Written by the medical coordinator for Major League Soccer, a nationally recognized physical therapist who treats athletes of all ages and abilities, Soccer Injury Prevention and Treatment is a comprehensive, illustrated guide to the best training, strengthening, stretching, nutrition, and hydration regimens to keep athletes of all ages and abilities safe and on the field. You'll learn:

✱ Ways to prevent the most common soccer injuries, including ACL tears, ankle sprains, calf strains, and shin splints
✱ To identify the signs and symptoms of injury and when to seek treatment
✱ How to stop nagging injuries from becoming chronic problems
✱ Exercises to build endurance, flexibility, and power while protecting your body from harm
✱ The LESS program, a targeted lower body strengthening plan to prevent injury

“An important resource for soccer players of all ages and abilities.”

— Don Garber, Commissioner of Major League Soccer

“Deliver(s) expert advice on injuries and how to prevent them. John Gallucci’s insight provides parents, coaches, and players with an invaluable soccer medicine resource.”

— Sunil Gulati, President, United States Soccer Federation


— Larry Lemak, MD, Medical Director of Major League Soccer

John Gallucci Jr., MS, ATC, PT, DPT is the medical coordinator for Major League Soccer (MLS), and the president of JAG Physical Therapy, managing eight outpatient physical therapy sports medicine centers in New York and New Jersey. Gallucci serves as a sports medicine consultant for many NFL, NHL, NBA, MLB and MLS athletes. He has appeared on ESPN's award-winning Outside the Lines, Fox 5 News, and WFAN and has been featured in the New York Daily News and First for Women, among numerous other media outlets. Visit him at www.JAGPT.com and www.JAGPEDIATRIC.com.
Praise for *Soccer Injury Prevention and Treatment*

“The health and welfare of our players is a top priority. As a major league sport, we are constantly evaluating our programs and procedures to ensure our athletes are operating at peak performance. In *Soccer Injury Prevention and Treatment*, John Gallucci has done a terrific job outlining some of the most common soccer injuries and explaining what any athletes can do—from an amateur to a professional—to prevent injuries before they occur. John’s book serves as an important resource for soccer players of all ages and abilities.”

—Don Garber, Commissioner of Major League Soccer

“During my more than 30 years working in soccer in the United States, the game has developed in many areas on and off the field. While not always discussed, injury prevention is an important aspect in helping us continue to grow the game at all levels. *Soccer Injury Prevention and Treatment* does an outstanding job at delivering expert advice on injuries and how to prevent them. John Gallucci Jr.’s insight provides parents, coaches, and players with an invaluable soccer medicine resource.”

—Sunil Gulati, President, United States Soccer Federation

“As a player who experienced a handful of nagging injuries throughout my career, I know firsthand how important it is to take the time to prepare your body for the rigors of your sport. This book not only describes common soccer injuries and the treatment process, but goes into detail about how to prevent these injuries to keep you on the field and at 100%. The knowledge and resources outlined in John Gallucci’s book would have been invaluable to me if available during my tenure as a professional athlete.”

—Claudio Reyna, Sporting Director, New York FC

“I have had a lifelong interest in sports medicine, stretching back to my days as a high school and college athlete. Throughout my career I have served as head orthopedic surgeon for a handful of professional sports teams, including the New York Red Bulls. During my experiences, I have seen countless injuries and have always stressed the importance of education to not only my patients, but their coaches and parents as well. John’s book does a great job of giving a true understanding of sports medicine knowledge, written and executed in a way that makes it easy to follow, understand, and absorb.”

—Dr. Decter, Former New York Red Bulls Team Physician
“I’ve known John for the past 10 years and can attest to his dedication and commitment to his patients and practice. John was instrumental in keeping me in peak shape to perform at an elite level even into my late thirties. This book is a must read for any athlete who plays sports. The lessons and practices in this book are invaluable and can help you perform at your best!”

—Jeff Agoos, Vice President of Competition, Major League Soccer

“An excellent book! I’ve worked closely for many years with John Gallucci to offer the highest quality sports medicine care and resources for the athletes of Major League Soccer. In 2001, I founded the National Center for Sports Safety after identifying a need to decrease the number and severity of injuries to youth, recreational, and high school athletes. Soccer Injury Prevention and Treatment follows the same principles and gives the reader a wealth of information about common soccer injuries, and more importantly, proactive preventive measures.”

