

Revolutionary Non-Surgical Heel Pain Treatment

“APC – Autologous Platelet Concentrates”

By Dr. S. Don Kim

During the last 18 years, I have seen thousands of patients who suffer from **heel pain**. Next to fungal nail conditions, **heel pain** is by far the most common foot condition that brings patients to my office. Last year alone, I saw almost 200 **heel pain** patients and operated on two of these people. Yes, only one percent of the patients ended up needing heel surgery, but to me, that was one percent too many! Even though heel surgery is simple to perform, it has a grueling recovery period. Following heel surgery, the patient’s foot will be in a cast for four weeks, after which time he or she will need extensive rehabilitation for two to four months.

Why is **heel pain** so prevalent? How can you prevent **heel pain**? How can you prevent heel surgery when you have **heel pain**? In this issue, we will find the answers to the above questions through an exploration of the following topics:

1. What is **heel pain**?
2. What causes **heel pain**?
3. When does **heel pain** come?
4. How to treat **heel pain**
5. How to prevent **heel pain**?

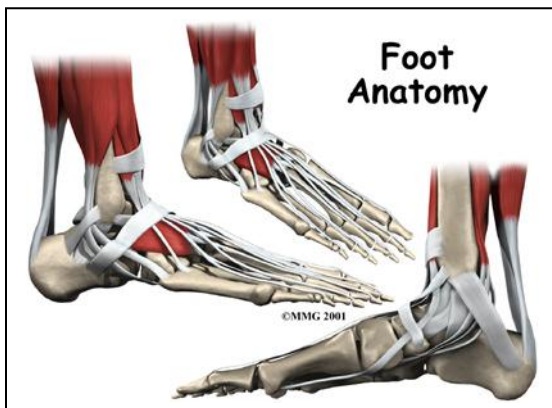


My Foot Philosophy

After examining more than 20,000 different pairs of heels, soles and toes, I developed a very deep philosophy about feet in general: **“Your feet are like the tires of a car.”** Think about it: you can have the most beautiful car in the world, but if you have a flat tire, it won’t move. Similarly, your feet are one of the most important parts of your body, and you have to treat them that way. Unfortunately, most people don’t take care of their feet unless they start hurting. But this is not how you should approach foot care; it’s like going on a long trip and not checking your car’s tires ahead of time. You may get lucky and have no problems. But if you do have tire issues, you’re in for trouble. You know what it’s like; we’ve all experienced flat tires in the past, and they’re never fun, especially if you’re on a trip or headed to a very important engagement. Checking tires ahead of time virtually eliminates problems with flats. Likewise, preventative foot care can make heel pain highly unlikely.

Foot Facts

Let’s talk about some facts regarding the human foot. You’re probably unaware of just how amazing your feet are! Each foot is built with 26 bones, 33 joints, 20 muscles, 107 ligaments and more than a quarter million sweat glands. These elements all work together to provide mobility. With every step you take, your feet do a lot of grunt work: when you begin a step, each foot has to flex to absorb the shock of impact. Then, it needs to lock up and be rigid to propel your body forward. These actions happen in less than a second, and they are repeated thousands of times each day every time we walk.



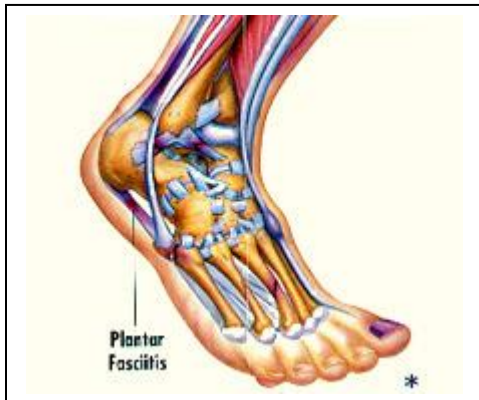
Repeated flexing and locking motions put a lot of stress on your feet; your feet experience one-and-a-half to two times your body weight with every step you take, which is a huge amount of pressure regardless of body size. But imagine how many pounds each foot has to handle if

you're overweight! The enormous amount of extra force brought down on each foot is the reason why overweight people have foot problems. When you gain weight, it's hard to avoid foot pain because of the undue extra pressure. And it's even worse if you participate in high-impact activities. If you run, you put two to three times your weight on your feet with every stride. This stress is devastating for runners, which is why I do not recommend running for people who are above their ideal weight.

