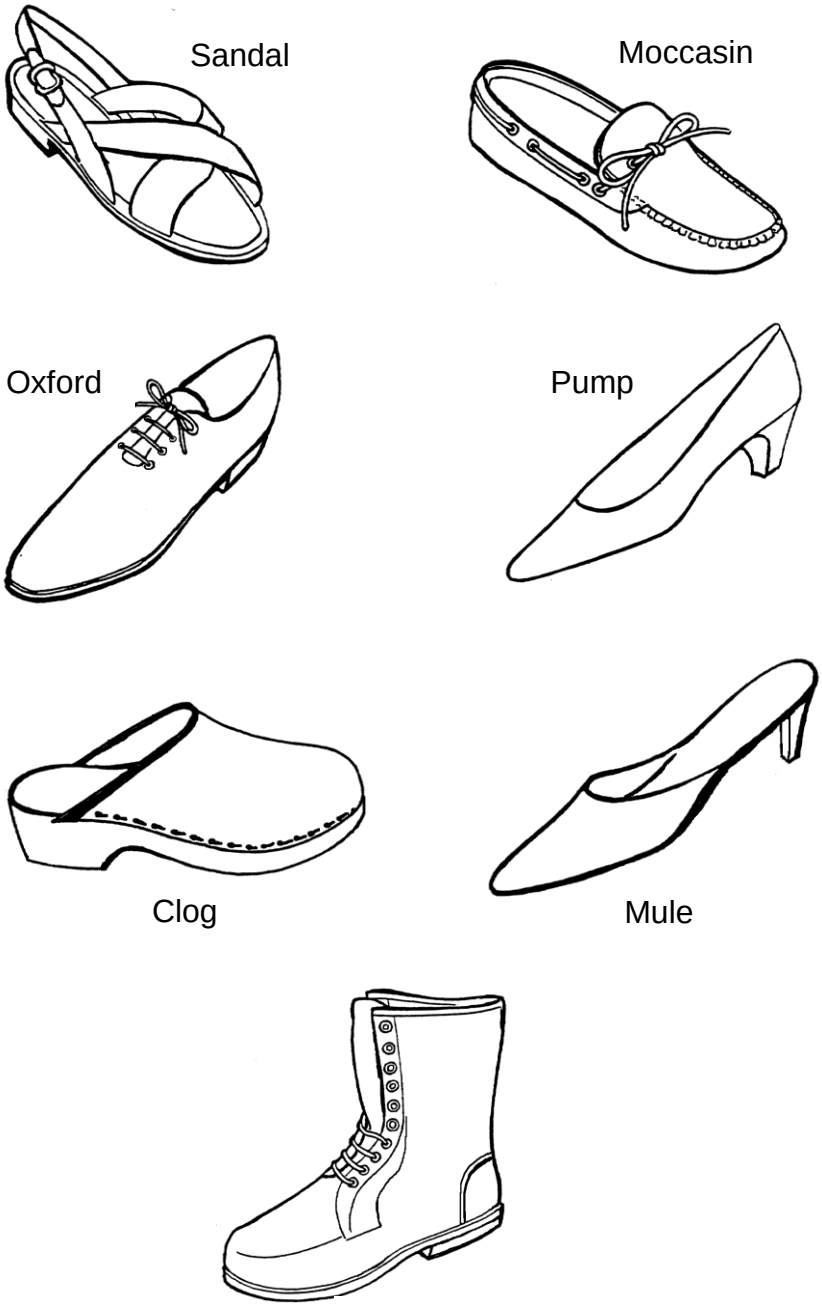
FOOTWEAR

It's a foot, orthotic, shoe to ground interface, always!

YOU CAN PLAY IN THE SHOE YOU'RE DEALT, BUT PREFERABLY…NOT!