—Dr. Larry Lemak, Medical Director of Major League Soccer

“I’ve been treating and researching sports specific musculoskeletal injuries for nearly two decades and I’m confident in saying that Soccer Injury Prevention and Treatment is an exceptional tool for medical professionals and athletes alike. This book covers it all, from nutrition to concussions and injuries of all kinds. It’s second to none for knowledge on prevention and getting players back out on the pitch after injury.”

—Dr. John G. Kennedy, Orthopedic Surgeon, Hospital for Special Surgery, New York, NY

“I’d like to say I’ve seen it all when it comes to injuries, both during my years as a professional soccer player and now as a youth coach. You always hate to see a player on the sidelines due to injury, and as a coach I am constantly educating my athletes on how to properly prepare for the game of soccer. John does a great job of using his expertise and knowledge and putting it out there for the masses to utilize. As a former athlete and coach, and as a parent, this book is a must read!”

—Tony Meola, U.S. Soccer Hall of Fame Goalkeeper

“Soccer Injury Prevention and Treatment is a great resource for athletes looking to compete and progress on the soccer field. The attention to detail that John utilizes while describing each injury makes it relatable to parents, players, and coaches as they educate themselves on common soccer injuries. As a sports medicine physician, I am always preaching that “prevention is key,” and this book thoroughly outlines techniques used to prevent injuries, not only in text form, but by providing pictures and charts that make the content relatable and easy to understand.”

—Dr. Hutter, Former Assistant New York Red Bulls Team Physician
"As Senior Director of Supporter Relations and Safety at Major League Soccer, I too often see players out due to injury. Soccer Injury Prevention and Treatment is a great go-to guide for the non-medical professional, explaining what you need to know in detail, defining terms, and providing visuals to supplement the text. John Gallucci helps players, coaches, and parents by providing education and understanding about the causes of injuries and the proper path to recovery."

—Evan Dabby, Senior Director of Supporter Relations and Safety, Major League Soccer

"Soccer has been in my life since the day I was born. My father is a long-time coach, and at the age of sixteen I signed my first professional contract with Major League Soccer. Throughout my youth years I sustained several injuries, and John Gallucci assisted in my care. John’s Soccer Injury Prevention and Treatment does a great job of taking the questions that players, coaches, and parents have regarding soccer injuries, and thoroughly explains the entire process from start to finish. More important, the emphasis on injury prevention serves as a great resource for athletes at all levels, because no matter what level you play at, the last thing you want to do is watch from the sidelines."

—Michael Bradley, Professional Soccer Player, Toronto FC, U.S. National Team

"I have sent numerous patients to John over my many years in practice and they have had not only exceptional care but have been able to return to high level of sport. He has also instructed many of my non-surgical patients in prevention programs, which has had much success in helping to prevent lower extremity injuries. Soccer Injury Prevention and Treatment is a must-read for parents, players, and coaches throughout the soccer community."

—Dr. Beth Shubin Stein, Orthopedic Surgeon, Hospital for Special Surgery

"Having worked as a team physician throughout all levels of athletics, I put a huge emphasis on keeping my athletes physically fit and at the top of their game. Unfortunately, injuries do happen, and when they do it is my job to get that athlete back to 100% as quickly and effectively as possible. In Soccer Injury Prevention and Treatment, John Gallucci Jr. does a great job of providing education on the recovery process, allowing parents, players, and coaches to take a proactive approach in getting back on the soccer field."

—Dr. Riley J. Williams, Orthopedic Surgeon, Hospital for Special Surgery, Head Team Physician, New York Red Bulls

Published by Demos Health
"John Gallucci was an integral part of my success as a soccer player at Harvard University. John understands what it takes physically, mentally, and emotionally to compete at the highest level. Not only does John provide exceptional treatment, he is a specialist in injury prevention, focusing on individualized care well beyond return to sport. Thanks to John I was able to be the best and healthiest athlete that I could be."

