

## Preventing Fatigue-Related Injuries

Unfortunately, injuries are a part of soccer. As the athletic trainer for the Red-Bull New York, I've seen my share of soccer injuries. Bruises, cuts, and muscle pulls are common; joint damage and fractures are less common, but not rare. It's an intense contact sport, and a certain number of mishaps are inevitable. However, this is not to say that a lot of the injuries I see couldn't be prevented. On the contrary, with a little knowledge and diligence, you can greatly reduce the likelihood of injuries.



When discussions turn to preventing soccer injuries, they generally focus on equipment, and with good reason. Proper use of appropriate gear, including proper footwear, shin guards, and a mouthpiece, is probably the most effective way to reduce the incidence of some contact-related injuries. Another measure that is often talked about is fair play, and I'm a big proponent of this one, as well. From the very beginning, youth players must be taught to avoid cheap shots and other risky moves that could unfairly jeopardize the safety of their opponents.

There are other means of preventing injuries that receive little attention, however. I'm talking about **fending off fatigue**. Recently, researchers at the University of North Carolina completed a three-year study on youth soccer injuries sponsored by Nike. They found that nearly 25 percent of soccer injuries occur during the last 10 to 15 minutes of games. The English FA has similar findings. Fatigue appears to be a cause of this disproportionate occurrence of injuries late in matches. When players get tired, their reaction time slows and their judgment deteriorates.

Another study, performed at the University of Kentucky demonstrated how fatigue can put athletes at risk. Nineteen female basketball and volleyball team members took part in the study. Players performed repeated series of running and rapid stopping drills. They measured the women's muscle activation patterns and ground reaction forces at several points during the workout and found that muscle activation during rapid stopping was delayed when players became fatigued, *rendering the knee less stable and more prone to injury*.

### The Role of Conditioning

By helping players maintain their muscle energy stores during a game, coaches can avoid compromising the ability of their athletes to perform at their highest level and stay healthy. There are a couple ways of doing this. The first is conditioning. In my opinion, too many youth soccer coaches pay too little attention to conditioning their players. There's a tendency to view conditioning as a grown-up concern and skills as the most important concern for youngsters. I'd like to see more coaches enhance their players' aerobic and anaerobic endurance with appropriate drills, scrimmages, and even off-the-field exercise.



Although injury prevention is the most important result of better aerobic and anaerobic endurance, it also affects wins and losses. I believe that conditioning has a tremendous influence

on game outcomes. There's no substitute for talent, of course, but talent without endurance is no better than endurance without talent. So many games are decided in the final minutes when fatigue is a factor.

### Fueling Up

A second way to delay fatigue during games is to **supplement nutrition** leading up to a game with proper in-game nutrition. *The primary causes of fatigue in soccer are dehydration and depletion of energy stores in the muscles.* As little as a 2% loss in body fluids (water and electrolytes) through sweating will negatively impact cardiovascular performance. Soccer players can easily lose twice this amount during a game. Carbohydrate is the primary fuel that powers the muscles during high-intensity exercise. The average player cannot store enough carbohydrate to last an entire game, so it's important to take in additional carbohydrate during the game.

A quality sports drink can supply the fluid, electrolytes, and carbohydrate a player needs to maintain performance in the third period. Drinking water alone will not do the job. In a study performed by researchers at the University of South Carolina, players who consumed a sports drink during high-intensity soccer workout were able to continue running 37% longer than players who drank only water.

Most sports drinks are very similar. The typical sports drink contains 6-8 percent carbohydrate and enough electrolytes to offset sweat losses. However, new research coming out of the University of Texas may alter our view of what constitutes an ideal sports drink. Recently, a team of scientists led by Dr. John Ivy evaluated the effect of a sports drink containing carbohydrate and protein in a 4 to 1 ratio versus a conventional sports drink containing no protein, during exercise.

*The results were impressive.* Consuming the 4 to 1 sports drink led to a 24% improvement in endurance as compared to the conventional drink and 54% improvement as compared to water. The combination of carbohydrate and protein in this ratio can help soccer players maintain energy in the later stages of competition or training. This will help them perform better and help keep them from falling victim to fatigue-related injuries.

I tell players to drink about 12 ounces of a sports drink about an hour before a game and to drink 7-10 ounces every 15 minutes during a game. A sports drink containing carbohydrate and electrolytes is better than just plain water. Also, players should consider using one of the newest sports drinks, such as Accelerade, that contain protein in a 4-1 ratio with carbohydrate and have been shown to significantly improve endurance and delay fatigue compared to a conventional sports drink. By doing so they will be less fatigued in the latter portion of games and less likely to get hurt.



**Not every soccer injury can be prevented. But by conditioning their players properly and encouraging good exercise nutrition habits, they can greatly reduce the number of injuries that occur as a direct result of fatigue.**