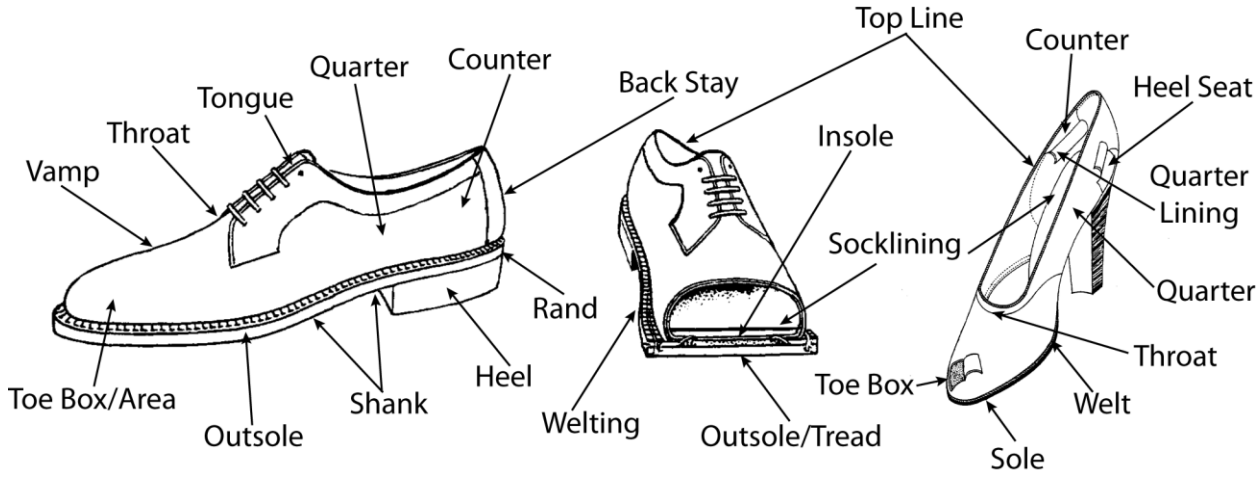
SHOES TYPES:

Seven Basic Shoe Types – The Foundation for All Shoe Styles



SHOE ANATOMY / COMPONENTS:

Quarters, Vamp, Openings, Tongue, Toe Area, Heels, Welting, Counters, etc…



Shoe Openings:

The tongue is stitched into the Balmoral opening at the throat. The quarters overlap the tongue of the Blucher opening.

There is limited consistency between manufacturers with regard to identifying components and materials, and especially when it comes to sizing.

Shoe companies generally make their full and half sizes on the same last, along with the accompanying outsole. Some brands change lasts (sizes) on the full size and others on the half size.

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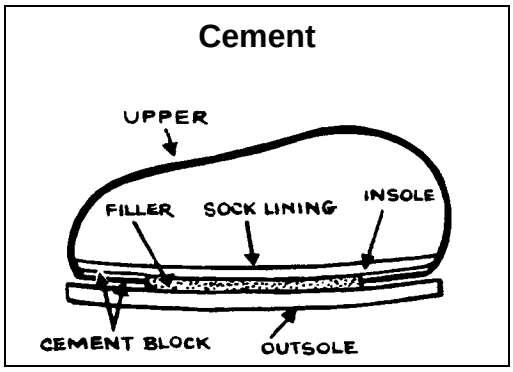
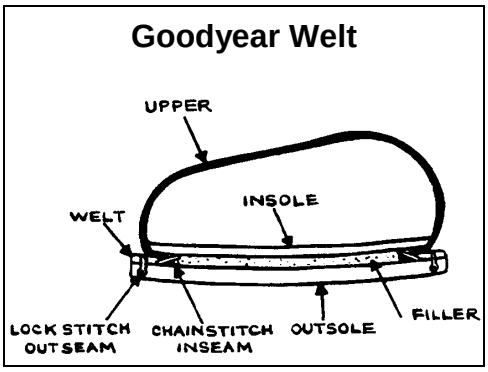
SHOE CONSTRUCTION:

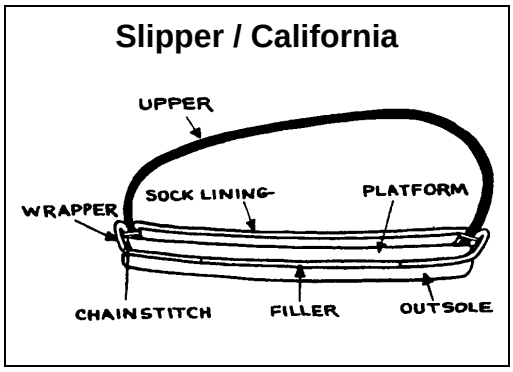
Cement



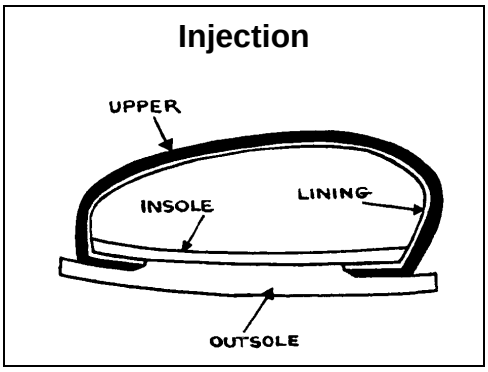
Goodyear Welt



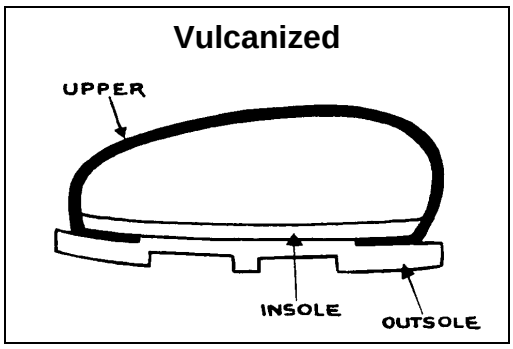
Slipper / California



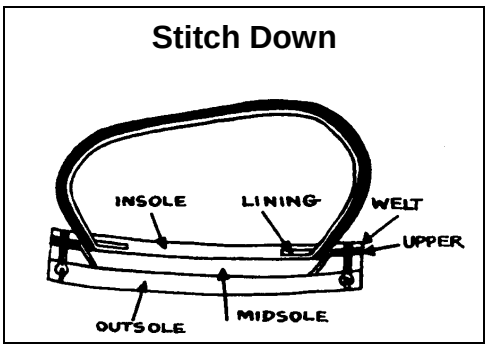
Injection



Vulcanized



Stitch Down



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SHOE SHAPE CONSIDERATIONS:

THE LAST

A shoe last is a 3D mechanical model on which shoes are formed during the fabrication process. They are constructed to mimic foot shape, but ultimately to produce a shoe shape. Lasts vary in shape between manufactures and within an individual manufacturer. There are an extremely large number of variations for last shapes. Every shoe maker constructs their own lasts, producing as many variations as there are feet and shoe types.

Straight

Semi-Curved

Curved

When considering shoe fit, there are three primary last shape options: Straight, Semi-Curved and Curved

ATHLETIC FOOTWEAR

Athletic Shoes

Running Shoes
Cross Trainers
Walking Shoes
Trail Shoes

Court Sport Shoes
Tennis Shoes
Basket Ball Shoes
Deck Shoes
Skate Shoes

Cleats
Low Top
High Top
Molded Studs
Screw In Studs
Stud Length
Studs Per Sq. Inch












SHOES ARE TREATMENT

The Effects of Elevated Heel Height

Shortened stride

Shortened contact phase/loading response

Effective application for limiting OMJA pronation secondary to Forefoot Equinus

The Effects of Soft Shoes

Decreases activity and inhibits small muscle integration, promotes propriceptive dullness.

Increases shock absorption

Decreased motion control

Soft Shoes wear out sooner, reducing control.

Hard orthotic materials will break down shoes faster.

The Effects of Hard Shoes

Increases proprioceptive input (stimulates sensory awareness)

Last longer

Better motion control.

Stiffness of soft orthotic materials is increased.

Help the patient select a shoe that is best for their condition, otherwise, match the device to suit the shoe your patient has self-selected and then warn them about what to expect, the consequences.

Running Shoes

Research has shown that runners with different arch heights typically develop different injuries. Running shoe manufacturers attempt to address these various conditions by making a range of shoes with proprietary components, materials, design features and construction attributes. Since this produces an often overwhelming myriad of models and styles to choose from, journal critics from industry and sport specialty magazines popularized a simple categorization system to help direct the consumer when purchasing shoes. Unfortunately this system, while convenient, has proven ineffective when correlating injury rates to foot type and categorical shoe selection.