Besides the natural stress of walking, many people experience added tension from misaligned feet. Think of each foot as a tripod. One leg of the tripod rests on the heel, another is under the big toe, and the third leg drops under the little toe. You need all three legs to rest on the ground for balance. But unfortunately, this isn't the case for the vast majority of people. Ninety-five percent of the population has off-balanced tripods because the leg near their big toe is shorter than the other two. This leads to a pronated foot, which has collapsed arches; the condition is known as having flat feet. Another four percent of people have little toe leg that's shorter than the other legs of the tripod; this leads to a supinated foot with high arches, which is also known as a *pes cavus* foot. Only one percent of people have normal feet with all three tripod legs balanced perfectly. As a foot doctor, I am in good business when only one percent of people have normal feet!!!

What is Heel Pain?

Most people think of **heel pain** as *plantar fasciitis*. It's true that inflammation of the plantar fascia leads to discomfort, but heel pain involves many more structures too. In fact, it includes so many structures in the foot that we call it "Heel Pain Syndrome," which insinuates that there are many components to the condition. **Heel Pain** is caused by the inflammation of the following structures under the heel: the plantar fascia, multiple muscles, the bursa, nerves and the periosteum.



Inflammation of plantar fascia is called *plantar fasciitis*. The fascia is a layer of thick fibrous tissues that holds together all the structures underneath it, including muscles. Without the fascia, muscles would not stay intact and would become flabby. In your foot, the plantar fascia stretches from the ball near your

toes to the bottom of the heel. Then, it continues to the back of the heel and attaches to the Achilles tendon. It is the insertion site at the bottom of heel that is often inflamed. When there is constant tension of the fascia, the covering of the bone on the heel is pulled off, leading to bleeding. This bleeding causes a new bone to form along the fascia, and the new growth is known as a **heel spur**.

Underneath the fascia layer, there are three layers of muscles known as intrinsic muscles, which are responsible for supporting and giving strength to the arches of the feet. The insertion site of these muscles can become inflamed in a condition known as **myositis**.

There is also a bursa at the bottom of the heel. This bursa is a fluid sack that acts to cushion the heel bone. There are bursas all over the body to cushion the joints or bones and minimize friction. When there is swelling at the bottom of the heel, the bursa gets inflamed too. This condition is called **bursitis**.

Heel pain is known to be extremely uncomfortable because of the nerve that crosses over the area of inflammation. The posterior tibial nerve splits into the medial and lateral plantar nerves near the bottom of the heel. The medial plantar nerve is an especially big cause of heel pain because it travels right near the bottom of the heel. When this nerve becomes inflamed, we called it **neuritis**. Sometimes, this nerve becomes trapped in between the muscle and fascia and needs to be surgically removed or loosened.



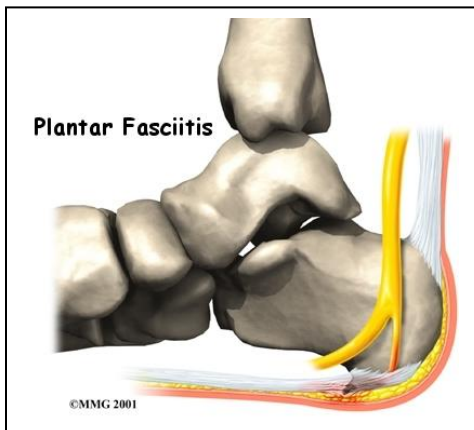
Lastly, heel pain can be caused when the covering of the heel bone, or periosteum, becomes inflamed, which is known as **periostitis**. You can visualize the periosteum by thinking about the ribs that you eat; on ribs, the periosteum is the glistening film that is attached to the bone. The periosteum delivers all the blood supply and nerve

innervations to the bone. When you have inflammation on the bottom of the heel, it's the periosteum that becomes swollen and painful.

What Causes Heel Pain?

Structural misalignment is the number one cause of **heel pain**. Either a flat foot or a highly arched foot can cause **heel pain**, and as we've already seen, most people have one of these two problems. Flat feet or high arches are caused in part by the sedentary lifestyle that most people lead. We sit for too long and don't walk enough. When we sit for too long, our body stays bent forward, which moves our center of gravity in front of us. This puts tension on the calf muscles, which in turn flattens the arches. And when your arches are flattened, you put tension at the insertion site of the heel, causing *plantar fasciitis* as described above. Think about the tire metaphor again: when you have a flat tire it puts pressure on the axels of your car.

You sure don't want to run on rims alone.



When you have the other extreme foot type, the high-arched foot, you have to deal with an extremely rigid foot. This foot type is not very flexible; it causes too much shock to be absorbed in your foot with every heel strike. If you were a car, high arches would mean that you would have too much tire pressure, so you would feel every bump on the road. Your shock absorbers wouldn't be working either, meaning there would be too much tension on the plantar fascia, leading to inflammation.

