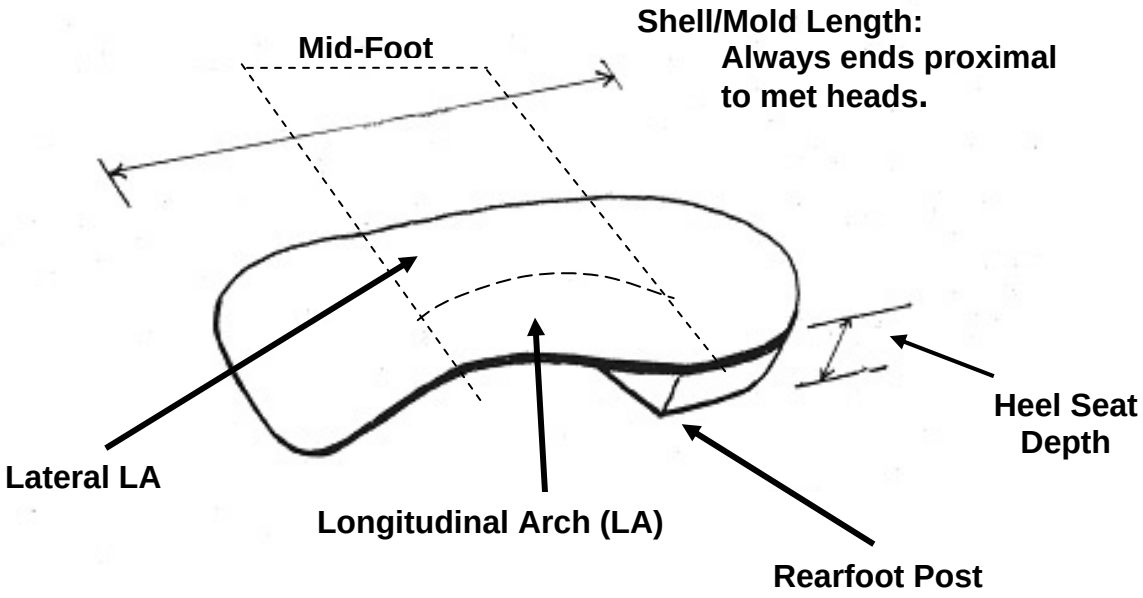
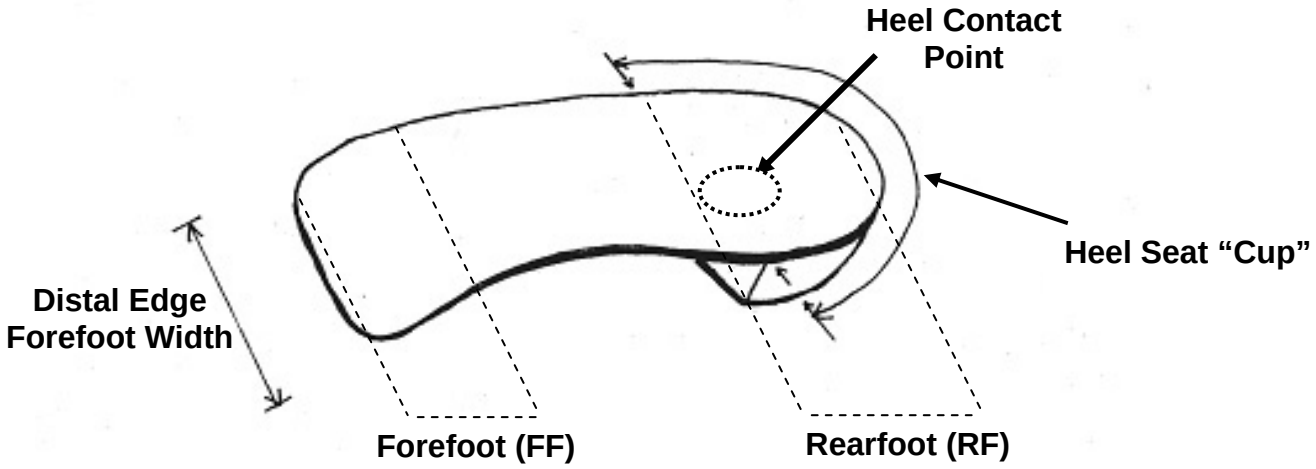
# ORTHOTIC COMPONENTS

