



JOHNS HOPKINS  
MEDICINE

# A WOMAN'S GUIDE TO SPORTS INJURY PREVENTION AND TREATMENT

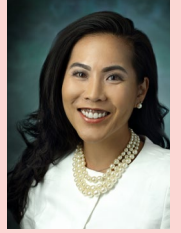


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“The topic of gender in sports medicine, in terms of the way it affects the diagnosis, treatment and outcomes, is relatively understudied. As the number of female athletes continues to rise, the need for this knowledge increases. The Johns Hopkins Women’s Sports Medicine Program was developed to address this need through a multidisciplinary, patient-centered approach toward female athletes.”



*Miho Tanaka, M.D., director of the Women’s Sports Medicine Program at Johns Hopkins*

## Why Do Sports Injuries Affect Women Differently Than Men?

Today, women are more active and athletic than ever. The idea of “playing like a girl” has never before packed a more positive and empowering message.

If you’re an athlete, however, chances are good that at some point you’ll experience a sports-related injury. And while active men and women may be equally likely to get hurt, some sports injuries do discriminate — affecting women more often or in different ways.

The solution isn’t to stop playing the sports you love. You just need to learn how to perform at your best, prevent injuries when you can and heal correctly if you do get hurt. The purpose of this guide is to help you do just that.

## What Predisposes Female Athletes to Injury?

One reason for the increase in female sports injuries over the past few decades comes down to simple math: More women are playing sports and participating in athletic activities. As a result, more women are at risk for a sports injury. But women also have a higher incidence of injury per exposure — meaning that even when the same number of men and women are playing, more women will wind up hurt.

Thanks to the passage of Title IX in 1972 (which requires schools to offer girls and women equal access to athletics), a wider variety of sports are accessible to women. Even long after graduating from high school or college teams, more and more women continue to be active throughout their lives.

There are also physical differences that come into play, namely:

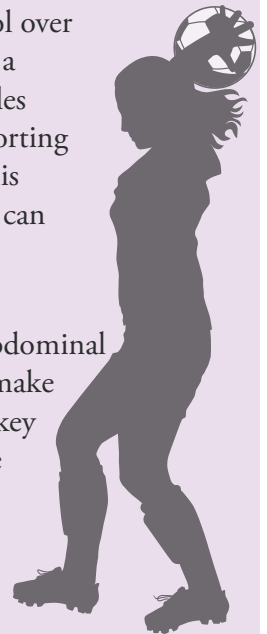
- **Female anatomy:** It's not news that women and men are built differently. On average, women are about 3 to 4 inches shorter, 30 pounds lighter and have 8 to 10 percent more body fat than men.
- **Female athlete triad:** This is the name for a group of conditions (see sidebar) that mostly affect young female athletes — especially those who participate in sports in which thinness is seen as an advantage (like dance, gymnastics, figure skating and distance running).



We've created this guide to help female athletes — and all active women — play the sports and pursue the activities they love. You will learn about the biggest risks active women face and how you can play smarter to prevent injury.

### Female Anatomy: The Small Differences Between Men and Women That Lead to Bigger Risks

- **Narrower shoulders:** This means less muscle mass in the upper body and less upper body strength.
- **Shorter extremities:** Longer arms and legs can generate more force (for faster throws, higher jumps) using less strength. When you have shorter extremities, you have to use more force to get the same results.
- **Wider hips:** A wider pelvis means that hips and knees aren't in line with each other, creating an angle that can put stress on knees and create other imbalances.
- **Strong quadriceps/weak hamstrings:** This combination gives women less control over the way they land from a jump because the muscles in their legs aren't supporting their knees properly. This imbalance means knees can get hurt more easily.
- **Less core strength:** A strong core (all the abdominal and back muscles that make up your midsection) is key for stabilizing the entire body and keeping hips, knees and ankles injury free.



## The Female Athlete Triad: Three Conditions That Can Spell Trouble for Young, Active Women

At the Johns Hopkins Women's Sports Medicine Program, we know that female athletes have specific needs. One of those is addressing the female athlete triad.