—Katherine Sheeleigh, 2010 Ivy League Player of the Year, Soccer America All-American
SOCcer Injury Prevention and Treatment
SOCCER INJURY PREVENTION AND TREATMENT

A Guide to Optimal Performance for Players, Parents, and Coaches

John Gallucci, Jr., MS, ATC, PT, DPT

Published by Demos Health
I would like to dedicate this book to my wife, Dawn, and my children, Stephanie and Charlie. Your support and love help me persevere each and every day. Your smiles give me the drive to go after my dreams and accomplish my goals.
CONTENTS

Foreword by Tab Ramos xiii
Introduction xix
1. Youth Injuries 1
2. Overuse Injuries 13
3. Foot and Ankle Injuries 35
4. Knee Injuries 57
5. Hip and Thigh Injuries 79
6. Spinal Injuries 99
7. Injuries to the Upper Extremities 117
8. Concussions 137
9. Strength and Conditioning 147
10. Hydration and Nutrition 157
JAG Physical Therapy LESS Program 171
Glossary 185
Acknowledgments 191
Index 193
FOREWORD

Tabaré (Tab) Ramos Ricciardi was born in Uruguay, and emigrated to the United States with his family in 1978. They settled in New Jersey, where Ramos was a soccer star at St. Benedict’s Preparatory School in Newark. He went on to play at North Carolina State University, where he was a three-time All-American. Ramos played professionally for 13 seasons in Spain, Mexico, and the United States. He was the first player to sign with Major League Soccer, where he played seven years and was a three-time All-Star with the MetroStars. Ramos’s U.S. National Team career began in 1988 and ended in 2000, and included three World Cup appearances. He was elected to the National Soccer Hall of Fame in 2005 and to the U.S. Soccer Federation 100th Anniversary All-Time Best XI in 2013. He is currently the U.S. Soccer Federation Youth Technical Director and head coach of the U.S. U-20 national team.

I basically grew up with a soccer ball at my feet. My father played professionally in Uruguay, for CA River Plate in Montevideo, but my mother was actually the bigger fan of the game. I always remember her in the kitchen, cooking something with a soccer game on in the background. There wasn’t a lot of soccer
on TV back then, so she’d find a tape of an old game or watch a replay of a game on Univision. My mom and I really connected because she watched soccer all the time.

And I played it all the time.

We came to this country when I was 11 years old. It was strange and difficult for me. I had taken English classes in Uruguay, but I could only say things like “the cat is under the table.” Nothing useful. So I spent about six months playing soccer by myself on the playground, just kicking the ball around on my own. And then one day, a kid came up and asked to play with me, and asked if I was interested in signing up for recreational soccer. I did, and I played for one day.

The field was too small and I was way too advanced. They took me to a travel team in Kearny, which had a lot of people with European backgrounds. I began playing with the children of immigrants from Ireland and Scotland and other countries where soccer is the most popular sport. Playing sports always helps you make friends, so being involved in soccer really helped me at that time. Being a good player made it even easier to meet people, make friends, and be accepted into the culture.

There wasn’t a point when I realized a pro career was going to happen, but my motivation was always to play professional soccer. It was all I wanted since I was six or seven years old. All my parents wanted was for me to get an education, so for them, that was what mattered. Today, games are so important to players and to parents, but to my parents, how I did in school was what was really important. A bad grade in school meant I was not allowed to play soccer, end of story. It didn’t matter if it was a regional final or just another indoor game. My coaches would call, and my parents would just say, he’s not playing, that’s it.

Things are so different now. Parents are so involved. Probably too involved. My father would be the first to say he was not very involved in my development as a soccer player. He played professionally, yes, and he would go to my games and yell, but he was not one to be involved in terms of making sure he took me to practice, or got me on the best team. There was none of that, because my parents had to go to work. If I said I had practice on Thursday at 5:00, they would tell me to find my own way if I wanted to go. So I’d find a ride or get on my bike. It’s just how sports were back then, at least in my family. All the time,
I think about how much things have changed since then. I’m the broken-record parent, telling my son and my daughters over and over that they can’t go anywhere by themselves. I pick them up and take them everywhere, and do my best to get them in the right situation and make sure they develop properly.

Because education was so important to my parents, there was never any question that I would go to college. University of Virginia and North Carolina State University were my final two choices, but my parents basically decided I would go to NC State because the coach was an Argentine and they could speak with him about my grades and about soccer. They didn’t really want me to go far away for school, but since Uruguayans and Argentinians are basically the same people, they felt very comfortable with me going there. I remember picking up the phone one day and hearing the NC State coach saying, “Congratulations, welcome aboard!” I hadn’t even decided yet, but that’s where I was going. My parents had decided for me.

