



**CLINICAL BOTTOM LINE:** In children with Childhood Apraxia of Speech, an integrated phonological awareness program can promote age appropriate early literacy development as well as gains in speech skills. Language difficulties in children with CAS should be targeted specifically during intervention as they do not resolve as speech difficulties improve.

**Clinical [PICO] Question** In children with CAS does intervention (e.g., DTTC, Integrated Phonological Awareness Approach, AAC, Combined Melodic Intonation Therapy + Multimodal approach, +/-use of PML principles) improve speech (+/- literacy, overall communication skill) when compared to no intervention?

**Citation:** A longitudinal case study of the effects of an integrated phonological awareness program for identical twin boys with childhood apraxia of speech (CAS). McNeill, B. C., Gillon, G. T., Dodd, B. *International Journal of Speech-Language Pathology*, 2009, 11 (6) 482-495.

### Method: Design and Procedure

Longitudinal within subject design. 18 hours of individual therapy provided at home over two 6 week treatment blocks. Frequency and dose of therapy not provided. Assessment at pre-intervention (4;5yoa), post-intervention (4;9yoa), 6 months post therapy (5;3yoa), and 12 months post therapy (5;9yoa). Assessment included: speech production (PCC, PVC, early/middle/late 8 sounds, consistency); PA skills (PIPA, including sound/letter knowledge); phonological representation (auditory assessment of polysyllabic words as correct/incorrect based on vowel production); narrative production; reading and spelling. Therapy targets included velar fronting (block 1) and reduction of /s/ clusters (block 2). Therapy approach was not described. Phonological awareness tasks were integrated within therapy (ie words with velar sounds were used as stimulus within phoneme awareness activities when focusing on velar fronting). Targeted speech production practice was integrated by drawing attention to the spelling of words.

### Method: Participants (where relevant note number of participants, inclusion/exclusionary criteria, characteristics of participants in experimental group and control group/s):

Twin boys (identical); induced at 37 weeks; unremarkable birth; early feeding and swallowing difficulties with some chewing difficulties remaining; normal hearing at the time of study; limited babble as babies; delayed speech and language; normal early motor development. Speech therapy from 2;6 focusing on Makaton, then later (3;6) on target sounds and words. Receptive language WNL. Rare chromosomal deletion (10q21.2.222.1) with mild impact. History of dyslexia in extended family members, and reading in older sister. CAS diagnosis using Ozanne's model (2005) at 3;6 years. Participants selected from another CAS study at the university. Selected as positive for CAS, not yet at school and identical twins. No control group.

## Critically Appraised Paper: TREATMENT (CAP-T) *continued....*

### Results:

**Speech measures** – speech accuracy (PCC, PVC) increased; inconsistency decreased; PCC of early, middle and late 8 sounds increased. Most gains were made during intervention and up to the first follow up test. Gains were generally held over the following 6 months. Both were at times unintelligible at the 2<sup>nd</sup> follow up session in connected speech. Volume control and a concurrent excess and equal stress pattern occurred frequently, with some long pauses between words creating an 'effortful' quality to speech.

**Phonological awareness measures** – phonological awareness and letter knowledge was within the range expected for age; phonological representation judgement increased to ceiling.

**Reading and spelling development** – within the expected range for age

**Expressive morpho-syntactic development** - persistent word level errors (pronouns, irregular past tense), omitted words (determiners and auxiliary verbs) and omitted bound morphemes (past tense, contractible auxiliary and copula verbs), despite increased intelligibility.

**Level of Evidence (NHMRC, 2009)** *Circle one*   I   II   III-1   III-2   III-3   IV

**Quality of Evidence:** ☐ Rated   ☒ Not Rated

(i) **rating system** (e.g., PEDRo, SCED Scale from SpeechBITE) \_\_\_\_\_

(ii) **score** \_\_\_\_\_ *If the paper has not been rated, just check 'not rated'.*

**Nature of Evidence:** ☐ feasibility   ☐ efficacy study   ☒ effectiveness study

**Additional comments about level, quality and/or nature of the evidence:** (e.g., limitations of the study, need for further research addressing a specific issue; assessors weren't blind, insufficient baseline or baseline not stable, effect size not reported)

### Relevance to practice

Relevant to community clinical practice, though frequency of therapy sessions may be a barrier to replicating treatment. Detail of therapy approach and target selection not noted in this paper, but could be obtained from the author or from the original larger study published information.

**Appraised By:** EBP Paediatric Speech Group

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