If you're an athlete (especially in a sport that puts an emphasis on appearance and thinness), you may be at risk for one or more of the interrelated conditions that make up the female athlete triad. And if you're the parent or coach of young, female athletes, be on the lookout for signs of these three conditions that can increase the risk of certain sports injuries:

- **Disordered eating:** Not eating enough to fuel your workouts will not only leave you hungry, it can cause your body to break down and get injured more easily. In addition to taking in enough calories, female athletes need adequate protein and the recommended amounts of bone-building calcium and vitamin D.
- **Loss of periods:** Many young female athletes assume that irregular periods are just a normal side effect of training hard. But losing your menstrual cycle is a condition called amenorrhea, which can lead to serious complications.
- **Low bone density:** The combination of a diet that doesn't provide your body with enough calories, calcium and vitamin D plus the hormonal upset of losing your period can turn a young woman's bones brittle and more susceptible to fractures.



“Women have several biomechanical differences that predispose them to knee injuries—such as wider hips, weaker hamstrings and dominant quadriceps.”



*Miho Tanaka, M.D., director of the Women's Sports Medicine Program at Johns Hopkins*

# Knee Injuries

Whether they're victims of an acute injury (you hear a sudden pop followed by pain) or suffering from overuse, the knees often bear the brunt of an active lifestyle. Thanks to the female anatomy, women's knees are even more at risk than men's.

## The Two Most Common Knee Injuries in Women Athletes

- **Anterior cruciate ligament (ACL) tears:** The ACL is a ligament that runs diagonally across your knee and is key to keeping your knee stable. Sprains or tears of this ligament can happen when landing from a jump or quickly pivoting or turning.
- **Patellofemoral pain syndrome (more often called runner's knee):** This condition involves pain around the front of the kneecap, also called the patella.

## ACL Tears: Causes and Prevention

Women are four to eight times more likely to tear their ACL than men. When men do suffer an ACL injury, it's often during a collision (like getting tackled), but only 30 percent of women's ACL tears are the result of contact.

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Instead, **most women injure their knees while trying to pivot or quickly change directions**, causing the knee to twist. While that motion can happen playing any sport that requires a fast stop-and-start motion, it's particularly common in basketball, lacrosse and soccer.

Addressing some of the common reasons why women's knees are more at risk for ACL injuries can help prevent them from happening. **These include:**

## 1. IMBALANCES IN STRENGTH AND FLEXIBILITY

When you don't strengthen and stretch your left and right sides equally, your muscles can end up off-kilter. Even a small difference from side to side can cause your center of gravity to shift when landing a jump, increasing the twist on your knee.

### PREVENTION TIPS

Lessen imbalances in muscle strength by doing single-leg training (one-legged squats, throwing a medicine ball while balanced on one leg).

When lifting weights, use free weights instead of machines—dumbbells don't allow your body to over-compensate for your weaker side the way machines can.

Post-workout, focus on stretching the muscles you used most. Stretch each side equally — up to two minutes per muscle group (stretches can be done in 30-second segments that add up to two minutes total).

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## Anterior Cruciate Ligament Surgery: Michelle's Story



While pivoting for a kick during a martial arts grading examination, Michelle felt a painful pop in her knee and knew something was terribly wrong. Michelle was determined to get back to her active lifestyle and find a doctor who understood her goals. She traveled to Johns Hopkins for ACL reconstruction surgery under the care of sports medicine orthopaedic surgeon Andrew Cosgarea, M.D. Now Michelle is back in action and feels stronger than before surgery.

[Watch Michelle's story.](#)

## 2. WEAK HAMSTRINGS

If you're landing from a jump, cutting or pivoting, and your hamstrings aren't strong enough to stabilize your knee, the resulting strain could cause injury to the ligament.

### PREVENTION TIP

Strong hamstrings that fire up as you land a jump are key to protecting your knees. Make hamstring-strengthening moves (such as bridges, deadlifts, hamstring curls and squats) an important part of your workout.

## 3. QUADRICEP STRENGTH

As girls mature and their hips widen, body weight is redistributed in a way that makes them rely more on their quadriceps. As a result, those muscles become dominant. That, combined with weak hamstrings, leads to an imbalance that can strain the knee.

### PREVENTION TIP

The solution isn't weaker quadriceps; it's stronger hamstrings. Once the body is more balanced, the knees will be stronger and more stable.