I made the U.S. U-20 team when I was 15 years old, and played my first game for the senior national team when I was 21 years old. I’m happy to have played on the national team for so long, and proud to have played in the Olympic Games and the World Cup. They’re all great memories. I’m also proud of being inducted into the Hall of Fame and even more importantly to be on U.S. Soccer’s All-Time Best XI. All my life, I dreamed of being a professional player, but being named to the best team of all time is beyond anything I could have imagined.

I was a good player, but I also had many injuries. I didn’t have anything chronic as a kid, but I had ankle issues and would miss a week here and there. We played on bad fields all the time. But I was lucky to not have anything very serious until my mid-20s. I had my first knee surgery when I was 26 years old, to repair cartilage, and I’ve had nine knee surgeries in total.

I played seven seasons with the MetroStars of MLS, and that’s where I met John Gallucci, who was the team athletic trainer and physical therapist at the time. John was instrumental in helping me through countless soft tissue injuries; muscle strain and tendinitis plague every soccer player, but with proper care and treatment, their effects can be minimized. John’s wisdom and education and his special way of handling athletes always got me back on the field.
John is still helping me today. As a coach with the Youth National Team, I’m very involved in my practices and often suffer bumps and bruises. I recently had another knee surgery, and did my rehab with John at JAG Physical Therapy. My local soccer club, the New Jersey Soccer Academy, uses John and JAG PT as athletic training and physical therapy resources for all its athletes. John’s expertise is a valuable tool, and any time I have a question about the training or treatment of one of my athletes, or about myself, I find myself reaching for the phone to call him.

I know now that with some of the simple techniques available today, a lot of injuries can be prevented. Nowadays, there are so many ways to prepare that we didn’t know about when I was playing. For example, I use the foam roller every day now, and I can’t believe someone didn’t discover that thing 20 years ago. It’s such a simple concept. We don’t let the U-20 kids leave without foam-rolling. I would have limited a lot of the muscle tears that I had if I had a better understanding of how to take care of my body when I played.

There are so many ways to strengthen the legs to prevent injury. At every level, injury prevention is extremely important and taken very seriously among all pro teams, and we need for that level of preparedness and awareness of how to prevent injuries to trickle down to the lower levels. Younger players and their parents and coaches need to be educated on how to specifically prepare for the sport of soccer.

For soccer, athletes need to work on speed, agility, and balance. These are all things we didn’t work on in the past that are so effective for preventing injuries, and many are so easy they can be done in five minutes in your living room. It’s just about spending a little extra time and being focused and dedicated to your sport.

This book is going to be a great tool for parents, coaches, and youth athletes to use to educate themselves about injuries that can happen to every soccer player and how to prevent them, and take care of them should they occur. There is so much information available now over the Internet, and a lot of it doesn’t offer proper guidance and doesn’t come from medical professionals. This book can help everyone wade through the sea of information and just get to what’s right.
If soccer players are suffering constant injuries, they’re probably not doing the right things to prepare to play. Hopefully, parents, coaches, and players will read this book and come to the soccer field better prepared. I hate to see players get discouraged due to nagging injuries and walk away from the game, because soccer is such a great sport. The running, jumping, flexing, and turning involved in soccer are all movements that bodies of all ages can really benefit from.

And soccer is fun. Of course, that counts, too.

Tab Ramos
INTRODUCTION

As I write this book, I look back at the tremendous growth of the game of soccer over the last 25 years. According to FIFA (Fédération Internationale de Football Association, the international governing body of soccer), there are 265 million male and female players, along with five million referees and officials, actively involved in the game of soccer worldwide. That’s 4% of the world’s population.

Also according to FIFA, there were over 24 million Americans playing soccer as of 2006, and 30% of American households contain at least one person who plays soccer. Those figures are second only to baseball, which has always been America’s game. But as Latin American immigration into the United States has increased, so has the popularity of soccer. The globalization of the game, the ongoing presence of U.S. teams in international competitions, and the continued building of soccer-specific stadiums in this country have also contributed to the popularity of the game.

