Ottobock MPKs – 12 years of health economics

Summary of 10 health economic studies from 2008 to 2020

**Major Findings**

**Cost-effectiveness was demonstrated from payer perspective**

- When comparing C-Leg with NMPKs, the value of the incremental cost-effectiveness ratio (ICER) per quality adjusted life year (QALY) was **16,123 Euros** in amputees without diabetes mellitus (DM) and **20,332 Euros** in amputees with DM in a German study [1], **40,155 Euros** in a recent Italian study from 2016 [3], **35,971 Euros** in an earlier Italian study from 2008 [4], and **3,128 Euros** based on data gathered from a Swedish study [5].

- One study compared Genium with C-Leg and obtained an ICER per QALY between **6,000** and **11,957 USD** based on an US cohort [7].

**Cost-effectiveness was demonstrated from societal perspective**

- An ICER of **11,606 USD** for comparing C-Leg (MPKs) with NMPKs from the societal perspective was obtained in a US study [2].

**A marginal budget impact of C-Leg in comparison to NMPKs was demonstrated in 1 study**

- Over the period of 5 years, a **diminishing effect** in the size of the annual budget impact of C-Leg in comparison to NMPKs was observed [6].

**Further important health economics findings were obtained**

- A **favourable cost-benefit ratio** between C-Leg (MPKs) and NMPKs was demonstrated in a Dutch population from the societal perspective (total costs were lower, and mean quality of life (QoL) was higher).

- In 2017, for the first time, **direct medical costs of falls** were determined for adult transfemoral amputees [8].

- Studies before 2012 were summarized for the evaluation of past health economics finding as part of 2 review articles [9,10].

**All ICERs were below common national thresholds**

<table>
<thead>
<tr>
<th>Year of publication</th>
<th>ICER</th>
<th>National thresholds</th>
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</thead>
<tbody>
<tr>
<td>Kuhlmann 2020</td>
<td>16,123</td>
<td>Italian = 54,120 EUR/QALY gain</td>
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<tr>
<td>Chen 2017</td>
<td>11,606</td>
<td>US = 50,000 USD/QALY gain</td>
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<td>Cuti 2016</td>
<td>40,155</td>
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<tr>
<td>Highsmith 2016</td>
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<td>Gerzel 2008</td>
<td>35,971</td>
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<tr>
<td>Brodtkorb 2008</td>
<td>3,128</td>
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</tbody>
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**Notes**

- Details in section ‘comments’.
Clinical relevant outcomes

C-leg (MPK) compared to NMPK improved QoL in 4 studies

- With an increase of 13-14% \(^{3,4}\) based on EQ-5D measures in the Italian studies, of 57% based on the EuroQoL VAS measure in the Swedish study \(^{5}\) and of 18% based on the SF-6D measure in the Dutch study \(^{6}\).

C-leg (MPK) compared to NMPK increased QALY in 5 studies

- With a QALY gain of 1.74 for the non-DM and 0.92 for the DM cohort \(^{1}\), of 0.91 within the US study \(^{2}\), of 0.42 and 0.46 within the Italian cohorts in 2008 and 2016 \(^{4,3}\) and of 2.38 within the Swedish study \(^{5}\).

C-Leg (MPK) compared to NMPK improved safety - falls reduction in 2 studies

- With a reduced rate of fall-related hospitalizations by approximately 85% and reduced rate of outpatient treatments by approximately 84% \(^{1}\).
- The rate of fatal falls was reduced by approximately 83% \(^{1}\).

Further clinical relevant outcomes were demonstrated in 2 studies

- C-Leg (MPKs) resulted in 16 fewer incidences of osteoarthritis per 100 persons \(^{1}\).
- Improved physical functionality of activities of daily living of Genium compared to C-Leg was observed in one study \(^{7}\).

Costs

- National (DRG statistics \(^{1}\)), health insurance (Medicare \(^{2}\), INAIL\(^{3,4}\)) and medical (Dutch rehabilitation centre\(^{6}\)) databases, literature reviews, expert panels as well as interviews with health specialists and patients were used to inform costs.
- Direct medical costs included: device acquisition, fall-related injury (hospital, inpatient, outpatient treatments e.g. for hip/femur/ankle/wrist fractures) and rehabilitation costs.
- Indirect medical costs included: lost wages, caregiving and transportation expenses (used for social perspective of studies).

Summary

- Health economics of MPKs were extensively evaluated over the last 12 years.
- Cost-effectiveness of MPKs compared to NMPKs was demonstrated.
- Individuals using an MPK benefit from improved physical functionality of activities in daily living, QoL, QALY gain, reduced number of falls and fall-related injuries.
- A negligible marginal budget impact of MPKs compared to NMPKs was demonstrated.
- These results strengthen the argumentation to provide MPKs as standard of care.
References of summarized studies


8 April 2020

[1] Ottobock MPKs – 12 years of health economics AK/SSE
National thresholds

- **German threshold**: is equal to the German GDP per capita in 2018, which is a threshold proposed by the WHO [1]
- **US threshold**: corresponds to the commonly accepted threshold according to the Institute for Clinical and Economic Review in the US [2]
- **Italian threshold**: is equivalent to the converted upper threshold of 44,000 GBP that was reported as NICE practical acceptability threshold in the UK [3]