## 4. LACK OF CORE STRENGTH

When your core is strong, your whole body benefits—including your knees. A strong core can help absorb the forces of impact that happen when running and jumping, which helps protect your knees.

### PREVENTION TIP

Instead of focusing on crunches to create six-pack abs, include exercises — like planks, bicycles and bird dogs (on your hands and knees, alternate raising opposite arm and leg) — that engage and strengthen all the muscles in your core.



### Preventing ACL Tears: 4 Tips for Girls and Women

Women of all ages are constantly pushing their own physical limits and challenging what it means to be a female athlete. But it's much more common for women to tear their ACL than men. Miho Tanaka, M.D., shares four tips to keep yourself from getting injured.

[Read full article.](#)



## Treating an ACL Tear

You'll know you've torn your ACL while landing a jump or pivoting if your knee buckled, you heard a pop and it swelled up right away. Whether you need surgery to repair it depends in part on your age and what activities you do. The knee, once healed, can be stable enough for ordinary activities (walking, jogging) without surgery.

### Here are some things to discuss with your doctor regarding surgery:



Talk to your doctor about the sports you play and the level of competition. This can help determine whether your condition requires surgery in order to make your knee strong and stable enough to return to your sport.



Discuss your specific recovery timeline, but if you do have surgery, expect to be on crutches for a week or two and to wear a brace for four to six weeks post-surgery. You'll be able to start light exercise and physical therapy right away, but probably won't return to your sport for six to 12 months.



### Running with the Johns Hopkins Women's Sports Medicine Program: Our Approach

We take a multidisciplinary approach to assessing and treating running-related knee injuries. "Runners are different," acknowledges Sameer Dixit, M.D., sports medicine specialist at Johns Hopkins Medicine. "In runners we assess flexibility, core and especially hip strength, running gait and foot strike, posture and foot anatomy."

Our sports medicine specialists work closely with our physical therapists to come up with a program to:

- **Correct core weaknesses**
- **Improve flexibility**
- **Achieve optimal movement**
- **Attain a balanced gait**

## Runner's Knee: Causes and Prevention

Those suffering from runner's knee feel pain under the kneecap, usually after (not during) activity or when getting up after sitting for a while. This condition is an overuse injury that, as the name implies, is very common among runners.

Addressing some of the common reasons why women's knees are more at risk for runner's knee can help prevent it from happening. **These include:**

### 1. WIDER HIPS

If you're landing from a jump, cutting or pivoting, and your hamstrings aren't strong enough to stabilize your knee, the resulting strain could cause injury to the ligament.

#### PREVENTION TIP

You can't fight your basic anatomy, but you can work with what you have and make your muscles as strong as possible. Strengthening the hip abductor muscles (with moves like clamshells and fire hydrants) makes the hips strong and helps keep the kneecap working in its proper track.

### 2. HAMSTRING AND IT BAND FLEXIBILITY

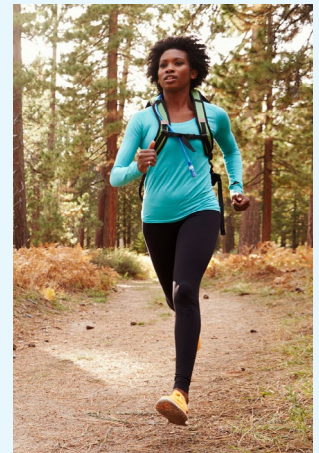
Runners are particularly at risk for tight hamstrings and IT bands (the iliotibial band is a ligament that runs on the outside of the thigh from hip to shin). This can change the way the kneecap tracks and can lead to pain.

#### PREVENTION TIPS

Do stretches that target your hamstrings and IT bands after every run.

Lie on your side with a foam roller under your IT bands for a form of self-massage to improve mobility and promote recovery.

### In for the Long Run? Medical Considerations for a Lifetime of Running



Sports medicine expert in the Department of Orthopaedic Surgery, Sameer Dixit, M.D., discusses the most common running injuries, how they can be prevented and how they are treated in this online webinar.

[Watch our webinar.](#)

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### 3. INCORRECT RUNNING GAIT

Women's wider hip anatomy can often lead to a slightly turned-out running stance that puts extra stress on your joints.

