quantified EMG activity in Gastrocnemius Medialis (GM) and Peroneus Longus (PL) during the swing phase (SW) of gait in very young hemiparetic children with an equino-valgus pattern [3], comparing the paretic and non-paretic side. **Materials and methods** Ten hemiparetic children (age 3 ± 1, mean ± SD) were monitored for GM and PL EMG during gait. The SW was divided into three thirds (initial-T1, middle-T2 and end-T3). In each period, a Cocontraction Index (CCI) [4], ratio of the Root Mean Square (RMS) EMG from each muscle during that period to the peak 500-ms RMS obtained from voluntary plantar flexion during a selected submaximal stance (standing on tiptoes) was measured. **Results** GM and PL CCI during SW were higher on the paretic than on the non-paretic side (Wilcoxon: CCI_GMT1, P < 0.01; CCI_GMT2, P < 0.01). When subdividing the SW, there was a CCI increase on the paretic side during mid and late SW for GM (Wilcoxon: CCI_GMT2, P < 0.01; CCI_GMT3, P < 0.001), and during early, mid and late SW for PL (Wilcoxon: CCI_GPL1, P = 0.03; CCI_GPL2, P = 0.014 and CCI_GPL3, P < 0.001).

**Discussion and conclusion** GM and PL cocontraction increases may contribute to the equinus on the paretic side. Specifically, PL cocontraction increase might cause the hind-foot valgus at late swing, moving the first metatarsal downwards and pronating the foot/toe. Quantification of cocontraction could provide a better understanding of the adverse muscle actions and contribute to better target the therapeutic actions, especially botulinum toxin injection in PL, to improve gait in very young hemiparetic children before orthopaedic deformation.

**Keywords** Cerebral palsy; Spastic co-contraction; Equinus; Gastrocnemius medialis; Peroneus longus; EMG

**Disclosure of interest** The authors have not supplied their declaration of conflict of interest.

**References**


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**Locomotor independence level assessment of stroke survivors using an obstacle course: Development and validation**

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**Objective** Traditional gait assessments often evaluate patients in idealised conditions (level ground, straight way, no obstacle) in order to define the gait capacity. In this sense, the way the patient walks in daily gait conditions remains unknown and the level of locomotor independence cannot be evaluated. The aim of this study was thus to develop and validate a course with ecological gait conditions. This tool must be able to categorise patients by their capacity to cross a set of obstacles linked to three level of independence: limited household walkers, limited community walkers and community walkers [1].

**Material/patients** The gait obstacle course is composed of four 10-m walking tests (t1 to t4) and one 6-min walking test. The tests t1 and [t2, t3, t4] respectively represent the traditional 10-m walk test and a set of 10-m walk tests with obstacles corresponding to the 3 evaluated levels of independence. 14 stroke survivors patients (50 ± 15 years old) were selected and gave their consent. This study was validated by the local ethic committee of CNRFR, Rehazenter.

**Method** The time to perform each part of the course was evaluated for all the patients 3 times by 2 operators in a randomised order. In order to realise a first validation of the course, inter- and intra-operator tests were then performed based on these records. A Wilcoxon test was employed for that with a confidence level of 95%.

**Results** On the whole, patients having a similar functional level present difficulties at the same part of the gait obstacle course. Moreover, tests {t2, t3, t4} and {t1, t2, t4, 6 min} present a significant reproducibility inter- and intra-operator.

**Discussion** Results are encouraging and demonstrate the potential of the proposed gait obstacle course. However, this first validation must be completed by evaluating much more patients and by achieving additional tests such as sensitivity tests before a daily clinical use.

**Keywords** Gait course; Independence level; Ecological conditions; Stroke

**Disclosure of interest** The authors have not supplied their declaration of conflict of interest.

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**Long-term effects of an implantable peroneal nerve stimulator on kinematics and gait capacities in the drop-foot treatment of stroke survivors**

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**Objective** The aim of this study was to show the long-term effects of an implantable peroneal nerve stimulator on articular kinematics and gait capacities in the drop-foot treatment of stroke survivors.

**Material and method** Twelve patients (4 women, 8 men, 45.45 ± 12.88 years, 171.92 ± 8.07 cm, 81.14 ± 20.30 kg) were selected and implanted with a Actigait stimulator (Neurodan, Denmark, OttoBock Group) in the CHL hospital of Luxembourg. A 12-month follow-up was proposed in CNRFR, Rehazenter to these patients composed of 4 assessments (1 month before implantation and 3, 6 and 12 months after implantation). At each assessment, a 10-m walk test, a 6-min walk test, a four-square step test and a clinical gait analysis were performed. A t-test was used to evaluate the improvement of each parameter with confidence level of 95%.

**Results** Most of the followed parameters, such as gait symmetry, foot/ankle kinematics and balance, are significantly improved after implantation. However, the 10-m walk test does not show any significant gait velocity improvement. Similarly, no significant effect appears on the compensations developed during gait. Even if the stimulator mainly has an orthotic effect, a therapeutic effect is shown for this patient group on the foot prepositioning in dorsiflexion at foot strike.

**Discussion** Unlike recent results reported in the literature [1], gait velocity does not seem to be impacted by the use of the stimulator during gait. However, the global quality of gait is improved, with a better gait symmetry, a reduced risk of falling and