Still, three categories: motion-control, stability and cushion running shoes for low-, neutral- and high-arched runners, respectively, has been used to guide runner's purchasing decisions for over thirty years.

There is some merit to the distinction for two of these categories, motion control and cushion shoes, in that research has shown those categories of shoes do provide those distinguishing attributes, motion control and cushioning. The difficulty is in prescribing those attributes to specific foot types and running styles.

Since runners and most everyone else do not respond systematically to industry advocated footwear features and since gait patterns are highly unique, if not irregular, it is not always possible to predict how someone will interact with a given shoe. This suggests recommending specific shoe components for each individual following an examination of their foot type, and gait pattern.

It's recommended that you become familiar with materials, shape characteristics and structural components of shoe construction and direct your patients to seek out those particular features when selecting shoes.

Heel Counter: Close contouring, stiff heel counters keep the shoe in direct contact with the heel and maintains direct proximity to the foot throughout stance and especially swing phase.

Midsole: The density or rigidity of materials in the midsole will make a shoe stiffer or more flexible, which determines its torsional characteristic. Midsoles that bend with very little pressure allow your feet to move freely in all directions. Excessively stiff midsoles like most often found in straight lasted motion control shoes have been linked to greater levels of pain. This supports the hypothesis that excessive midsole thickness may dampen sensory input, amplifying the potential for injury because the athlete can't "feel the ground."

Dual Density Midsoles: is a material combination usually made of EVA or thermoplastic urethane within the midsole where material on the lateral side, especially posteriorly, of the shoe is softer than the remainder of the midsole material, medially. This aids in compression of the midsole during loading response, reducing the effective lever arm length between the calcaneus and ground, which prevents abruptly forced STJ pronation secondary to a laterally displaced fulcrum/rocker. Stiffer material medially acts like a rearfoot post, arch reinforcement and is commonly referred to as a "Medial Post" in the shoe. Medial Posts may also made be made of, carbon fiber, polypropylene or other materials. The size and the shape of the posting device along with the density of the material used determine how much stability it provides. By stabilizing the midsole under the medial rearfoot and arch, pronation may be controlled. Medial Posts are found in most all stability and motion control shoes, may be found in neutral shoes, but are not found in cushion shoes.

Last construction: refers to the manner in which the upper is attached to the midsole. The significance of last construction is that the type of last influences the stiffness and flexibility of the shoe.

Board Lasted: shoes have a firm board that provides a rigid platform for the foot. Boards are often made of plastic or cardboard. Board lasted shoes are the most stable but are less common in today's running shoes.

Slip Lasted: shoes wrap fabric from the upper under the foot without using any type of additional board for support. Slip lasted shoes are recognizable by removing the sockliner/inlay and looking for a seam down the middle of the insole. Slip lasted shoes are the most flexible.

Combination Lasted: Board lasted in the rearfoot and slip lasted in the forefoot. Combination lasted shoes allow for more control of the rearfoot but without limiting flexibility of the forefoot.

Strobel Lasted : Strobel lasted shoes are the most common type in today's running shoes. A thin sheet of material such as EVA is attached to the insole from the heel seat through the midsole, then the upper is stitched to the material. You can recognize a strobel lasted shoe by the stitching around the perimeter of the foot bed. Strobel lasted shoes are less flexible than slip lasted yet not as rigid or heavy as board lasted shoes.

Shank: is a component applied in the midfoot area on the outsole configuration. It stiffens the shoe under the arch which makes the middle portion of the shoe more resistant to torsion and flexion. Many neutral and cushion running shoes incorporate a shank. Minimalist, "Bare Foot", the most flexible, lighter and sprinting shoe models do not have shanks. Some shoes wrap the shank up the medial (or arch side) of the shoe so that it functions also as a medial post. Shanks add torsional stability to the shoe without increasing weight. So as heel lifts and

the foot rockers over the ball in terminal stance, weight is transferred to the forefoot efficiently.

