

Foot Types and Proper Footwear

Foot problems are one of the most common health complaints. The high incidence of foot problems is understandable given the fact that there are 26 bones, 33 joints, 112 ligaments, and tendons, nerves, and blood vessels in the foot. It's even more understandable when the weight of the body is considered. The force of the body weight borne by the foot increases roughly 1½ times during walking and up to 3-4 times during running. Add in 10,000 steps during a typical day while wearing ill-fitted shoes possibly, and it's a wonder one's feet are willing to get out of bed the next day.

Not all feet are created equal. To tell what type of foot one has, one can get the bottom of the feet wet, stand on a paper bag, and check the outline of foot. If a lot of the foot between the heel and forefoot can be seen, then one has a flat foot. If there is minimal contact of the midfoot between heel and forefoot, then one has a high arched foot. An outline in between is considered a neutral foot.

1. Flat Foot (Pronation)



- The foot rolls inward and flattens (pronates) with weight bearing, placing increased stress on the inner foot structures.
- This is typically a flexible foot, providing decreased stability during walking.
- This person tends to wear out the inner side of the shoe, to include under the big toe. Calluses can be seen frequently under the base of the 2nd and 3rd toes and inside of the big toe.
- If this person's shoe is placed on a flat surface, the shoe may tilt inward.
- Related problems include metatarsal stress fractures, plantar fasciitis, Achilles tendonitis, patellar pain, and hip pain.

Proper Shoe

- A flat foot benefits from a **motion control** shoe - a heavier, less flexible shoe. This limits excessive inward motion and helps stabilize the foot which is typically too flexible.
- The **midsole** is the part of the sole that provides most of the cushion and support. For a motion control shoe the midsole likely is a firm, dual density material, denser on the inside at the arch and heel.
- The **last** refers to the method of attaching the upper to the midsole/outsole, and also the shoe curvature shape. A motion control shoe typically has a board last, with a straight to semi-curved last shape.
- The **heel counter** (the area surrounding the heel) is very firm to squeeze, providing stability in the heel

2. High Arched Foot (Supinator)



- The high arched foot tends to be a more rigid, less flexible foot with more weight borne on the outside part of the foot.
- Less shock absorption occurs in the foot. Consequently more forces are transmitted up the leg to the trunk.
- This person tends to wear out the outer side of the shoe from heel to toe. Calluses may be seen along the outer edge of the foot to the base of the 5th toe.
- If this person's shoe is placed on a flat surface, the shoe may tilt outward.
- Problems seen with this type of foot include stress fractures in the tibia or femur, Achilles tendonitis, and plantar fasciitis.

Proper Shoe

- A high arched foot benefits from a **cushioned** shoe providing shock absorption. This reduces the amount of impact transmitted upwards through the legs.
- The **midsole** is a softer, more flexible, single density material, providing less support and more cushion.
- The **last** is a slip last (sewn down middle of shoe sole), with a curved or semicurved last shape.

3. Neutral Foot



- This is a more desirable foot structure. The foot pronates, or rolls inward, initially with weight bearing, but when the person is ready to push off with the forefoot and toes while walking, the neutral foot adjusts to provide stability. The neutral foot therefore provides a combination of shock absorption and stability at the appropriate times during walking or running.
- An even wear pattern on the shoe sole is expected with a minimum of calluses.

Proper Shoe

- The neutral foot benefits from a **stability** shoe, which provides both cushioning and pronation control.
- The **midsole** frequently is a dual density material limiting excessive movement inward and providing cushion.
- The **last** is combination lasted (board lasted in heel, slip last in the forefoot) with a semicurved last shape.

Orthosis

Sometimes proper footwear isn't enough to correct one's foot problems, especially if one's foot significantly deviates from a neutral foot. In that case orthosis may also be useful to provide additional support or control to the foot. Orthosis replace the existing insole in the shoes. They may range from simple over the counter insoles providing primarily only additional cushion, to other over the counter products providing some control of motion, to expensive custom made orthosis. These are fabricated under the direction of a podiatrist or other qualified health care professional. Orthosis should be worn with shoes that are combination or board lasted and should be gradually broken in to allow the foot to adjust to them.

Sport Specific Footwear

If one participates in a sport three times a week or more, it would be beneficial to purchase footwear designed specifically for that sport. For instance, playing basketball requires a stiffer sole for running and good cushioning for shock absorption from landing jumps. Runners in general require additional shock absorption. Court sports and sports like soccer, rugby, and Ultimate Frisbee require footwear providing good lateral support for the frequent and quick change of direction.

Lacing

Different ways of lacing based on different situations can be seen at: www.aofas.org - search using "lacing."

Flip flops

Wearing flip flops is very popular during warmer months. In most cases flip flops are not good for the feet. For someone with flat feet, flip flops provide no support. For someone with high arches, many flip flops have minimal cushioning. Prolonged standing or walking in flip flops will often, over time, cause the onset of pain in the feet, ankles, or further up the body.

References

"The Running Shoe Prescription," Physician & Sportsmedicine; Jan, 2005; Vol. 33 Issue 1, p17-24
American Orthopaedic Foot and Ankle Society Web site: www.aofas.org
Runners World magazine Web site: www.runnersworld.com

If you are a registered University of Illinois student and you have questions or concerns, or need to make an appointment, please call: **Dial-A-Nurse at 333-2700**

If you are concerned about any difference in your treatment plan and the information in this handout, you are advised to contact your health care provider.

Visit the McKinley Health Center Web site at: <http://www.mckinley.uiuc.edu>