#### PREVENTION TIP

Many specialty running stores provide analysis of your running stride that can reveal your trouble spots. Our physical therapists offer a high-tech version of this service.

### 4. DOING TOO MUCH, TOO SOON

Not taking enough time to work up to your goal is one of the leading causes of any type of overuse injury—including runner's knee.

#### PREVENTION TIP

If you're starting to train for a specific distance (like a half marathon), follow a program that allows plenty of time for gradual increases in your mileage. Cross training—replacing running with other activities like biking or swimming some days—will also help keep your body injury free.



## Treating runner's knee

Follow these steps (and your doctor's advice) until your pain gets better:



**Rest:** You may need to take a few weeks off from running in order to allow your body to heal. During that time, stay fit with activities like biking or swimming that create less impact on the knee.



**Treating pain:** Both ice and nonsteroidal anti-inflammatory (NSAID) medications, such as ibuprofen, can help reduce any inflammation and pain.



**Seek out a physical therapist (PT):** He or she can put together a program of exercises specifically designed to improve strength and flexibility. A PT can also provide gait analysis (see sidebar) and address the issues it reveals to help prevent future injuries.



**Return to activity slowly:** Keep in mind that runner's knee is usually caused by overuse, so doing too much too soon could put you at risk. Gradually build back up to your former pace and distance, while following the prevention tips above to avoid reinjury.

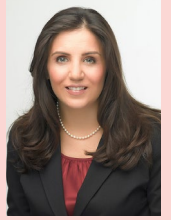
### Gait Analysis at Johns Hopkins

Gait analysis can help pinpoint the cause of your pain, plus help your physical therapist (PT) create a specific treatment plan. At Johns Hopkins, we have a state-of-the-art treadmill that uses more than 5,000 pressure sensors to measure the impact of your foot strike and the forces exerted on your hips and knees. This information can help a PT assess issues that can lead to reinjury.

Learn more about the [Johns Hopkins Running Program](#).



“I tell my patients, the damage is done from the initial ankle sprain. The rehab is about preventing future ankle sprains.”



*Casey Humbyrd, M.D., orthopaedic foot and ankle surgeon, Johns Hopkins Medicine*

# Ankle Sprains

Ankle sprains are an injury to the ligaments around the ankle. They usually happen when you suddenly twist your foot out of its normal range of motion.

While ankle sprains are one of the most common sports injuries, they can just as easily happen walking down an unevenly paved sidewalk as they can while running down the soccer field.



## Ankle Sprains: Causes and Prevention

Addressing some of the common reasons why ankle sprains occur can help prevent them from happening in the future. **These include:**

### 1. POOR PROPRIOCEPTION

Proprioceptors are sensors in your ligaments that send information to the brain about your body's position in space. When your ankle proprioception is off, you're more likely to land wrong and twist your ankle.

#### PREVENTION TIP

One easy way to improve your ankle proprioception is to use each foot to draw the ABCs in the air (think of your big toe as your pencil). This exercise fires up those tiny sensors and improves their ability to protect your ankle.

### 2. LACK OF BALANCE

The more unbalanced you are, the more likely you are to wobble and twist an ankle.

#### PREVENTION TIPS

Exercises to improve your balance can be as simple as standing on one leg and then the other while you do everyday tasks (brushing your teeth, washing dishes).

At the gym, challenge your balance by doing exercises (like squats) on an uneven surface, such as a wobble cushion or balance disc.

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### 3. WEAK CORE

A strong core can help absorb the forces of impact when running and jumping, which helps stabilize your torso and prevent ankle twists.

#### PREVENTION TIP

Focus on exercises (like planks, bicycles and bird dogs) that engage and strengthen all of the muscles in your core.

### Treating an ankle sprain

Follow these steps (and your doctor's advice) until your pain goes away:



**Don't try to walk it off:** Right after a sprain — when the ankle is still swollen — you should treat it with rest, elevation and ice. If swelling persists for more than a few days, see your doctor to rule out a fracture.



