



Richie Brace Treatment Guide: Tips for Evaluation, Casting, Prescription, Modifications and Troubleshooting

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Achieving Maximal Success with the Richie Brace®: General Considerations

The Richie Brace® has long track record of remarkable success in thousands of patient fittings. Outcomes are almost always favorable with very little need for adjustment or re-make. In these relatively rare instances, the problem with fitting, comfort and relief of symptoms boils down to several simple factors which may have been overlooked by the prescribing practitioner.

PATIENT EVALUATION - Four major components:

- Gait Analysis: Knee stability
Weakness: Quads, Calf, Ankle Extensors
Equinus or lack of heel strike
Foot alignment at heelstrike, midstance and toe off

- Range of Motion: Can the ankle joint be dorsiflexed to neutral?
Is there a normal range of subtalar joint motion?
Is there evidence of spasticity or contracture?

- Deformity: Is it fixed or flexible/reducible?
Is it the result of muscle weakness or tightness?

- Muscle Testing: Is the Tibialis Posterior weak? How much?
What muscle groups are affected in dropfoot?
Is excessive knee flexion due to weak soleus -quads?

IMPRESSION CASTING - Perhaps the most important step in achieving a positive patient outcome with the Richie Brace!

Four major components

1. Select the proper STS Casting Sock for the prescribed brace:
 - A. Ankle Sock or Plaster splints: can be used for:
Standard Richie Brace, the
Restricted Hinge Richie Brace
(with or without arch suspender), and the
Dynamic Assist Richie Brace.

- B. Mid-leg Sock: must be used for
**Richie Gauntlets,
California AFO**
And any Richie Brace where there is severe abnormality in lower leg girth (wide or thin) or structural abnormality such as extreme tibial varum (over 10 degrees). Also requested when prescribing the Richie Restricted Hinge brace when Dropfoot and Equinus are present (See Dropfoot section)
 - C. Bermuda Sock: must be used for:
Richie Solid AFO
2. Mark bone landmarks with felt tip pen
 - A. Medial and lateral malleoli - assures accurate hinge placement (required for all Richie Braces except gauntlet, Cal AFO and solid AFO)
 - B. 1st and 5th MTP joints- assures proper footplate length
 - C. All bone prominences which need accommodation
 3. Neutral Suspension Casting Technique must be used!!!
The reason the Richie Brace achieves better outcomes than the competition is partly based upon our requirement to cast the patient non-weight bearing. This preserves the shape of the plantar surface of the foot, especially the heel and arch contours as well as the metatarsal weight bearing parabola.
 4. Positioning of the foot during casting:
 - Knee flexed 20-40 degrees
 - Subtalar joint positioned in neutral
 - Midtarsal joint “locked” or fully pronated
 - First ray plantarflexed to end range (ie remove all forefoot supinatus deformity).Note: Pronating themidtarsal joint while plantarflexing the First Ray maximally EVERTS the forefoot on the rearfoot...a vital requirement to achieve maximum foot stability with the Richie Brace products.

See the Richie Brace Casting DVD or visit www.richiebrace.com

FILL OUT THE PRESCRIPTION FORM COMPLETELY !

Most important parts:
Patient weight
Diagnosis
Model of Richie Brace
Additions/Modifications



ADULT ACQUIRED FLATFOOT: Richie Brace® Treatment Recommendations

DESCRIPTION: A progressive symptomatic deformity of the ankle and hindfoot resulting from attenuation and tear of the posterior tibial tendon as well as other key ligament structures. Deformity is characterized by: Severe valgus alignment of the hindfoot, collapse of the medial longitudinal arch and abduction of the forefoot.

Key points of biomechanical control: Prevent internal rotation of the tibia which limits subluxation of the talo-navicular joint. Prevent abduction of the forefoot. Preserve ankle joint motion when possible.

Brace Recommendations

Stage 1 Deformity: Use foot orthoses initially, and consider **Standard Richie Brace** if treatment fails

Stage 2 Deformity: Flexible Hindfoot
Brace Recommendation: **Standard Richie Brace**

Stage 3 Deformity: Rigid Hindfoot
Brace Recommendation: **Restricted Hinge with Medial Arch Suspender**

Casting: For Standard Richie Brace or Restricted Hinge with Arch Suspender, plaster splints or the STS Ankle Casting Sock may be used.