**Specific Elements:** Shell/Module/Plate



## SHELLS & MOLDS

Shells, also referred to as Modules or Plates range from:

Flexible (Soft) ---------- Firm (Rigid)

Shells are generally formed using a thermoplastic molding process, where thin flat plastic blanks are heated to a highly malleable state and then vacuum formed over a model of the foot.

Molds are also thermoformed or cold stretched over a model of the foot using softer, thicker materials. Available materials and material combinations are numerous and vary greatly.

## BASIC TYPES/CATEGORIES OF DEVICES (MODULES)

Biomechanical/Functional: used to control motions around specific joint axes that are secondary to pathological mal-alignments of the foot and lower extremity, causing repetitive stress/strain syndromes

Adaptive: capable of incrementally altering osseous alignments in the foot during function, activating cellular elasticity, which induces ligamentous creep, resulting in a plastic response. The foot adapts to a new alignment over time.

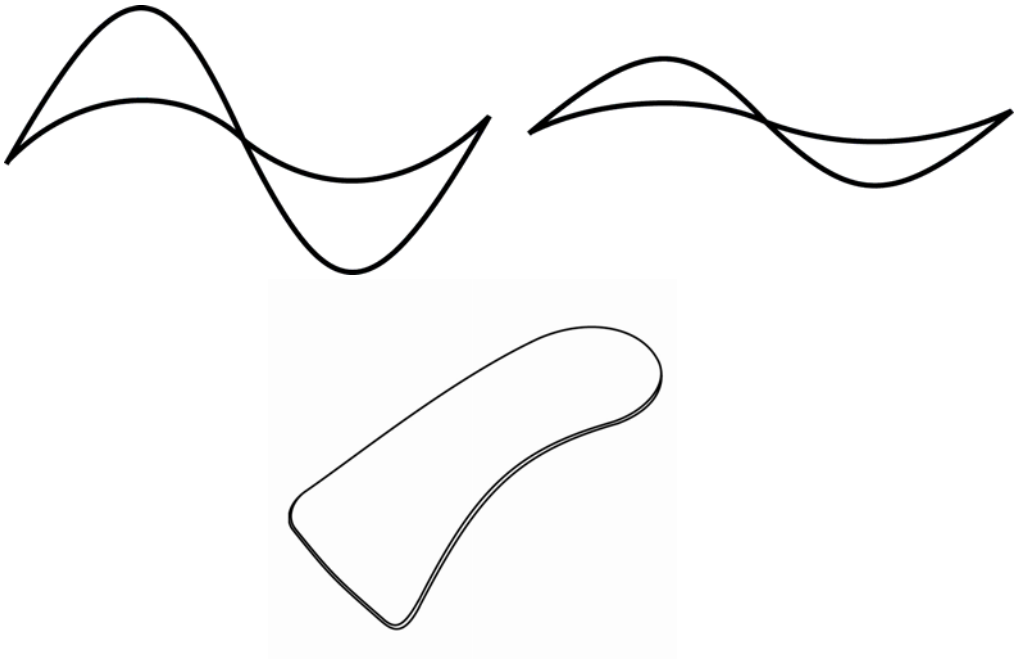
Accommodative: Increases contact surface area under foot and therefore wider distribution of body weight. Control over foot and lower extremity movements are random and unpredictable.

