The Effects of a Unilateral Cam Boot and TayCo External AFO on the Gait of Healthy Young and Old Adults

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"TayCo outperformed the CAM Boot in all categories conducted in this study. Relative to a CAM boot, TayCo provides greater stability, less energy expenditure, and reduced risk of proximal injury"

Overall Results

% Comparison by multiples of improvement by Fixed TayCo External Ankle Brace vs Controlled Ankle Motion (CAM) Boot. Young (<50) and Old (>50). TayCo outperformed the CAM Boot on all 9 Gait Measurements by the following multiples.

	Young	Old
1. Velocity	8X	8X
2. Step length	3X	4X
3. Base of support	2X	2X
4. Foot length	6X	6X
5. Stance time	2X	1.7X
6. Stance %	2X	1.5X
7. Heel on to toe on %	2X	2X
8. Foot flat %	2X	2X
9. Symmetry	1.5X	1.5X

Category Results

Step Length

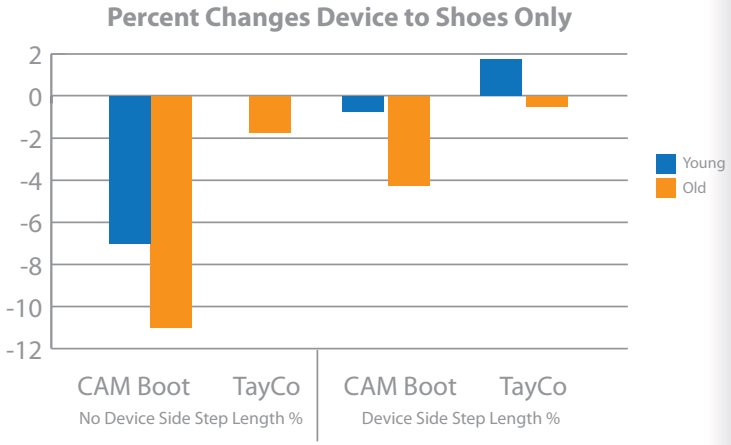
Decrease in step length is associated with lack of stability and increased energy expenditure.

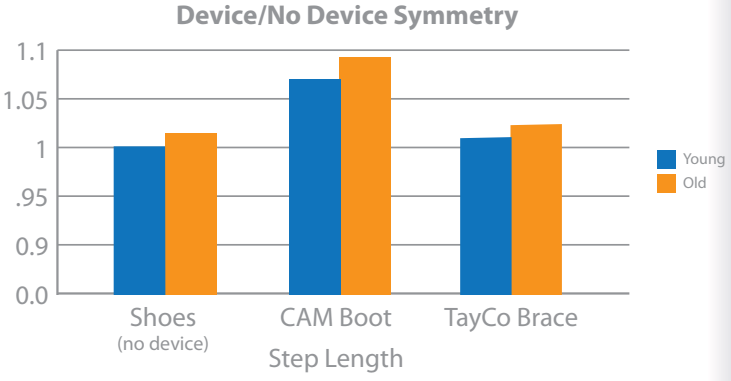
Summary: Step Length decreased bilaterally with the CAM Boot. This may be due to a lack of stability on the Device Side and affected the Old group more than the Young group. With the TayCo, there were no significant changes in Step Length on either side.

Heel On to Toe on %

Timing affects chain reaction forces to knee, back and hip, increasing the risk of proximal injury.

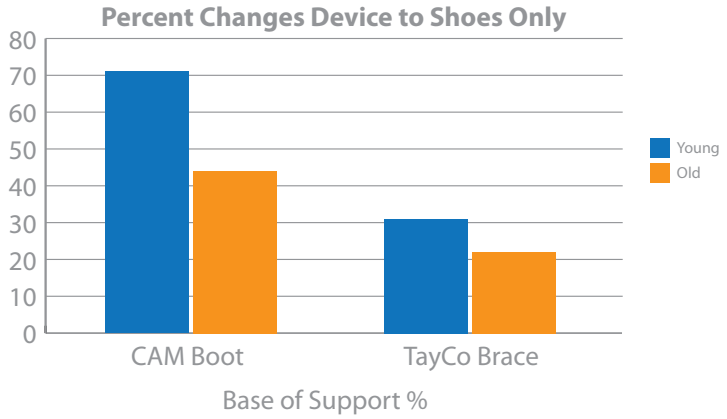
Summary: There was a significant asymmetry in the CAM Boot condition, with the Device Side longer than the No Device Side.





Base of Support
An increase in base of support can indicate a lack of stability.

Summary:. There were significantly less changes in the TayCo than the CAM Boot.



Methods

38 patients between ages 19 and 91 walked on the GaitRite gait analysis mat. No participants had lower extremity involvement at the time of the study. Average age of included patients was 52 years old. Patients were categorized into 2 groups – Young and Old. Young patients were under 50 years old; Old patients were over 50 years old.

Patients walked in Shoe condition first. Then were fit with either a CAM Boot or a TayCo External AFO on the right side. After doing 4 passes on the gait mat, they were then fit with the other device.

Data was analyzed by looking at percent changes for each patient. Percent changes reported were Cam Boot compared to Shoes Only and TayCo compared to Shoes Only. Velocity, Step Length, Base of Support, Foot Length and Stance Timing Parameters were evaluated.

What the test subjects had to say:

"I wasn't expecting that big of an impact with the walking boot, it completely changed the way I had walk, and I could feel it in my lower back in a not so good way. I definitely think I could continue my normal lifestyle with TayCo, where a boot would really impede," 36 y/o Male

"The old fashioned boot limited my mobility; it was big, weighty, and cumbersome. In the time I used TayCo, I felt like my gait was better, I walked more naturally, and I had the comfort of my own shoe. I could see walking my dog longer because it fit better, it was a comforting feeling because it provided so much stability." 75 yo female

"Walking boot was clunkier, made me feel tilted, I tripped over myself a couple times, TayCo was a flawless walk, totally natural, and gave more support than the walking boot. Feels like walking without a brace at all." 37 yo male

Additional Research on the CAM Boot

Proximal Injuries *"Secondary site pain after CAM walker boot wear is common. The frequency and severity of pain lessened after transition out of the boot. Yet, one-third of patients still had new or worsened secondary site pain 3 months after cessation of boot wear." Associated Joint Pain With Controlled Ankle Movement Walker Boot Wear J Am Acad Orthop Surg Glob Res Rev. 2018 Dec*

Low Compliance *"This amounts to only 28% of total daily activity recorded while patients were wearing their RCW" Activity patterns of patients with diabetic foot ulceration Diabetes Care. 2003 Sep;26*