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## A web-based therapy program enhances occupational performance and visual perception in children with unilateral cerebral palsy

### Synopsis

Summary of: James S, Ziviani J, Ware R, Boyd R. Randomized controlled trial of web-based multimodal therapy for unilateral cerebral palsy to improve occupational performance. *Dev Med Child Neuro.* 2015; doi:10.1111/dmcn.12705.

**Question:** Does a web-based therapy program improve occupational performance, upper limb function and visual perception in children with unilateral cerebral palsy? **Design:** Randomised controlled trial with concealed allocation and blinded outcome assessment for some, but not all, outcome measures. **Setting:** Home environment in Australia. **Participants:** Children with spastic-type unilateral cerebral palsy, Manual Ability Classification System levels I to III and Gross Motor Function Classification System levels I or II. Children were aged 8 to 18 years, had sufficient understanding and co-operation to perform the program, and internet access at home. Exclusion criteria were: upper or lower limb surgery in the previous 6 months and unstable epilepsy. Randomisation of 102 participants allocated 51 to the web-based therapy group and 51 to a waitlist control group. **Interventions:** The intervention group participated in a web-based therapy program comprising upper limb, cognitive and visual perceptual training (60%) and gross motor activities (40%). The dose was 20 to 30 minutes, 6 days per week for 20 weeks (maximum 60 hours). For each child, therapists devised an individual program selected from 14 modules and adjusted it weekly. The control group received usual care. **Outcome measures:** The primary outcomes at baseline and after the intervention were: the Assessment of Motor and Process Skills, Assisting Hand Assessment, the Jebsen-Taylor Test of Hand Function and the

Melbourne Assessment of Unilateral Upper Limb Function. Secondary outcome measures were: the Canadian Occupational Performance Measure and the Test of Visual Perceptual Skill. **Results:** Ninety-two participants completed the study. The intervention group completed 32 hours (95% CI 4 to 75 hours) of the program. At the end of the intervention, the Assessment of Motor and Process Skills motor scores were significantly greater in the treatment group by 0.28 logits (95% CI 0.17 to 0.39). The Jebsen-Taylor Test of Hand Function for the dominant limb improved significantly more in the intervention than the control group (-4.7 seconds, 95% CI -7.4 to -2.0), but not for the impaired limb (-22.0 seconds, 95% CI -44.8 to 0.7). The intervention group had higher scores on the Canadian Occupational Performance Measure performance (1.3 points, 95% CI 0.7 to 1.9) and satisfaction (1.5 points, 95% CI 0.4 to 0.8) scales, and the Test of Visual Perceptual Skill (6.8 points, 95% CI 2.8 to 10.8). The groups did not differ for other outcomes. **Conclusion:** A web-based therapy program at home has the potential to enhance occupational performance and visual perception for children with cerebral palsy and to increase therapy dose.

**Provenance:** Invited. Not peer-reviewed.

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### Commentary

The efficacy of high-intensity therapy programs in improving upper limb function in children with unilateral spastic cerebral palsy has previously been established.<sup>1,2</sup> However, these programs can be labour-intensive and are not feasible for all families. The use of interactive computer play to augment face-to-face therapy is appealing as it may afford a low-cost means of intensive therapy delivery, typically in the home setting.

This trial was well designed, conducted and reported. The observed differences between the intervention and control groups in motor and processing skills, occupational performance and visual perception validates the proposal that web-based training permits repetitive practice of the perceptual, cognitive and motor control components of a task. The absence of improvement in the Assisting Hand Assessment and the Melbourne Assessment of Unilateral Upper Limb function scores for the impaired limb could be due to the lack of specificity of the training: it was neither goal-directed nor task-specific. Alternatively, the program may not have been sufficiently intense to achieve experience-dependent neuroplastic changes. Participants completed an average of 32 hours (of the recommended 40 to 60 hours) over 20 weeks, with six participants completing  $\leq 10$  hours. These training hours were substantially less and were distributed over a longer period than typically advocated for other efficacious 'high-dose' therapy programs.<sup>2</sup>

The efficacy of home programs for children with cerebral palsy has been demonstrated<sup>3</sup> and is a central component of service provision for this client population. Web-based programs afford another mode of service delivery for therapists that may, by their tech-based nature, be of greater appeal to children and adolescents than more traditional approaches to home program prescription. Web-based programs facilitate repetitive practice and can improve the quality of performance of activities of living, motor and processing skills. Clinicians should consider the intensity, duration and specificity of training when considering implementing such programs in practice.

**Provenance:** Invited. Not peer-reviewed.

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