



# Congested Traffic at the Tarsal Tunnel

The tarsal tunnel is a narrow space located on the inside of the ankle. It is formed by the ankle bones and a band of ligaments that stretch across the foot. The ligaments act as protectors for arteries, veins, tendons, and nerves that are passing through.

The largest nerve entering the foot travels through the tarsal tunnel, the posterior tibial nerve (PTN). It is responsible for the sensation we feel on the sole of the foot and coordinates with muscles in the bottom of the foot to direct movement. When the PTN is compressed, discomforting things happen.

PTN compression typically prompts a tingling or burning sensation; numbness; or outright pain, including shooting pain in one's inner ankle that frequently extends into the foot. For some people, the discomfort may also involve the heel, extend to the arch or even the toes, or head north to one's calf.

Risk factors for tarsal tunnel syndrome include the following:

- Overpronation.
- Flat feet (sometimes a byproduct of overpronation).
- Ankle injuries (e.g., swelling, inflammation).
- Unwelcome visitors occupying space in the tarsal tunnel (e.g., varicose vein, ganglion cyst, tumor, or bone spur).
- Diabetes or arthritic conditions.
- Overuse (e.g., prolonged standing, walking, or running).

Left untreated, tarsal tunnel syndrome can cause permanent nerve damage. Early intervention using conservative measures has a good success rate in eliminating it or keeping it well managed. Surgery may be recommended in severe cases to release the nerve or to remove a growth.

Before treatment, a thorough evaluation and accurate diagnosis are required. That's where our office comes in. If you suffer from any lingering foot or ankle discomfort, please don't hesitate to give us a call.

## About the Doctor

Terence D. Bredeweg, DPM



A West Michigan native, Dr. Terence Bredeweg was born and raised in the Grand Rapids area. He earned his bachelor's degree in cell and molecular biology from Grand Valley State University, then moved to the Chicago area to earn his doctor of podiatric medicine from the William M. Scholl College of Podiatric Medicine at Rosalind Franklin University.

Dr. Bredeweg returned to Michigan for his podiatric surgical residency at Henry Ford Wyandotte Hospital. He then moved back to the west side to join Kalamazoo Podiatry, and later became a partner in the practice in January 2015. He became lead podiatrist in January 2016, after Dr. Redmond's retirement from full-time practice.

Dr. Bredeweg believes that spending time with patients, educating them about their condition and treatment options, and helping them feel empowered to make decisions about their health care are key to providing the best outcomes.

In his free time, you might find Dr. Bredeweg reading a book or watching the game. He also enjoys outdoor activities, including golf, fishing, and skiing.



# Gender Influence on Common Foot and Ankle Problems

Although each person's feet and ankles are unique, there are general differences between genders that influence our assessment of risk factors, future injury prevention, treatments, and home care. Following are a few examples.

Women are more likely to suffer from bunions than men. High heels and other fashionable shoes with narrow toe boxes are featured villains. Men are no strangers to bunions, but inherited foot function and posture are more frequently to blame.

Plantar fasciitis is prevalent among women and men. Women tend to have a naturally flatter foot posture than men due to having more flexible ligaments and other soft tissue. This places added stress on the plantar fascia, leading to discomfort and pain.

Men are often plagued by plantar fasciitis because they overdo it with their workouts; miss a few days of working out then try to pick up where they left off; or make a sudden leap in workout length or intensity. Women are sometimes guilty of this, too, but in our experience it's more common with men.

Studies have shown that women are more susceptible to ankle sprains than men. Again, women have more naturally flexible ligaments, enabling the ankle to roll out further before the ligaments begin to stabilize and support the situation. Women also have a wider pelvis, which changes the angle from the hips to the knees, which can impact ankles, increasing women's vulnerability to sprains.

Other factors that weigh in on foot and ankle injuries among men and women include hormonal differences that affect muscle mass and joint strength (e.g., testosterone, estrogen), dimensions of bones, and differing bone densities and body-fat percentages. Biomechanics, activities, and heredity, among other factors, have their say, too.

## Mark Your Calendars

- July 4** Independence Day: Three presidents died on July 4: Jefferson, Adams (first), Monroe.
- July 5** Bikini Day: The name "bikini" was inspired by a U.S. atomic bomb test site: Bikini Atoll.
- July 10** Piña Colada Day: The piña colada is the national drink of Puerto Rico.
- July 20** Moon landing (1969): The earth's moon is the fifth-largest in our solar system.
- July 24** Cousins Day: If identical-twin women marry identical-twin men, identical-cousin offspring are possible.
- July 28** Milk Chocolate Day: By U.S. law, milk chocolate requires only 10% cocoa; Europe, 25%.
- July 31** Mutts Day: Mixed-breed dogs have longer life spans than purebreds (genetic diversity).