## GENERAL CHARACTERISTICS

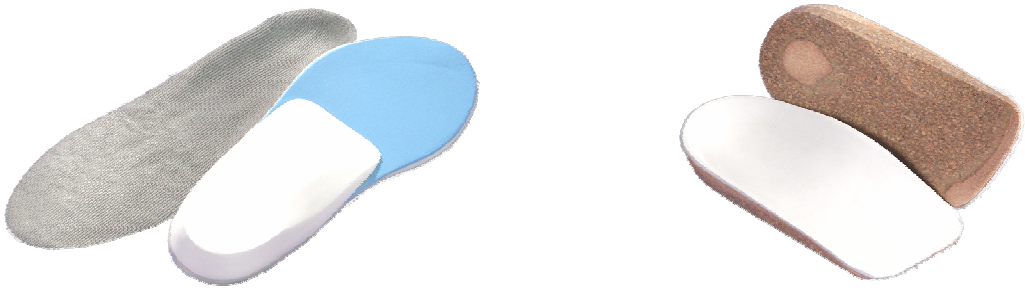
General "Rule of Thumb":

Thinner = Flexible
Thicker = Rigid
Compressible = Flexible
Denser = Rigid

Acute contours or abrupt curvatures in a shell will make it more rigid. Less acute contours or flatter curvatures will result in a more flexible shell.



Thicker molded materials are compressed under pressure in the forming process, resulting in a denser/stiffer module.



# ORTHOTIC COMPONENTS

## ORTHOTIC MATERIALS BY ASSOCIATIVE CATEGORY

Rigid:
- Carbon Graphite Composite (TL 61-1200)
- Polydur

Semi-Rigid / Semi-Flexible:
- High Density Polyethylene
- Polypropylene
- Subortholen
- Co-Polymer
- Low Density Polyethylene
- Rigid Plastazote™
- Aquaplast™

Shoe Specific:
- Carbon Graphite Composite (TL 61-1200)
- High Density Polyethylene
- Polypropylene
- Subortholen
- Co-Polymer

Athletic:
- High Density Polyethylene
- Polypropylene
- Subortholen™
- Co-Polymers
- Low Density Polyethylene
- Rigid Plastazote™
- Aquaplast™
- Soft Plastazote™
- Heat-moldable Crepe
- Heat-moldable Cork
- Poron™

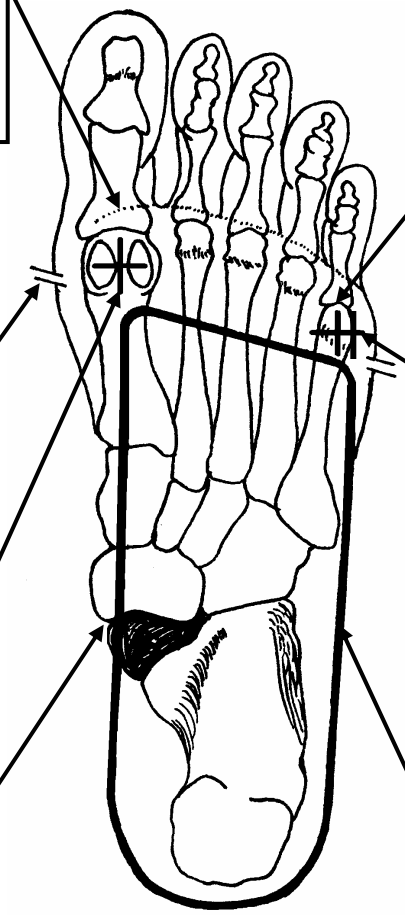
Accommodative
- Soft Plastazote™
- Low Durometer EVA
- Heat-moldable Crepe Rubber
- Heat-moldable Cork
- Poron™

# ORTHOTIC COMPONENTS

Sulcus of the Toes:
Area of the foot, along the margin created by the trough (indentation) **between** the **ball** of the foot and the **toes.**

Distal Edge:
Marked $^{1}/_{8}$" behind a line connecting the 1st and 5th metatarsal bi-sections.

1st Metatarsal Bisection:
First metatarsal head divided in half, medial to lateral and proximal to distal, for the purpose of locating the center.



5th Metatarsal Bisection:
Fifth metatarsal head divided in half, medial to lateral and proximal to distal, for the purpose of locating the center.

5th Metatarsal Marking for Lateral Trim Line:
Mark lateral (outside) Fifth metatarsal head to indicate where the lateral edge is finished, medial to lateral. Proximal to distal line is per 5th metatarsal head bisection (above).

