

## **Will my foot problems get passed on to my children?**

Have you ever asked yourself, "Will I be passing my aching bunions and hammer toes on to my kids?" "Are these foot issues genetic?"

There are many different types of foot problems that occur for a multitude of reasons, many of which are multi-factorial. Body weight and other environmental factors (such as footwear) are considered probable causes of many foot conditions, but genetics has recently been shown to play an important role as well. Here is a brief list of some common foot ailments and their causes.

**Bunions.** Bunions are the most common problem of the forefoot (the front part of the foot). They occur in about 23% of 18- to 65-year-olds and 36% of people over 65 years. This is a condition where the big toe points toward the second toe causing a bump on the inside edge of the toe. This bump is an enlargement of bone or tissue around the joint at the base of the big toe. Bunions are generally caused by bone structure and ligamentous laxity or "loose ligaments" and tend to occur more often in women. We now know that genetics do play a role in the development of bunions. In fact, the results of the recent Framingham Foot Study, published in the September 2013 issue of *Arthritis Care and Research*, show significant heritability for bunions. This study showed that bunions were inherited in 39% of the women and 38% of the men in the study; while a whopping 89% of participants with bunions under the age of 60 had inherited the condition. But, keep in mind that narrow-toed, high-heeled shoes can certainly aggravate the problem. The condition can progress and become quite painful. On the other hand, sometimes bunions are not bothersome at all.

**Hammer toes.** This is a condition where one, or both, joints of the second, third, fourth, or fifth toes (the "little toes" or "lesser toes") bend. The abnormal bending is caused by an imbalance between the flexor and the extensor tendons of the toes. This imbalance is often caused by ill-fitting or high-heeled shoes. However, we now know that genetics do play a role. High arches and flat feet, and the pressure from a bunion can all increase the risk of developing hammer toes. Additionally, sometimes a hammer toe is caused by genetically inherited conditions that cause nerve damage in the foot. Recent studies have shown that lesser toe deformities as a group (e.g., claw toe, hammer toe, mallet toe) have a significant heritability, ranging from 0.5 heritability to 0.9, depending on age and sex (scale is from 0–1; with 0 meaning genes do NOT contribute at all to the observable differences between individuals and 1 meaning genes are the ONLY reason for the observable differences between individuals; or, to put it another way – a heritability of 0.5 means that, on average, 50% of the differences among individuals that we observe in the "little toes" is attributable to genetic differences).

**Corns.** A corn is a circular, thickened area in the skin of the foot that usually forms after repeated pressure on the skin, such as the rubbing of an ill-fitted shoe. Corns are caused by foot wear. No genetics involved – so you can't blame Grandma Rose for this one, but, this also means you won't pass this condition on to your children. In fact, in some third world countries where people don't generally wear shoes, this problem is extremely rare. However, other foot conditions can contribute to the problem, such as hammertoes where the tops of the bent toes tend to rub against the tops of shoes.

**Ingrown toenails.** This condition occurs when the rim of the nail grows down into the skin of the toe. Genetics do play a small part in this. In some cases a genetic predisposition has been noted and familial cases have been reported. Additionally, congenital ingrown toenails, though uncommon, are believed to be due to intrauterine trauma or hereditary transmission. However, research shows that activity or shoes are the main culprits. Ingrown toenails occur most often in young athletes and in those that squeeze their feet into shoes that are one size too small. Nail salons that give pedicures can also aggravate this problem when they attempt to dig the ingrown nail out. This can cause irritation or an infection and is clearly not recommended. Additionally, make sure your nail salon uses only sterilized instruments, especially considering the next common foot problem.

**Fungal infections.** The origins of this infection are completely from the environment and are caused by microscopic organisms (fungi) that can live on the skin. The more exposure, the more likely a skin or nail

infection will develop. It is usually picked up at the gym, hotel, locker room, or nail salon where the warm, damp environments may breed higher concentrations of fungi. You can pick up fungus from a loved one.

At the cutting edge of research in foot disorders, scientists have been trying to identify genes involved in various inheritable foot conditions. So far, new candidate genes have been identified that may help reveal the genetic basis of structural foot disorders. This research is currently ongoing.

How to reduce the risk of these foot issues:

1. Wear comfortable shoes. Deep wide shoes that are not pointy. Sensible heels. Do not let your young girls/teenagers wear heels. These can cause tendon imbalances that can lead to many problems in the future.
2. Let the feet and nails breathe. Don't wear nail polish 24/7 year-round. Give the nails and feet a break.
3. Have feet checked if any calluses, corns, bruises, blisters, or areas of irritation appear.
4. Once-a-week self-examination is recommended to check for cracks on the bottom of the heels. Pay particular attention to the skin between the toes.
5. Moisturize. Using moisturizing cream can help prevent cracks, particularly in the winter time.
6. If copious sweating is a major issue, consider tea soaks. Dilute caffeinated tea and soak for 15 minutes, twice a day. The caffeine and the tannic acid in the tea help constrict the sweat glands.

So, perhaps the answer to the question is both; footwear and genetics both play roles in the development of many foot issues. You may have a genetic predisposition to certain foot issues, but poor footwear will exacerbate it. For additional information regarding these and other foot health issues, consult with your Podiatrist or visit [www.APMA.org](http://www.APMA.org) or [www.GreatFootCare.com](http://www.GreatFootCare.com)