Modifications to these two braces for Adult Acquired Flatfoot include:

- 6mm Medial Heel Skive
- Lateral flange

For heavier patients: 4.0 poly shell material

For enhanced stiffness: Flat Rearfoot post- replaces standard stabilizer bar
Crepe Arch Filler

For severe forefoot abduction: Add forefoot strap

Stage 4 Deformity: Severe Valgus Ankle with DJD of Ankle and Subtalar Joints

Brace: **Richie Gauntlet or California AFO**

Cast with STS Midleg Sock, capture height (minimum) of 7 inches

For all patients with Adult Acquired Flatfoot:

Patient must be casted non-weight bearing, neutral suspension technique.

Be sure to push down on First Ray and remove all forefoot supinatus

This is most important when treating the Adult Acquired Flatfoot!

DROPFOOT CONDITIONS: Richie Brace Treatment Recommendations

First Requirement: All patients must be carefully observed in gait looking for:

1. Stability of Knee: Unstable knee (abnormal flexion in sagittal plane)
- Requires a **Solid AFO**
2. Equinus: Does the heel reach the ground or does the foot remain on the toes? Remember: An AFO cannot correct a fixed equinus deformity!
3. Spasticity: Are muscle groups overpowering others? Solid AFO may be required.

The Richie Dynamic Assist Brace is preferred for all dropfoot conditions, but will fail if there is: Lack of Knee Stability, fixed equinus or spasticity

Second Requirement: All patients must be examined for Range of Motion and Muscle Strength

1. **The Richie Dynamic Assist** will achieve a heel strike for Dropfoot Conditions if RANGE OF MOTION IS AVAILABLE IN THE ANKLE JOINT TO REACH 90 DEGREES (FOOT TO LEG).

2. **The Richie Dynamic Assist** will achieve a normal gait pattern as long as the posterior calf musculature is strong. Check with single foot calf raise.
Weak Calf: consider **Richie Restricted Hinge Brace** or **Richie Solid AFO**

Third Requirement: Evaluate for Frontal Plane Deformity (varus or valgus) of the rearfoot during gait

1. The **Richie Dynamic Assist Brace** is the preferred brace for all dropfoot conditions, but is less effective to correct severe valgus and varus deformity of the hindfoot. The flexible Tamarack® hinges will give way in these deformities particularly in tall or obese patients.
2. The **Restricted Hinge Richie Brace** is preferred when there is significant Varus or Valgus deformity.

DROPFOOT CONDITIONS (Cont.)

Richie Dynamic Assist is indicated for dropfoot conditions where there is good stability of the knee, good range of motion of the ankle and lack of severe deformity in the hindfoot. Most stroke patients and common peroneal nerve injuries meet this criteria.

Richie Restricted Hinge Brace: Preferred over the Dynamic Assist Brace when:

1. Dropfoot with **significant varus or valgus deformity**
In Charcot Marie Tooth disease or other common peroneal nerve injuries, there is often an acquired cavo-adducto-varus deformity of the foot.

The varus condition combined with dropfoot requires the following prescription modifications:

- Measure tibial varum and ask lab to bend uprights when tibial varum exceeds 10 degrees
- Add 6 mm LATERAL HEEL SKIVE
- Add 4 degree valgus sulcus wedge (extended forefoot post)
- Add 4 degree valgus Rearfoot post for extreme cases

Severe varus conditons which arise from neuromuscular pathologies often require footwear modifications such as a valgus midsole wedge.

2. Dropfoot **with equines** - better controlled with Restricted Hinge Brace but requires specific laboratory modifications:
 - The brace must hold the foot in maximum dorsiflexion position which is available to that specific patient
 - This requires that the footplate be aligned at the ankle in a plantarflexed position. This position must be measured and designated by the prescribing doctor, based upon measurements of maximum range of ankle dorsiflexion available in that patient.
 - When this brace is fixed in equinus, a heel lift should be applied to bring the limb uprights to perpendicular
 - the heel lift will also aid in achieving a heel strike when equinus deformity is present
 - Remember to apply heel lift to contralateral shoe!

