

# Bunions: Can Anything Really Be Done for Them?

## Physical Therapy in Merrimack Valley for Foot

The "what, when, and why" of bunions explained. If you have a family history, or personal experience with bunions this article explains the rationale for orthotics in the prevention of bunions. Talk to your Physical Therapist at Gemini Physical Therapy Spine & Sports Rehabilitation to determine if orthotics would be appropriate for you.

Bunions can get pretty ugly -- and not just because they look funny. But because with the big toe angled so oddly, the foot loses the normal function of that joint and changes how a person walks. They can also be very painful.

It's possible that the use of a shoe insert called an orthotic to support the arch early on may prevent this unsightly deformity. At least that's what a group of Physical Therapists at the University of Minnesota Medical School are proposing. If that's true, it will be the first treatment discovered to affect bunions in any way other than surgery. And that would be good news for bunion sufferers!

What is a bunion anyway? That bony knob sticking out from the big toe is caused by a change in the alignment of the first metatarsal and the hallux. The first metatarsal is the bone inside the big toe. The hallux is the bone in your foot that connects to the first metatarsal. The joint where these two bones meet is called the first metatarsophalangeal joint or MTP joint.

As the hallux shifts away from the foot (a movement called abduction), the first metatarsal adducts (moves toward the other toes). The result is a disruption of the metatarsophalangeal (MTP) joint. Swelling around the joint develops and forms the deformity you see on the outside of the foot that's called a bunion. Once the shift begins, it seems there's no stopping it without surgery.

No one knows exactly why this shift gets started. There have been many theories and experts agree that it's probably multifactorial. In other words, there are many things combined together to cause this foot deformity. Some of those things include environment (shoe wear), genetics (family history), and anatomy. This group of therapists takes a look at the anatomical component and suggests that a collapse of the arch of the foot may be at fault.

If you look at the alignment of the foot arch from the front of the foot, it's easy to see how a change in the tilt of the arch can change pressure placed on the big toe. Collapse of the arch while standing up on the foot in a weight-bearing (load) position may set up a chain of events that ultimately leads to hallux valgus (the medical term for bunions).

That sounds simple enough but as the authors of this article point out, the anatomy and movement of the joints in the first (big) toe are quite complex. By analyzing the joint in three dimensions (3-D), it's possible to see that the joint functions like a pin around which the bones rotate. This is called a joint axis.

The shape of the arch of the foot affects the axis of the first metatarsal (big toe). As the arch drops down, the first metatarsal axis becomes more vertical (aligned up and down). Shifting of the hallux and first metatarsal occur and that affects the joint axis, too. Pressure on and stretching of the ligaments and cartilage around the joint further weaken the support of the bony structures.

As the bones of the first ray (all the bones lined up to form a toe) shift, so do the bones in the second ray. The angle between the first and second toes widens further changing the pattern of weight and pressure under the foot and at the point of the bunion. The changes also affect how the tendons attached to the bones and the muscles associated with the tendons pull on the foot. Besides being ugly, painful, and changing the person's gait (walking) pattern, it can become increasingly difficult to find shoes that fit!

With the right kind of support, the metatarsal axis can be oriented more toward the horizontal (straight across from side to side). In this way, the arch can help support the weight of the body without collapsing, shifting the arch, and altering the alignment of the foot. The words of the song Dem Bones (the toe bone's connected to the foot bone, the foot bone's connected to the ankle bone) are quite right. A shift in one arch affects joint axis, bones, ligaments, alignment, and so on.

The authors conclude that hallux valgus (bunions) may not be irreversible with conservative treatment as was once thought. If they are right and a simple orthotic (shoe insert) can make a difference, the world will be a different place -- at least for those who are affected by this foot deformity.

The next step will be to find a way to predict who is at risk for bunions and try using orthotics to prevent the hallux valgus deformity from forming. Research to identify the optimal time for this type of early intervention will also be helpful. Delaying the need for corrective surgery and possibly eliminating the need for surgery would be the final future goal of these studies.

Reference: Ward M. Glasoe, PT, MA, ATC, et al. Hallux Valgus and the First Metatarsal Arch Segment: A Theoretical Biomechanical Perspective. In *Physical Therapy*. January 2010. Vol. 90. No. 1. Pp. 110-120.