

# Dr. Kilberg's Seven Steps To Healthy Feet In Diabetics

## #1 Inspect Your Feet Daily

In my practice, most diabetics have some form of peripheral neuropathy. This condition is caused by diabetes and the way the excess blood sugar affects the small arteries that give nerve tissue nutrients, as well as a direct effect of excessive blood sugar on the nerve tissue itself. What this means for a diabetic is that gradually foot sensation will decrease. Although uncontrolled diabetes will lead to this sooner, simply being a diabetic for a long period of time will lead to peripheral neuropathy. Peripheral neuropathy simply means disease of the nerves in the periphery of the body- legs and arms. Diabetics will experience a subtle form of this condition in which a small amount of foot sensation will be lost. Unfortunately, most diabetics will not know that this sensation has been lost, because the foot won't feel 'numb' until much later in the process. Other symptoms can be felt in diabetic peripheral neuropathy, including pain.

When a diabetic cannot feel properly in their feet, they will not be aware of injuries or problems in the feet that a non-diabetic will easily feel. For example, a diabetic may not feel the puncture of a sharp object like a needle, instead feeling as if something flat or soft was stepped on. Normally one would not look at their feet if it did not hurt to step on something, and in a diabetic this could lead to an infection if an object truly penetrated the skin and was not immediately removed. I have seen countless diabetics walk into my office with vague foot discomfort only to find a sewing needle on x-ray that had been stuck in the foot for awhile. Sometimes these get very infected, and require immediate surgery to remove the object and flush the infection. A daily foot inspection may have caught the puncture wound in time before infection set

in, and possibly before the object worked its way in deeper. Another common problem is the development of wounds in a diabetic. Normally skin wounds are easily felt as they are painful to walk on for a non-diabetic. A diabetic with neuropathy will not necessarily feel a wound on the bottom of the foot, and the wound can fester for weeks before it is noticed. I have unfortunately seen many cases of diabetics who never noticed a foot wound until it was oozing pus into a sock from infection. At that point, many of these people needed powerful antibiotics, possible hospitalization, possible surgery, or possible amputation. Wounds can develop from something as simple as poorly fitting shoes rubbing on skin, or even from corns and calluses that become thicker and thicker. Corns and calluses are the skin's way of protecting itself from excessive pressure and are usually started when an abnormally prominent bone under the skin forces the skin to rub against a shoe above it. The skin will then thicken to protect itself. Normally people without neuropathy will feel pain from the corn or callus, and will alter the way pressure is placed on the foot at that spot or will change shoes to avoid the pain. Diabetics may not feel this pain and the pressure on the skin will continue. Eventually, the skin will start to die underneath this thick tissue, and an ulcer or wound will form under the corn or callus. The corn or callus will remain on top looking like normal, if not thickened, skin, but a deepening wound continues to worsen underneath. Eventually it may become infected, and all of the serious treatment options listed above may be needed. Simply inspecting the foot each day will reveal if a callus has formed, and watching for any discoloration of the skin underneath like bruising or redness could catch a developing wound under the corn or callus.

Simply put, a daily inspection will catch any visible foot problems before they have a chance to worsen and cause serious problems. Do this at night before going to bed, to catch any problems that occurred that day. Simply look at the bottom and top of the foot, the sides, the heel, and in between the toes. If seeing the bottom of the foot is difficult due to arthritis or an inability to bend the back or legs, use a hand mirror on the ground and wave the foot over it to see the sole of the foot. Just be sure to pick the mirror up so it doesn't get stepped on! During the inspection, which should not need to take longer than 30 seconds, look out for redness, bruises, blisters, wounds, cuts, scrapes, new swelling, excessive skin warmth, or new derangement of joints or of the

toes. If any of these things are seen, call a foot specialist first thing in the morning. If the foot has a wound that is draining, red, and hot, or if the foot looks newly deformed or is warm to the touch with redness and without a wound, proceed to the nearest emergency room or urgent care center immediately, as a serious infection or injury could be occurring.

Very few serious diabetic complications develop in the feet instantly. Most of the time these problems can be easily treated or prevented if caught early enough. The foot inspection is a vital part of this, and getting into the habit of inspecting ones feet, even if neuropathy is not present, will likely one day be the difference between quick treatment and an amputation. Always remember that peripheral neuropathy is not 'felt' until much later in the process, and a diabetic may not know if their foot sensation is poor.

## **#2 Always Wear Shoes**

You've probably heard it time and time again from your family doctor, books, diabetic friends, and family. "Always wear shoes", they say. I imagine you have questioned why this is necessary. Unfortunately, I'm here to tell you they are right- as a diabetic you need to wear shoes nearly as much as you need to control your glucose. Its that simple and straightforward.