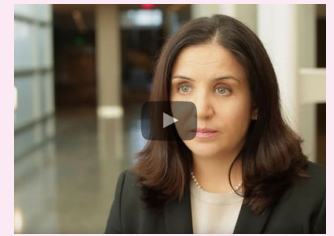
**Consider a brace or a boot:** If your ankle feels unstable, a brace or walking boot will help stabilize it so you can get around without doing further injury to the ligament.



**Let the ligament heal:** You need full range of motion and no swelling before returning to your sport — and that can take six to eight weeks.



### Is Your Ankle Fracture Stable or Unstable?



If your ankle injury involves a fracture, our sports medicine specialists have developed specific guidelines to help determine whether or not it will require surgery. “An unstable fracture — meaning it's fractured in two places or that you fractured one side of the ankle and injured the ligament on the other side— will require surgery,” says Casey Humbyrd, M.D., orthopaedic foot and ankle surgeon at Johns Hopkins Medicine.

Watch our [Q&A on foot and ankle injuries with Dr. Humbyrd](#).

“Wearing down of the rotator cuff is actually an issue of aging more than a sports injury. What often causes your shoulder to start hurting suddenly is a sudden increase in activity — like starting a new exercise class five times a week or going on vacation and playing tennis every day.”



*Miho Tanaka, M.D., director of the Women's Sports Medicine Program at Johns Hopkins*

## Rotator Cuff Injuries

The rotator cuff is a group of muscles that support your shoulder and keep it in place. After years of use, most of us will experience some wear and tear of the cuff, which in turn gradually begins to weaken the shoulder. You'll know it's reached a problematic point when you have pain in the side of your shoulder when trying to lift something overhead or reach behind you or no longer have a full range of motion.





## Rotator Cuff Injuries: Causes and Prevention

Addressing some of the common reasons why rotator cuff injuries happen can help prevent them. **These include:**

### 1. WEAK BACK MUSCLES

If your back muscles are weak, that can lead to a rounded shoulder posture, which increases the stress on the front of your shoulders.

#### PREVENTION TIP

Strengthening the muscles in your upper back and focusing on maintaining proper posture — during your sport or even just sitting at your desk — will make the shoulders more stable and reduce wear and tear.

### 2. NOT WARMING UP

As we age, the collagen that makes up our soft tissues becomes more brittle. If you don't warm up and stretch properly before your activity, that brittle collagen can cause the tissue to tear more easily.

#### PREVENTION TIP

Focus on dynamic movements that warm your muscles and get blood flowing before launching into your activity. For activities that involve the shoulders (tennis, swimming, weight lifting, volleyball) try moves like arm circles, arm swings and shoulder rolls.

### 3. DOING TOO MUCH, TOO FAST

The simplest way to turn basic wear and tear into a suddenly painful injury is to step up your activity too quickly.

#### PREVENTION TIP

Ease into a new activity (or increase the intensity of one you've been doing) gradually to avoid suddenly overloading your rotator cuff.



### Wear and Tear of Your Shoulder: No Gain, Just Pain

The shoulder is one of the most complex joints in the body and provides an incredible range of motion that we often take for granted. Although we don't walk on our shoulders, this joint is susceptible to wear and tear just like hips and knees. Orthopaedic surgeon Umasuthan Srikumaran, M.D., discusses how everyday use can impact shoulder health.

[Read full article.](#)

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## Treating rotator cuff injuries

Follow these steps (and your doctor's advice) until your pain gets better:



**Rest:** If lifting your arms overhead causes pain, plan to take a few weeks off from activities that involve overhead motion.



**Manage pain:** The pain and stiffness may be bad enough to wake you up at night. If over-the-counter NSAIDs aren't providing enough relief, your doctor may consider a cortisone injection to relieve pain and inflammation.



**Discuss the severity of the injury with your doctor:** Larger tears may require surgery, while others can be treated with physical therapy alone.



**Return to activity slowly:** Don't race back to the gym the minute your pain goes away. Gradually build back up to your former intensity and frequency to allow the shoulder muscles to regain strength and stability.



“Stress fractures are more common in women, and part of the reason is the female athlete triad — a combination of conditions that leads to lower bone density and increased risk of fractures.”



*Sameer Dixit, M.D., sports medicine specialist,  
Johns Hopkins Medicine*

# Stress Fractures

Stress fractures are tiny cracks in a bone that are caused by repetitive use. Typically, they show up in the lower legs — shins, ankles, feet — since those are the bones that take the most impact during sports and everyday activities.



