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Gearing Up:
How PTs Work With Manufacturers to Help Patients

Net Gains

Physical therapists help soccer players—both amateur and professional—stay at the top of their game

By Keith Loria

Later this month, more than 700 million viewers from around the world will watch the quadrennial World Cup. Teams representing 32 nations—ranging from Algeria to Uruguay and including the United States—compete in the month-long tournament. (See "About the World Cup.")

While not everyone in America is a die-hard soccer fan, followers of the sport will tell you that it is an intricate, fast-paced battle that showcases some of the world's best conditioned athletes with spectacular offensive and defensive maneuvers.

But with the competition comes injuries. A growing number of professional, college, and amateur players are relying on physical therapists (PTs) to help prevent injuries and to assist in their recoveries.

For example, last September, Steve Ralston—New England Revolution captain, and Major League Soccer's all-time leader in games started—suffered a torn ACL in his right knee, after landing awkwardly while attempting to go for the ball.

"My PT has me doing a ton of things. Everything from squats to leg presses to pulling a sled, to walking backwards on a treadmill. It was a slow progression the first 6 weeks, but now I'm at the stage where I can do some running and straight ahead moves, and I'm trying to strengthen my quad," says the 36-year-old Ralston, who has earned 36 caps—appeared 36 times—with the U.S. Men's National Team.

John Gallucci Jr, PT, is the medical coordinator for Major League Soccer. Throughout his years tending to soccer players, he has witnessed just about every injury an athlete can experience.

"The most common are lower extremity injuries. You see a tremendous amount of foot and ankle injuries, as well as a lot of knee, hip, and groin injuries," he says. "After that, we see concussions and facial lacerations due to the contact and aggressiveness of the game."

"Soccer is particularly challenging because it's one of the few sports where the lower extremities require exceptional, controlled action, as opposed to functioning primarily to stabilize the body and move it forward," explains Dan Alma, PT, with Excel Physical Therapy and Fitness in Pennsylvania.

Mike Shirilla, PT, DPT, the physical therapist for the Chicago Red Stars of the Woman's Professional Soccer League, deals with many lower extremity injuries with the field players, including injuries to the ankle, hamstring, hip flexors, knee, and pelvic areas.

If a player injures her ankle during a game, initially the team's athletic trainer, Laura Behr, will go on the field. Shirilla takes over for the post injury treatment.


Alma


Shirilla

"It's typically rest, ice, compression, and elevation. Then I address the neuromuscular balance components," he says. "I focus on dynamic stability, working in all planes, not just forward and back."

Ara Uebelhor Knepp, PT, DPT, CSCS, physical therapist for Major League Soccer's Chicago Fire, says she encounters a number of overuse injuries to the leg, with plenty of hamstring strains, quad strains, and adductor tendinitis.

In her 4 years on the job, though, she most often sees pelvic issues.

The Challenges of a "Lopsided Sport"

"Soccer is a lopsided sport. Most of the guys are 80% one leg dominant. So most of the time they are kicking with one leg and planting with the other," Knepp says. "They use their hip flexor and quads on one leg and a lot of glutes and hamstring on the planting leg. This causes many issues with both the hip and the spine."

Because of the high demands that soccer places on their bodies, the players need exercises that focus on core strengthening, hip flexor stretching, abductor strengthening, and hip strengthening.

"I'm convinced soccer players are the best athletes in the world," Knepp says. "What I like as a physical therapist is that you get to be creative with your treatment plans and exercises. I can go with a really unusual exercise, and it's not even a challenge for a lot of these guys."

For recovery following hip labrum surgery, Gallucci says the most important factor in the 2 weeks following surgery is to decrease pain and inflammation.

"They you can start passive range of motion exercises and progress to active range of motion. A strengthening program begins with the abductors and extensors of the hips. An athlete can be back to play in 4 months depending on how well he or she progresses."

Gallucci is an advocate of hands-on interventions. He says specific exercises include general isometric exercises, resistance bands for strengthening, and pelvic stabilization.

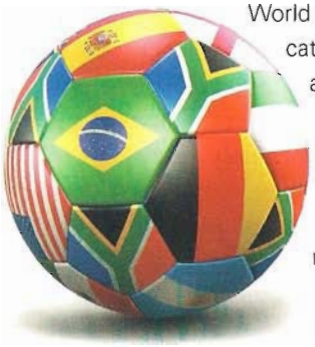
"We do a lot of lower core exercises when we get past the acute stage. We will do some abdominal work with simple partial sit-ups to isometric contraction vs. lower extremity, muscle energy techniques. It's a nice, slow, good healing progression."

