**Stephen Barrett, DPM**

**Elizabeth Bondi, DPM**

**Doug Richie, DPM**

**Lisa Schoene, DPM**

**Jarrod Shapiro, DPM**

**Lowell Weil, Jr., DPM**

# Treating Heel Pain: A 2026 Update

Find out how the experts approach the most common of all podiatric presentations.

**BY MARC HASPEL, DPM**

Once again, *Podiatry Management*® magazine is pleased to present an updated roundtable on *Heel Pain*, a topic that embraces the most common presenting complaint to most offices of doctors of podiatric medicine. This condition can be disabling for a wide range of patients who must be on their feet participating in all the activities of daily living. Fortunately, podiatrists are well-equipped to treat this painful condition using a variety of modalities, all designed to get patients off the sideline and back into action. Such treatments require all capabilities of the podiatric physician, from biomechanical treatments to those employing effective medications to physical modalities and, of course, possible surgical intervention. This update includes several panelists from past updates as well as new panelists. We thank them for graciously sharing their perspectives on this important topic. The panelists:

**Stephen Barrett, DPM:** Stephen Barrett brings decades of experience in foot and nerve care to US Neuropathy Centers in Marietta and Atlanta, GA. Dr. Barrett holds five patents: two for developing innovative endoscopic procedures, the endoscopic plantar fasciotomy (EPF) and endoscopic decompression of the intermetatarsal nerve (EDIN). He now serves as chairman of the board of trustees for the Association of Extremity Nerve Surgeons.

**Elizabeth Bondi, DPM:** Elizabeth Bondi is a podiatrist in the Department of Orthopedics at Mayo Clinic in Rochester, MN. She serves on the Board for the American Academy of Podiatric Sports Medicine, the American Society for Medical Shockwave Treatment, and the American Society of Forensic Podiatry. Her primary clinical interests include sports medicine and regenerative medicine.

**Doug Richie, DPM:** Doug Richie is an associate clinical professor at the California School of Podiatric Medicine at Samuel Merritt University. Dr. Richie is a fellow and past president of the American Academy of Podiatric Sports Medicine. Dr. Richie is the author of *Pathomechanics of Common Foot Disorders*, which includes a chapter devoted to plantar heel pain.

**Lisa Schoene, DPM:** Lisa Schoene is a dance and sports medicine specialist, recently retired from private practice in Chicago and Gurnee, IL. She was board certified by the American Board of Foot and Ankle Surgery and the American Board of Podiatric Medicine. She is a fellow of the American Academy of Podiatric Sports Medicine and was a certified athletic trainer for more than 30 years. She worked at the World Cup Games, at the Atlanta Olympics, and at the Olympic Training Center in Colorado. She consulted for numerous professional dance companies in Chicago, and was the podiatric consultant to the DePaul Blue Demons for more than 32 years. She also had a faculty appointment at William M. Scholl College, teaching, hosting, and employing podiatric students for more than two decades.

**Jarrod Shapiro, DPM:** Jarrod Shapiro is a clinical podiatrist, teacher, and residency program director of the Chino Valley Medical Center program, and a writer who practices in the Riverside and Upland areas. He

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is also a professor and associate dean of Clinical Affairs at the Western University of Health Sciences College of Podiatric Medicine. He is a fellow of the American College of Podiatric Medicine and American College of Foot and Ankle Surgeons. He is a diplomate of the American Board of Podiatric Medicine and American Board of Foot and Ankle Surgery. Dr. Shapiro's clinical emphasis and philosophy of patient care is to help them by identifying their specific diagnosis, determining the cause of their pain, and partnering together to empower patients to improve their lower extremity health. He has extensive clinical and surgical experience, with an emphasis on foot and ankle reconstructive surgery, including complex pediatric and adult reconstruction.

**Lowell Weil, Jr., DPM:** Lowell Weil, Jr. is executive chairman of Balance Health, a majority physician-owned organization with more than 250 podiatrists in 12 states. He practices in Chicagoland as part of the Weil Foot & Ankle Institute and served as fellowship director from 2000-2017. He has published more than 50 articles and peer-reviewed papers on treatment of foot and ankle conditions and has lectured nationally and worldwide.

**PM:** *How prevalent is heel pain in your practice? What key findings would you expect in taking a history and performing a physical examination on a patient complaining of heel pain?*

**Barrett:** Heel pain represents a substantial portion of my practice. I've observed that what clinicians often diagnose, especially in recalcitrant cases, as straightforward plantar fasciitis frequently involves underlying nerve entrapment that goes unrecognized. The classical presentation includes first-step morning pain and pain after periods of rest, but I've found these symptoms alone don't tell the complete story.

During history-taking, I pay particular attention to the quality of pain—burning, tingling, or electric-like sensations that suggest nerve involvement rather than pure fascial pathology. Night pain is especially telling; plantar fasciitis rarely causes significant nighttime symptoms, while tarsal tunnel syndrome characteristically does. I also ask about compensatory gait changes, as biomechanical alterations from chronic heel pain can create secondary nerve compression. Another thing I've found is that if patients have been treated with orthotics that make them worse, or they simply cannot tolerate the device, then you really need to think about tarsal tunnel syndrome.

**In the summer, patients tend to relate to the pain starting after wearing flip-flops for a prolonged period.—Dr. Bondi**

The physical examination goes beyond just palpating the medial calcaneal tubercle. Initially, we evaluate the status of the plantar fascia with diagnostic ultrasound, as this guides much of the treatment. This is very objective and lets the practitioner know what they are actually dealing with.