For Dropfoot **with equinus**, the laboratory can make the necessary brace modifications based upon the deformity captured in the impression cast, *HOWEVER THE STS MIDLEG CASTING SOCK* must be used! This allows accurate measurement of fixed equinus, but requires the practitioner to:

- Cast the patient non-weight bearing with knee flexed to at least 45 degrees
- Dorsiflex ankle to end range during the casting process
- Ask lab to: "Set footplate to exact equinus angle captured in cast, add heel lift to bring uprights to perpendicular"
- Remember: Patient must wear heel lift on contralateral side of equivalent height!

KEY QUESTIONS TO ASK THE DOCTOR WHO ORDERS A BRACE FOR DROPFOOT:

1. When you watched the patient walk, was their knee stable?
2. Did you measure maximum ankle joint dorsiflexion?
3. Are you sure the patient's ankle can be corrected to neutral i.e. 90 degrees foot-to-leg?
4. If there is equinus, are you selecting the proper brace and giving the lab the necessary modifications?
5. Is there varus or valgus foot alignment during gait which you wish to correct?

DEGENERATIVE ARTHRITIS (DJD)

The Richie Brace can relieve symptoms of degenerative arthritis, particularly in the ankle and subtalar joint. Some of the most positive and life-changing experiences with the Richie Brace have resulted from treating DJD of the ankle where no other viable treatment options have been available to the patient.

The goal of brace intervention: Limit Motion
Decompress a joint surface

Subtalar Arthritis - **Standard Richie Brace** with flat rearfoot post

If the patient also has significant varus or valgus alignment of the calcaneus, add medial heel skive (valgus deformity) or lateral heel skive (varus deformity) to decompress the affected side of the subtalar joint.

Ankle Arthritis - **Restricted Hinge Richie Brace**

Please check for fixed equinus and adjust angle of footplate accordingly.

If the ankle mortise is compressed in varus/valgus direction, add a medial heel skive to **decompress valgus deformity** or a lateral heel skive to **decompress a varus deformity**.

Posting of the brace in rearfoot or forefoot or both can also be utilized to decompress frontal plane deformity of the ankle.

Midfoot Arthritis - Less predictable to treat with the Richie Brace

Recommend the **Restricted Hinge Richie Brace**, but suggest trying standard foot orthotic therapy first and use brace if foot orthotic therapy fails.

Richie Gauntlet or California AFO are indicated when there is global DJD of the ankle, subtalar joint and midfoot and where there is severe deformity. In most cases, the Restricted Hinge Richie Brace will work just as well with far better shoe fit and ease of wearing.

TENDINOPATHY OF THE ANKLE

Description: Degeneration and intrasubstance tearing of tendons around the foot and ankle

Treatment: requires long term immobilization for healing.

The Richie Brace family of products are ideally suited for treating these conditions which usually affect active individuals who need to maintain mobility.

POSTERIOR TIBIAL TENDINOPATHY - See Adult Acquired Flatfoot

PERONEAL TENDINOPATHY - Goal of treatment is to limit ankle inversion and Plantarflexion.

Brace Recommendation: **Restricted Hinge Richie Brace**

Important: Measure any tibial varum in relaxed stance and have lab adjust limb uprights for any tibial varum exceeding ten degrees.

Brace Modifications: Lateral heel skive

Valgus rearfoot post: 2-4 degrees

Extended forefoot valgus sulcus wedge: 2-4 degrees

ANTERIOR TIBIAL TENDINOPATHY - Common in active female patients

Goal of Brace Therapy: Limit ankle plantar flexion

Recommend: **Dynamic Assist Richie Brace**

Consider: **OTC Dynamic Assist** if there is minimal foot deformity.

ACHILLES TENDINOPATHY - Goal of treatment: Limit ankle dorsiflexion

Recommend: **Restricted Hinge Richie Brace**

Brace Modifications: Set brace in 10 equinus with 1/4" heel lift

VARUS DEFORMITY AND LATERAL ANKLE INSTABILITY

Goal of Treatment - Reduce load on lateral ankle structures

1. Chronic Ankle Instability- seen in athletes and active individuals

Brace Recommendation: **Standard Richie Brace**

If there is **not** any significant Varus alignment of the hindfoot, no need for any additional modification

If there is varus alignment of the hindfoot, suggest the following:

Modifications: 6mm Lateral Heel Skive
2–4 degree Valgus sulcus wedge
Medial flange (yes medial flange encourages pronation!)

