C-Leg vs MPKs

Metabolic energy consumption

**Major Findings**

With C-Leg compared to Rheo Knee:
- Oxygen costs decreased by 5.1% at self-selected walking velocity
- Oxygen costs tend to be decreased by 2.7% at fast walking velocity

With C-Leg compared to Intelligent Prosthesis:
- Oxygen uptake tends to be reduced by 4.3% up to 6.5% when walking at different velocities

With C-Leg compared to Hybrid Knee:
- Oxygen costs tend to be decreased by 2.7% at fast walking velocity

**Decreased oxygen costs with C-Leg**

Oxygen costs were measured when subjects walked at different velocities: slow (0.6–0.8 m/s), self-selected (0.8–1.0 m/s) and fast (1.0–1.2 m/s) (Bellmann et al 2010).

**Clinical Relevance**

Energy expenditure refers to the amount of energy a person uses to perform a certain activity such as walking. The difference between prostheses regarding the energy expenditure is of interest since transfemoral amputees are generally less efficient ambulators. The oxygen consumption of transfemoral amputees is 27% higher compared to able-bodied subjects (Gitter et al. 1995). Energy expenditure is determined based on measurements of oxygen cost, heart rate or carbon dioxide production.

**Summary**

Oxygen costs decreased at self-selected walking speed by 5.1% with C-Leg compared to Rheo Knee. At fast walking speed, C-Leg showed a trend towards decreased oxygen costs by 2.7% compared to Rheo Knee and Hybrid Knee (Bellmann et al 2010). In contrary, another study showed a trend towards increased oxygen uptake by 3% for C-Leg compared to Rheo Knee (Johansson et al. 2005). Additionally, C-Leg showed a trend towards decreased oxygen uptake by 4.3% – 6.5% compared to Intelligent Prosthesis at different gait speeds (Chin et al. 2006).
References of summarized studies


Other references