A 2012 ESPN sports poll ranked soccer as the second most popular sport in the country for 12- to 24-year-olds. Soccer has also grown in popularity as a spectator sport; increasing numbers of Americans, having played the game in their youth, are now avid fans of the game.
Introduction

With the rise in popularity of the sport has come an increase in the incidence of injury for soccer players of all ages. As medical coordinator for Major League Soccer (MLS) and owner of JAG Physical Therapy, I see the injury statistics first-hand; not just from MLS but also from youth leagues, international professional leagues, and the NCAA. My job responsibilities also include overseeing the medical care throughout MLS and assisting and implementing the development of our Medical Policy and Procedures Manual. The goal is to prevent and treat soccer injuries efficiently through top medical care and resources.

Over three million youth players are registered with U.S. Soccer, but countless players, from 6 to 75 years old, take to the field every day in the United States. This accounts for innumerable emergency room and doctor visits, along with hours and hours of rehabilitation with a physical therapy or athletic training professional similar to myself.

In February 2010, the Journal of Pediatrics reported that soccer has a higher injury rate than any other contact sport, such as basketball, football, field hockey, and lacrosse, with players 15 years of age and younger at a higher relative injury risk when compared with older players.

The goal in writing this book is to combine my education as an athletic trainer and physical therapist, my years of experience, and my clinical aptitude to try and keep players on the field, be they U.S. National Team players, professional players, college players, high school players, club players, or just recreational players trying to keep fit. I will give a detailed look at every joint and the common soccer injuries that affect them, and will simplify the diagnosis, mechanism, treatment, and prevention of each of these injuries. I hope this book becomes a resource for players, coaches, referees, and parents to assist in keeping our players safe, healthy, and on the pitch.

You will see many references within this book to JAG Physical Therapy’s Lower Extremity Strengthening System, or LESS Program. Many lower body injuries can be prevented if the muscles of the lower body and core are strengthened in preparation for activity. The LESS Program is listed in its entirety on page 171–184 for easy incorporation into any athlete’s training program.

While I was finishing my master’s degree in athletic training and my doctorate in physical therapy, I was always interested in
teaching athletes about how to take care of their bodies. I have always told parents, coaches, athletes, and medical professionals, “Your body is your tool. You need to take care of your tools to accomplish your goals.”

Over my 22-year career, I have seen many different types of sports medicine injuries. My time with New York University, Columbia University, and the New York Knicks gave me a platform of experiences and education to prepare me for the last 16 years of my career as a sports medicine professional.

My career with MLS began when I started doing rehabilitation on surgical cases with the MetroStars. I had the opportunity to stay with the team through many changes in management and ownership, as the league grew and other teams and owners were brought in. The team later became known as the New York Red Bulls, and I became their head athletic trainer.

I used that position to educate more and more soccer enthusiasts about injuries and their prevention. Major League Soccer executives were so impressed with my knowledge and experience that they made me the league’s medical coordinator in 2006. This position has afforded me the opportunity to work with not only our players but with soccer medicine colleagues from around the world. In any given week, I find myself consulting with professionals from soccer federations such as the English Premier League, Germany’s Bundesliga, and Spain’s La Liga. I regularly confer with U.S. players such as Tim Howard, Claudio Reyna, Tab Ramos, and Michael Bradley and have become a medical resource to the soccer community.

Along with my background and experience in the realm of professional soccer, I also own and operate JAG Physical Therapy, a private outpatient orthopedic sport physical therapy company with eight facilities in New Jersey and New York. At JAG Physical Therapy, I treat patients of all ages, shapes, and sizes, which allows me to utilize my expertise on not only the professional athlete, but on the youth athlete and weekend warrior as well. Whether you are playing your first game as a child, or are a businessman kicking the ball around with a few friends, injuries can occur. I work hard every day to get people back to 100% so they can continue doing what they love to do.

It is my hope that soccer enthusiasts will read this book and become much more versed in the soccer player’s body and how
it works during the game. Parents will understand how to seek treatment for the various injuries their children might suffer. Coaches will have a better understanding of how to prevent injuries during games and practices. Players will be better able to prevent nagging injuries and understand the rehabilitation process when it comes to more serious injuries, like chronic ankle instability or the very common anterior cruciate ligament tear. Readers will take away simple soccer conditioning, strengthening, flexibility, nutritional, and hydration techniques that will keep them playing the game instead of watching from the sidelines.