In the above step I discussed the development of diabetic peripheral neuropathy and the need to inspect your feet daily. Diabetics hardly ever notice when this neuropathy develops. Poor sensation gradually occurs, and the chance of stepping on a sharp object and not feeling much of it gradually increases. For the most part, stepping on a needle, piece of glass, nail, or sharp rock is painful during early stages of diabetes, as it is in non-diabetics. However, the longer one is diabetic and certainly the worse one controls their diabetes, the more likely neuropathy will develop and that previously painful sensation of stepping on something sharp becomes a dull sensation, almost like one were stepping on something flat and harmless. In later stages of neuropathy no sensation is felt at all. All of this becomes a problem because diabetics generally heal poorly from puncture wounds to the feet, and are much more likely to develop an infection from the bacteria living on the object puncturing the skin. This object can occasionally penetrate deep into the foot, even to the bone, and this may cause a deep abcess that needs

surgery to drain. Unfortunately, most puncture wounds that go deep are not visible on the skin, as the objects causing this tend to be small (for example, a sewing needle). These deep infections are not noticed until they are severe enough to cause redness, swelling, and sometimes drainage if it is able to work its way to the surface. Most of the time I have to open these feet up in an operating room to drain the infection, and if a patient ignores the foot long enough, sometimes I have to remove bone or amputate part of the foot. These problems can be easily prevented by wearing shoes. Shoes in general will protect the foot from most puncture wounds (unless you happen to step on a three inch nail or such). My simple advise to you is to wear shoes at all times. This is common sense, of course. Most people always wear shoes when walking outside or in public. Now, here's the hard part: you need to wear shoes indoors as well. This is the part most diabetics dislike. What can be better than coming home from work or a long afternoon at the store and taking off your shoes? Well, if you are a diabetic, you can't afford such a luxury. No matter how clean the home is kept, sharp objects lurk everywhere. Whether its the wood splinter brought in by the kids from outside on their shoes, the piece of ceramic missed in the cleanup of the broken dish last week, the errant sewing needle, or the carpet tack pushed up after many years of foot traffic, dangers abound in the perceived safety of home. In fact, most of my patients' puncture wounds occur in their own home. This is why its important to wear shoes around the house. A dedicated clean 'house shoe' is recommended, but even a slipper with a thick sole will do. Obviously you don't have to shower in shoes, but everywhere else a shoe or sturdy slipper is highly recommended. Another piece of advise is to quickly inspect the inside of your shoes or slippers, as occasionally objects fall into them. I remember treating a patient that presented with a large coin-sized indention in the skin that was becoming irritated. A quick shoe inspection revealed some pocket change that had fallen into the shoe at some point! Inspecting for and removing any object in the shoes is another important step to protecting the foot, and is one most people don't think about.

If you inspect your feet daily for any developing problems, and wear shoes to protect them, the likelihood of developing serious diabetic foot complications lessens significantly. These two steps alone will save many feet from amputation.

### #3 Wear Properly Fitting Shoes

Simply put, a diabetic cannot afford to wear an improperly fitting shoe. Improperly fitting shoes will cause pressure and rubbing on the skin, which will eventually lead to blisters and wounds. This obviously applies to tight shoes, but did you know that shoes sized too big can also cause problems? When a shoe is too big, the foot will slide backwards and forwards like a piston within the shoe itself, causing friction blisters to form and jamming of the toes at the end of the shoe, which can also lead to wounds. As you know from the above steps, wounds can lead to infections and eventually amputations. It is imperative that diabetics get properly measured at the shoe store every time shoes are bought to ensure the best fit. Although sizes are supposed to be universal, different manufacturers create slightly different shoe size variations, and a 10 medium in one brand may be a 10 wide or even a 10 1/2 in another brand. Diabetics should purchase shoes from a store who is staffed with employees trained to help with shoe fitting, and preferably who are knowledgeable about the brands they carry. Fitting is best done in the late afternoon, when foot/leg swelling (edema) is at its greatest. There is no sense in fitting for a shoe if one has edema when the edema is down, as the shoe won't fit when the edema returns. Yes, the shoe may be bigger during the early part of the day, and this can allow for movement of the foot in the shoe. However, if a shoe cannot be worn at all in the afternoon/evening, it is of no use. Those with edema unfortunately will always have shoe fit issues no matter what. It is preferable to err on the side of bigger, as tighter shoes will cause the worst problems. Additionally, if one has a foot that is bigger than the other, the bigger shoe size determines which size to get, as one does not want to wear a smaller size shoe. Most people with different sized feet have only a half size difference. If the size is more than that, say 1-2 sizes different or more, then one must consider buying different sized shoes for each foot. This can get expensive if specially ordered, or if two different sized pairs of shoes are purchased to make this possible, but is necessary in the long run for foot protection.