2. Varus Deformity of Ankle or Hindfoot

Description: This may be seen in severe cavus, Charcot Marie Tooth or other neurologic conditions

Brace Recommendation: **Restricted Hinge Richie Brace**

Additional modifications are recommended to encourage full eversion of the forefoot, ankle and hindfoot:

Modifications: 6mm Lateral Heel Skive
4 degree Valgus Sulcus wedge
4 degree valgus rearfoot post
Medial flange

*Measure tibial varum in static stance: Ask lab to adjust uprights for any varum of tibia which measures 10 degrees or higher

BRACE MODIFICATIONS/ADDITIONS

MEDIAL AND LATERAL ARCH SUSPENDERS

Description: The Medial and Lateral Arch Suspenders are a patented technology which provide powerful enhancement of varus and valgus control over the hindfoot.

Requirements:

1. The lifting strap of the Arch Suspenders require a STABLE LIMB UPRIGHT OF THE BRACE in order to provide counter-force when lifting and tightening.
2. Therefore, the Arch Suspenders are recommended to **ONLY BE USED ON THE RESTRICTED HINGE RICHIE BRACE.**
3. The Arch Suspender **cannot and should NOT BE USED ON THE DYNAMIC ASSIST RICHIE BRACE**
4. In special cases where the patient is capable of rigidly tightening the posterior strap, the STANDARD RICHIE BRACE may be used with an Arch Suspender, but the doctor should be **warned about the possibility of forward slippage of the limb support.**

Special Considerations:

1. The Arch Suspenders require a cut-out of the footplate of the brace which may weaken the structural stability of the brace, depending on the size of the patient. In patients over 200 lbs, request a modification of 4.0 poly material to stabilize the footplate when an Arch Suspender is ordered.
2. A request can be made to eliminate the footplate cut-out, while still adding an Arch Suspender strap, when there is concern about weakening the brace. The Arch Suspender can be very effective in controlling the foot even when there is no foot-plate cut out
3. The Medial Arch Suspender can cause a lateral-abduction force on the midfoot and forefoot in severe Adult Acquired Flatfoot (PTTD). It is suggested that a **Lateral Flange be added to the prescription** whenever ordering a Medial Arch Suspender for Adult Acquired Flatfoot.
4. An Arch Suspender can be added to an existing Standard Richie Brace, but it is recommended to convert that brace to a Restricted Hinge brace for reasons listed above. Normally, when an Arch Suspender is added to an existing brace, the goal is to increase control of the brace. Converting to a Restricted Hinge brace will enhance that goal as well.

MODIFICATIONS (Cont.)

FLANGES

DESCRIPTION: An extension of the heel cup of the orthosis to the mid-shaft of the 5th metatarsal (lateral flange) or the medial-cuneiform (medial flange).

Purpose: Flanges are designed to control transverse plane motion of the foot. They accomplish this by apply a buttress or a resistance force against the mid-foot, either medial or lateral.

Problem: Flanges are among the most mis-understood orthotic modification in the podiatric profession. The majority of practitioners assume that flanges act in the opposite way which they actually function.

While flanges extend the footplate wider under the midfoot, they can provide additional sagittal plane control to prevent flattening of both the medial and lateral arches of the foot. With foot orthotic therapy, where 14 -18 mm heel cups are standard, adding flanges will widen the footplate for additional control. However, the Richie Brace has a 35 mm heel cup which already provides a very wide footplate. Adding a flange will only provide a wall up against the medial or lateral midfoot area. Therefore, flanges on a Richie Brace will only enhance transverse plane control over the foot, not sagittal plane control.

Medial flanges

Function - Prevent ADDUCTION of the foot, therefore tend to prevent SUPINATION. Primarily provide an abductory force against the talo-navicular joints and navicular-medial cuneiform joints. In general, this will PRONATE the foot at the mid-tarsal joint.

Indications-A medial flange can be used to resist excessive adduction of the forefoot and midfoot as seen in severe varus deformities. A medial flange will help prevent supination of the foot.