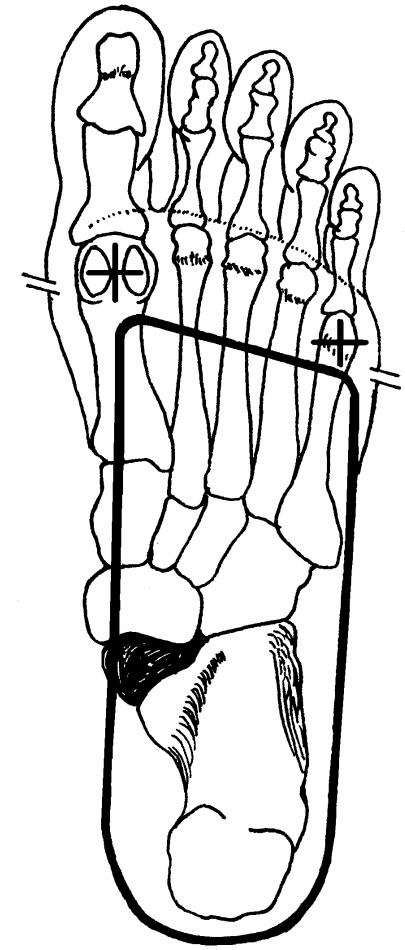
Standard Medial Edge Width:
Medial edge is finished to the 1st metatarsal head bisection.

Standard Lateral Edge Width:
Lateral edge is finished lateral (outside) Fifth metatarsal head.

# ORTHOTIC COMPONENTS

## TRIM LINES - LENGTH & WIDTH

**Standard Trim Shape:** The medial and lateral sides are trimmed to a width set by the bisection of 1st and 5th metatarsal heads. The length is also determined by the bisection of 1st and 5th metatarsal heads, proximal to distal.



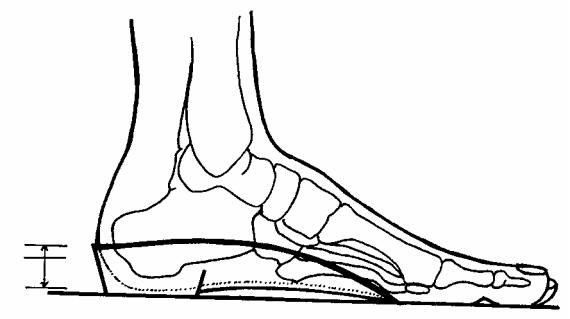
**Shell Modifications:** which reduce motion (pronation) control.
Narrow Shell - to fit the shoe width
Reduce Heel Seat Depth - to fit heel counter depth
Narrow Borders - to fit the arch area and vamp of the shoe.

# ORTHOTIC COMPONENTS

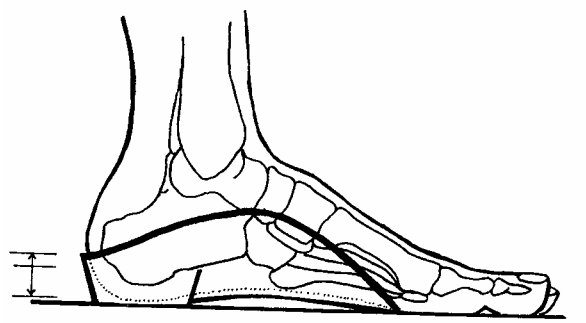
## TRIM LINES - LENGTH & WIDTH

Shell modifications which promote/increase motion (pronation) control.

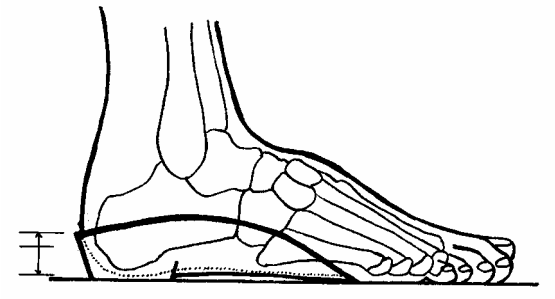
Deep Heel Seat - heel sits deeper into the device. Pressure around fat pad of the heel is increased, helps to control calcaneal movement, STJ motion.



