Ramp descent performance with the C-Leg and interrater reliability of the Hill Assessment Index


### Products

**C-Leg vs NMPKs**

### Major Findings

With C-Leg compared to NMPKs:

- **Improved walking velocity during ramp descent by 23%**
- **Improved mobility during ramp descent**

  Hill Assessment Index score improved from 7.8 to 8.9 (14% increase)

### Improved ramp mobility with C-Leg for descent

Subjects descended a ramp (4.9 m, 5° slope) with self-selected walking speed and handrail use as they deemed necessary.

### Population

| Subjects: | 21 unilateral, transfemoral amputees |
| Previous prosthesis: | NMPKs |
| Amputation causes: | 38% vascular, 38% trauma, 19% congenital, 5% malignancy |
| Mean age: | 52.1 yrs (± 18.6 yrs) |
| Mean time since amputation: | not reported |
| MFCL: | K3 (independent community ambulators) |

### Study Design

Interventional, pre- to post-test design:

- NMPK
- Study registration
- Data collection
- C-Leg
- Data collection

≥ 90 days

14 days

90 days
Results

<table>
<thead>
<tr>
<th>Category</th>
<th>Outcomes</th>
<th>Results for C-Leg compared to NMPKs</th>
<th>Sig.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramps, Hills</td>
<td>Hill Assessment Index (HAI)</td>
<td>HAI scores increased by 14% (7.8 vs 8.9 points). 8 points represent ‘step-to without assistive device’ and 9 points represent ‘step a little past without assistive device’.</td>
<td>++</td>
</tr>
<tr>
<td></td>
<td>Time to complete ramp task</td>
<td>Time to complete ramp descent decreased (6.0 vs 7.7 s) and therefore walking velocity increased by 23%.</td>
<td>++</td>
</tr>
</tbody>
</table>

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

Author’s Conclusion

“This study confirms that accommodation with and use of a C-Leg can improve ramp descent performance at an ADA grade in terms of HAI scores and time to descend the ramp. Relative to ramp descent quality, use of the C-Leg appears to offer the possibility of removing the use of an assistive device when present and/or improving step length from a step to gait pattern to an asymmetric step through pattern in the absence of an assistive device. The use of the C-Leg also resulted in a 23% increase in gait speed during ramp descent.” (Highsmith et al. 2013)