I systematically evaluate for nerve entrapment using lidocaine mapping administered to the tibial nerve, or specifically to the medial plantar nerve (MPN), lateral plantar nerve (LPN), or medial calcaneal nerve(s). We also use the Phoenix sign technique, an ultrasound-guided subanesthetic dose of lidocaine (approximately 0.3-0.5 mL of 1% lidocaine). A positive response, with improvement in symptoms within minutes, strongly suggests nerve entrapment rather than isolated fascial disease.

I'm also vigilant for the biomechanical cascade where plantar fasciitis pain leads to compensatory pronation, which then increases tarsal tunnel pressure. This isn't theoretical. It's a pattern I see repeatedly in practice and one that our research protocols are specifically designed to investigate.

**Schoene:** Heel pain is probably the most common diagnosis that presents in my office. If the pain is at the medial plantar aspect of the heel, then plantar fasciitis is suspected at first. The key signs and symptoms include pain at the medial plantar tubercle, and sometimes along the fascia band. Patients may complain of foot or leg tightness or cramps, or have trigger point pains in the gastroc/soleus or other lower extremity muscles. Usually absent are warmth, swelling, ecchymosis, and nighttime pain. I believe the three main etiologies of plantar fasciitis are increase in activity from work or exercise, increasing body weight—either from gaining weight or prolonged lifting/carrying—and shoe gear that's poorly fitting, old, or unsupportive. Traditionally, pain with the first step is common and aggravated by activity, but I agree that if there are symptoms like nighttime pain, neurological symptoms, history of low back/radicular or local nerve pain, then we consider a different diagnosis.

**Bondi:** Heel pain is one of the most common patient presentations in my clinic. A good history and physical exam are critical in determining the cause of heel pain. For plantar fasciitis specifically, patients will generally describe post-static dyskinesia and pain with increased activity. They often relate to an abrupt increase in activity, such as when training for an athletic event or going on a more active vacation. Additionally, they tend to describe wearing shoes that are not appropriate for the sport or activity, or that are too old. In the summer, patients tend to relate to the pain starting after wearing flip-flops for a prolonged period. Key physical exam findings, as they pertains to plantar fasciitis, include

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pain in the center of the heel or proximal plantar fascia, tight gastrosoleal complex and plantar fascia, tight hip flexors, and often either a pes planus or pes cavus foot structure. In more severe cases, they may have a positive calcaneal squeeze test because they often have bone edema in the plantar calcaneus, but a stress fracture would need to be ruled out. They also tend to be unstable with a single-leg stance.

**Shapiro:** Heel pain is very common. I would estimate at least 10 percent of my patients have heel pain. The findings of the history and physical will depend on what the underlying diagnosis is. Since the differential diagnosis is broad, the answer to this question would also be broad. For patients with plantar fasciosis, one would expect a complaint of poststatic dyskinesia and pain at the medial calcaneal tubercle. Neurological diagnoses like radiculopathy or Baxter's neuritis would present with different signs and symptoms.

**Richie:** Heel pain is the most prevalent complaint of our new patients, about one in three new patients. The key part of the history is determining causative factors. For my athletic patients, there has usually been a change in intensity or frequency of training. I also often find that they have started a new activity, which often involves ballistic loading of the foot.

Also, a key contributing factor is improper footwear. This must be identified and corrected, or else all treatment interventions will fail. Often, patients don't recognize the importance of wearing proper footwear in the home setting, as they may stand for hours in the kitchen or on another hard surface. I practice in a beachside community in southern California, where a barefoot or flip-flop lifestyle is prevalent, which is predictably why I probably see so much heel pain.

As I am concerned about the overall health status of the patient, I always consider the possibility of an autoimmune-mediated inflammatory reaction at the plantar fascia origin or at the Achilles insertion. I make sure that my history recording considers any other areas of pain and swelling in the body, as well as any diagnosed autoimmune disease. I feel that all patients should be asked about stiffness in the low back in the morning, which may point to the possibility of ankylosing spondylitis.

I believe gait analysis is critical to the physical exam, as it will demonstrate the severity of pain, presence of equinus, and abnormal alignment of the rear foot. The off-weight-bearing exam will confirm equinus and any other limitations of joint range of motion. Certainly, palpation is also critical to determine if the pain is in the plantar fascia or might be more medial and proximal at the inferior calcaneal (Baxter's) nerve. For that pathology, I always ask patients to spread their toes to activate their abductor digiti minimi brevis muscles. It's surprising how often these small muscles are compromised in patients who present with long-term chronic heel pain.

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***PM:*** *What diagnoses are included in your differential for a patient with heel pain? And what diagnostic studies would you order?*

**Weil:** Plantar fasciitis, calcaneal stress syndrome, calcaneal stress fracture, nerve entrapment, and radiculitis make up 99 percent of the heel pain I see. I would order bilateral weight-bearing x-rays. I believe that if patients have long-standing heel pain or multiple previous heel pain experiences, I expect there to be inferior calcaneal bone spurs. An absence of heel spurs leads me in the direction of other causes of heel pain, such as neurologic. If there is long-standing heel pain that has not responded to previous appropriate care, or substantial pain, I order an MRI. An MRI can help determine whether there is pathology in the plantar fascia, the morphology of the plantar fascia to determine best treatment options, microfracture and bone marrow edema in the calcaneus, stress fracture of the calcaneus, degenerative abductor digiti minimi (neurologic component), mass in the tarsal canal, or some unusual findings. I find MRIs far more useful than ultrasound in diagnosis-recalcitrant heel pain. I will order EMG/NCV when history and clinical symptoms indicate. On the other hand, I rarely order blood work.