So let’s move forward and learn. As my long-time friend and legendary American soccer coach Bob Bradley would say, “Let’s get stuck in and compete.”
SOCCER INJURY PREVENTION AND TREATMENT
As coaches and parents working with youth athletes, our primary concern should be their proper growth and development. No matter what stage of their career that athletes are in, growth and development is cyclical and there is always room for improvement. By varying training regimens and keeping them fun and interactive, we can be certain our children are learning what it takes to be successful not only on the field, but also in life.

Of course, we wouldn’t have a topic for our book if it weren’t for the injuries in soccer that are inevitable! Injuries specific to the youth athlete often arise from various growth patterns and disorders, combined with acute or chronic trauma. But even these youth-specific conditions can be easily managed with proper care and a logical treatment progression.

SEVER’S DISEASE

Sever’s disease, or calcaneal apophysitis, is a painful bone disorder resulting from inflammation in the calcaneal epiphyseal
plate, or growth plate, in the heel. A growth plate is an area of growing tissue at the end of a developing bone. Over time, cartilage cells change into bone cells and the growth plates expand and join together, which is how bones grow.

The calcaneal epiphyseal plate is the growth center of the heel bone where the Achilles tendon attaches at the heel (see Figure 1.1). Sever’s disease is a common cause of heel pain in growing kids, especially those who are very active. This condition typically arises during the growth spurts in the adolescent years—between the ages of 8 and 13 for girls, and 10 and 15 for boys. During these years, adolescents are experiencing rapid growth with immature bone transforming into fully matured bone. Sever’s disease rarely occurs in older teenagers because the growth plate in the heel typically hardens by age 15.

**Mechanism of Injury**

During an adolescent growth spurt, the heel bone can grow faster than the leg muscles and tendons around it. This causes the muscles and tendons, especially the Achilles tendon or heel cord, to become very tight and to pull directly on the growth

![Figure 1.1 Anatomy: Calcaneus with Achilles attachment.](image-url)
plate in the calcaneus, or heel bone. This increase in stress and tension, which is exacerbated with activity, causes an irritation at the heel. Over time, repeated stress can damage the growth plate, causing the swelling, tenderness, and pain of Sever’s disease.

Though Sever’s disease can occur in any growing child, certain conditions, such as pronated feet that roll in at the ankle, flat or high arches, short leg syndrome (where one leg is shorter than the other), and childhood obesity may increase the chances of its development.

**Signs and Symptoms of Sever’s Disease**

The symptoms of Sever’s disease are seen most often in the running athlete (which, of course, includes soccer). Complaints most often include heel pain, tightness, swelling, and sometimes bruising. The pain will increase with running and jumping activities, and may be exacerbated with a tight shoe or boot.

**Treatment of Sever’s Disease**

If Sever’s disease is identified early on, treatment can be successful and will limit any long-term difficulties that might arise. Take note of when the athlete begins to complain of heel pain, so a doctor or physical therapist can assess how the symptoms are progressing.

The initial goal in the treatment of Sever’s disease is pain relief through a decrease in inflammation. The best way to accomplish this is with the RICE protocol: Rest, Ice, Compression, and Elevation.

Icing at the heel is best done with an ice cup (see Figure 1.2), for approximately 15 minutes, four times per day. Once the initial inflammatory response has subsided, a flexibility program can be started for the Achilles tendon to limit the tension being placed on the growth plate. The goal is to increase the elasticity of the calf muscles and associated tendons that insert at the calcaneus (see Figure 1.3).

No treatment can change the course of a child’s growth spurt, nor can we determine when growth spurts will begin and how long they will last. Should symptoms arise, they must simply be treated appropriately with rest and modified activity. Rest is
### RICE Protocol

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<tr>
<td>Rest</td>
<td>Remove the stress. This means take a break from, change, or altogether stop any activity that increases pain or soreness.</td>
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<tr>
<td>Ice*</td>
<td>Three to four times per day, 15 min per session, remembering not to leave on too long to avoid potential damage to the skin.</td>
</tr>
<tr>
<td>Compression</td>
<td>Wrap the injured area with an elastic bandage to aide in limiting inflammation.</td>
</tr>
<tr>
<td>Elevation</td>
<td>Use pillows to elevate the injured area while sitting or lying down. Gravity will help to pull the inflammation back toward the core of the body.</td>
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*A note about icing: With soft tissue tendon injuries, it is often more beneficial to administer an ice massage rather than to simply lay a bag of ice or frozen peas over the injured area. Freeze water in a Dixie cup, peel away the excess paper and use the cup to massage the area. The massaging action will decrease the inflammation and pain in the area at a more efficient rate.*

