

Monday 16 April 2012

Cerebral Palsy Alliance is delighted to bring you this free weekly bulletin of the latest published research into cerebral palsy.

Our organisation is committed to supporting cerebral palsy research worldwide - through information, education, collaboration and funding. This free weekly bulletin is just one of our activities. Please find out more at www.cpresearch.org.au

Professor Nadia Badawi

Macquarie Group Foundation Chair of Cerebral Palsy
PO Box 560, Darlinghurst, New South Wales 2010 Australia

Interventions and Management

1. Augment Altern Commun. 2011 Dec;27(4):292-303. doi: 10.3109/07434618.2011.630022.

Parachute without a ripcord: the skydive of communication interaction.

Smith MM, Murray J.

Trinity College, Dublin, Ireland. mmsmith@tcd.ie

Identifying and rating the outcomes of an intervention is not a new concept, but has gained impetus and currency with the emergence of evidence-based practice to support clinical decision making. In this paper, we present a metaphor as a unifying framework for the many different goals and outcomes that may come into focus across extended interventions with individuals who use aided communication. The metaphor is that of skydiving. We explore the value of this metaphor in understanding outcome measures for interventions, using analysis of interview data collected with adults who have used high-tech aided communication devices over many years.

[PMID: 22136367](#) [PubMed - indexed for MEDLINE]

2. BMC Neurol. 2012 Apr 12;12(1):21. [Epub ahead of print]

Valid and reliable instruments for arm-hand assessment at ICF activity level in persons with hemiplegia: a systematic review.

Lemmens RJ, Timmermans AA, Janssen-Potten YJ, Smeets RJ, Seelen HA.

BACKGROUND: Loss of arm-hand performance due to a hemiparesis as a result of stroke or cerebral palsy, leads to large problems in daily life of these patients. Assessment of arm-hand performance is important in both clinical practice and research. To gain more insight in e.g. effectiveness of common therapies for different patient populations with similar clinical characteristics, consensus regarding the choice and use of outcome measures is paramount. To guide this choice, an overview of available instruments is necessary. The aim of this systematic review is to identify, evaluate and categorize instruments, reported to be valid and reliable, assessing arm-hand performance at the ICF activity level in patients with stroke or cerebral palsy. **METHODS:** A systematic literature search was performed to identify articles containing instruments assessing arm-hand skilled performance in patients with stroke or cerebral palsy. Instruments were identified and divided into the categories capacity, perceived performance and actual performance. A second search was performed to obtain information on their content and psychometrics. **RESULTS:** Regarding capacity, perceived performance and actual performance, 18, 9

and 3 instruments were included respectively. Only 3 of all included instruments were used and tested in both patient populations. The content of the instruments differed widely regarding the ICF levels measured, assessment of the amount of use versus the quality of use, the inclusion of unimanual and/or bimanual tasks and the inclusion of basic and/or extended tasks. **CONCLUSIONS:** Although many instruments assess capacity and perceived performance, a dearth exists of instruments assessing actual performance. In addition, instruments appropriate for more than one patient population are sparse. For actual performance, new instruments have to be developed, with specific focus on the usability in different patient populations and the assessment of quality of use as well as amount of use. Also, consensus about the choice and use of instruments within and across populations is needed.

[PMID: 22498041](#) [PubMed - as supplied by publisher]

3. J Pediatr. 2012 Apr 10. [Epub ahead of print]

Identification of Facilitators and Barriers to Physical Activity in Children and Adolescents with Cerebral Palsy.

Verschuren O, Wiart L, Hermans D, Ketelaar M.

Rudolf Magnus Institute of Neuroscience and Center of Excellence for Rehabilitation Medicine, Utrecht University Medical Center, Utrecht, The Netherlands; Hoogstraat Rehabilitation Center, Utrecht, The Netherlands.