**If patients have long-standing heel pain or multiple previous heel pain experiences, I expect there to be inferior calcaneal bone spurs.—Dr. Weil**

**Bondi:** Baxter's neuritis is one of the most common differentials that I have in the back of my mind. Often a combination of the history, physical exam, x-rays, and diagnostic ultrasound can help determine if this is causing the pain. Additionally, stress fracture, lumbar radiculopathy, inflammatory arthritis, fat pad syndrome or atrophy, fractured fat pad, other nerve entrapment, bone contusion, plantar fascia rupture, bone tumor, gout, and bursitis are all on my list of differentials.

Depending on the history and physical exam finding, I most commonly do a diagnostic ultrasound first. It's faster and less expensive than an MRI. Also, it's helpful when trying to rule out other potential causes of heel pain since the fat pad, bursa, muscles, and nerves can be evaluated as well. If the ultrasound is negative, or I have a suspicion for a bone injury, then I would lean more towards an MRI. I will occasionally order inflammatory markers or an EMG if the history and exam suggest the need for either of these.

**Shapiro:** My differential for plantar heel pain would include plantar fasciosis, Baxter's neuritis, lumbosacral radiculopathy, dermatologic conditions such as keratomas, tarsal tunnel syndrome, and calcaneal edema after trauma or overload secondary to obesity. Posterior heel pain would include Achilles insertional tendocalcinosis, Haglund's syndrome, Achilles watershed tendinosis, bursitis, and neuritic causes such as sural neuritis. Advanced imaging generally follows an appropriate history and physical examination and radiographs.

**Barrett:** Our differential for heel pain extends beyond plantar fasciitis. My primary considerations include nerve entrapment syndromes, fascial and soft tissue pathology, osseous causes and systemic conditions. For diagnostic workup, I employ a targeted approach. Ultrasound is my first-line imaging modality. It allows real-time assessment of the plantar fascia thickness, levels of tissue degeneration, nerve visualization, and status of the infracalcaneal fat pad. I reserve MRIs for cases where ultrasound is inconclusive or when I suspect stress fracture, occult bone pathology, or space-occupying lesions within the tarsal tunnel. Electrodiagnostic studies can be helpful, though they lack the sensitivity I've found with the Phoenix sign or simply low-dose lidocaine block that many patients with clinically evident nerve entrapment have normal nerve conduction studies, particularly early in the disease process.

I do blood work when I suspect systemic inflammatory conditions. I'll order testing of inflammatory markers. In diabetic patients, or those with risk factors, metabolic evaluation is essential since diabetes creates vulnerability to metabolic neuropathy and superimposed compression neuropathy. Interestingly, our clinical experience has shown that entrapment of the medial calcaneal nerve can be one of the first signs of diabetes.

**Schoene:** The differential diagnoses for heel pain are plantar fasciitis, hypertonic plantar fascia, plantar fibroma, fibroadipose nodules, medial calcaneal nerve impingement, radicular issues from the lower back, posterior heel issues such as insertional Achilles tendonitis, or "bump" pain issues. Occasionally we see an autoimmune-driven enthesiopathy condition.

My favorite diagnostic test, in addition to traditional weight-bearing x-rays, is diagnostic ultrasound. I refer patients out for the test, as I am fortunate to have a very experienced musculoskeletal ultrasound specialist near my office. This test affords excellent soft tissue evaluation and functionality, as it can see when the band is hypertonic. This diagnosis presents with similar symptoms, but with an unusually tight bow string fascia—not thickened or torn, but exquisitely tender to palpation or painful along the more distal portion of the fascia. These patients can have exquisite pain along the actual fascia.

The hypertonic fascia will have a different approach with treatments, relying more on deep-tissue work, mechanical control of the foot, and heel cups or higher heel drop early in the treatment plan. The beauty of the ultrasound is that it also measures the thickness of, and detailed evaluation of, the fascial fiber alignment, and can pick up very small tears down to less than 1mm, as well as discovering

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muscle atrophy of the intrinsics; and if it's only unilateral, then we diagnose suspicion of radiculopathy, rather than a bilateral neuropathy. If I suspect a stress fracture or some unusual lesion within the calcaneus, I will order an MRI. Rarely do I order blood work or NCV/EMG unless I suspect gout, autoimmune issues, or neurological conditions.

**Q** ***PM:*** *Assuming you have a patient with plantar fasciitis, what conservative treatment do you order? How effective are strappings, tapings, night splints, and plantar fasciitis sleeves for this condition?*

**Richie:** One of my mantras when I lecture on this subject is that podiatric physicians are the best specialists to treat plantar heel pain based upon knowledge of the contributing factors, and are able to directly implement all the effective treatment interventions. Still, I see many colleagues treating the new patient with plantar heel pain exactly the same as any primary care physician would, with instructions for stretching, icing, massage, use of night splints, and perhaps recommending an over-the-counter arch support. All this information can be found online, so chances are that the patient has already tried these interventions. Therefore, I feel that this condition must be treated as a biomechanical disorder.

Research has shown that there are three mechanical factors which cause overload of the plantar fascia: excessive tension on the Achilles, abnormal arch mechanics, and dysfunction of the windlass mechanism. Podiatric physicians should be able to evaluate and determine the contribution of any three of these factors and then intervene appropriately.

The Achilles often needs to be neutralized with a heel lift. The arch needs to be stabilized with strapping. This is mandatory on the first visit, and I often teach patients how to self-tape. There is accumulating evidence that excessive dorsiflexion of the first metatarsal phalangeal joint creates the greatest tensile load on the plantar fascia. This dorsiflexion activating the windlass may be neutralized with stiff-soled shoes or rocker-bottom shoes such as the Hoka. A carbon fiber footplate inserted into an athletic shoe is an effective strategy to limit the windlass. A walking boot can neutralize the Achilles tendon and contains a rocker sole and sometimes is required for severe cases of plantar heel pain.