*Figure 1.2* Ice cup massage: A good way to target a superﬁcial tissue with cryotherapy. Simply freeze a half-ﬁlled wax paper cup with water, peel back the excess and apply the ice directly to the skin in a gentle circular pattern for 10 minutes, or until the skin is sufﬁciently numb. Important to the resolution of Sever’s disease, so pressure on the heel bone can be relieved. Athletes will often have to sit out for a period of time to allow the pain and swelling to subside. In severe
cases, doctors may even choose to immobilize the foot in a cast or boot to allow for healing (see Figure 1.4). After the athlete can walk without pain, a good protocol to improve the strength and flexibility of the foot and heel cord are important for successful outcomes.

After enough time has passed to restore strength and flexibility, we can begin functional and sport-specific activity to physically prepare the athlete for a partial return to sport. In the beginning, the athlete can participate at a 50% to 75% level in order to keep them involved while limiting the trauma to the heel. For this athlete, low-impact soccer drills and skills are better than more stressful long runs.

Remember, do not neglect the foot! Elasticity within the plantar fascia can also be helpful in curbing the symptoms of Sever’s disease by dispersing the ground reaction forces experienced at the heel and above. Simple stretching is beneficial, deep-tissue massage is even better and can be done by rolling the foot on a firm ball to break up any adhesions (see Figure 1.5). This same method can and should be done at the calf muscle belly.

The soccer player, based on the type and fit of the soccer boot, may also want to protect the area with an arch support or heel lift to decrease direct trauma to an already sensitive area.
Figure 1.5 Myofascial tissue release: A deep tissue massage for the plantar fascia using a tennis or golf ball. Place tolerable pressure through the bottom of your foot onto the ball, and gently roll forward and backwards on the ball.

OSGOOD–SCHLATTER’S DISEASE

Osgood–Schlatter’s disease is similar to Sever’s disease, but occurs at the knee joint rather than at the heel. Specifically, pain and inflammation occurs at the proximal tibia where the quadriceps tendon inserts into the bone, at the bony protuberance below the knee cap (see Figure 1.6). This protuberance is
more prominent in some individuals, and is often the result of the same type of force reaction that defines Sever’s disease. In general, a tight quadriceps tendon pulls on the growth plate during running and jumping activities. When combined with rapid growth spurts in adolescent athletes, Osgood–Schlatter’s disease can result. Most often, it only affects one knee, and is more prevalent in boys than in girls. It is relatively common, occurring in about one of every five youth athletes.

**Signs and Symptoms of Osgood–Schlatter’s Disease**

Swelling and inflammation exists directly at the site of trauma, often with point tenderness. A visible, painful bump may develop just below the knee joint at the proximal tibia. The muscles surrounding the knee, including the hamstring and quadriceps, may be tight. Adults who experienced Osgood–Schlatter as adolescents may still have a visibly enlarged bone protuberance. This symptom can remain, and must be managed throughout an athlete’s career.

![Figure 1.6 Anatomy: Tibia tubercle with quad attachment.](image-url)
Treatment of Osgood–Schlatter's Disease

Symptoms of Osgood–Schlatter’s disease can be acutely exacerbated with activity, so there needs to be a period of RICE to reduce pain and swelling at the knee. After inflammation is controlled, a program can begin to increase elasticity in the surrounding musculature (see Figure 1.7). A good quadriceps-strengthening protocol should be included, beginning with muscle-setting exercises done on a table, such as quad sets, and advancing to include closed kinetic chain exercises (in which the limb is in contact with either the ground or another stable surface, such as squats or lunges). Avoiding open kinetic chain activities (when the limb is not in contact with the ground or any other stable surface and is free to move, such as a leg extension) will also help with this injury, since these exercises often increase the symptoms. Anti-inflammatory drugs, or nonsteroidal anti-inflammatory drugs (NSAIDs), may be warranted, depending on the severity of pain and level of dysfunction.

