

Morgan AT, Hodge M, Pennington L. [Scientific forum topic: Translating knowledge to practice in childhood dysarthria](#). *International Journal of Speech-Language Pathology* 2014, 16(4), 335-336.

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DOI link to article:

<http://dx.doi.org/10.3109/17549507.2014.930176>

Date deposited:

12/08/2015



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Scientific Forum Topic: Translating knowledge to practice in childhood dysarthria.

Angela T Morgan, Megan Hodge, Lindsay Pennington

Editorial

Dysarthria can have profound effects on children's quality of life and social participation (1, 2). Despite such impacts, there has been a critical lack of research investigating the causes, treatment and outcomes of childhood dysarthria compared to other paediatric speech-language disorders. For example, a simple search in Pubmed reveals a literature ratio of around 1:3.5 for dysarthria treatment compared to speech sound disorder treatments (child* dysarthria treatment, 398 results vs. child* articulation treatment and/or phonological treatment, 1441 results), and an even greater ratio (1:41) for dysarthria versus child language treatment literature (child* language treatment, 16267 results). More importantly, the level of evidence for treating childhood dysarthria is low. No studies were identified that met inclusion criteria for meta-analyses examining treatment efficacy in the Cochrane Database of Systematic Reviews (see Pennington et al., 2009 for dysarthria acquired under 3 years; Morgan et al., 2008 for dysarthria acquired from 3 years and upwards). By contrast, a number of papers met inclusion criteria for a Cochrane review on efficacy of treatment for developmental speech and language disorders (Law et al., 2003; updated 2010). There is a clear need to generate robust evidence to support interventions for children with dysarthria, and integrated measures to evaluate their outcomes.

With this need in mind, we gathered a group of international scholars who share the goal of improving the clinical management of these children to contribute original research studies to this Special Issue, "Translating Knowledge into Practice in

Childhood Dysarthria”. It is an exciting time to focus on this population of children because the World Health Organization’s International Classification of Functioning, Disability and Health (ICF) has given researchers and clinician’s a newfound recognition of the need to consider, and where possible, modify how dysarthria impacts an individual’s activity and participation in daily life. This issue is organised so that aspects of impairment, activity and participation are covered by the invited authors.

A relative strength of the extant literature is the characterisation of speech deficits or speech impairment in children with dysarthria. Our Special Edition builds on this strength. Ann Nordberg and colleagues examined speech impairment, cognitive level and gross motor function in children with CP and report that level of nonverbal cognitive impairment, rather than level of gross motor impairment, may be of greatest relevance when considering management of speech treatment in this population. At the level of communication activity, Kristen Allison and Katie Hustad investigated the effects of two important linguistic variables - sentence length and phonetic complexity - on the intelligibility of children with CP. They highlight the need for information from measures at levels of both body function and activity to plan treatment for an individual child. Further insights into the complex issue of intelligibility for children with dysarthria are provided by Sophie Landa and colleagues who examine the association between listeners’ perceptions of the ease of understanding dysarthric speech and the amount of speech they actually understand. This work provides an important conceptual leap in the field, providing measures of the impact of listener, as well as speaker, factors on intelligibility.

A critical issue limiting our ability to measure intelligibility and associated measures of speaking rate in children with dysarthria has been a lack of standard tools for eliciting connected speech. Megan Hodge is a pioneer in this regard and here reports criterion reliability data for the Test of Children's Speech Plus, compared to children's conversational speech samples. Rupal Patel's contribution also augments our ability to assess dysarthric speech by providing the first picture description task; 'Play Park,' which is designed specifically for eliciting connected speech in children with motor speech disorders.

The work of Cristina Mei and colleagues extends the scope of the contributions focused at the impairment and activity levels by describing the impact of motor speech impairment on activity and participation in the home, school and community in a cohort study of children with CP. As anticipated, limitations in activity and participation were found to increase as motor speech ability and speech intelligibility decreased.

We're delighted that three manuscripts are dedicated to treatment of children with dysarthria. For the past two decades, the Lee Silverman Voice Treatment (LSVT) program has been at the forefront of rigorous dysarthria treatments in adults and is increasingly applied to children. In this Special Issue, Carol Boliek and Cynthia Fox discuss two case studies, described as one weak and one strong responder to LSVT LOUD. In particular, they demonstrate how individual and environmental features may affect immediate and lasting responses to treatment. Erika Levy also presents findings from implementing LSVT LOUD and Pennington and colleagues' Speech Systems Intelligibility Treatment in children with CP. She discusses specific strategies for outcome measurement including acoustic analysis of dysarthric speech. Roslyn Ward and colleagues also discuss a well known speech treatment approach,

the Prompts for Restructuring Oral Motor Targets (PROMPT) program and demonstrate promise for its utility in children with dysarthria.

We are proud that this special issue also considers outcomes in paediatric dysarthria at a more global level. Pamela Enderby challenges us to account for our practice and improve our clinical outcome measurement. She encourages us to think at a broader level of health care service provision, to strive to bench mark our practice within and across services, at and beyond an individual patient level. Her paper describes an important extension of TOMS that reflects the impact of the range of treatments for childhood dysarthria, with practical real world examples to facilitate our learning.

We thank the authors for their valuable contributions. We trust that these papers will increase readers' awareness and understanding of the multifaceted and complex issues in childhood dysarthria and inspire some to continue to build a much-needed research base on this topic, cast within the ICF-CY framework.

1. Fauconnier J, Dickinson HO, Beckung E, Marcelli M, McManus V, Michelsen SI, et al. Participation in life situations of 8-12 year old children with cerebral palsy: cross sectional European study. *BMJ*. 2009;338(apr23_2):1458- 71.
2. Dickinson HO, Parkinson KN, Ravens-Sieberer U, Schirripa G, Thyen U, Arnaud C, et al. Self-reported quality of life of 8-12-year-old children with cerebral palsy: a cross-sectional European study. *The Lancet*. 2007;369(9580):2171-8.