OBJECTIVE: To explore facilitators and barriers to participation in physical activity and sport in youth with cerebral palsy (CP). **STUDY DESIGN:** This was a qualitative study involving in-depth focus group interviews with 33 ambulatory youth with CP and their parents. The interviews were conducted until informational redundancy was achieved. **RESULTS:** Youth with CP and their parents reported personal and environmental facilitators and barriers to participation in physical activity. Seven major themes related to personal and environmental factors were identified. **CONCLUSIONS:** This study suggests that various personal and environmental factors play a key role in determining the extent to which youth with CP participate in physical activity. The facilitators and barriers identified provide important theoretical insights into how and why youth with CP and their parents might change their physical activity behavior.

Copyright © 2012 Mosby, Inc. All rights reserved.

[PMID: 22494875](#) [PubMed - as supplied by publisher]

4. Eur J Paediatr Neurol. 2012 Apr 5. [Epub ahead of print]

Assessment of families of children with cerebral palsy of the "CP-graph on treatment modalities for gross motor function"

Papavasiliou AS, Ioannou J, Gavatha M, Nikaina I, Rizou I.

Pendeli Children's Hospital, Athens 15236, Greece.

[PMID: 22483444](#) [PubMed - as supplied by publisher]

5. J Bone Joint Surg Am. 2012 Apr 4;94(7):627-37.

Long-term results after gastrocnemius-soleus intramuscular aponeurotic recession as a part of multilevel surgery in spastic diplegic cerebral palsy.

Dreher T, Buccoliero T, Wolf SI, Heitzmann D, Gantz S, Braatz F, Wenz W.

BACKGROUND: Equinus of the foot at the ankle is one of the most common deformities in patients with spastic diplegic cerebral palsy, leading to gait disturbances and secondary deformities. During single-event multilevel surgery, equinus is commonly corrected by calf muscle lengthening, such as gastrocnemius-soleus intramuscular aponeurotic recession. Various studies have described satisfactory short-term results after gastrocnemius-soleus

intramuscular aponeurotic recession. However, there is no evidence for maintenance of equinus correction because of the small and heterogeneous case series and short follow-up time previously reported. **METHODS:** The present study provides long-term results after gastrocnemius-soleus intramuscular aponeurotic recession as a part of multilevel surgery for the treatment of equinus in forty-four patients with spastic diplegia who were able to walk (forty-eight legs had lengthening of the gastrocnemius and thirty-four legs had lengthening of the gastrocnemius and soleus). Standardized three-dimensional gait analysis and clinical examination were done preoperatively and at one year, a mean (and standard deviation) of 3 ± 1 years, and a mean of 9 ± 2 years after surgery. **RESULTS:** Significant improvements in kinematic and kinetic ankle parameters on gait analysis as well as passive dorsiflexion in clinical examination were found one year after surgery. While there was a significant loss of passive dorsiflexion at the time of long-term follow-up, the improvements in gait analysis parameters were maintained. The endurance of gait improvements was accompanied by a persistent increase of dorsiflexor muscle strength without relevant loss of plantar flexor strength. Although it was not significant, there was a tendency for deterioration of gait analysis parameters over the nine years. The analysis of individual patterns showed recurrence of equinus at the ankle in 24% of the legs. Early-onset calcaneal gait was found one year after surgery in seven legs (9%), but without secondary crouch gait, and there was recovery at the time of the long-term follow-up. Late-onset calcaneal gait was seen at the time of long-term follow-up in eight legs (10%), of which four had an accompanying crouch gait. **CONCLUSIONS:** Gastrocnemius-soleus intramuscular aponeurotic recession as a part of multilevel surgery leads to satisfactory correction of mild and moderate equinus deformity in children and adolescents with spastic diplegia without relevant risk for overcorrection and should be preferred over Achilles tendon lengthening to avoid overlengthening. The long-term results in the present study demonstrate that the improvements are long-lasting on average, but individual patients tend to develop recurrence and may need secondary gastrocnemius-soleus intramuscular aponeurotic recession.

LEVEL OF EVIDENCE: Therapeutic Level IV. See Instructions for Authors for a complete description of levels of evidence.

[PMID: 22488619](#) [PubMed - in process]

6. Dev Neurorehabil. 2012;15(2):114-8.

Plantarflexor muscle and spatiotemporal gait characteristics of children with hemiplegic cerebral palsy: an observational study.