Once full range of motion has been achieved, Gallucci will include functional exercises, such as squats, leg presses, and full

The 2010 World Cup

The FIFA World Cup, usually referred to simply as the World Cup, is an international competition contested by the men's national teams of the members of Fédération Internationale de Football Association (FIFA), the sport's global governing body. (In the United States, the sport is called soccer. In most of the rest of the world, it's called football.)

The 2010 FIFA World Cup, the 19th, will be held June 11-July 11 in South Africa. The 2010 FIFA World Cup will be the culmination of a qualification process that began in August 2007 and involved 204 of the 208 FIFA national teams. As such, it matches the 2008 Summer Olympics as the sports event with the most competing nations.

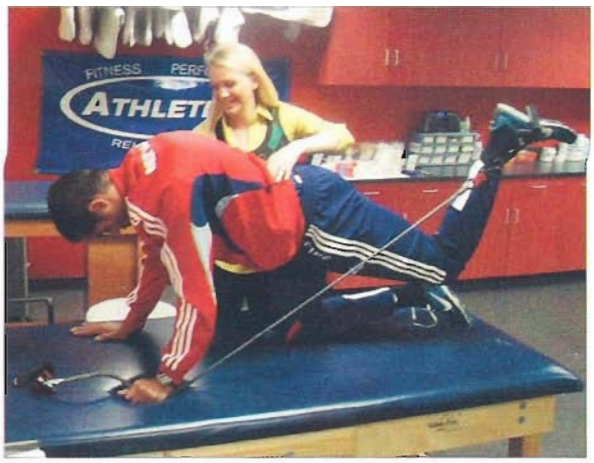


This will be the first time that the tournament has been hosted by an African nation.

The championship has been awarded every 4 years since the first tournament in 1930, except in 1942 and 1946 when it was not contested because of World War II.

The current tournament format involves 32 teams competing for the title at venues within the host nation(s) over a period of about a month. This phase often is called the World Cup Finals. A qualification phase, which takes place over the preceding 3 years, is used to determine which teams qualify for the tournament together with the host nation(s). The World Cup is the most widely-viewed sporting event in the world, with an estimated 715.1 million people watching the most recent World Cup in Germany in 2006. The 2014 World Cup will be held in Brazil.

Excerpted from 2010 FIFA World Cup. http://en.wikipedia.org/wiki/2010_FIFA_World_Cup Accessed April 12, 2010. Also excerpted from FIFA World Cup. http://en.wikipedia.org/wiki/FIFA_World_Cup Accessed April 12, 2010.



Ara Uebelhor Knepp, PT, DPT, CSCS, works with a player with the Chicago Fire.

lower extremity strengthening including muscles of the foot, ankle, knee and hip, and the activities to strengthen the core.

Alma has worked with soccer players of all levels and regularly works with college and recreational players to address injuries sustained on the field. Ankle injuries are among the most common ones he sees.

"A soccer game requires a lot of changes of direction, stopping, starting, and similar maneuvers. Much of what I do [for ankle injuries] is work on the player's balance. I start with stretching and resistance band exercises and often have them perform lunges, squats, step-ups, and step-downs," he says. "I have them pick things up off the ground while standing on one leg, pick things up with their eyes closed, and change directional activities to allow the ankle to withstand the stress it will encounter during a soccer game."

The physical therapists interviewed for this article stress that PTs also have a major role in injury prevention. For example, Gallucci says, "Usually soccer players have very, very tight adductors and tight hip flexors. One of our most important goals in the league is to improve players' flexibility in those two areas. We believe that if we can get more elasticity in the tissues, we can prevent more of the groin and hip injuries that are common to these athletes."

Fighting an Epidemic of ACL Tears

ACL tears have brought down a number of MLS' top players, such as Kansas City's Zoltan Hercegfalvi and Colorado's Conor Casey. However, "For the female athlete, the rate of ACL injuries is a lot higher," says Shirilla.

Christopher Lauretani, PT, is even more direct. "For female soccer players, one of the biggest problems I've seen is ACL tears. There is a major problem—even an epidemic—when you see 20%-30% of one team's players suffering from ACL tears." Lauretani is the owner of Symmetry Physical Therapy in Pelham, New York. He knows soccer well, having played both in college and throughout Europe. He currently is treating one of the nation's top-ranking high school girl soccer players and has worked with numerous high-level amateur, college, and professional athletes including several girls who played for the under-17 national championship club team.