**Bondi:** I generally have a long discussion with my patients about the many conservative options available and let them determine how much they feel like they can take on that moment in their life. Many patients just want to throw everything at it at once, and others prefer to keep it simple and start with just a few things. I've found that physical therapy, focusing primarily on intrinsic foot strengthening, toe yoga, soft tissue work, glute and core strengthening, as well as hip mobility, are extremely helpful, as is general shoe education. Night splints tend to work well for patients with post-static dyskinesia. Occasionally, I will also incorporate some low-dye taping, as I've found that patients who have heel pain secondary to plantar fasciitis often feel better with

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taping, as opposed to other potential contributors of heel pain. Other treatments I generally offer include plantar fascia compression sleeves or socks, over-the-counter or custom orthotics, air heel braces, recovery sandals, various at-home soft tissue exercises for the plantar fascia and gastrosoleal complex, as well as shock wave and radial pressure wave therapies.

**If a patient isn't better in two visits, I recommend changing the course and not wasting time.—Dr. Schoene**

**Schoene:** I actually tell patients I have a recipe for treating plantar fasciitis. I feel that as podiatric physicians, we need to treat acute foot pain as soon as possible. If a patient isn't better in two visits, I recommend changing the course and not wasting time. My regimen includes a two-pronged approach: inflammation and mechanical treatments, both at the same time. These typically include corticosteroid injection and ice, coupled with mechanical treatments, which are the most important: removable longitudinal and metatarsal arch pads, calf stretching, higher-profile heels for all patients, no barefoot walking, and cross training only, no running, jumping or fitness walking. This is our initial office visit treatment regimen, and I'm adamant about cross training only.

In 32 years I have never had any plantar fascia ruptures from utilizing the steroid on day one. I educate patients about the importance of knocking out the local inflammation while properly supporting the foot during the plan. I am adamant about wearing arch padding, supportive shoes, and doing no running or jumping, because we do not want the issue to become chronic. I learned very early, a good dose of education makes for a win for patients.

For the second visit, at the two-week mark, I have them continue with all the original treatments, and I may consider one last steroid injection if they are at least 50 percent better. At this point we add physical therapy treatments, deep tissue massage therapy, self-massage, Ultrasound, and either class III or IV laser treatment. If patients are not at least 80 percent better by the third visit, which is at the four-to-five-week mark, I consider ordering diagnostic ultrasounds if I suspect the issues are more chronic (or occasionally because of patient non-compliance) and consider re-directing the treatment plans towards my chronic protocols.

I have always believed in the importance of getting patients better quickly, and even though most of mine were athletes, I treated all my patients the same way. The chronic protocol sometimes includes a walking boot along with aforementioned longitudinal and metatarsal padding, and more intense massage and physical therapy (performed in the office, as I never referred these patients out).

I implement my chronic protocol after confirmation, on diagnostic ultrasound, that the fascia is abnormally thickened or torn. This would often include my bi-monthly injection therapy protocol utilizing my natural homeopathic injectables. Rather than attending traditional PT for 2-3 visits a week for 6-8 weeks, totaling 20+ visits, I would see the patients about eight times, and at the 14-16-week mark, the fascia would be remodeled, and patients were feeling good.

We also utilize ESWT in the office. Traumatizing the fascia however a doctor chooses does the exact same thing by inciting the inflammatory response and allowing the tissue to get inflamed, proliferate, and then remodel. I found that tissue remodeling occurs at the 14-16-week mark. Even for my patients on immunotherapy drugs, this protocol seems to work.

My protocol is simple: one hour in the office every two weeks for the injection and physical therapy treatments, all covered by insurance, which many of the other inflammatory inciting treatment protocols are not. This has proved very simple but has had profound results. The patients get all the necessary shoe, orthotic, strengthening, and flexibility treatments, plus instruction. I used to tell patients you can stretch or do toe scrunches all day, but if the fascia is damaged, we need to get your body to repair the tissue first.

**Shapiro:** My primary treatment for plantar fasciitis is as follows: shoegear education, weight loss counseling, anti-inflammatory methods such as ibuprofen (for pain control rather than for inflammation), non-barefoot walking in the home, and frozen water bottles for pain reduction. My primary long-term treatment is custom foot orthoses and proper supportive shoes. Over-the-counter inserts may also provide temporary relief. I do not offer strapping, taping, or plantar fasciitis sleeves. I commonly employ night splints as a secondary line of treatment.

**I am not a big fan of night splints. In practice, I find compliance to be poor because many patients can't tolerate sleeping with them.—Dr. Barrett**

**Barrett:** Conservative management remains our first-line approach, but I've become increasingly systematic about distinguishing between mechanical plantar fasciitis and cases with nerve involvement, as the treatment algorithms differ.

For pure plantar fasciitis, I employ a structured approach that includes activity modification, targeted stretching protocols (gastrocnemius and plantar fascia-specific stretches), and appropriate footwear. We have had some good responses to the BBACK 0524 shoe, which is classified as a medical device in Europe. Honestly, I am not a big fan of night splints. In practice, I find compliance to be poor because many patients can't tolerate sleeping with them. When I suspect concurrent nerve involvement, which

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happens more often than most practitioners recognize, the conservative approach must address both components. Nerve gliding exercises may be of benefit, and I'm more aggressive about ruling out entrapment that might require definitive treatment beyond standard fasciopathy protocols.

**Q** ***PM:*** *What role do non-steroidal anti-inflammatory medications play in your treatment of plantar fasciitis? Do you use Medrol dose packs in your treatment plan?*

**Weil:** I typically prescribe non-steroidal anti-inflammatory medications or topical compounded creams. Either route can help reduce pain in a non-habit-forming way, which is critical in today's environment, reduces swelling, and breaks the pain cycle. Normally, people want prescriptions instead of being told to take over-the-counter medications. I do use Medrol dose packs occasionally when pain and swelling dictate and there is no fracture (which is rare).