## Stress Fractures: Causes and Prevention

Addressing some of the common reasons why stress fractures occur can help prevent them. **These include:**

### 1. DISORDERED EATING

Not taking in enough calories to fuel your workouts is a key component of the female athlete triad (along with loss of periods and low bone density).

#### PREVENTION TIP

Consulting with a sports nutritionist can help you create a diet that provides adequate calories and all the essential nutrients you need to fuel your active lifestyle.

### 2. LOW BONE DENSITY

Not getting your period disrupts your hormones and puts your bones at risk.

#### PREVENTION TIPS

Losing your menstrual cycle isn't a normal part of training. If your periods have stopped, that's a sign you should see your doctor.

Make sure you're getting the recommended daily dose of bone-building calcium and vitamin D.

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### 3. DOING THE SAME ACTIVITY ALL THE TIME

Stress fractures get their name from their cause — repetitive stress. If you're constantly doing the same high-impact activity, you're putting your bones at higher risk.

#### PREVENTION TIP

Both competitive and recreational athletes can benefit from cross training. It's important to mix up your workouts and to include some lower-impact activities (swimming, biking, elliptical training) along with the high-impact ones (running, jumping).

### 4. DOING TOO MUCH TOO SOON

Stress fractures can affect anyone from competitive athletes to weekend warriors. Trying to go from the couch to running (even a 5K) too quickly can overstress your bones.

#### PREVENTION TIP

Start slowly, and build up both the duration and intensity of your workouts gradually.

## Treating a plantar fasciitis

Follow these steps (and your doctor's advice) until your pain gets better:



**Rest:** If you experience symptoms of a stress fracture (pain during activity, swelling or bruising in the area), you need to stop doing high-impact activities (like running) immediately. Continued impact will just worsen the fracture. Icing the area can help the inflammation go down.



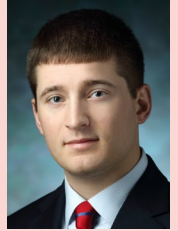
**Seek treatment:** Get your injury evaluated by a doctor who can check the severity of the fracture and recommend treatment. Most often, a stress fracture needs to be immobilized (for instance, with a walking boot) in order to heal. Working with a physical therapist can give you the tools to prevent re-injury.



**Resume activity slowly:** Expect to take four to 12 weeks off to allow the fracture to heal. Once it's healed, take your time building back up to your former level of activity.



“Women are busy — managing jobs and families in addition to their sports. They’ll make the time to fit in their workout, but might skip a proper warm-up. That causes muscle flexibility and joint mobility imbalances that can contribute to injuries like plantar fasciitis.”



*John Dale, certified athletic trainer and sports medicine physical therapist, Johns Hopkins Medicine*

## Plantar Fasciitis

If you feel a stabbing pain in your heel as soon as you step out of bed in the morning (and again after periods of prolonged sitting), you’re probably suffering from plantar fasciitis. The plantar fascia is a thick band of tissue that runs along the bottom of the foot, connecting your heel bone to your toes. Overuse, anatomical issues, poor form or footwear can cause that tissue to degenerate, leaving micro-tears at the insertion point in the heel.

This incredibly common injury affects about 25 percent of the population — both male and female — but there are a few factors that contribute to its high incidence in women.

## Plantar Fasciitis: Causes and Prevention

Addressing some of the common reasons why plantar fasciitis occurs can help prevent it. **These include:**

### 1. WEAK CORE

When the core isn't strong enough to stabilize your trunk, your feet are more inclined to pronate (roll inward). And when you pronate, it puts more strain on the plantar fascia.

#### PREVENTION TIP

In order to create stability throughout your body, focus on exercises (like planks, bicycles and bird dogs) that engage and strengthen all the muscles in your core.

### 2. TIGHT ACHILLES TENDON

Your Achilles tendon attaches your calf muscle to your heel bone, which is where the plantar fascia also attaches. When your Achilles is tight, it can put more stress on the plantar fascia.

#### PREVENTION TIP

Stretch your Achilles and your calves first thing in the morning (they tighten up while you sleep) and after a workout.