Crosbie J, Alhusaini AA, Dean CM, Shepherd RB.

Clinical Rehabilitation Sciences Research Group, Faculty of Health Sciences, The University of Sydney, New South Wales, Australia.

Objective: The study investigated associations between the active and passive mechanical properties of the calf muscle in children with cerebral palsy and the spatiotemporal features of their gait on both level ground and over stairs. **Methods:** 26 children with hemiplegic cerebral palsy (age 4 - 10 years) walked barefoot across a level ten metre pathway and a staircase. Walking speed, stride length and cadence were calculated and spasticity, maximum isometric strength, stiffness and hysteresis of the affected side calf muscle measured. Multiple linear regression was used to determine the associations among variables. **Results:** Walking speed and stride length were significantly associated with dorsiflexor muscle strength and the stiffness of the calf muscle, while stair ascent and descent speeds were significantly and inversely related to the amount of hysteresis displayed by the calf muscle. **Conclusion:** Passive mechanical properties of the calf muscle are influential in gait performance in these children.

[PMID: 22494083](#) [PubMed - in process]

7. Pediatr Phys Ther. 2011 Winter;23(4):364.

Commentary on "Walking stride rate patterns in children and youth".

Redman-Bentley D, Wardell M.

Western University of Health Sciences, Pomona, California, USA.

Comment on

Pediatr Phys Ther. 2011 Winter;23(4):354-63.

[PMID: 22090076](#) [PubMed - indexed for MEDLINE]

8. Radiology. 2012 Apr 10. [Epub ahead of print]

Spastic Cerebral Palsy in Children: Dynamic Sonoelastographic Findings of Medial Gastrocnemius.

Kwon DR, Park GY, Lee SU, Chung I.

Department of Rehabilitation Medicine, Catholic University of Daegu School of Medicine, 3056-6 Daemyung 4-Dong, Nam-Gu, Daegu 705-718, South Korea.

Purpose: To study the elastic properties of the medial gastrocnemius (GCM) in children with spastic cerebral palsy. **Materials and Methods:** The study protocol was approved by the Research Ethics Committee of the hospital, and informed consent was obtained from each child's parent. Fifteen children with spastic cerebral palsy (group 1) and 13 children without neurologic and musculoskeletal disabilities (group 2) were included. Because group 1 included three children with hemiplegia, the total number of legs examined was 27. Children in group 2 had both legs examined, for a total of 26 legs studied. The modified Ashworth scale score of the ankle in group 1 was assessed by a physical therapist. A physiatrist performed ultrasonography and dynamic sonoelastography (DS) together, measured the thickness of the GCM, and calculated the GCM ratio in both groups. On color-scaled DS images, the DS score of the GCM was graded from DS 1 (purple to green: soft) to DS 4 (red: stiff), and the color histogram of the GCM was subsequently analyzed. Strain ratio and local shear wave velocity were calculated in the GCM and the soleus muscle by using acoustic radiation force impulse imaging. **Results:** The GCM ratio in group 1 was significantly smaller than that in group 2. The DS score of GCM in group 1 was significantly higher than that in group 2. The median red pixel values were significantly higher, and the blue pixel values were significantly lower on color histogram in group 1 than those in group 2. The strain ratio in group 1 was significantly lower than that in group 2, and the local shear wave velocity of GCM in group 1 was higher than that in group 2. There were significant correlations between the modified Ashworth scale scores and DS parameters. **Conclusion:** DS demonstrated a difference in muscle stiffness in the GCM between children with spastic cerebral palsy and those without neurologic and musculoskeletal disabilities. © RSNA, 2012.

[PMID: 22495685](#) [PubMed - as supplied by publisher]

Subscribe to CP Research News

To subscribe to this research bulletin, please complete the online form at www.cpresearch.org/subscribe/researchnews You can bookmark this form on the home screen of your smart phone and also email the link to a friend.

To unsubscribe, please email researchnews@cerebralpalsy.org.au with 'Unsubscribe' in the subject line, and your name and email address in the body of the email.