case would most likely be a good exercise program focusing on strength, balance and coordination in the lower extremities as well as protection (possibly with an ankle brace).

Q: What is the latest recommendation on stretching? Should I be doing it before I exercise or after?

A: As you may have heard, there isn’t strong, obvious, research-based evidence that stretching prevents any injuries, though it is certainly recommended by many in the health and fitness field. Nevertheless, flexibility and stretching is an important part of overall musculoskeletal health. Reviews of the existing studies involving stretching suggest that routine stretches, which are held (static) without bouncing, do not reduce overall injury rates. In laboratory-based studies of stretching, muscle stretching also does not seem to reduce delayed-onset muscle soreness in young healthy adults. Of course, certain sports require more flexibility than others, but in general, a good balance between strength and flexibility is desired. Warming up muscles beforehand appears to be helpful for reducing injury, but heavy stretching before exercise does not seem to reduce injury risk. Stretching should be done to the point of feeling the stretch, but not extreme pain. Usually after around 10-15 seconds, the tension of a stretch should decrease somewhat as tissue fibers lengthen. Take things gradually, and steadily improve flexibility. It takes at least six weeks of consistent training to get noticeable long-term improvements in one’s flexibility. People have a natural flexibility range as well, so there are some limits to how much flexibility one can gain. Keep in mind that there are possible detrimental effects of over-stretching for athletes, which can affect performance.