Vamp and Toe Box: The toe area should be sized a little longer than everyday footwear. There should be at least 3/8" of space between the longest toe and the distal end of the upper of the shoe, for an average size nine male foot and size ten female foot, size the extended length on larger size shoes and extend shorter for smaller shoes. Toe areas that are sized too short will impinge the toes and cause injury, especially black & blue toe nails, usually from excessive downhill running.

Hysteresis: is the dependence of the output of a system, material in this case, not only on its current input, but also on its history of past inputs. The mid-sole and outsole of running shoes are subject to hysteresis dependence because functional history affects the creep value of its internal material state.

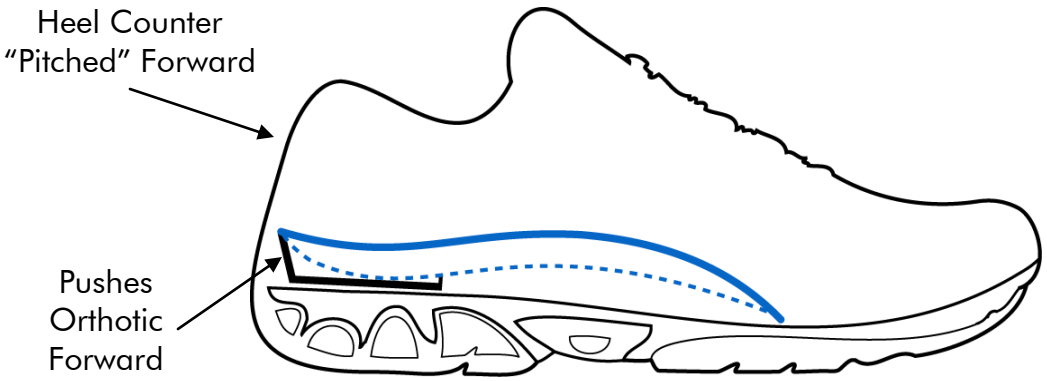
What hysteresis means to running shoes is that the greater frequency of foot falls on a shoe, the more the material of a shoe is repetitively (history) affected/compressed. It takes more than twenty-four hours for most running shoe materials to fully recover to their original form/state after use even minimal use.

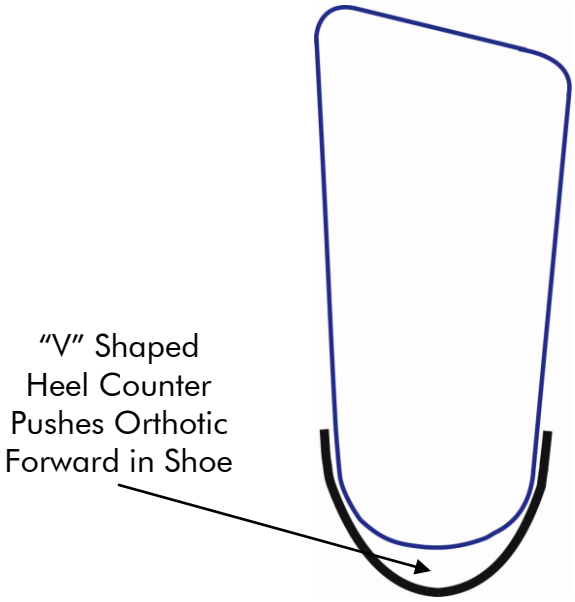
The recommended solution to hysteresis affect on running shoes is alternating two different pairs of shoes from one training session to the next.

SHOE / ORTHOTIC FIT CONSIDERATIONS:

The heel counter of a shoe is perhaps the most significant component that determines if an orthotic device will fit into it well or not. The heel cup is the first part of an orthotic shell to be sized into any particular shoe when trimming it to fit during fabrication.

The most common problem occurs when the shape of the shoe's heel counter construction pushes an orthotic forward in the shoe. There are two common shapes to heel counters that cause this problem, if the posterior aspect is "pitched" forward from the lowest part of the counter to its upper part, and when the curvature of the counter is more "V" than "U" shaped between the quarters (from inside to outside) of the shoe.





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