The next common cause of **heel pain** is increased weight. Back to the car metaphor: if you put too much cargo in your small-tired car, your car will not be able to handle the load and will break down eventually. As a nation, we don't walk enough. Our lack of walking causes a weakening of the foot and leg muscles. In addition, more than 60 percent of our population is overweight. The combination of insufficient walking and obesity is deadly to the heel, which gets pressure every step you take.

When does heel pain come?

For most people, **heel pain** is at its worst with the first steps in the morning. When you are asleep, your foot rests in a downward relaxed position. In this position, your calf muscles and plantar fascia are tight. Therefore, when you take your first steps in the morning, you are stretching the plantar fascia, which causes an extreme amount of pain.

When you get up from a sitting-down position, you could also feel **heel pain**. In this scenario, your plantar fascia is in a tightened position while sitting down; when you get up from being seated, you feel the stretch of the fascia.



After prolonged standing and walking, you will also feel heel pain. That's why many people complain of sore heels after a long day on their feet. You may be surprised to hear that most people feel more pain after standing than walking. This is because you have more tension on the plantar fascia while standing than during the actual movement of walking. People with flat feet have an especially hard time with standing.

When your body is more inflamed, you will feel more **heel pain**. Therefore, if you have cold, fever, or infection in your body, you will feel more pain. Any generalized swelling of the body can exacerbate **heel pain**.

How to Treat Heel Pain?

To decrease **heel pain**, you have to control the inflammation first. The quickest way to decrease inflammation is to immobilize the heel. I use strapping with tape for every person who visits my office with **heel pain**. Most people hate to be strapped because they're not able to shower, but strapping is one of the best ways to improve and control the inflammation. If the patient is in a lot of pain, I use a CAM walker to immobilize him or her. The CAM walker is like a space boot and a cast, except that you can come in and out of the CAM walker as needed.

Another powerful way to decrease **heel pain** is through physical therapy. Ultrasound, electro-stimulation and deep tissue massage are very effective techniques for resolving inflammation. In addition, stretching and strengthening exercises can be lifesavers. I also recommend using a night splint, which keeps the foot in a straight position to help stretch the plantar fascia during sleep. This prevents the morning pain when you first step out of your bed.



By far, the most effective way to improve pain and inflammation is with cortisone injections. This time tested method has been used for many years with great success. Cortisone is a strong anti-inflammatory medication. But even though it is very effective, it is not without side effects. Cortisone is known to thin blood, skin, and bone near the injection sites. It is also not recommended to use more than three injections per condition due to potentially deadly side effects.

Recently, there was a discovery that surprised many foot and ankle specialists like me: chronic inflammation can lead to the death of cells. When researchers examined plantar fascia cells that had been inflamed for more than six months, they found many dead cells in the mix. When there are many dead cells in an area, the tissue is said to be necrotic. In other words, if you inject cortisone into chronically inflamed tissues, you are not doing much good because the tissue could already be necrotic. Because of the many side effects, you may, in fact, be harming the area.

In light of the new discovery of necrotic tissue after chronic heel pain, some doctors have begun injecting **APC** (Autologous Platelet Concentrates) into chronically inflamed areas with great success. It has been known for many years that your blood's platelets contain growth factors (specifically, PDGF, TGF, VEGF, and EGF). The doctors who injected **APC** isolated the platelets from each patient's own blood and re-injected it into the area of chronic inflammation. So far, this technique has been utilized for many different kinds of chronic inflammation, such as chronically inflamed wounds, bones, tendons and fascia.

