

CSM 2019 UPDATE

FASIG Leadership

Following another great year for the FASIG at the Combined Sections Meeting in Washington, DC, we are continuing initiatives to explore and define what a specialty practice in Foot and Ankle might look like. Further, we continue to seek out collaboration and shared opportunities to advance foot and ankle clinical care. The American Orthopaedic Foot and Ankle Society (AOFAS) will host their annual meeting in Chicago this September with expanded programming focused on rehabilitation for a growing number of associate members. The FASIG also continues to advocate for foot and ankle related research across the AOPT and the APTA at large. In that spirit, we continue to use our Facebook page to disseminate a current “literature update” for research related to foot and ankle topics. We would like to highlight one such article just published in the *Journal of Prosthetic and Orthotics International*.

LITERATURE UPDATE

Chris Neville, PT, PhD

The use and management of foot orthoses is common to many clinical practices that treat patients with foot and ankle complaints. This intervention can be confusing to patients and clinicians alike, with numerous custom and off-the-shelf options available across the market. It is also a controversial intervention with an abundance of literature that can provide conflicting views. One recent study¹ is worth review because it was performed using sound methods and a strong design for addressing many of the biomechanical questions related to orthoses use. It is also particularly interesting because the findings are quite similar to other work in the field and despite providing insight, also raises many questions about how and if orthoses work.

In the study by Balsdon et al, the goal was to compare 3 orthotic devices (hard custom, soft custom, off-the-shelf [OTS]) to a barefoot and shod condition. The study included subjects with a range of foot types (pes planus, pes cavus, and normal arch) and measured medial longitudinal arch movement using a novel markerless fluoroscopic method to compare the biomechanical effects across 5 conditions. All subjects were fitted with custom foot orthoses that were hard or soft in construction and compared to OTS orthoses during the mid-stance point of a single step. The hypotheses in the study were that the hard orthoses would create the largest change in raising the arch while the soft orthoses would be associated with less change, while OTS would have the least change. These conditions were compared to shod and barefoot conditions.

As a partial rejection of the hypothesis, the results indicated that both the hard and soft custom orthoses were associated with similar amounts of raising the arch compared to the shod and barefoot conditions. Interestingly, there was not a difference between the OTS and the control conditions. But, there was also not a significant difference between the OTS and custom orthoses although the effect of the OTS was smaller. This is a rather typical set of findings from studies designed to compare a gradient of effects (hypothesized largest effect with hard orthoses, less

with soft, and least with OTS) using biomechanical measures. The results and effect from the orthoses are largely as expected but given the size of the differences they only reach statistical significance when comparing the largest effect to the control condition. The subtler effect from the OTS orthoses ends up not being different from the control conditions suggesting it is less effective but also not different from the custom orthoses creating some confusion as to the best interpretation. One could correctly state the custom orthoses did not function any better (statistically speaking) than the OTS with regards to arch control. The overall changes measured in this study were around 5° so the ability to find differences between conditions is hard except at the extremes. So, one is left to speculate as to the value of these differences for comparing the two custom orthoses to the OTS as the study limitations (sample size, subject selection, etc) make further studies necessary to address the question.

This study adds to the body of literature that orthoses do have biomechanical effects that might explain the positive clinical effects found in controlled trials completed for a host of clinical pathologies. However, the interpretation of results remains difficult with the small changes in motion typically seen in the foot leaving recommendations for future studies to fill the gaps typically left.

REFERENCE

1. Balsdon M, Dombroski C, Bushey K, Jenkyn TR. Hard, soft and off-the-shelf foot orthoses and their effect on the angle of the medial longitudinal arch: A biplane fluoroscopy study. *Prosthet Orthot Int*. 2019;309364619825607. doi: 10.1177/0309364619825607.