High Medial Flange - medial edge of shell is extended to help control the navicular.



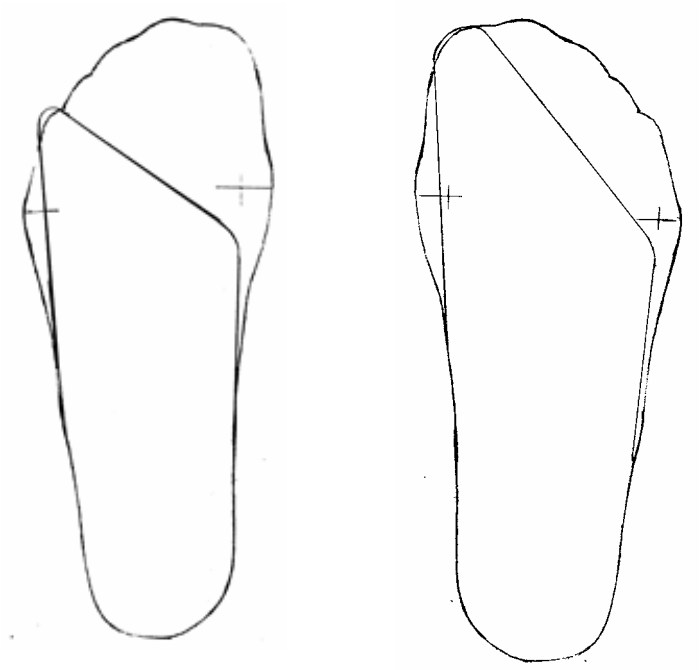
Lateral Flange - lateral edge of shell is extended (more bulky than clip).



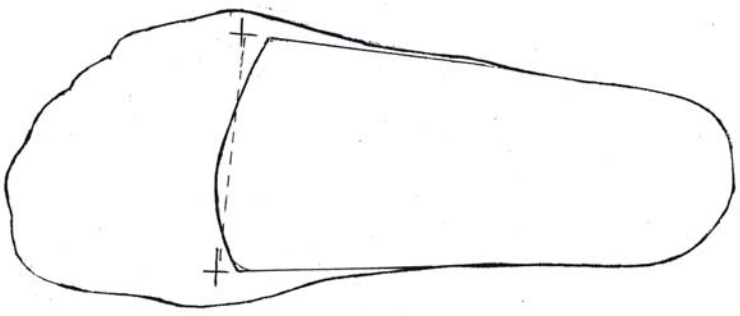
# ORTHOTIC COMPONENTS

## TRIM LINES - LENGTH & WIDTH

Gait Extensions - distal edge of shell is trimmed at a diagonal from beneath the metarsal heads on one side to beyond the toes on the other side of the foot to promote repositioning of the angle of gait during function.



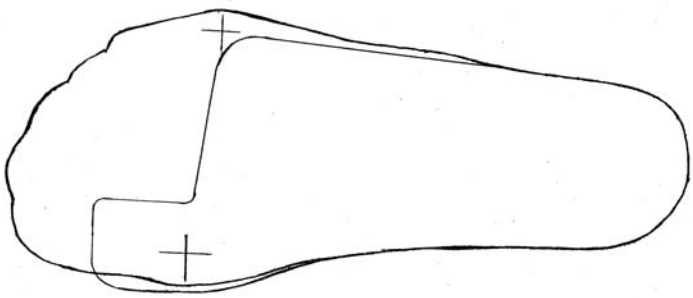
Parabolic Distal Edge - distal edge of shell is trimmed at a diagonal from beneath the metarsal heads on one side to beyond the toes on the other side of the foot to promote repositioning of the angle of gait during function.



