

Bunion Formation and Orthotic Support

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A bunion is a bursa and/or osteophyte over the prominent medial portion of the first metatarsal head. It is characterized by a lump or bump at the base of the first toe that is red, swollen and/or painful.

Bunion pain can have a significant effect on mobility and activity levels, especially during middle age.¹ A large, population-based survey of people over the age of 65 found that 20 percent reported nontraumatic foot complaints of more than four weeks duration (most commonly at the forefoot and first toe), which significantly affected their health and well-being.² The National Center for Health Statistics estimated that in 1996, surgeons performed 171,000 bunionectomies.³

Hallux Valgus

A bunion forms when the first metatarsal joint is subjected to a classic foot deformity - hallux valgus. The first metatarsal deviates medially (widening the space between the first and second metatarsal bones), and the first toe (hallux) angles medially into the second toe. There is often some axial rotation of the great toe as it goes into valgus. As the deformity increases, the sesamoid bones under the joint subluxate. A painful callus may develop under the second metatarsal head due to the transfer of weight-bearing from the large toe. [Hallux valgus is the most common pathology of the first metatarsophalangeal joint.](#)⁴

Causes of Hallux Valgus

Several factors appear to be involved in the formation of a bunion secondary to hallux valgus. While mechanical instability of the foot and excessive pronation play a large role, improper footwear will accelerate the inflammation and symptom progression. [Women are much more frequently affected](#), but there is debate as to whether it is their shoes or their genes (or some other gender differences) that are responsible.

Shoes. Since bunions almost never develop in societies that go barefoot, and seldom in men (who do not generally wear constrictive and high-heeled shoes), footwear is considered a major risk factor for hallux valgus.⁵ Women tend to wear shoes that are too small, very constrictive in the forefoot, and with higher heels. [One investigation found that 88 percent of the women in the study were wearing shoes that were smaller than their feet, and 54 percent demonstrated a hallux valgus deformity.](#)⁶ The major problem appears to be that women don't change their shoe size as their feet grow larger with age, and that most shoes sold to women constrict the width of the forefoot in order to maintain fashion. Also, [high heels increase the walking pressures on the metatarsals from 22 percent to 90 percent.](#)⁷

Biomechanics. Excessive pronation and loss of the medial arch are two very important causes of hallux valgus and formation of a bunion. Using weight-bearing radiographs, researchers validated the

correlation of hallux valgus and medial arch collapse. They found "the single most dominant variable affecting metatarsal pronation (and hallux valgus) was the height of the medial longitudinal arch."⁸ Using a different approach, other investigators compared weight-bearing X-rays of the hindfeet in normal female subjects to those with hallux valgus. They found that the calcaneus and talus in the feet with hallux valgus had excessive pronation.⁹ The resulting prolonged pronation is a risk factor for developing hallux valgus and bunions.¹⁰

Treatment

Since the formation of a bunion is a multi-factorial problem, effective treatment must cover several areas. Selection of appropriate footwear is imperative. Treatment of foot fixations and subluxations will be helpful. Biomechanical support to decrease stress on the first metatarsal joint is necessary to prevent further degeneration. Custom-made orthotics worn in properly sized shoes will clear up most problems. Natural anti-inflammatory supplements may be needed for those with a very tender joint.

In spite of custom and fashion, all patients with bunions must be encouraged to wear shoes that fit properly and do not have high heels. This means wide and soft shoes that are the right size, and have plenty of room in the toe boxes. Researchers have shown that the sagittal profile (vertical height) of the toe box is especially important.¹¹ Custom-made sandals (weather permitting) and custom-made shoes that incorporate biomechanical support are an excellent recommendation.

Custom-made foot orthotics worn in properly sized shoes will help most patients with bunions. It is especially important to provide support for the longitudinal and anterior transverse arches.¹² The orthotics should have sufficient torsional rigidity to control pronation, yet be flexible enough to encourage first metatarsal mobility. Additional shock absorption under the forefoot can improve comfort and tolerance. A pronation wedge at the heel is often necessary to limit hindfoot valgus.

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