The first step in addressing ACL injuries is prevention. Recent studies have found that specialized stretching, strengthening, agility and jumping exercises could lower the overall ACL injury rate among female athletes. [See "Warm-up Program Can Help Reduce Female Soccer Athlete ACL Injuries."]

If an ACL injury does occur, Lauretani says, "The most important factor following an ACL reconstruction, especially with a younger athlete, is education. They need to identify their goals. We work on getting their range of motion back, bringing the swelling down, and increasing the initial function. They are told how long the road to recovery will be, but they don't truly understand it until they get to rehab for the first time."

He has the girls start with a four-

Warm-up Program Can Help Reduce Female Soccer Athlete ACL Injuries

Several years ago, the American Physical Therapy Association (APTA) began urging female athletes—particularly soccer players—to consider a new warm-up program to help lower their growing risk of anterior cruciate ligament (ACL) injuries.

Concurring with a study published in the *American Journal of Sports Medicine*[1], APTA says specialized stretching, strengthening, agility, and jumping exercises could lower the overall ACL injury rate among female athletes.

The study evaluated outcomes of NCAA Division 1 female soccer players who performed the Prevent Injury, Enhance Performance (PEP) program, designed by physical therapists at Santa Monica (CA) Orthopedic and Sports Medicine Group. Those who performed the PEP program had an overall ACL injury rate 41% lower than a group of female athletes who did their regular warm-up. This was one of the largest studies conducted in the NCAA with 1,435 athletes participating.

The PEP program, one example of the many physical therapy-based programs that have demonstrated an equal ability to reduce ACL injuries among female athletes, consists of sport-specific agility exercises and addresses potential deficits in the strength and neuromuscular coordination of the stabilizing muscles around the knee joint. Holly Silvers, PT, MPT, who helped develop PEP, explains, "The program was created to address the deficits that are seen in female athletes, particularly weakness in the lateral hip muscles, gluteal, and core muscles." These deficits can contribute to ACL injuries, notes Silvers.

Mark Paterno, PT, MS, MBA, SCS, ATC, coordinator of orthopedic and sports physical therapy at Cincinnati Children's Hospital Medical Center, said that recent research found that ACL tears occur 4 times more frequently in females than in males involved in the same amount of sports participation.[2] He says the difference in neuromuscular control is one of 4 primary factors contributing to women's greater susceptibility to knee injuries. Other discrepancies are anatomical (men and women are structurally differently), hormonal (women's hormonal make-up affects the integrity of the ligament, making it more lax), and bio-mechanical (the positions of knees during athletic activities).

"Women perform athletic tasks in a more upright position, putting added stress on parts of the knee such as the ACL, resulting in less controlled rotation of the joint," Paterno says. "While men use their hamstring muscles more often, women rely more on their quadriceps, which puts the knee at constant risk. To combat these natural tendencies, physical therapists may develop a treatment program to improve strength, flexibility, and coordination, as well as to counteract incorrect existing patterns of movement that may be damaging to joints," he adds.

Silvers notes that physical therapist-designed programs can teach athletes how to avoid abnormal movement patterns and lessen stress on the knee, which may include exercises to strengthen hamstring and core muscles. "Whether patients are athletes or not, physical therapist expertise includes not only rehabilitation and restoration of normal levels of function, but also education regarding how to prevent further injury," says Silvers.

For a consumer handout on preventing ACL injuries, go to APTA's Web site at www.apta.org. Click "Information for Consumers" on the menu bar on the left. Then click "Consumer Tips," then "Preventing ACL Injuries."

References

1 Gilchrist J, Mandelbaum BR, Melancon, H, et al. A Randomized Controlled Trial to Prevent Noncontact Anterior Cruciate Ligament Injury in Female Collegiate Soccer Players. *Am J Sports Med.* 2008;36(8): 1476-1483

2 Nyer GD, Ford KR, Paterno MV, Nick TG, Hewett TE. The effects of generalized joint laxity on risk of anterior cruciate ligament injury in young female athletes. *Am J Sports Med.* 2008 Jun;36(6):1073-80. Epub 2008 Mar7.