**Bondi:** I generally do not prescribe Medrol dose packs for plantar fasciitis unless a patient is not responding to other conservative measures or has an underlying inflammatory process, and the ultrasound confirms a significant amount of soft tissue inflammation.

**Barrett:** NSAIDs have a limited but reasonable role in managing acute exacerbations of plantar fasciitis, particularly when used strategically rather than chronically. The pathology of chronic plantar fasciitis is more degenerative (fasciopathy) than inflammatory, which limits the utility of anti-inflammatory medications. That said, for acute flares or in the initial weeks when inflammatory components may be present, NSAIDs can provide symptomatic relief and may facilitate participation in physical therapy. I use NSAIDs judiciously, typically recommending them for 7-to-14 days during acute phases rather than as chronic management. Regarding Medrol dose packs, I occasionally employ them for plantar fasciitis and have found them beneficial to many patients, albeit temporary.

**Shapiro:** I generally recommend over-the-counter ibuprofen early in treatment. Topical diclofenac is also sometimes helpful. I typically reserve Medrol dose packs as a secondary or tertiary option for patients with severe pain, or for those who want to avoid steroid injections.

**Schoene:** This may sound odd, but I rarely prescribe oral pharmaceutical medications, including Medrol packs, post surgery or for any musculoskeletal conditions. As I noted, I generally prefer natural injection therapies at the site of the problem, which I have found to be very effective. If a patient presents with overall inflammation issues, due to autoimmune disease or other etiologies, and/or prefers to stay away from pharmaceutical products, for 30 years I utilized many supplements and dispensed many that are well studied for inflammation: fish oils, curcumin, and other natural supplements in a therapeutic dosage.

**Q** ***PM:*** *When do you turn to administering injectable corticosteroids for plantar fasciitis, and what is the course of your injection therapy? Where do you prefer to locate the site of the injections? When would you discontinue this therapy?*

**Richie:** I am very likely to inject corticosteroids on the initial visit for a patient with plantar heel pain, particularly if the symptoms have been present for more than two months. Although there are documented cases of rupture after steroid injection, I have never seen one in my 37 years of practice. I have seen at least 20 cases of spontaneous rupture of the plantar fascia in athletes who never had received a steroid injection.

I would never inject a steroid, however, without addressing the mechanical causes of plantar fascia overload, so taping the arch is mandatory on the day of the injection. I try to limit the injections to one time only. If I do two, or (rarely) three injections, I like to space them at one-month intervals. My injection is 0.5cc Celestone Soluspan mixed with 2cc 0.5% Bupivicaine, administered under a posterior tibial nerve block. This allows me to target the point of maximal tenderness marked out before the block, and using a plantar approach to the target, rather than a medial approach. I inject directly into the fascia itself, not above or below it.

**Weil:** As my career has progressed, my utilization of cortisone injections for plantar fasciitis has substantially lessened. I have found that most cases are manageable without cortisone. With more research showing the deleterious effects of cortisone, I'd rather find regenerative ways to help patients. I also almost never perform an injection on the initial presentation. Ironically, my belief is that I am doing a disservice to the patients in making them immediately pain-free. If they become pain-free, most of them will not follow the directions of mechanical change of footgear and orthotic support, or improving their condition of equinus. Then, when the injection wears off, they are in worse shape.

Interestingly, there are virtually no studies validating the benefits of cortisone injections for heel pain. In the unusual event that patients have complied with previous treatments and have not responded, and have continued pain and swelling, I will utilize a cortisone injection. I will rarely perform a second injection. I use a combination of 1.5cc of 0.5% Marcaine plain, 0.5cc of dexamethasone and 0.5cc of Kenalog in a 3cc syringe, and a 30-gauge needle. Under ultrasound guidance, I directly introduce the needle medially and inject the contents between the plantar fascia and calcaneus.

**Bondi:** I very rarely perform steroid injections for plantar fasciitis for my patients. I would consider administering a steroid injection as a last resort after trying every other feasible conservative treatment option. I will also consider a steroid injection if a patient has a significant limp secondary to pain and is unable to take time off work. In either situation, however, patient edu-

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cation about the risks of the injection is imperative, to help them understand the underlying factor(s) causing heel pain in the first place. If they don't understand the cause, in my opinion, the injection is a band-aid that may buy the patient some time, but in the end will likely be a recurring issue.

**Shapiro:** I typically use this modality for patients with severe pain (7/10 or higher). This usually occurs in the form of 0.5% Marcaine plain and dexamethasone phosphate 4mg/mL (1:1 mix of 3cc total). I inject the needle from the medial side of the heel, rather than directly plantar at the glabrous skin junction, aiming at the area of the patient's complaint.

**Barrett:** I also approach corticosteroid injections very cautiously and selectively, and almost never use them. If we know the status of the plantar fascia from our diagnostic ultrasound, and there is a significant amount of degeneration, then we employ regenerative injections using BPC-157 or other peptides.

**Q** ***PM:*** *What physical therapy modalities would you order in treating plantar fasciitis? Do you perform these treatments in-office, have a physical therapist on staff, or do you refer them out?*

**Bondi:** In our practice there are physical therapists within the system, but not specifically within our foot and ankle space. But I often refer patients to physical therapy, and based on where they live, so that it's more convenient. Apart from intrinsic foot strengthening and mobility work, I will often write for instrumented, assisted soft tissue work such as graston, active release technique, or dry needling. While not a modality, I will also have them perform either a walking or running gait analysis as well, if indicated.

**Shapiro:** I also do not provide physical therapy in the office but rather refer patients out. This is usually a later treatment method since eliminating biomechanical etiologies to the increased plantar fascial strain is more important and effective.