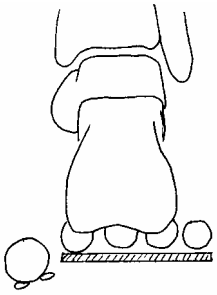
# ORTHOTIC COMPONENTS

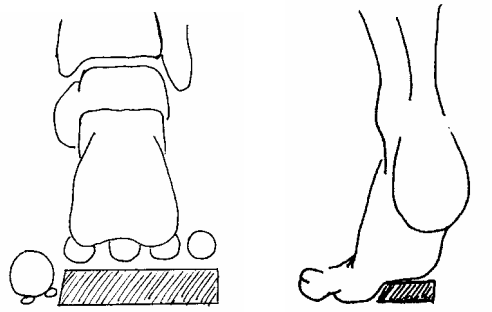
## TRIM LINES - LENGTH & WIDTH

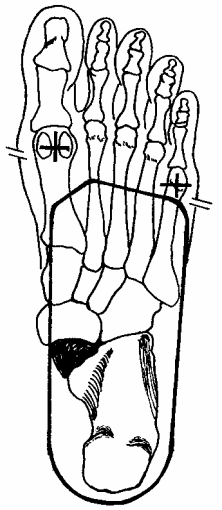
Rigid Morton's - distal/medial corner of shell is trimmed so that the plastic extends out under the 1st metatarsal head/proximal phalanx.



1st Ray Cut Out – the shell is cut away behind the first metatarsal head to promote a plantarflexed position relative to the plane of the 2nd through 5th metatarsal heads.







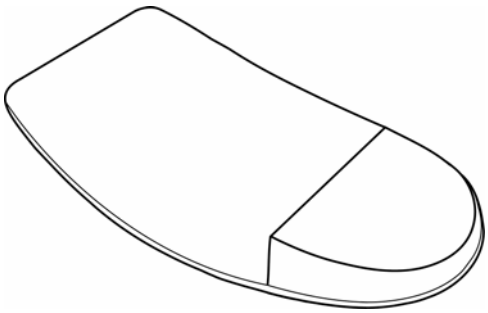
1st Ray Cut Outs are created by trimming away from behind the first metatarsal head at an angle that promotes plantarflexsion and eversion.

# ORTHOTIC COMPONENTS

## POSTS – EXTRINSIC

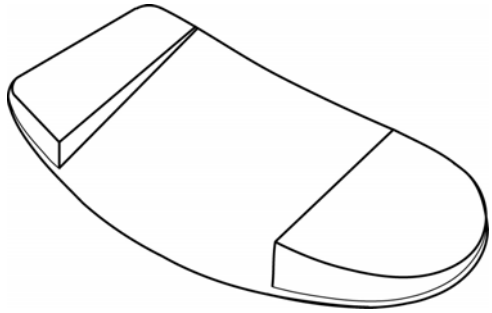
### EXTRINSIC RF POST

Material applied to the rearfoot, around the plantar heel cup area, extending $^{1}/_{2}$" distal to contact point of shell, angled in degrees, varus or valgus.



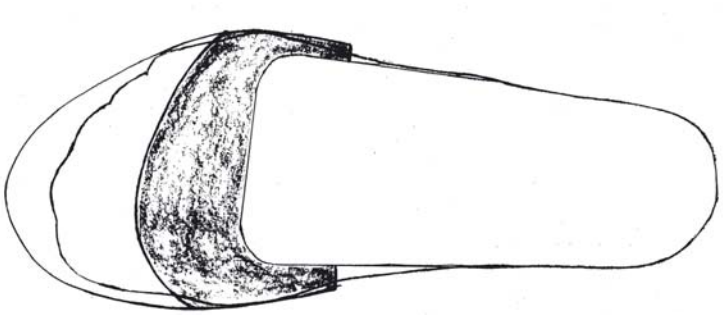
### EXTRINSIC FF POST

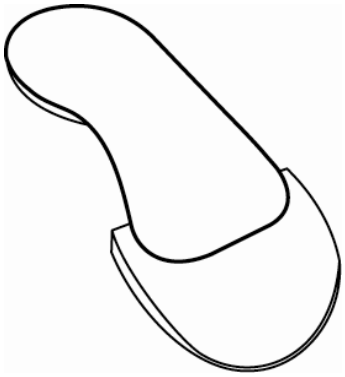
Material applied to the forefoot, along the plantar-distal edge of a shell, extending proximal approximately 1" on the medial side and $^{3}/_{4}$" on the lateral side, angled in degrees, varus or valgus.



