

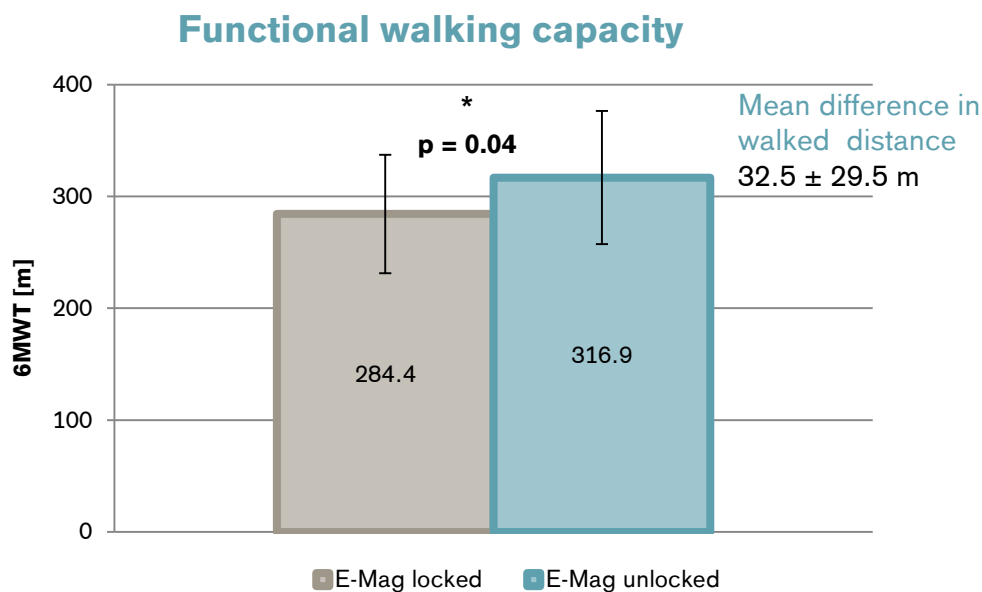
E-MAG Active

Functional tests

Major Findings

With E-MAG Active in unlocked mode (vs locked mode):

→ **significantly increased walking distance in the 6-minute walk test (+32.5 ± 29.5 m)**



Schröder et al., 2018

Clinical Relevance

The aim of E-MAG Active is to enable independent and safe ambulation. It provides the required safety by locking the knee joint for stance and automatically unlock during swing phase. This has influence on activity, mobility, and participation and, therefore the overall well-being of the user.

Timed walk tests are validated measures of physical performance and overall mobility in patients with various medical conditions (Rossier & Wade, 2001), including incomplete spinal cord injury (Jackson et al., 2008), post-polio syndrome (Flansbjerg & Lexell, 2010) and lower limb amputations. In subjects with lower limb amputations, the distance walked is well correlated with daily activity and indicative for substantial functional limitations in daily life (Gremeaux et al., 2012).

Summary

The results of the study by Schröder et al. (2018) show that subjects walked significantly slower in the locked mode compared to the unlocked mode of E-MAG Active. The average difference in walking speed between the orthotic modes was bigger in the 6MWT with 0.09 m/s than in the gait analysis with 0.06 m/s.

In the literature, five studies reported comparable parameters determined in 3D gait measurements. In those studies, subjects demonstrated a significantly faster or at least a tendency toward faster walking speed between 0.06 m/s and 0.1 m/s with the SCO compared to a locked KAFO (Bernhardt et al., 2006; Davis et al., 2010; Irby et al., 2007; McMillan et al., 2004; Schmalz et al., 2005).

With the E-MAG Active in the locked condition, subjects were significantly restricted in their functional walking capacity as demonstrated by a mean 32.5 m reduction in the distance walked in 6 minutes (Schröder et al., 2018). This difference and thus the effect of the SCO mode on the functional walking capacity is close to the reported minimal clinically important differences (MCID) for incomplete SCI (36 m) (Forrest et al., 2014) and stroke rehabilitation (34.4 m) (Eng & Dawson, 2004) and is also comparable to the effect of a 3-months physical therapy program in polio survivors (40 m) (Bertelsen et al., 2009). Using the E-MAG Active, subjects reached almost exactly the normative value of 316.8 m reported for subjects after 12 months of rehabilitation after an incomplete spinal cord injury (Ditunno et al., 2007).

Thus, it can be concluded that walking with an orthosis with a locked knee joint results in a significantly reduced functional walking capacity as compared to walking with the E-MAG Active.

References of summarized studies

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