**Schoene:** We offer many physical therapy treatments in our office and make them a very integral part of the protocol from the very beginning. Included are various manual massage and therapeutic exercise techniques, with massage therapists, ultrasound, electric stimulation, class III and IV laser treatments, kinesiology tape, longitudinal and metatarsal padding, and occasionally TENS units. We add stretching and strengthening of the lower extremity muscles as well. I almost always give bouncy balls in two different sizes to patients and have them use these every day. For the recalcitrant chronic protocols, I even hand out flat rocks that mimic massage tools. I instruct patients to massage the plantar fascia themselves between office visits. We all get a good laugh, but the balls and rock work very well when integrated with the traditional podiatric protocols. Patients receive the treatments from the medical and massage staff.

**Richie:** We happen to have an in-house physical therapy team that is integral to our success in treating heel pain. Physical therapy always helps ensure success of a comprehensive treatment plan. Therapeutic massage is probably the key ingredient, followed by ultrasound.

**Weil:** I think impacting the posterior muscles and tendons is critical here. In my mind, it is all about loosening that tissue through stretching, manual manipulation, and stimulation. Also, building strength in the extremity is important. Often, the hip flexors are weak, which can impact everything. We have physical therapists on staff who take care of 10-to-15 percent of our patients who need physical therapy. The rest are referred out.

**Q** ***PM:*** *What role does orthotic therapy play in treatment of heel pain, and how are orthotics biomechanically effective in treating this condition?*

**Barrett:** Orthotic therapy can play a significant role, though the mechanism of action is more complex than simply supporting the arch. When patients develop heel pain, and subsequently alter their gait to avoid discomfort, they often can increase pressure in the tarsal tunnel. Orthotics that address the fascial strain and the compensatory biomechanics might prevent this progression. In our experience, orthotic therapy should be part of a comprehensive treatment plan, not monotherapy. It works best when combined with stretching, appropriate footwear, activity modification, and treatment of concurrent conditions like nerve entrapment.

**Richie:** I am a big proponent of custom foot orthotic therapy in treating plantar heel pain. I realize that several studies have shown no superiority of custom foot orthoses over pre-fab devices in treating plantar heel pain. That has not been affirmed, however, by my own experience. At least half of my new patients presenting with heel pain are already using some type of pre-fab arch support that has failed to resolve their pain. Regardless of what some research shows, custom foot orthotic therapy following Root principles will give positive results 90 percent of the time, in my experience. Patients should be casted non-weight-bearing, with a neutral suspension technique, everting the forefoot on the rear foot as much as possible. Pushing down on the first ray will assure pronating or everting the forefoot during the casting procedure. The lab should intrinsically balance the positive cast to capture this position. The everted forefoot will offload the plantar fascia, as research has shown.

**Schoene:** I feel orthotics are a very important tool that all podiatrists should be utilizing for all the musculoskeletal conditions they treat. Podiatrists should be considered the experts in biomechanical evaluation of the foot and ankle as it relates to overall skeletal health. Having said this, I feel there is a timing issue about when to dispense the devices to patients with plantar fasciitis. I prefer to use a true functional orthotic for my active or athletic populations. I consider a functional device as a rigid/semi-rigid device with the appropriate correc-

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tions for the biomechanical faults, and to support the body weight properly. I still do biomechanical exams on all my orthotic patients and evaluate them prone, standing, and then on the device, when dispensing. Whatever the method, I teach students that it's imperative to perform a meticulous impression technique. A soft material accommodative insole is not what I'd consider a true functional orthotic, and I prefer to save these for our diabetic or rheumatoid patients. Polypropylene devices will last many years and can easily be refurbished, which saves money for the patient long-term versus soft material devices that need to be replaced every couple years.

Until the heel pain is at least 90 percent improved, the patient will often complain that the orthotics are uncomfortable, so I hold off on dispensing a new device until the patient is almost free of pain. The breaking in of the device can backfire, as symptoms may return because, for many patients with tight gastroc-soleus, there is reduced dorsiflexion at the ankle joint, which means the needed dorsiflexion compensation occurs at the midtarsal joint through the oblique midtarsal joint axis. If we dispense a firmer device too quickly to a patient, the symptoms can flare and return again, causing pain at the plantar fascia attachment. The longitudinal and metatarsal pad can be worn during the break in period, and it works well as it gently supports the foot. Plus, it fits in many shoes and slippers. The timing of orthotic dispensing is a pearl I have taught many students over the past 20-plus years of teaching. Because of this, I prefer to use the longitudinal and metatarsal pad until at least 90 percent improvement has been achieved, then gradually ease them into the new devices. This is why I always instruct patients to continue their stretching routines when breaking in orthotics. I also evaluate for any leg length discrepancy, typically functional in nature, and although it's not "normal", it is very common. I check this with the standing patient and always correct it with a lift if needed, with or without the orthotic device. I often hear from patients with long-standing hip, sacroiliac, or low back pain that the cork lift has worked miraculously well for them.

**Bondi:** I do think orthotics can be a useful tool in treating plantar fasciitis. I see them more as a crutch for the foot in that they help take some of the pull and load off the plantar fascia and calcaneus. Modifications to improve the alignment of the foot and offload the painful area on the heel can be helpful as well. If patients do not have a significant deformity, once they start feeling better, I try to get them out of the orthotic device. I want them to build up their intrinsic foot, glute, and core strength in physical therapy so they don't have to rely on orthotic devices.

**I try to push patients away from specific brands and focus instead on the characteristics of a quality shoe.—Dr. Shapiro**

***PM:*** *What shoe therapies and modifications would you consider in patients with plantar fasciitis?*

**Shapiro:** Every patient receives education about the use of supportive shoes. In general, shoes with a rigid heel counter, torsional stability in the midfoot, and stable vamp are most appropriate. I try to push patients away from specific brands and focus instead on the characteristics of a quality shoe.

