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Journal articles

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**Title:** To what extent can the use of a mobility assistance dog reduce upper limb efforts when manual wheelchair users ascend a ramp?

**Citation:** Journal of Applied Biomechanics, April 2016, vol./is. 32/2(186-195), 1065-8483;1543-2688 (April 2016)

**Author(s):** Martin-Lemoyne V., Gagnon D.H., Routhier F., Poissant L., Tousignant M., Corriiveau H., Vincent C.

**Language:** English

**Abstract:** Biomechanical evidence is needed to determine to what extent the use of a
mobility assistance dog (AD<inf>Mob</inf>) may minimize mechanical loads and muscular demands at the upper limbs among manual wheelchair users. This study quantified and compared upper limb efforts when propelling up a ramp with and without an AD<inf>Mob</inf> among manual wheelchair users. Ten manual wheelchair users with a spinal cord injury who own an AD<inf>Mob</inf> ascended a ramp with and without their AD<inf>Mob</inf>. The movements of the wheelchair and upper limbs were captured and the forces applied at the pushrims were recorded to compute shoulder mechanical loading. Muscular demand of the pectoralis major, anterior deltoid, biceps, and the triceps was normalized against the maximum electromyographic values. The traction provided by the AD<inf>Mob</inf> significantly reduced the total force applied at the pushrim and its tangential component while the mechanical effectiveness remained similar. The traction provided by the AD<inf>Mob</inf> also resulted in a significant reduction in shoulder flexion, internal rotation, and adduction moments. The muscular demands of the anterior deltoid, pectoralis major, biceps, and triceps were significantly reduced by the traction provided by the AD<inf>Mob</inf>. The use of AD<inf>Mob</inf> represents a promising mobility assistive technology alternative to minimize upper limb mechanical loads and muscular demands and optimize performance during wheelchair ramp ascent.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Training to use a commercial brain-computer interface as access technology: a case study.

**Citation:** Disability and rehabilitation. Assistive technology, May 2016, vol. 11, no. 4, p. 345-350, 1748-3115 (May 2016)

**Author(s):** Taherian, Sarvnaz, Selitskiy, Dmitry, Pau, James, Davies, T Claire, Owens, R Glynn

**Abstract:** This case study describes how an individual with spastic quadriplegic cerebral palsy was trained over a period of four weeks to use a commercial electroencephalography (EEG)-based brain-computer interface (BCI). The participant spent three sessions exploring the system, and seven sessions playing a game focused on EEG feedback training of left and
right arm motor imagery and a customised, training game paradigm was employed. The participant showed improvement in the production of two distinct EEG patterns. The participant’s performance was influenced by motivation, fatigue and concentration. Six weeks post-training the participant could still control the BCI and used this to type a sentence using an augmentative and alternative communication application on a wirelessly linked device. The results from this case study highlight the importance of creating a dynamic, relevant and engaging training environment for BCIs. Implications for Rehabilitation Customising a training paradigm to suit the users’ interests can influence adherence to assistive technology training. Mood, fatigue, physical illness and motivation influence the usability of a brain-computer interface. Commercial brain-computer interfaces, which require little set up time, may be used as access technology for individuals with severe disabilities.

Source: Medline

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