RECOMMENDED WHEN THERE IS A DIAGNOSIS OF: Lateral ankle instability, cavus deformity, varus deformity

Lateral flanges

Function- Prevent abduction of the foot. Primarily provide an adductory force across the midfoot and forefoot. In general, this will SUPINATE the foot at the midtarsal joint.

Indications-A lateral flange is used to prevent excessive forefoot abduction as seen in Adult Acquired Flatfoot. It is an enhancement to SUPINATE the foot. A lateral flange will help prevent pronation of the foot.

RECOMMENDED WHEN THERE IS A DIAGNOSIS OF: Adult Acquired Flatfoot, PTTD, Severe Pronation

MODIFICATIONS (Cont.)

POSTING

Description- All Richie Brace positive casts are **intrinsicly balanced** to correct the calcaneal bisection to an alignment perpendicular to the supportive surface. Early in its design, it was recognized that the Richie Brace could not have the normal frontal plane motion that functional foot orthoses have which allow rearfoot posting to control motion of the foot during the contact phase of the gait cycle. Therefore, rearfoot posting is not a standard feature of any Richie Brace. Instead, a **rearfoot stabilizer bar** is added for frontal plane stability, but not intended to control foot motion as seen in standard functional foot orthoses.

Rearfoot Posting-Myths and Misconceptions

- Cannot control rearfoot motion during the contact phase of gait when used in a Richie Brace
- Cannot, by itself, change alignment of the rearfoot, forefoot or both relative to the supporting surface when used in a Richie Brace
- CAN improve stability of the brace in the shoe by increasing surface area of contact and increasing stiffness of the orthotic footplate of the Richie Brace.
- CAN, when used with complimentary forefoot posting, change alignment of the rearfoot and forefoot relative to the supportive surface

Forefoot Posting with the Richie Brace- Myths and Misconceptions

- Forefoot posting can be used to invert or evert a functional foot orthosis.
- When forefoot posting is added to a Richie Brace, it will invert or evert the entire brace, INCLUDING THE LIMB UPRIGHTS to the exact degrees of posting added.
- Adding a 4 degree Varus Forefoot Post will INVERT THE UPRIGHTS 4 degrees to the ground - If the patient does not have 4 degrees of Tibial Varum to match the inverted uprights, then a mis-fit of the uprights will theoretically occur.

HOWEVER, THE REALITY IS THAT THE LIMB UPRIGHTS ARE SOMEWHAT FLEXIBLE AND WILL ALLOW A COMFORTABLE FIT WITH UP TO 6 DEGREES OF EXTRINSIC FOREFOOT POSTING ADDED TO A RICHIE BRACE

MODIFICATIONS (Cont.)

POSTING

Recommendations:

- Valgus posting has generally worked better with the Richie Brace than Varus posing
- In most cases, identical degrees of **both forefoot and rearfoot posting** are recommended: i.e. degree varus rearfoot post matched with 4 degree FF post
- Sulcus wedging is a form of an extended forefoot post. This can provide a longer lever for eversion or inversion moment delivered to the forefoot or rearfoot, especially during heel rise or the propulsive phase of gait. Other than the Dynamic Assist Brace, all sulcus wedging will change the length of the top cover from a “metatarsal head” length to a sulcus length.

Examples:

1. Varus Posting
 - a. Use with difficult cases of Adult Acquired Flatfoot where pronation is not being controlled
 - b. Use caution when ordering posting over 4 degrees varus in the forefoot in Adult Acquired Flatfoot as this type of correction tends to cause the entire foot of the patient to slide laterally off the footplate (i.e. forces the foot to pronate)
 - c. Generally, combination of Rearfoot and Forefoot Varus posting of 2 - 3 degrees is helpful in Adult Acquired Flatfoot simply because the entire foot plate rendered stiffer. Any higher degrees of posting in varus are counter-productive.
 - d. Consider adding medial heel skive when Varus posting
2. Valgus Posting
 - a. Use with: Dropfoot, Varus deformity, Lateral Ankle Instability
 - b. Extended forefoot valgus sulcus wedging provides better results than standard rearfoot posting
 - c. Rearfoot valgus posting, by itself is not effective in reducing varus deformity or varus motion. Always combine a rearfoot post with a forefoot post of identical dimension
 - d. Consider adding lateral heel skive when Valgus posting

MODIFICATIONS (Cont.)