### FOREFOOT (FF) POST/WEDGE to SULCUS

Material applied from $^{1}/_{2}$" behind the plantar-distal edge of the shell, extending distal to the sulcus of the toes, angled in degrees, varus or valgus.





CREPE POST:
Crepe rubber material applied (glued) to the plantar surface of the shell, usually angled in degrees.

POLY POST:
Polyethylene or Polypropylene plastic material applied for extrinsic rearfoot post on shell and angled to a specific number of degrees. All poly posts get a tri-plane medial grind off, unless otherwise specified.

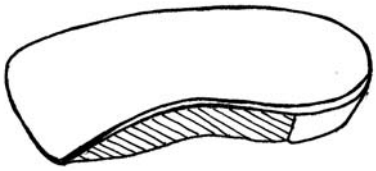
UNITIZED POSTS
Material applied to a shell, where the shell and post, or the post and arch fill-in are the same material.

# ORTHOTIC COMPONENTS

## SPECIFIC COMPONENTS & ADDITIONS

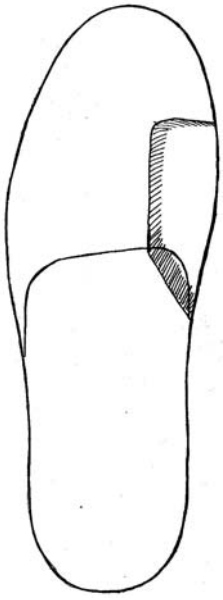
### Arch Reinforcement - Fill In L.A.

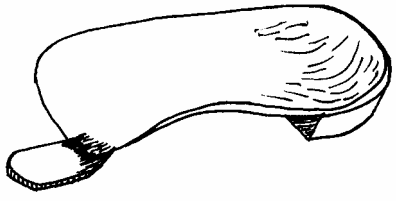
Foam, crepe, plastic or other materials are laminated to the bottom of the shell to reduce distortion under body weight or increase the rigidity of the shell.



### Morton's Extension

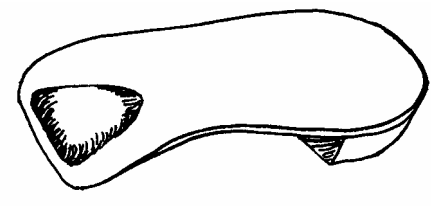
1st metatarsal head lift. Used to functionally lengthen the 1st ray, by providing a platform to stabilize upon.





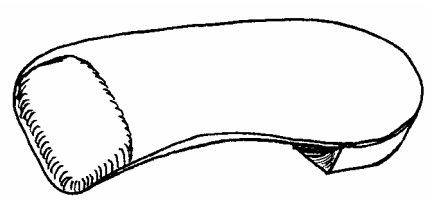
### Met Pads

Met pads lift and separate 2nd, 3rd & 4th metatarsals. Creates/Restores an anterior metatarsal arch.



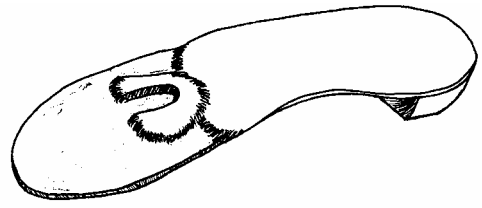
### Met Bars

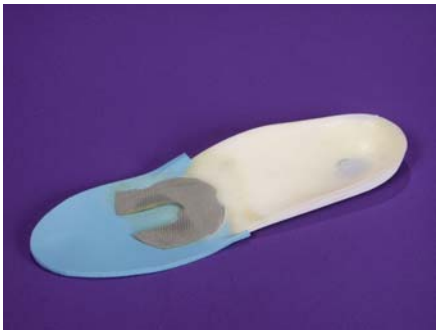
Met bars lift 1st through 5th metatarsals. Pushes up under mid-shaft of metatarsals, delaying weight bearing into forefoot, which reduces overall weight bearing duration. Creates an additional "rocker" behind met heads.