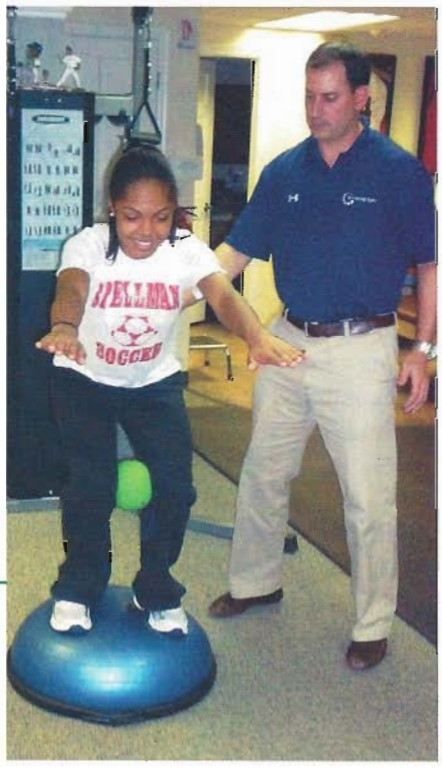
way leg raise to strengthen muscles around the knee and hip. He also says it is important to strengthen above and below the knee joint, so he has the athletes do some calf strengthening and hip exercises. Early on, they will work to isolate the hamstrings and glutes with exercises such as physioball crunches.

"We gradually begin a strengthening and flexibility program and progress them rather quickly if they respond well to treatment. Many of the exercises focus on quadriceps strengthening. The goal is to get the leg functional again," he says. "Hamstring activity and muscle balance are important. With adolescent athletes in general, flexibility is frequently a problem."

Shirilla stresses the importance of addressing multiple planes of motion to recreate what the athletes will be confronting on the field. "I have them work on landing techniques, coming down with quick bursts and speed training in a functional sport-specific fashion," he says. "We try to build coordination, muscular control, and overall strength. This is even more important for female athletes than for males because the prevalence [of ACL injuries] is so much higher."

On the other hand, when it comes to the amateur boys, Lauretani says he deals more with soft tissue injuries and muscle strains.

"We see a lot of growth spurt and overuse injuries like Sever's Syndrome



Christopher Lauretani, PT, MS, CSCS, CEES, works with Taylor Addison, a sophomore at Cardinal Spellman High School in the Bronx. Addison, ranked as one of the top 2 female high school soccer prospects, tore her ACL, MCL, LCL, and lateral meniscus in a game.

and Osgood-Schlatter's disease. The muscles aren't growing as fast as the bone, so stresses are put on the growth plates in both the knee and ankle joints," he says.

"The biggest problem for younger kids is a lack of understanding about strengthening programs and overuse," Gallucci says. "Some of the kids play on many different teams and are not getting a lot of downtime. This problem, combined with poor flexibility, can lead to in an increase in injuries."

Goalies: Fierceness And Aggression

Unlike the field players, soccer goalies are more prone to collisions on the field. Since the activity around the net can be some of the fiercest in the game,

they use their hands and arms more throughout a game, which creates additional opportunities for injuries.

"Goalies have to be aggressive. They frequently land on their shoulders, causing dislocations, and can experience finger and hand injuries," Shirilla says. "They also kick, which can cause muscle imbalances and strains."

"There are many opportunities for injury when they land with their arms outstretched," Lauretani says. "We see a lot of shoulder dislocations, AC joint separations, and rotator cuff and shoulder labrum tears."

For shoulder injuries, Lauretani recommends strengthening the shoul-

Mike Shirilla, PT, DPT, is the physical therapist for the Chicago Red Stars.

der stabilizing muscles by doing some resistance band internal and external rotation as well as light dumbbell work emphasizing those smaller muscles.

"We have many closed chain stabilization exercises performed on the floor that use only body weight for resistance. For example, the athlete will assume a push up position, stepping up on to a box and back down with his hands, then up onto a medicine ball. Another exercise involves throwing a medicine ball while standing on a trampoline to work the chest and back muscles."

The Need for a PT

In its first season, the Red Stars went without a physical therapist. This season, the team's athletic trainer, Laura Behr, felt it was necessary to add Shirilla to the staff.

"We wanted to institute an ACL injury prevention program. That's one reason we wanted to bring in a PT," she says. "Mike has tailored a program for each player and designs a rehab program for the athlete if she is having problems."

Alma believes that the fact that he plays soccer adds to his skills when called upon to handle soccer injuries. "My injuries have provided me with an insight into what patients are experiencing," he says. "I have learned which types of injuries need rest and which will tolerate play."

Meanwhile, another injured player will soon get back on the field. After 14 years in Major League Soccer, New England Revolution captain Steve Ralston signed to play in the inaugural season for the North American Soccer League's AC St Louis club, where he also will serve as assistant coach. Healing from his torn ACL, he expected to take to the field in time for games in May.

"For me, working with a physical therapist has been huge in my recovery," Ralston says. "It's been nice to have someone pushing me every day, but not pushing me too far. They know what they are doing, and they guide me in the right direction." PT

Keith Loria *is a freelance writer.*