Shoe habits are the number one reason I see patients with shoe-related diabetic foot complications. Many people are used to wearing styles of shoes that have

long been considered fashionable and are generally very tight on the feet. This includes women's and men's dress styles, as well as many women's casual styles. Getting these patients to wear a properly sized roomier shoe is extremely difficult. My advise to those of you who are holding on to these styles is simple: your feet look much less fashionable with a prosthetic leg after an amputation. This scenario does occur with alarming frequency, and many times is attributed to wounds caused by poorly fitting shoes.

## **#4 Moisturize Your Feet Regularly**

Dry feet are often a problem for diabetics, as the high blood sugar will cause a decrease in the body's natural sweating mechanism likely in the way it effects small nerves that control the sweat glands and the small blood vessels that help dissipate heat out of the skin. In the colder months, this effect is even greater, as the body will try to conserve more heat towards the central core (like the chest and abdomen). To preserve this body heat near the more vital organs, the body will decrease sweating amongst other actions. Sweating helps the body get rid of excess heat, and this process is significantly decreased in colder weather. Add the drying effect of diabetes, and one can experience significant drying of the legs and soles of the feet. Dry skin that is simply flaky is not so much of a problem as dry skin that forms cracks and fissures. Cracks and fissures, especially in weight-bearing areas like the heel and ball of the foot, can often lead to wounds and even infections. Any skin crack in a diabetic that is open or bleeding needs to be evaluated by a foot care specialist for immediate attention and treatment before it can become a more significant problem. Treatment usually involves trimming the fissure down to an even level with the surrounding normal skin, and applying ointment and a light dressing. Unfortunately, even skin that is simply dry and flaky can eventually progress to cracks and fissures. This is why it is important for diabetics to moisturize their feet and legs.

Typically most diabetics need to moisturize their feet each day for proper hydration. During the winter months this may be necessary 2-3 times per day. Some diabetics may even need prescription strength moisturizers that contain urea or lactic acid if the dryness is not improving. It is very important not to apply moisturizers in between the toes, as this can sometimes lead to

skin breakdown in between the toes and can lead to infection. The areas in between the toes are the only places on the feet that should stay dry. Contrary to popular belief, soaking the feet will often lead to increased dryness as the water and soap or epsom salt solution will leach the skin's moisture, causing even more of a problem after the skin dries. Unless necessary for a therapy or post-surgical treatment course, it is a good idea not to soak your feet in the winter if you are a diabetic.

Although it requires some effort, keeping one's feet well moisturized is key to preventing diabetic foot problems.

## **#5 Check Bath Water Temperature With Your Arms**

Part of neuropathy could include poor sensation of temperature. Diabetics can easily misjudge the true temperature of water and scald their feet. The foot is more likely to lose this temperature sensation than the hands, which can still lose temperature sensation in advanced neuropathy cases. The arms, however, will maintain temperature sensation in general. Simply put, it is much safer to check bath or hot tub water temperature with the forearms than it is the feet or hands. If you don't do this, you risk scalding your foot before the rest of your body gets into the water to realize that it is too hot. Burns in diabetics are all too common, and heal at a decreased rate. Burns are also susceptible to infections more than other wounds, and diabetics are more likely to develop infections from those burns than non-diabetics. Before you get into the hot tub for a warm and relaxing soak, keep this in mind.

On the other hand, cold injuries like frost bite are also found in diabetics due to poor temperature sensation. Common sense dictates that everyone, diabetic or not, should protect their feet from freezing temperatures by wearing warm, dry socks and the appropriate shoes for the climate. Wet feet and socks should be dried immediately to avoid cold-related skin injury, and diabetics should periodically check their socks for dryness. Diabetics should never venture outside without adequate protection for their feet when the weather is cold and wet.

## #6 Do Not Perform Bathroom Surgery

The story is a simple one: Picture a diabetic with hard corns on the toes that ache while in shoes all day. Nothing would feel better than to trim the hard skin with a pocket knife or a razor to ease the discomfort, right? This diabetic then goes to the bathroom, puts their feet on the bathroom counter, and begins to trim away the hard skin. Unfortunately, this person can't feel their feet well due to diabetes, and ends up cutting off part of the toe's good skin. They hastily cover the bleeding toe with a band aid, thinking it will heal just fine. The next day, the toe is red, swollen, and draining pus.....

Unfortunately, this scenario is all too common. Simply stated, diabetics should never try to cut any part of their foot skin for any reason. Not only is working on yourself difficult due to poor positioning and reach, but poor sensation in diabetes can allow for disastrous injuries inflicted to one's own foot. All skin lesions or hard spots should be treated by a professional, and preferably a podiatrist, as surgically working on feet is what we do all day. Although a corn may not seem like a big deal to you, the fact of the matter is that improper treatment of painful skin lesions at home often lead to wounds that take a long time to heal, infections that persist, and sometimes even amputations.