**Barrett:** In my opinion, appropriate footwear is fundamental to heel pain management, yet it's often overlooked or addressed superficially. My approach has become increasingly sophisticated as I've recognized that footwear affects not just mechanical loading but potentially nerve compression as well.

This is where our research with the BBACK model 0524 shoe becomes relevant. We're specifically investigating whether optimized biomechanical design can address the fascial strain/shearing forces and potentially reduce secondary nerve compression that develops from compensatory gait patterns. The hypothesis is that preventing the biomechanical cascade early might prevent the progression from simple plantar fasciitis to combined fasciopathy and nerve entrapment.

**Schoene:** During active plantar fascia treatment regimens, I instruct patients to always wear shoes indoors, even in the evening, and utilize a very supportive shoe/sneaker or slipper around the house. I suggest wearing the longitudinal and metatarsal pad with all shoes. For women, I ask them to wear heels as much as possible, and I ask men to wear the highest heel profile shoe they have. The shoe aspect of treatment is so important for resolution, and it's very helpful for symptom control. The athletic shoe industry's new standards of the low profile/zero drop is not helpful for acute plantar fascia or posterior heel conditions, so I try to instruct patients to look for a higher heel drop for the duration of the treatment regimen.

**Bondi:** I generally tell patients that shoe comfort is one of the most important factors when selecting a shoe. And if they have orthotic devices, the shoes must also be compatible. That is why I generally do not recommend specific brands or models of shoes. I do, however, recommend specific features of shoes that I think they would benefit from based on their mechanics and condition, which can help narrow their options. For plantar fasciitis, I generally recommend avoiding maximally cushioned shoes. I find that many patients with plantar fasciitis tend to have weaker feet. I believe that if you put weaker feet in softer shoes, there tends to be less stability which, in my opinion, can cause the foot muscles to overwork and fatigue. That does not mean that they should not have any cushioning, though. I

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also recommend shoes with rocker soles, as these patients often have a tight gastrosoleal complex. The rockers can help compensate for some of this tightness and potentially alleviate some of the pull on the plantar fascia.

**Richie:** Proper footwear is an essential complement to all aspects of heel pain treatment. There are three key shoe components: a heel drop of 12mm or more, a stiff shank, and a stiff stable forefoot with minimal flexion. Stiff, rocker-style shoes have shown the ability to offload the plantar fascia, and this design can be found in some athletic shoe designs. I like some of the Hoka shoe models as long as the heel drop is over 12mm. Hiking shoes and work boots can provide these same criteria. For women, a wedge slide or clog with a thick forefoot platform can be ideal but may not be suited for custom foot orthotic therapy intervention.

**Q** ***PM:*** *Some of the more advanced therapies for heel pain include the use of ESWT, EPAT, cryosurgical units, ultrasound (phonophoresis), lasers, and high-frequency electronic wave technology (Neurogenx). Other new contenders include percutaneous tenotomy (e.g., Tenex, Hydrocision), amniotic membrane matrix, platelet-rich plasma (PRP), and cannabinoids. Do you include one or more of these in your protocol?*

**Weil:** The vast majority of patients will improve with conservative treatment. There are, however, a few things to consider. Patients may want to try to get better faster. With higher deductibles, patients may not want to go through the standard care and prefer to get to more advanced therapies more quickly. I have been using ESWT/EPAT since 2000. It has proven to be better than 90 percent effective, in our research. In fact, I believe, the less than 10 percent of patients on whom it has not been effective have actually had another undiagnosed cause of heel pain. High-level research supports ESWT/EPAT more than all other treatments combined, including surgery. I have had patients who requested EPAT/ESWT much earlier in the treatment paradigm than I recommended, because they wanted to take an aggressive approach.

Understandably, many have shied away from cash services like ESWT/EPAT. Now, however, in the world of high deductibles, we are dealing with cash services on nearly every patient. When presented in the right way, ESWT/EPAT is fantastic for plantar fasciitis. Since 2017 I have increased my usage of placenta-derived injections, mostly Wharton's Jelly (which is not covered by insurance). I much prefer them over cortisone. They are regenerative and non-harmful. I often use them in combination with ESWT/EPAT and have anecdotally found quicker and better responses compared to using each one individually. Years ago, I stopped using PRP in favor of placenta tissue, as I did not see the results that others have reported. I have very limited, and unfavorable, experience with Tenex. Very occasionally, I will use coblation, in isolation, for someone who has recalcitrant plantar fasciitis and isn't interested in the non-covered services above.

**Shapiro:** Since most of these modalities have poor research literature support, I generally do not use them. My practice does employ radial shockwave therapy at five once-per-week sessions of about five minutes each. This is generally offered as a third-line therapy due to lack of insurance coverage, but we have found it to be highly effective as part of a multi-modality approach with proper shoes, orthotics, weight loss, and night splints.

**Barrett:** We employ ESWT in combination with other modalities, while our focus is highly oriented toward regenerative techniques after accurate diagnosis. I have seen only disastrous results from Tenex, but that does not mean that many folks have not improved with this modality, rather only that the ones who don't have a good experience show up for evaluation.

The evidence for ESWT in chronic plantar fasciitis that has failed conservative treatment is reasonably strong. Multiple randomized controlled trials demonstrate moderate effect sizes. I consider ESWT for patients with chronic symptoms for greater than six months, who have failed comprehensive conservative treatment and want to avoid surgery. It's not first-line therapy, but it has a legitimate place in the treatment algorithm.