HEEL SKIVE

Description: A positive cast modification to change the shape of the plantar surface of the heel cup of the orthosis to provide either varus (medial heel skive) or valgus (lateral heel skive) wedging of calcaneus.

History of Use: In the functional foot orthotic industry medial heel skive modifications of 2mm, 4mm and 6mm are commonly prescribed to enhance pronation control. This basically provides a varus wedge under the heel to increase supination moment at the subtalar joint. Less popular, but equally effective, is the prescription of a lateral heel skive to provide a valgus heel wedge under the heel and increase pronation moment at the subtalar joint.

Indications:

Medial Heel Skive: Adult Acquired Flatfoot (Any Stage)
Any severe pronation or valgus deformity

Lateral Heel Skive: Peroneal Tendinopathy
Charcot-Marie-Tooth Disease
Any severe varus deformity

Recommendation: A 6mm heel skive is recommended over a 2mm or 4mm
However, anything higher can lead to plantar heel irritation

Note: A heel skive enhancement can be added after brace fabrication in the lab by the addition of either 1/8" or 1/4" Korex added to the top surface of the heel cup of the orthosis. Extending the wedge to the midfoot is even more effective.

MODIFICATIONS (Cont.)

HEEL LIFTS

Overview - Heel lifts of at least 6mm are usually required in the contralateral shoe of the user of the Richie Brace to prevent a limb length discrepancy. However, often a custom foot orthosis is prescribed for the contralateral foot and therefore any additional lift is un-necessary.

Indications

A heel lift is applied when:

1. There is a limb length discrepancy
2. The foot plate is set in equinus in a Restricted Hinge Richie Brace (see recommendations for “Dropfoot with Equinus” on page 5)
The heel lift will bring the uprights to a perpendicular alignment in this situation.

ACCOMODATIONS

Overview - Any custom foot orthotic accommodation can be incorporated into the Richie Brace. Prominent plantar fascia band, prominent navicular, prominent styloid 5th met, and plantar forefoot lesions can all be accommodated if the negative cast is marked appropriately.

Marking for Accommodations

Plastar Casting: Used with Standard Richie Brace, Restricted Hinge Richie Brace and Dynamic Assist Richie Brace.

Area of accommodation can be marked with felt pen and the ink will transfer directly to the plaster cast

STS Casting Sock: Can be used with all Richie Brace models

Marking for accommodations: Can be done after cast has dried and has been removed from the foot. Remove plastic bag, mark the area on the skin of the foot and then slip the dried cast back on the foot and press cast against ink mark on the foot.

Or...Mark outside of STS Cast with felt pen over the area of accommodation.

TROUBLESHOOTING

MEDIAL MALLEOLUS RUB

Description - The brace is rubbing against the medial aspect of the ankle at or near the junction of the medial footplate upright and the and rivot of the medial ankle hinge.

Cause - Patient's foot is pronating in the brace. This causes the tibia and talus to shift medial while the forefoot abducts at the midtarsal joint.

This problem is rarely a laboratory error. When evaluated, the patient will be noted to have their ankle medially displaced in the brace with plenty of room at the lateral ankle pivot location. This brace has been fabricated with accurate width, but the movement of the foot within the brace has created medial impingement.

The main reason that a patient continues to pronate in the Richie Brace with Adult Acquired Flatfoot is due to:

1. Casting Error:Forefoot Supinatus was not reduced during negative impression casting. Medial malleolus was not marked accurately.
2. Footplate is too flexible
3. Footwear is inadequate to provide stiff heel counter, firm midsole

Solution to Medial Malleolus Rub

1. Evaluate if there was a casting error. Did you reduce Supinatus??
2. Evaluate if footwear is adequate: firm midsole, stable shank??
3. Evaluate if the footplate is too flexible and "giving way" under the talo-navicular joint. If so: Add Crepe Arch Fill to brace footplate, Add 3 degree varus rearfoot post and 3 degree varus forefoot post
4. Add an extrinsic "Medial Heel Skive" with Korex to the top surface of the orthotic footplate at the medial heel cup and extending to talo - navicular joint.
5. Add ¼ "poron" or PPT to the inner surface of the medial limb support pad or use same material to fashion a "donut" type accommodation.