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### 3. OBESITY

Being severely overweight puts you at higher risk of plantar fasciitis because of the extra strain the tissue receives with every step.

#### PREVENTION TIP

Maintaining a healthy weight will help your body function more efficiently — and safely — during sports and activities.

### 4. HIGH ARCHES

Women often have higher arches than men and that can predispose them to plantar fasciitis. When your arch is high and not properly supported, the plantar fascia (which runs underneath your arch) stretches more with every step. You can't change your arches, but you can keep them well supported.

#### PREVENTION TIPS

Consider supportive insoles for your athletic shoes.

Avoid shoes like ballet flats and flip-flops that leave your high arch completely unsupported.

### 5. TOO MUCH TIME ON YOUR FEET

Whether you're logging long training miles or have a job that keeps you standing all day, all that time on your feet can cause inflammation of the plantar fascia.

#### PREVENTION TIPS

Manage how quickly you increase your activity since ramping up your mileage can overly stress the plantar fascia.

If you have a job that keeps you on your feet, wear supportive shoes and be sure to stretch your Achilles and calves periodically throughout your shift.





## Treating plantar fasciitis

Follow these steps (and your doctor's advice) until your pain gets better:



**Rest:** You will probably need to stop — or at least slow down — high-impact activity until the fascia heals. Switching to lower-impact activities and switching up the surface on which you run (from concrete to dirt or grass, for example) can help ease some of the strain on the plantar fascia.



**Massage:** Manipulating the heel can help relieve pain. Some practitioners advise using heat, others ice (rolling your heel on a frozen golf ball is an easy self-massage technique).



**Shock wave therapy:** A physical therapist can do shock wave therapy on the affected tissue. A noninvasive probe delivers high-energy acoustic waves that stimulate healing.



## Shock Wave Therapy at Johns Hopkins

Our physical therapists use a form of low-energy shock wave treatment. We use it to treat various conditions, including plantar fasciitis.

This method is much less painful than extracorporeal shock wave therapy, but is highly effective at healing the fascia.

## Preventing Running Injuries



Many overuse injuries — such as plantar fasciitis — are especially common among runners. Whether you run casually or competitively, the most important injury prevention technique is patience. Stepping up your mileage too quickly is the fastest way to sideline yourself.

Watch our webinar [about seasonal running and injury prevention](#).

“Studies have shown that, when playing the same sports, women have higher rates of concussion than men.”



*Sameer Dixit, M.D., sports medicine specialist,  
Johns Hopkins Medicine*

# Concussions

A concussion, also known as a traumatic brain injury (TBI), is often the result of a fall, collision or other sharp blow to the head. Women who play sports in which there can be high-impact contact — such as basketball, soccer, lacrosse or volleyball — are at the highest risk of sports-related concussion.



## Concussions: Causes and Prevention

Addressing some of the common reasons why concussions occur can help prevent them. These include some issues that are specific to women and others that apply equally to male and female athletes:

### 1. WEAK NECK MUSCLES

One of the theories as to why women get more concussions and have more severe and long-lasting symptoms has to do with their necks. Women, on average, have smaller necks and lower neck strength than men, which could leave them more vulnerable to a hard hit.

#### PREVENTION TIP

Exercises that strengthen the neck and upper back muscles will help provide more support and stability for the head.

### 2. POOR FORM OR TECHNIQUE

Even in a sport like soccer where using your head is part of playing the game, you can reduce your risk of concussion by learning to do it more safely.

#### PREVENTION TIP

Your head isn't a weapon, so don't use it that way. Learning and using proper form for heading the ball can help keep your head safe.

### 3. NOT FOLLOWING PROPER RULES OF PLAY

Not following the rules — especially in contact sports — can increase your risk of concussion.

#### PREVENTION TIP

Whether you're new to a sport or a seasoned player, be sure to learn and follow your sport's official rules as well as your coach's guidelines for safety and good sportsmanship.

### Concussion Symptoms in Women



There is some evidence that women's concussion symptoms tend to be more severe and last longer than men's, although more research is needed to understand why that may be the case. Any injury to the head has the potential to be serious and should always be evaluated immediately by your team trainer or a physician.