### Balance for Lesions

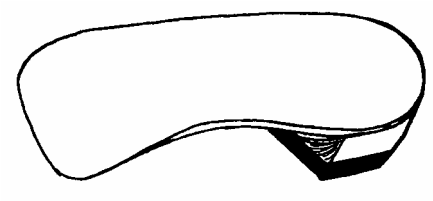
Relieves pressure and shear forces by building up around a metatarsal head or other bony prominence.





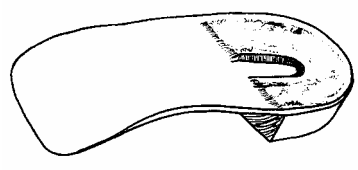
**Heel Lift**

Used bilaterally to reduce effect of forefoot or ankle equinus. Used unilaterally to lift a short leg. Half of height (over $^{1}/_{4}$") used on the RF should be applied to forefoot.



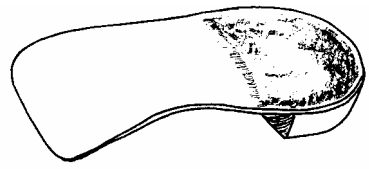
**Heel Spur Accommodation**

Squeezes fat pad around medial condyle of calcaneus, displacing it to beneath the condyle.



**Heel Cushion**

Cushions for plantar bursitis.



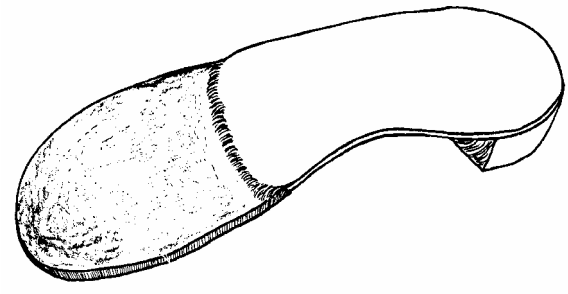
# ORTHOTIC COMPONENTS

## SOFT TISSUE SUPPLEMENTS (PADDING)

Open cell materials do not bottom out or take a set. Closed cell materials will compact or mold to the pressure areas over time.

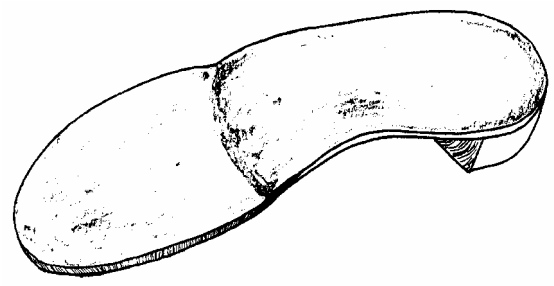
**Extensions:**

- Distal to anterior edge of shell, ending at sulcus or toes.
- Various types of materials to supplement soft tissue under ball of foot.
- Includes padding for painful calluses, disperses compression ands shear forces



**Covers:**

- Over shell, from heel seat (cup) to mets, sulcus or toes.
- Various types of materials to supplement soft tissue under whole foot.
- Includes padding for painful calluses, disperses compression and shear forces.



## TOP COVERS

Large selection of materials:

Vinyl (Leatherette) - moisture resistant, allows for foot slip a little.
Leather - common, durable sock liner, susceptible to moisture
Cambrelle™ - common, clothe sock liner, wicks moisture
Poly-Foam - plastic sock liner, water resistant, minimal slippage
Neolon™ - common soft clothe/foam sock liner, molds to foot

Covers top of shell, or over S.T.S. - 3 lengths

Metatarsal heads - ends at the end of the shell
Sulcus - ends at the ball of the foot
Toes - ends at the end of the foot