Remember, diabetics feel less foot pain, heal wounds more slowly, and resist infections less effectively. Any time a diabetic inflicts a skin injury to their own foot, they run the risk of developing any/all of these problems. Since this could have easily been prevented by letting the professionals do the work, there is no reason for any diabetic to develop a toe problem at their own hands. Even under the best professional care, the skin can be accidentally cut if there are problems with the surrounding tissue. The difference between this situation and one at home in the bathroom is that a podiatrist will know how to properly care for it to ensure no further problems develop, and that the skin will fully heal.

A simpler solution to dealing with hard skin lesions at home is to gently file them a little bit every several days after bathing using a fine emery board or pumice stone/block. After bathing the skin is softer, and will file easier. However, one must still be cautious, as aggressive filing can cause superficial wounds to the skin as well. Also, please don't use a wood file or



sand paper from the workshop! I have heard too many patients tell me about using those items. They are simply too coarse for skin use.

The bottom line is this- get all hard skin lesions like corns and calluses properly treated by a professional, preferably a podiatrist. A small amount of filing at home is ok as long as great care is exercised, but no cutting! Remember, if you develop a foot wound or infection by your own hand, the only person you can blame is.....you. Take better care of yourself and your feet will stay healthier.

## **#7 Control Your Diabetes**

If I could only give one piece of advise to my diabetics, I would not necessarily give advise on foot care. Although this may sound surprising coming from a podiatrist, the simple fact of the matter is that without high blood sugar, diabetics do not develop many foot problems. My one piece of advise is simply this: **control, control, control your blood sugar**. When your diabetes is properly controlled, the body's tissues and organs essentially exist in a state as if your diabetes did not exist. Only when your blood glucose elevates does the body's organ systems begin to alter in response, allowing the myriad of diabetic complications to slowly occur. If your blood sugar is always kept in good control, then these complications for the most part do not occur, or occur with less severity. This includes foot complications. Neuropathy, unfortunately, does increase somewhat with the number of years you are a diabetic despite good control, but poor sugar control will greatly accelerate this, and as I have discussed before neuropathy will lead to many foot complications. Therefore, daily foot inspections and consistent foot protection with shoe use (no barefoot walking) are still vitally important even if you control your glucose well. However, without a doubt the single most important thing a diabetic can do for themselves is to control their glucose. Diet, exercise, and vigilant self-monitoring are the hallmarks of this control. This is especially effective in type 2 diabetes. Diabetes (type 2 in particular) is not like cancer, or heart failure, in which only constant medication or surgery is needed to keep the disease under control. Through your actions, you can keep your blood sugars down and your body healthy. Do many type 2 diabetics need daily medication? Of course they do, but without self-control these medications will fail to keep glucose under control. Even in type 1 diabetes, just because you take some form of insulin

does not mean you are entitled to forget diet and lifestyle control. While this is especially important in type 1 diabetics, type 2 diabetics have the luxury of being able to control their disease better, and these controls become vitally important for them . The responsibility for you type 2 diabetics to become 'undiabetic' on a daily basis from a general health standpoint is entirely yours. If you choose to not follow a proper diet, then you are choosing to develop diabetic complications. If you knew you could save your leg or life by performing a simple daily action, would you not do it? It has broken my heart to see so many diabetic patients over the years who choose to ignore their diabetes and act without care or responsibility, and then develop leg-threatening infections and wounds, or die outright from diabetic-related heart or kidney disease. I cannot emphasize this enough- **IF YOU REFUSE TO CONTROL YOUR BLOOD SUGAR, YOU ARE STATISTICALLY LIKELY TO DIE WELL BEFORE YOUR TIME FROM DIABETIC-RELATED ORGAN DISEASE, AND ARE MUCH, MUCH MORE LIKELY TO LOSE A LEG (OR TWO) FROM INFECTED WOUNDS AND GANGRENE.** Do yourself the best favor you could ever perform: control your blood sugar each and every day to the best of your ability, and work closely with your family doctor, internist, or endocrinologist to maximize this control. You will not only live longer, but your legs will be intact and working up to the very end.

---

See Dr. Kilberg's diabetic foot blog at [thediabeticfoot.blogspot.com](http://thediabeticfoot.blogspot.com) for more information and advice.

## Indiana Podiatry Group

Drs Schulman and Kilberg, Podiatric Physicians and Surgeons

### Shadeland Office

Shadeland Medical Center  
7430 N. Shadeland Ave. Suite 290  
Indianapolis, IN 46250  
(317) 841-7990

### Noblesville Office

Riverview Surgical Pavilion  
325 Westfield Rd Suite B  
Noblesville, IN 46060  
(317) 773-7787