#### Symptoms of a concussion include:

- Headache
- Dizziness
- Nausea
- Confusion
- Blurry vision
- Brain fogging

Learn more about [concussions in female athletes](#).

*(continued on next page)*

## Treating a concussion

Depending on the severity of the injury, those symptoms can last for a few hours or many months. If you suspect you may have a concussion, you need to get evaluated by a professional. Treatment may include:



**Sleep:** You will need extra sleep at night, as well as daytime naps, to help your brain recover.



**Resting your brain:** Giving your brain a break from things that activate it — schoolwork, video games, reading, even watching TV — is essential to helping it heal.



**Taking a break from your sport:** Follow your doctor's guidelines carefully when it comes to how long you need complete rest, when you can return to light activity and when it's safe to go back to playing your sport. Resuming intense activity too quickly can be dangerous and will get in the way of your recovery.



“Women are more likely to have multidisciplinary problems — their sports injuries aren’t always just an orthopaedic issue. They might have nutrition problems or hormonal issues, or sometimes female athletes can be pregnant. Our team provides comprehensive care for these athletes.”



*Miho Tanaka, M.D., director of the Women's Sports Medicine Program at Johns Hopkins*

## What Is a Sports Medicine Specialist?

Serious athletes and active women alike can benefit from the expertise of specialized sports medicine doctors. What used to be a niche just for treating competitive athletes has evolved into a field focusing on treating any injuries people get from leading a healthy, active lifestyle.

Whether you're training daily with your team, hitting the gym or logging miles on your treadmill in the basement after the kids go to bed, you're an athlete, and you deserve the best care possible if you get injured.

At [Johns Hopkins Women's Sports Medicine Program](#), we have a team of top experts who can care for the needs of any female athlete.

## Sports Medicine Experts: Whom to See for Which Conditions

There are three types of sports medicine specialists who care for female athletes at Johns Hopkins. Here's what they do:

### 1. PRIMARY CARE SPORTS MEDICINE PHYSICIAN

This specialist is like your regular primary care doctor but has additional training in sports injuries and other sports-related conditions. A primary care sports medicine physician is a great first stop for most sports injuries, since about 90 percent of those injuries don't require surgery. They can evaluate your injury, order imaging tests and treatment, and if necessary, help you make a seamless transition to the care of a sports medicine orthopaedic surgeon.

#### See them for:

Ligament and muscle strains and many of the overuse injuries that occur from leading an active lifestyle. They can also perform sports physicals — an exam focused on any issues related to your active lifestyle (asthma, cardiac conditions, assessing the state of previous injuries).

### 2. SPORTS MEDICINE SURGEON

This specialist is an orthopaedic surgeon who focuses on sports-related orthopaedic injuries.

#### See them for:

Any condition that may require a surgical fix (e.g., torn ACL).

### 3. PHYSICAL THERAPIST (PT)

These highly trained specialists are a key part of the sports injury prevention and treatment team. They can provide targeted treatment — including specific strengthening and stretching exercises — to treat injuries and help prevent new ones.

#### See them for:

Specific strengthening and flexibility exercises to help prevent injuries from occurring or recurring. Also for the treatment of a current sports injury. Following a PT's plan for your injury recovery will not only get you back to your sport or activity more quickly, but it will also help you do it safely.

## What a Primary Care Sports Medicine Doctor Can Do For You



Rather than heading to the office of your primary care physician (PCP) for a sports injury, you may want to seek out a PCP who specializes in the field. Because they have the specific training and resources to handle sports injuries, they can help get you back out to play faster.

[Watch this interview](#) with Johns Hopkins Primary Care Sports Medicine physician Raj Deu, M.D.



# The Johns Hopkins Women's Sports Medicine Team

In order to provide a comprehensive menu of care for all active women, our team includes two primary care sports medicine doctors and four sports medicine-trained orthopaedic surgeons. Rounding out our team are physical therapists, experts in concussion treatment and obstetricians.

[Meet Our Team](#), and for more on the Women's Sports Medicine program at Johns Hopkins, watch our [Women's Sports Medicine Q&A with Dr. Tanaka](#).

**REQUEST AN  
APPOINTMENT**

If You Live In Outside of  
Maryland: **410-324-2309**

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**443-965-9899**