# Roller-Coaster Physiology

Roller coasters provide thrills and exhilaration galore. Naturally, outward sights and sounds grab the spotlight, but there's chaos beneath the surface, too.

A German study published in the *Journal of the American Medical Association* found that riders hooked up to heart monitors showed average heart rates spiking at 155 beats per minute — on the slow ascent up the first hill.

When faced with fear or stressful anticipation, the body unleashes a cocktail of hormones into the bloodstream — the “fight or flight” response. For instance, adrenaline and norepinephrine raise your heart rate and direct blood to the muscles, lungs, and brain, which heightens awareness and boosts energy.

However, g-forces — the force of gravity or acceleration on a body — are greatly elevated on a roller coaster, and at odds with some aspects of adrenaline and norepinephrine. Even at normal g-force, blood pressure is higher in the feet than the head. With increased g-forces, it's harder for circulating blood to return to the heart, reducing the brain's oxygen supply. Some riders may experience lightheadedness or wonky vision. Occasionally, some faint.

Our eyes and middle ears coordinate to achieve balance. However, the unpredictable movements and forces associated with a roller coaster can cause them to send conflicting messages to the brain, sometimes resulting in dizziness, vertigo, or motion sickness.

Neck muscles are under siege during a coaster run, too, and have to make rapid adjustments to keep your head stable. In normal circumstances, supporting that 11-pound melon is quite a feat, leaving aside the demands of unnatural forces. To aid your neck, keep looking forward, eyes open, to better anticipate what's coming.

Overall, roller coasters are thrilling, chaotic, and remarkably safe. Still, there's a reason why many warrant medical warnings before riding.



## Cilantro Lime Grilled Salmon

*Yield: 4 servings; Prep time: 10 minutes; Total time: 25 minutes*

### Ingredients

- 4 (6-oz.) salmon fillets
- kosher salt
- freshly ground black pepper
- 4 tbsp. butter
- 1/2 c. lime juice
- 1/4 c. honey
- 2 garlic cloves, minced
- 2 tbsp. chopped cilantro

### Directions

1. Season salmon with salt and pepper. Heat grill and place salmon on grill, flesh side down. Cook for 8 minutes then flip and cook on other side until salmon is cooked through, 6 minutes more. Let rest 5 minutes.
2. Meanwhile, make sauce: In a medium saucepan over medium heat, add butter, lime juice, honey, and garlic. Stir until butter is melted and all ingredients are combined. Turn off heat and add cilantro.
3. Pour sauce over salmon and serve.

### HELPFUL TIPS:

- The skin helps keep the salmon together while cooking, makes flipping the fish a lot easier, and offers crispiness and great taste. You can go skinless, but it takes much more finesse. Besides, the skin can always be removed after cooking. Your call.
- Good-quality salmon's doneness can be checked with a fork. Once it easily flakes upon a bit of pressure (at the thickest part of the fillet), it should be good to go.
- Fish obviously sticks to grill grates, but as soon as those lovely char marks are achieved, the fish will release from the grates and will be super-easy to flip. If you're feeling ANY resistance when you peek at the underside of your fish, DON'T flip!

*Recipe courtesy of [www.delish.com](http://www.delish.com).*





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## Running at the Beach Not Always a Shore Thing

For many beach vacationers, workouts with an ocean view, such as beach running, are on the agenda. But take heed of the following.

Running on sand requires more exertion than other typical running surfaces — studies have shown up to 1.6 times more energy is expended. More muscles are put to work, which means you might experience soreness afterward that you haven't felt before. To counter that, cut back on your normal mileage to avoid excessive stress not only on muscles, but on ligaments and tendons, too.

Run at low tide, as close to the water as possible without splashing, as the sand is packed (but still soft) and provides improved stability. Unpacked sand away from the water's edge is more of a menace for strains, sprains, and even fractures.

The shoreline is on a natural slant, which places extra stress on the pelvis as it adjusts for leg-length discrepancy with each stride. In turn, there's a chain reaction of added pressure on the back, hips, knees, ankles, and feet. If you plan to run along the water's edge, run an equal distance in both directions (an out and back) so that both sides of your body share the burden of the tilted landscape.

Wear running shoes, too. They provide support for your arches, heels, and ankles as well as protection from broken seashells, rocks, debris, jellyfish stings, etc.

If your beach trip wasn't a vacation for your feet or ankles, contact our office to make things right.