Interestingly, I believe that we were the first to implement PRP for plantar fasciopathy in the early 2000s. We had excellent results with this technique. But now, in my opinion and experience, it is far less beneficial than regenerative peptide infiltration under ultrasound guidance.

What virtually none of these technologies address is nerve entrapment. If a patient's heel pain is primarily or partially due to tarsal tunnel syndrome or other nerve entrapment, these fascial-targeted treatments will have limited benefit.

As far as cannabinoids are concerned, I'm intrigued by emerging data for neuropathic pain, but the evidence specific to heel pain is essentially nonexistent. In states where medical cannabis is legal, some patients report benefits for chronic pain conditions, but I can't make evidence-based recommendations for heel pain specifically.

**Bondi:** We do perform shockwave, ESWT, and pressure waves (EPAT) treatments, as well as PRP and Tenex procedures. I utilize shockwave and pressure wave therapies frequently in my practice for plantar fasciitis and plantar fasciosis, although more commonly for plantar fasciosis, given the timing of when patients generally seek treatment. We consider ESWT and EPAT to be low risk and will offer these treatments as first- or second-line treatments. For plantar fasciitis and fasciosis, we have seen improved outcomes when using both devices, as opposed to one or the other. These treatments work especially well in chronic cases, as they help stimulate the healing process by improving blood flow, breaking up scar tissue and adhesions, and reducing pain, among many other physiological effects. However, insurance generally does not cover these

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treatments. For PRP and Tenex or Ten Jet procedures, we tend to pursue these options if patients are not responding to conservative care, as these treatments are more invasive. The decision about which to pursue often depends on ultrasound findings and patient preference, and PRP is not covered by insurance. PRP injections and Tenex or Ten Jet are performed under ultrasound guidance. We have seen positive outcomes for both treatments as well.

**Richie:** Based on the research, two therapies stand out that have shown impressive results for treatment of chronic heel pain: ESWT and radiofrequency nerve ablation. EPAT is essentially the same as radial shock wave, and it shows similar excellent results compared to ESWT. None of the other therapies mentioned in this question have been tested or proven effective in any quality prospective studies. I was one of the co-authors of the original study of radiofrequency nerve ablation, by Landsman et al., which was a blinded, prospective, placebo-controlled study. This level-one study showed that 80 percent of patients with chronic heel pain can be successfully treated with radiofrequency ablation of the inferior calcaneal nerve with a high level of satisfaction and zero complications. Since then, there have been four other high-quality studies of radiofrequency nerve ablation of the inferior calcaneal nerve showing similarly impressive results. We also use radiofrequency nerve ablation, EPAT, which is really radial shockwave, and PRP injections. We have great success with the first two, and moderate success with PRP. Patients usually prefer shockwave because it is less invasive than radiofrequency nerve ablation, although the latter procedure is more successful.

**Based on the research, two therapies stand out that have shown impressive results for treatment of chronic heel pain: ESWT and radiofrequency nerve ablation.—Dr. Richie**

**Q** ***PM:*** *When do you decide to operate on patients with plantar fasciitis, and what is your procedure of choice?*

**Shapiro:** In the very rare case that a patient requires surgery, I tend to favor an open instep partial plantar fasciotomy. The incision is about 1.5cm, and the procedure takes two minutes, while allowing me to visualize exactly how much of the fascia I've cut. As a result, I no longer perform endoscopic plantar fasciotomy. Microdebridement has been successful in 50 percent of my patients, so I only offer this for patients who want a no-incision approach. I typically institute weightbearing with crutches and a controlled ankle motion boot immediately postop to avoid lateral column symptoms and allow full weightbearing at two-to-three weeks.

**Schoene:** I do not do any surgical intervention on plantar fasciitis, as the chronic protocol relieves the pain and restores the collagen integrity within the fascia.

**Barrett:** My surgical decision-making has evolved significantly as I've recognized that many patients with refractory plantar fasciitis may actually have nerve entrapment as a component in pathogenesis. If the plantar fascia is very severely degenerative, and there are signs of nerve entrapment, I recommend staging the procedures so the plantar fascia is primarily addressed. The patient is told that they may need additional surgery to address their nerve pathology, but in many cases the nerve component will resolve after an EPF.

Endoscopic plantar fasciotomy remains a very safe and effective method of treatment with minimal risks in experienced hands. If there is a combined nerve and fascia component, however, we will treat the plantar fascia primarily.

**Richie:** With our newer treatment modalities, our need to operate on chronic heel pain has been reduced to about one percent of all patients with this condition. When I do operate, I perform a percutaneous release of the medial one-third of the central band of the plantar fascia. I do not like endoscopic plantar fasciotomy because it limits the release to the plantar fibers only, while a release of the medial fibers is necessary, in my opinion. The percutaneous approach is a quick and easy procedure, but the recovery from any plantar fasciotomy is unpredictable. I really do not like cutting the most important ligament support of the human foot. I keep the patients non-weight-bearing for six weeks, and in a walking boot for a total of 12 weeks. I believe the fascia does repair in a lengthened fashion and does become functional again with this protocol. Fortunately, however, I rarely perform this procedure anymore.

**Weil:** It is very rare that I have to take someone to surgery for isolated plantar fasciitis. More commonly, the surgery is a tarsal tunnel release, and micro-fasiotomy with coblation. I frequently find evidence of calcaneal stress syndrome, with micro-fracture and bone marrow edema on MRI. As a result, I have been performing a subchondral biologic stabilization of the micro-fracture with results that are nothing short of amazing. People with months of substantial problems are pain free within days after the procedure. It has been one of the most game-changing things I've done in years. PM

**Dr. Haspel** is senior editor of this magazine and past-president of the New Jersey Podiatric Medical Society. He is a member of the American Academy of Podiatric Practice Management.