As the athlete’s pain decreases and elasticity increases, he or she can gradually be returned back to play. Once again, while we cannot change the growth pattern of the child, we can limit

Figure 1.7 Standing quad stretch: Standing with support, bend the knee, grab the foot and pull upward, keeping the hips open and extended. Try not to bend at the hip.
symptoms of Osgood–Schlatter’s disease by removing activities that irritate the area. If the athlete feels good enough for passing and dribbling drills and strengthening exercises, but running uphill sprints exacerbates the pain, coaches need to work with the athlete to make accommodations within the training protocol. The goal is to keep the athlete on the field, not sitting on the sideline because of a need to run sprints after practice. It is important for parents, athletes, and coaches to work together for proper management of the signs and symptoms of Osgood–Schlatter’s disease, and to keep the athlete under the care of a physical therapist or athletic trainer.

PATELLOFEMORAL SYNDROME

Patellofemoral syndrome is an overuse injury seen in youth athletes, caused by friction on the cartilage under the patella, or kneecap. This causes a softening, roughening, or general degeneration of the cartilage under the kneecap, known as chondromalacia.

Mechanism of Injury

Typically, the patella tracks in a straight line in the trochlear groove at the center of the thigh bone, and pressure is spread over the widest possible area. If the patella is tilted or slides outside of this groove, pressure is uneven and can irritate the cartilage under the patella. Improper tracking of the kneecap can be caused by a variety of pre-existing conditions, including flat feet, knock-knees, or weakness of the hip and thigh muscles. This disorder often affects females more than males, due to the widening of the pelvis during the adolescent years. The quadriceps tendon will pull more laterally on the patella, which causes the female adolescent athlete to be predisposed for patellar subluxation, which can cause biological changes at the knee. One such change is chronic weakness of the vastus medialis obliquus (VMO) muscle, which is the quadriceps muscle on the inside of the thigh. This muscle provides stability to the knee, and when weakened can contribute to incorrect tracking of the patella.

Repeated subluxation of the patella, or trauma to the posterior side of the patella (the side that articulates with the trochlear
groove of the femur), also causes a rubbing or grinding of the cartilage behind the knee cap, which has degenerative effects over time.

**Signs and Symptoms of Patellofemoral Syndrome**

The biomechanical deviation of the kneecap in patellofemoral syndrome causes an inflammatory response, resulting in pain and swelling behind the kneecap. It can also cause compensatory changes in the gait pattern. Pain may be aggravated by activity, and also by long periods of sitting with the knees in a moderately bent position; this is known as the “theater” or “movie-goers” sign of patellofemoral syndrome. The athlete may also complain of tightness or a feeling of fullness at the front of the knee. Patellofemoral syndrome does not always cause crippling pain, but it can lead to debilitating degenerative changes over time.

**Treatment of Patellofemoral Syndrome**

Patellofemoral syndrome is something most players can deal with and will attempt to play through, if their pain is mostly tolerable. However, if not properly managed, patellofemoral syndrome can progress into a more severe injury that may require surgical intervention, such as a fissuring or fracturing of the patella.

Initially, a RICE protocol is essential to limit the inflammation caused by patellofemoral syndrome. A physician may elect to prescribe anti-inflammatory drugs, or NSAIDs. Beyond immediate treatment to manage pain and inflammation, it is essential to change the biomechanics of the knee in order to correct the cause of this syndrome.

It’s important to get the VMO to fire in the proper sequence, and to make it strong enough so it pulls the kneecap in the proper direction (see Figure 1.8). The simplest way to do this is through isolation, through muscle-setting exercises such as quad sets, straight leg raises, adductor leg raises, and standing terminal knee extensions (see Figure 1.9). Strengthening the abductor and
Figure 1.8 Quad set: Muscle-setting exercise to strengthen the quad and regain neuromuscular control. Place a bolster behind the knee and firmly contract the quadriceps, elevating the heel off the floor or table.

Figure 1.9 TKE (terminal knee extension): This closed kinetic chain, quadriceps-strengthening exercise works on the final 30 degrees of range of motion with band resistance. Slightly bend your knee, tracking your toes, and extend to just before a full lock-out position.

The hip extensor muscles helps to decrease the incidence of patellofemoral syndrome.

If not treated appropriately, patellofemoral syndrome can result in more serious issues that require surgical intervention.