

C-Brace

Clinical Evidence Summary

Revised September 24, 2018

With its microprocessor-controlled hydraulic unit, the C-Brace makes the well-known benefits of microprocessor-controlled hydraulic prosthetic knee joints (used by above-knee amputees) available to leg orthosis-dependent patients for the first time. In a study comparing the benefits of using the C-Brace to the use of locked knee-ankle-foot (LKAFO) and stance control orthoses (SCO), all patients were able to walk with the C-Brace without problems. A nearly physiologic stance knee flexion (mean value $11^{\circ} \pm 5.6^{\circ}$) was seen during level walking with the C-Brace compared to only relative movements between the limb and the orthosis when locked and stance control orthoses were used, Maximum swing knee flexion when using the microprocessor swing controlled C-Brace was close to that of sound subjects (65°) and thus more physiologic than the free, but uncontrolled, swing phase experienced when using the stance control orthoses ($66^{\circ} \pm 8.5^{\circ}$ vs $74^{\circ} \pm 6.4^{\circ}$). Control of maximum knee swing flexion is necessary to provide sufficient toe clearance and prevent tripping and stumbling. Unlike when using locked and stance control orthoses, all patients were able to descend ramps and stairs using reciprocal gait with the C-Brace (flexion angles $64.6^{\circ} \pm 8.2^{\circ}$ and $70.5^{\circ} \pm 12.4^{\circ}$, respectively).

In conclusion, the results of this study demonstrate that users of Locked and Stance Control Orthoses are able to utilize the situation-dependent knee flexion during weight bearing offered by the C-Brace with a high level of confidence (1).

Another study surveyed subjects regarding perceived orthotic function and perceived difficulty and safety of performing activities of daily living (ADL) with the C-Brace as compared to LKAFO and SCO use. Orthotic function as measured with the modified Prosthesis Evaluation Questionnaire demonstrated significant improvements with C-Brace use in the overall orthotic function ($p=.02$) as well as in the subdomains of ambulation ($p=.001$), paretic limb health ($p=.04$), sounds ($p=.02$), and well-being ($p=.01$). The analysis of the mean perceived difficulty of 45 ADLs showed that 22 activities were rated significantly

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easier to perform with the C-Brace than with the previous devices combined. In the subgroup of previous SCO users, 5 activities were significantly easier to execute with the C-Brace, and another 13 activities showed a trend towards easier execution with p-values $\leq .09$. The previous LKAFO users rated 12 activities as significantly easier to perform with the C-Brace, while another 9 activities presented a trend towards greater ease of execution with p-values $\leq .09$. Of the responses for perceived comparative safety, 59% demonstrated a safer execution of ADLs with the C-Brace (2).

References

1. Schmalz, T., Pröbsting, E., Auberger, R., & Siewert, G. (2016). A functional comparison of conventional knee–ankle–foot orthoses and a microprocessor-controlled leg orthosis system based on biomechanical parameters. *Prosthetics and orthotics international*, *40*(2), 277-286. DOI: 10.1177/0309364614546524.
<http://www.ncbi.nlm.nih.gov/pubmed/?term=25249381>
2. Pröbsting, E., Kannenberg, A., & Zacharias, B. (2017). Safety and walking ability of KAFO users with the C-Brace® Orthotronic Mobility System, a new microprocessor stance and swing control orthosis. *Prosthetics and orthotics international*, *41*(1), 65-77. DOI: 10.1177/0309364616637954
<http://journals.sagepub.com/doi/abs/10.1177/0309364616637954>

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