

Orthotics Q&A: Exploring Orthotic Indications For Various Conditions

- [Guest Clinical Editor: James Losito, DPM](#)

In this edition of "Orthotics Q&A," the panelists discuss various issues ranging from indications for the Richie Brace, Arizona AFO and prefabricated orthoses to whether orthotic casting should reduce supinatus. Without further delay, here is what the panelists had to say.

Q: What are the indications for using a Richie brace versus using an Arizona brace?

A: For Doug Richie Jr., DPM, each custom ankle foot orthotic (AFO) has a different clinical indication and choosing one to treat a pathology is the same as choosing a surgical procedure. He notes the rigid Arizona AFO has a molded leather gauntlet that completely restricts movement in the midtarsal, subtalar and ankle joints. Applying an Arizona AFO provides the same effect as a pantalar arthrodesis, according to Dr. Richie. He adds that the device is indicated for severe end-stage posterior tibial tendon dysfunction (PTTD), Charcot arthropathy and severe degenerative joint disease (DJD) of the ankle.

In contrast, the Richie Brace is functional and designed to limit but not completely restrict rearfoot and ankle motion, notes Dr. Richie. He says the indications for the Richie AFO include reducible flatfoot deformity, tendinopathy and moderate hindfoot and ankle DJD. In addition, Dr. Richie notes the brace is indicated as a functional brace to treat lateral ankle instability in active patients.



Dr. Richie notes the Arizona AFO (shown above) is indicated for severe end-stage posterior tibial tendon dysfunction (PTTD), Charcot arthropathy and severe degenerative joint disease (DJD) of the ankle.

When treating adult-acquired flatfoot without ankle joint arthritis, Marque Allen, DPM, prefers the Richie brace over the Arizona brace. He cites the Richie brace's functionality due to its ankle joint and full-length orthotic. Dr. Allen says these characteristics permit the balancing of forefoot varus and facilitate the reestablishment of the foot's functional tripod. One can accordingly balance the foot as opposed to using a rigid constraint to stabilize the deformity, according to Dr. Allen.

"I also find the Richie brace to be more user-friendly," notes Dr. Allen. "Its ease of application and the ability to wear it with a greater variety of 'normal' shoes is increased."

Richie braces work "very well" for most patients with foot and ankle deformities that are not severe, according to Bruce Williams, DPM. He uses the Richie brace for about 90 percent of patients with PTTD and other patients with chronic ankle or subtalar joint (STJ) arthritis.

When treating a patient with more severe triplanar deformities or severely overweight patients, Dr. Williams suggests using an Arizona AFO or a fixed brace. He says the Richie brace is not strong enough at the hinge area to accommodate all patients' weights. However, Dr. Williams cautions that the more severe deformities are too hard to control with a non-rigid controlling device like an Arizona AFO.

Q: What are the indications for prefabricated orthotics?

A: One can use prefabricated orthotics for acute to subacute overuse injuries of the foot and ankle, according to Dr. Allen. He says prefab orthotics are an adjunct to an overall treatment program geared to permitting the athlete to continue training while

overcoming the injury. Due to the construction of prefab devices, Dr. Allen points out that the inserts will lose their support or functional control as the materials expire.

"I view these as a temporary, non-specific means to limit or reduce the velocity of motion that could be contributing to an injury," notes Dr. Allen.

Dr. Richie notes that DPMs and labs commonly utilize prefab orthotics when patients cannot afford custom devices. However, he says it is "unethical" when a practitioner selects a treatment based on his or her perception of a patient's ability to afford the treatment. Although Dr. Williams notes that "prefabricated devices are getting better and better, and much more affordable," he says he only uses prefab orthotics for those who absolutely cannot afford custom devices.

Custom orthotics can sometimes yield better long-term outcomes and cost savings than prefab orthotics, emphasizes Dr. Richie. He says clinicians should use prefabricated orthotics when a patient needs immediate treatment. Dr. Richie adds that one may also use a prefab device as a precursor to a custom orthotic if mechanical support can treat the symptoms.

Q: Does orthosis casting reduce supinatus?

A: Dr. Allen thinks one can reduce a supple forefoot varus deformity and produce a functional medial column. He says clinicians should reduce the forefoot supinatus while casting. If one casts the medial column in varus, he says it will stay in varus. Dr. Allen says the orthotic design must control hindfoot motion, consider equinus and create a stable peroneal pulley to permit plantarflexion of the first ray. He emphasizes balancing the forefoot varus of metatarsals two through five.

Furthermore, one should attempt to reduce any existing supinatus when the rearfoot is neutral since performance and balance are propulsion based about the great toe, according to Dr. Allen. Dr. Williams agrees that orthotic casting can reduce supinatus if one casts properly. He says clinicians can cast out the supinatus by placing the non-weightbearing foot in a slightly pronated subtalar neutral position and then plantarflexing the first metatarsal to light resistance.

Dr. Richie contends that traditional Root suspension casting does not fully reduce forefoot supinatus or acquired forefoot varus. Podiatrists must push the first ray down plantarly to end range of motion in order to achieve a full reduction of forefoot supinatus, according to Dr. Richie. He says this is especially the case when casting a patient with adult-acquired flatfoot deformity. If one does not do so, Dr. Richie warns that "the resultant negative cast will capture an inappropriate amount of forefoot varus, which will ultimately produce an ill-fitting and poor controlling foot orthosis."

Q: What factors should one consider when designing an orthosis for pes planus?

A: Dr. Richie notes orthotic design for pes planus depends on the etiology and symptomatology of the deformity. For a child with mildly symptomatic flatfoot, he believes a rigid device with a Kirby medial heel skive may be sufficient. For a pediatric patient with equinus, Dr. Richie says adding a heel lift can help relieve symptoms.

For a patient with adult-acquired flatfoot deformity, Dr. Richie says ligamentous disruption "will severely compromise the efficacy of the standard functional foot orthosis." As he explains, loss of the spring ligament and interosseous talocalcaneal ligament will result in significant transverse plane instability of the foot, severe internal rotation of the tibia and talus, and profound abduction of the forefoot. In such a case, Dr. Richie recommends a deep heel cup, Kirby medial heel skive and a long lateral flange on the footplate. He emphasizes the importance of reducing forefoot supinatus during the casting procedure.

Dr. Allen says one must consider if the pes planus deformity is supple or rigid. For a rigid deformity with underlying arthritis, he says one should design an orthotic to bring the ground up to the foot and prevent motion, which often requires coupling to the leg. Such an orthotic supports the deformity but does not correct it, according to Dr. Allen.

With a supple deformity, one must consider all possible influences upon the foot that encourage abnormal motion, advises Dr. Allen. He notes the difficulty of controlling the suprapedal influences upon the foot. In evaluating the dynamic function of the deformity, Dr. Allen says one must consider the leg, ankle, hindfoot and forefoot as separate units.

Orthotic materials depend on how much motion control the patient needs, according to Dr. Allen. Dr. Williams concurs, saying a 10-year-old may need a Richie Brace just as much as a 70-year-old patient despite the differences in activity levels. Dr. Williams also advocates not restricting the medial column with an orthotic device and suggests using first ray cutouts and various sizes of kinetic wedges.

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Dr. Williams is a Fellow of the American College of Foot and Ankle Surgeons, and is board certified by the American Board of Podiatric Surgery. He is a Fellow and the current Secretary/Treasurer of the American Academy of Podiatric Sports Medicine. Dr. Williams practices in Merrillville, Ind.