30cc Blood put into each tube



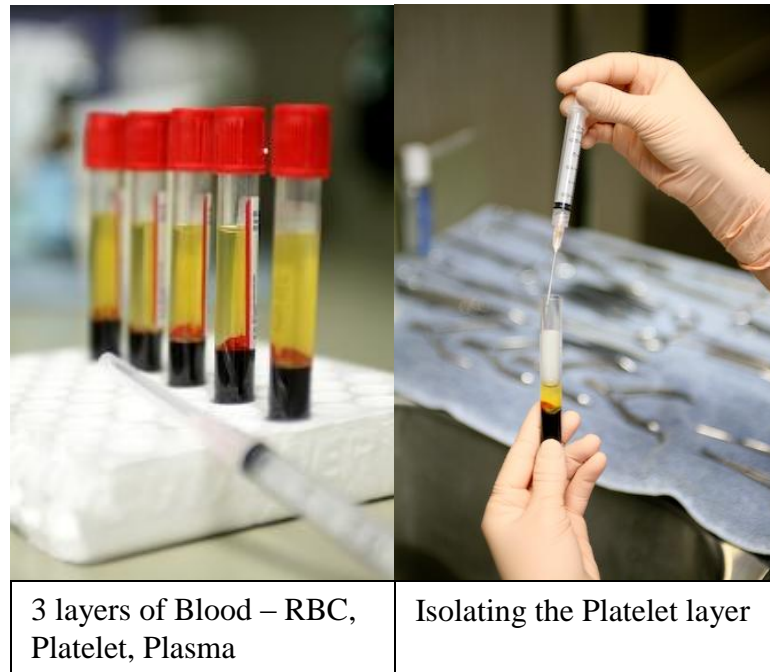
In 2004, the first scientific paper was published about the use of **APC** for *plantar fasciitis* and **heel pain** by Drs. Barrett and Erredge. The paper was titled “Growth Factors for chronic plantar fasciitis?” The publication demonstrated excellent results using APC in a nine-patient study targeting chronic heel pain. In response to this paper, our group of doctors at Kim Foot and Ankle took on the challenge of gathering a larger group of patients for a follow-up study. We collected data for the study from December 2006 to October 2008, and we just finished writing a paper called “Use of APC in Plantar Fasciitis and Achilles Tendinopathy”. (If you’d like to read about the study, you may request a copy of this paper from our office.) Our paper will be submitted for publication in the next few months. It details the study of 62 patients who have gone through the treatments with **APCs**.



Centrifuge for 10 minutes

Based on our research, we found that **APC** can be great treatment option for chronic heel pain. The wonderful thing about **APC** therapy is it has no side effects since it is the patient’s own blood that we are re-injecting. Obviously, we need to do more research on **APC** therapy, but for many of our patients, it has worked well as an alternative to surgical intervention.

The beauty of the **APC** procedure is its simplicity. It takes around 15 minutes to complete the whole procedure. We draw about 30cc of a patient’s blood and centrifuge it for



10 minutes. Then, we isolate around 3cc of platelets, which are re-injected into the heel. A local anesthetic is used on the injection site, so there is minimal pain involved. After **APC** therapy, patients are required to wear a CAM walker for a week. The therapy can be repeated once a month. Within our experience so far, about two or three injections eliminated chronic **heel pain**.

How to Prevent Heel Pain?

One of the most important things I do for my patients as a foot and ankle specialist is fit them for orthotics. Orthotic devices are custom-molded inserts that support and realign the misaligned feet. Orthotics help make the tripod of the foot stand balanced. As I already mentioned in the section on foot facts, your foot needs to be perfectly balanced to function properly. If one of legs of your tripod is not in line with the others, all kinds of foot pain will follow. Therefore, orthotics are paramount for the health of you feet; they will prevent the recurrence of **heel pain**. To make orthotics, we take molds of your feet and fabricate an insert to fit into your shoes.

Another very important thing you should do to prevent **heel pain** is stretch and strengthen your back muscles. When working out, most people focus on their front muscles. But you back muscles need attention too! As I

discussed above, the combination of sitting too long and not walking enough causes all kinds of imbalances, and it effects your whole body's posture.

This leads to my final and most important recommendation. We are designed to walk, not to sit. We need to walk frequently both to keep our weight down and to heal from many adult lifestyle diseases. Walking is the best exercise to improve posture, but it also decreases stress. When you walk, the synchronized movement of the body also synchronizes your brain waves, which reduces stress. If you can walk about 10,000 steps each day, which is approximately 5 miles, you will be totally healthy from your brain all the way to your feet. A walking regimen will strengthen your foot muscles too. So walk your way to better foot health and less **heel pain!**



Here is what our patients have to say about the APC injection...

"I have been a patient of KFAC for the past 6 months. I came to Kim Foot and Ankle Center with plantar fasciitis. This was a very painful condition. The pain was sharp, jabbing and I often have difficulty walking, especially when first rising in the morning. After having my first APC injection, I was 50%-60% better. I began experiencing much less pain. After the second injection I was pain free two out of three days! The sharp jabs of pain have disappeared and some days I forget that I have the condition at all." - **Sharon F.**

"I had pain that was like a big knife in the middle of my heel. I had extreme pain in the morning, swelling, and cramping. I am a mail carrier and could not do my job. After getting the APC injections I am able to do my job, I have no pain, and I have hardly any swelling. The great news is that I can also walk my two dogs." - **Rubi A.**