Consider and utilize all of the above solutions to medial malleolus rub before asking the lab to heat adjust the medial footplate uprights and widen the Richie Brace to make more room medially. This adjustment will potentially compromise the pronation control of the brace.

TROUBLESHOOTING

LATERAL MALLEOLUS RUB

Description - The brace is rubbing against the medial aspect of the ankle at or near the junction and pivot of the medial ankle hinge.

Cause- Patient's foot is supinating in the brace. This causes the tibia and talus to shift lateral while the forefoot adducts at the midtarsal joint.

This problem is rarely a laboratory error. When evaluated, the patient will be noted to have their ankle laterally displaced in the brace with plenty of room at the medial ankle pivot location. This brace has been fabricated with accurate width, but the movement of the foot within the brace has created lateral impingement.

Solution to Lateral Malleolus Rub

1. Evaluate if there was a casting error. Did you cast non-weight bearing an maximally pronate/lock the midtarsal joint??
2. Evaluate if footwear is adequate: firm midsole, stable shank??
3. Evaluate if the footplate is too flexible and "giving way" under the calcaneal-cuboid joint. If so: Add Crepe Arch Fill to brace footplate, Add 3 degree valgus rearfoot post and 3 degree valgus forefoot post
4. Add an extrinsic "Lateral Heel Skive" with Korex to the top surface of the orthotic footplate at the lateral heel cup and extending to calcaneal-cuboid joint.
5. Add ¼ " poron or PPT to the inner surface of the lateral limb support pad or use same material to fashion a "donut" type accommodation.

Consider and utilize all of the above solutions to lateral malleolus rub before asking the lab to heat adjust the lateral footplate uprights and widen the Richie Brace to make more room laterally. This adjustment will potentially compromise the supination control of the brace.

TROUBLESHOOTING

FOREFOOT ABDUCTING OFF FOOTPLATE

Definition: Patient experiences pain from irritation from shoe on rubbing on lateral side of forefoot. This would be the main tip-off that the patient's foot is abducting on the footplate.

False Alarm: Many practitioners inappropriately evaluate the fit of the Richie Brace on the foot of the patient, **OUTSIDE OF THE SHOE**, and note that the foot of the patient does not line up on top of the footplate of the brace. Often, the foot may appear abducted to the main part of the footplate. This may look worse when the patient stands up on the brace without the shoe on.

Fact: The shoe is an integral part of the brace system. The upper of the shoe is critical to provide counter-force to the severely pronated foot seen in adult acquired flatfoot. What might appear to be an abducted forefoot without the shoe will disappear when the shoe and brace are worn.

Recommendation: The position of the foot in the brace **MUST BE EVALUATED IN A WEIGHT BEARING ATTITUDE WITH A PROPER SHOE WORN BY THE PATIENT.**

If the foot is still abducting in the shoe, the following measures should be taken in this order of preference:

1. Apply a forefoot strap to the brace- this is easily done in the office if the lab sends the doctor a kit. No rivots needed to apply the strap. Once a forefoot strap is applied to a Richie Brace, the brace must be donned before putting on the shoe.
2. Have the fabrication lab apply an external "lateral flange" to the footplate of the Richie Brace . This is actually a Korex lateral "clip" applied to the footplate and secured with a new top cover.
3. Have the fabrication lab spot heat and abduct the footplate on the limb uprights.

TROUBLESHOOTING

DROPFOOT NOT BEING CONTROLLED

DEFINITION: Patient is observed to walk with dropfoot or contacts ground on forefoot despite wearing a corrective brace.

Causes:

1. Patient has fixed equinus and cannot be brought to neutral ankle position by any brace
2. Patient has spasticity which is overpowering the brace
3. Patient is tall or large and overpowering the brace

Solutions:

1. Fixed equinus requires a Restricted Hinge Richie Brace set into equinus with a heel lift. (See pages 5 - 6)
2. Spasticity requires a Solid AFO or a Restricted Hinge Richie Brace
3. Larger patients require higher durometer Tamarack hinges which can be changed out from the standard durometer hinges by the fabrication lab.

Reminder: The Richie Dynamic Assist Brace must be positioned properly for the Tamarack Hinges to gain mechanical advantage and control the dropfoot. The patient must be taught to position the limb uprights along the sides of the leg, and then fastening the posterior strap as tight as possible.