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Safety and walking ability of KAFO users with the C-Brace® Orthotronic Mobility System, a new microprocessor stance and swing control orthosis

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### Products

**C-Brace vs. KAFO (locked or SCO)**

### Major Claims

With C-Brace compared to KAFO (locked or SCO):

- **Improvement in perceived orthotic function and Quality of life**
  Compared to all previous orthoses combined, the results of the OEQ demonstrated significant improvements by C-Brace use in the total score.

- **ADLs become easier**
  With C-Brace the patients rated the activities in the domains of family and social life (+24%), mobility and transportation (+41%), sports (+35%) and other activities (+24%) significantly easier than with other KAFOs

  Of the responses for perceived comparative difficulty, 54% showed a greater ease of ADL execution with C-Brace.

- **ADLs become safer**
  Of the responses for perceived comparative safety, 59% demonstrated a safer execution of ADLs with the C-Brace.

### Distribution of the answers for the comparison of perceived safety of the 45 activities of the Orthotic ADLs Questionnaire between the C-Brace and the previous orthoses

- 59% safer with the C-Brace
- 37% safer with the previous orthosis
- 4% no difference

### Population

- **Subjects:** 13 subjects (12 unilateral, 1 bilateral)
- **Previous orthosis:** SCO (8), locked KAFO (5)
- **Underlying condition:** Poliomyelitis (8), incomplete spinal cord injury (3), peripheral lesion of the femoral nerve (1), stroke (1)
- **Mean age:** 57.4 ± 14.4 years
### Study Design

Interventional, pre- to post-test design:

![Diagram](image.png)

3 months acclimatisation

### Results

#### Functions and Activities

| Category                      | Outcomes                      | Results for C-Brace compared to KAFO | Sig.* |
|-------------------------------|-------------------------------|-------------------------------------|-------|
| **Biomechanics – Static measures** |                               |                                     |       |
| **Biomechanics – Gait analysis** |                               |                                     |       |
| **X-Ray**                      |                               |                                     |       |
| **EMG**                        |                               |                                     |       |
| **Functional tests**           |                               |                                     |       |
| **Clinical effects**           |                               |                                     |       |
| **Satisfaction**               |                               |                                     |       |
| **OEQ (scale 0 to 100)**       |                               |                                     |       |
| **Ambulation**                 | all KAFOs: Improved by 38%    | ++                                  |       |
|                               | SCO: Improved by 32%          | ++                                  |       |
|                               | Locked: Improved from 45%     | ++                                  |       |
| **Appearance**                 | all KAFOs: Improved by 3%     | +                                   |       |
|                               | SCO: Declined by -8%          | -                                   |       |
|                               | Locked: Improved by 27%       | +                                   |       |
| **Frustration**                | all KAFOs: Improved by 11%    | +                                   |       |
|                               | SCO: Declined by -4%          | -                                   |       |
|                               | Locked: Improved by 42%       | +                                   |       |
| **Perceived Response**         | all KAFOs: Declined by -5%    | -                                   |       |
|                               | SCO: Declined by -4%          | -                                   |       |
|                               | Locked: Declined by -8%       | -                                   |       |
| **Paretic Limb Health**        | all KAFOs: Improved by 21%    | ++                                  |       |
|                               | SCO: Improved by 17%          | ++                                  |       |
|                               | Locked: Improved by 29%       | +                                   |       |
| **Social Burden**              | all KAFOs: Improved by 6%     | +                                   |       |
|                               | SCO: Improved by 1%           | +                                   |       |
|                               | Locked: Improved by 13%       | +                                   |       |
| **Sounds**                     | all KAFOs: Improved by 52%    | ++                                  |       |
|                               | SCO: Improved by 53%          | +                                   |       |
|                               | Locked: Improved from 44%     | +                                   |       |
| **Utility**                    | all KAFOs: Improved by 8%     | +                                   |       |
|                               | SCO: Improved by 3%           | +                                   |       |
|                               | Locked: Improved by 16%       | +                                   |       |
| **Well-Being**                 | all KAFOs: Improved from 73 to 88 | ++                              |       |
|                               | SCO: Improved by 21%          | +                                   |       |
|                               | Locked: Improved by 29%       | +                                   |       |
| Category                                      | Outcomes                                      | Results for C-Brace compared to KAFO | Sig.* |
|----------------------------------------------|-----------------------------------------------|-------------------------------------|-------|
| Satisfaction Orthotic ADLs Questionnaire     | Personal Hygiene and Dressing                 | all KAFOs: Improved by 7%           | +     |
|                                              |                                               | SCO: Improved by 2%                 | +     |
|                                              |                                               | Locked: Improved by 8%              | +     |
|                                              | Family and Social Life                         | all KAFOs: Improved by 24%          | ++    |
|                                              |                                               | SCO: Improved by 17%                | +     |
|                                              |                                               | Locked: Improved by 42%             | ++    |
|                                              | Mobility and Transportation                   | all KAFOs: Improved by 41%          | ++    |
|                                              |                                               | SCO: Improved by 26%                | ++    |
|                                              |                                               | Locked: Improved by 67%             | ++    |
|                                              | Sports and Leisure Activities                  | all KAFOs: Improved by 35%          | ++    |
|                                              |                                               | SCO: Improved by 24%                | +     |
|                                              |                                               | Locked: Improved by 57%             | +     |
|                                              | Other Activities                               | all KAFOs: Improved by 24%          | ++    |
|                                              |                                               | SCO: Improved by 8%                 | +     |
|                                              |                                               | Locked: Improved by 63%             | ++    |

* no difference (0), positive trend (+), negative trend (−), significant (++/−−), not applicable (n.a.)

**Author's Conclusion**

“The MP-SSCO* may facilitate an easier, more physiological, and safer execution of many ADLs compared to traditional leg orthosis technologies. As the MP-SSCO allows for knee flexion during weight bearing, it enables leg orthosis users to perform many important ADLs such as descending ramps and stairs in a nearly physiological and naturally reciprocal manner. Moreover, its control of knee flexion and extension during swing supports walking with a wide variety of gait speeds. The results of this study suggest that users of LKAFOs and SCOs may benefit from MP-SSCO use in terms of perceived safer and easier execution of many ADLs.” (Pröbsting et al. 2016)

* C-Brace

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