Results.—This DT enables the detection of executive function impairment with 89% sensitivity and 87% specificity. This test also helped to detect impairments in aging participants that are not detectable with traditional psychometric tests.

Discussion.—The use of a DT that is inspired by an everyday event as an evaluation tool seems to facilitate the early detection of cognitive impairment in aging participants.

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Proprioceptive vibration effect in old healthy subjects
S. Mesure a, *, L. Maynard b, N. Duclos a
a Aix Marseille Université, Institut des Sciences du Mouvement, FSS, Marseille, France
b CRF de Valmante, France
*Corresponding author.

Keywords: Vibration; Posture; Cerebral hemisphere; Centre of pressure

Background.—Declines in proprioception function is part of aging process. The contribution of proprioceptive information in postural control seems to increase with aging and contributed to a greater risk of falling. Our objective was to determine if asymmetry between hemispheres with age had some specific postural consequences.

Methods.—We applied bilateral or unilateral vibration on Achilles or Peroneus tendons, to young and senior adults in standing position. Positions of the Center of Pressure and the covered length were computed. Statistical analysis was realized.

Results.—Vibration applied on Achilles tendons led to a backward shift of the CoP. The amplitude of this displacement was larger for senior than young group. In Uni-vibration, the Y displacement became significantly larger for vibration applied on the left limb than on the right one, for the senior group only. The stabilization time after left vibration on Achilles tendon was increased compared to right one for the senior group.

Conclusions.—Sensory-motor integration of proprioceptive information is well affected by age. We highlight here some age-induced postural consequences reflecting an asymmetry in plays of hemispheres in the postural control. It reflects a difficulty to down-regulate individual sensory modalities, possibly linked to a milder contribution of proprioceptive information in postural control seems to increase with aging and contributed to a greater risk of falling. Our objective was to determine if asymmetry between hemispheres with age had some specific postural consequences.

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Towards an objective assessment in daily practice of eccentric evertors weakness in chronic ankle instability
R. Terrier a, *, N. Forestier
Laboratoire de Physiologie de l’Exercice (EA 4338), Université de Savoie/CEVRES Santé, Le Bourget du Lac, France
*Corresponding author.

Keywords: Ankle; Inversion; Sprain; Evertor muscles weakness; Angular velocity; Weight bearing test

Objective.—Previous studies proposed that evertor muscles weakness represents an important factor affecting chronic ankle instability (CAI). Evertor muscles strength can be assessed by means of isokinetic evaluations. However, this methodology is too constraining to be widely used in clinical daily practice [1]. The present study assesses a new parameter, easily accessible for rehabilitation specialists. To this aim, we compared weight bearing ankle inversion control between healthy and CAI subjects.

Methods.—Twelve healthy and 11 CAI subjects made weight bearing ankle inversions on a specific ankle destabilization device equipped with a gyroscope. Instructions were to slowest possibly perform the ankle inversion. Angular velocity peaks were compared between the two groups.

Results/Discussion.—Data showed significantly higher angular inversion velocity peaks in CAI subjects, suggesting an eccentric weakness of evertor muscles. The proposed parameter seems to be interesting for daily clinical practice.

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Simulation of muscle retraction in Cerebral Palsy (SiMusCP), Validation of a decision support system for surgical lengthening of contractured muscles
E. Desailly a, *, A. Sebsadji a, F. Hare b, L. Lejeune a, D. Bouchakour a, N. Khouri b
a Fondation Ellen-Poidatz, St Fargeau Ponthierry, France
b Fondation Ellen-Poidatz, Hôpital Necker, France
*Corresponding author.

Keywords: Hamstrings lengthening; Decision making; Cerebral palsy; Clinical gait analysis

Introduction.—We developed a customizable musculoskeletal model able to analyze the muscles kinematics during walking and to simulate the maximum muscle length from clinical goniometric measurements (SiMusCP). This study assesses the real contribution of this procedure to the therapeutic decision of hamstrings lengthening (HL).

Material and methods.—Forty-two cerebral palsy children (12±3 years) were divided into two groups: G1 = 60 lower limbs and G2 = 20 lower limbs, respectively having followed and not followed HL among all the associated surgeries. All patients had clinical gait analysis before and 1.9±0.8 years after surgery. The limbs were classified, improved or not improved by HL, with a supervised classification system. SiMusCP procedure is performed retrospectively on the basis of clinical data and preoperative gait analysis. The concordance between the predictions from the simulation and the actual outcome of the surgery was evaluated.

Results.—SiMusCP procedure had a sensitivity of 87.5% and a specificity of 65%. The positive predictive value was 83.3%. The intensity of the connection between the result and the indication was significantly (P<0.001) very high (Yule’s-Q = 0.86).

Discussion.—SiMusCP requires significant rigor in the collection of data used as input. This decision support system can improve HL results by making outcomes more predictable.

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Preliminary study of the kinematics of the lower limb during direction changes in locomotion of hemiplegic children
A. Grigoria a, *, S. Vieilledent a, M. Lempereur b, R.N. Rémy-Néri a
CHRU, Service de Médecine Physique et Réadaptation, 29609 Brest, France
b Laboratoire de Traitement de l’Information Médicale (Inserm UMR 1101), 29609 Brest, France
*Corresponding author.

Keywords: Hemiplegia; Curved walking; Gait analysis; Kinematics

Object.—The aim of our study is to evaluate the kinematic modifications of the lower limb joints of hemiplegic children compared to typically developing children during a 90° change of direction.

Method.—Fourteen typically developing and 14 hemiplegic subjects aged from 7 to 13 walked along a path including a 90° bend. The kinematics was recorded by means of an optoelectronic Vicon system. The results are analysed in terms of kinematic differences of each limb (paretic or healthy) of the hemiplegic children compared to the control subjects as a function of the position of the limb in the bend (internally or externally).