Gazelle Sports

Foot types and Biomechanics

The Normal Foot
Description: Normal feet have a normal-sized arch and leave an imprint that has a flare but shows the forefoot and heel connected by a wideband.
Foot Characteristics: A normal foot usually lands on the outside of the heel, and then rolls inward (pronates) slightly to absorb shock. Runners with a normal foot and normal weight are usually considered biomechanically efficient and don't require shoes with high stability.
Best Shoes: Moderate stability shoes with moderate control features such as a dual-density or medially posted midsole.

The Flat Foot
Description: Flat feet have a low arch and leave a nearly complete imprint. That is, the imprint looks like the whole sole of the foot.
Foot Characteristics: This imprint usually indicates an overpronated foot that strikes on the outside of the heel and rolls inward (pronates) excessively. Over time, this can cause many different kinds of injuries and discomfort.
Best Shoes: Motion-control shoes, or high-stability shoes with firm, stiff midsoles and control features that reduce the degree of pronation. This type of shoe will usually feature a large of amount of dual-density material in the midsole and will appear to be fairly straight, as opposed to hourglass or peanut shaped, when looking at the bottom. Stay away from highly cushioned neutral shoes that lack stability and control for this individual.

The High-Arched Foot

Description: High-arched feet leave an imprint showing a very narrow band connecting the forefoot and heel.

Foot Characteristics: A curved, high-arched foot is generally termed and supinated or underpronated foot (the terms are synonymous). This type of foot doesn't pronate enough if at all, causing it to be an ineffective shock absorber.

Best Shoes: Cushioned shoes with plenty of flexibility to encourage foot motion. Stay away from motion-control or stability shoes that limit foot mobility.

Basic Foot Motions - Pronations Explained

What does pronation mean and how can you tell if your customer needs a stability or motion control shoe?

- When running, everyone has a unique motion in their legs and feet as they approach impact, at impact, and during toe-off…we call this the **Running Gait.**

- Typically, the foot starts by turning outward and becoming rigid to prepare for impact. (That is why most people tend to land on the outside of the hell.) At this point, the foot normally loosens up and rolls inward, and then becomes rigid again as the body weight is transferred over the ball of the foot, preparing for toe-off.

- The point at which the foot loosens and rolls inward is call **pronation**. Pronation is normal and is necessary to some degree for the foot to absorb shock and adapt to running surfaces.

- Someone who exhibits *excessive inward motion* is considered to be an **over-pronator.** Some over-pronators are best served by stability or motion-control shoes, which assist in controlling the excessive inward motion of the foot. Conditions such as flat feet, a flexible arch or an everted heel can cause you to overpronate or roll farther than what is necessary to absorb shock and adapt to different running surfaces. Approximately 70-80 percent of runners overpronate to some degree.

- Someone who *does not have enough inward motion* is considered to be an **under-pronator (more commonly referred to as a supinator).** Under-pronators strike the ground as other runners do, but their foot does not complete the motion needed to absorb shock. Usually, under-pronation is associated with

a rigid, high-arched foot. Because the foot is so rigid, it absorbs shock poorly and does not adapt to changes in running surfaces. Approximately less than 10 percent of runners under-pronate or supinate.

- Those that are *right in the middle* are known as **neutral.** Approximately 10-20 percent of runners pronate normally. By looking at the stride motion of the foot and simply discussing pronation and overpronation, we have only looked at the first portion of your stride when the foot strikes the ground. After your foot has rolled forward past your arch your foot is ready to leave the ground but before it can, your foot needs to roll in the opposite direction of pronation so that the loosened joints will tighten up again. This part of foot motion is called supination. It is necessary so that the foot becomes a more rigid lever to propel you forward.

- If the foot is still in a pronated position because of overpronation, when you start moving toward toe-off, you will be propelling yourself against a foot that is not ready to receive the force. The foot is still in a flexible position.