



Childhood Apraxia of Speech (CAS)

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What is CAS?

- Motor speech disorder
- Disconnection between the brain and the mouth
- Atypical and inconsistent errors

Start Here

AN IDEA

I want to say something!



Which words and in what order?

SAY I TO WANT

What sounds, in what order, to say each word?

A N T W

SUCCESS!

Move Muscles!



I want to say something!



What mouth parts need to move which muscles in what order?

This part is hard for kids with apraxia



Prevalence

- 1-2 per 1000
- Affects more boys than girls at a ratio of 2 or 3:1
- 3.4 to 4.3% of the children referred for speech disorders

Signs

***No validated list of characteristics

Signs with the most consensus:

- inconsistent errors on consonants and vowels in repeated productions of syllables or words,
- lengthened and disrupted coarticulatory transitions between sounds and syllables,
- inappropriate prosody, especially in the realization of lexical or phrasal stress.

Signs Continued

- high incidence of vowel distortions;
- limited consonant and vowel phonetic inventory in young children;
- frequent sound distortions and distorted consonant substitutions;
- initial consonant deletions;
- voicing errors;
- schwa additions/insertions to consonant clusters, within words and on the ends of words;
- predominant use of simple syllable shapes;
- greater ease in producing automatic (e.g., frequently used phrases, such as "I love you") versus volitional utterances (e.g., novel phrase or sentence);
- difficulty with smooth, accurate movement gestures;
- better performance on speaking tasks that require single postures versus sequences of postures (e.g., single sounds such as [a] vs. words such as [mama]);
- difficulty achieving accurate articulatory movement gestures when trying to imitate words not yet mastered;
- presence of groping behaviors when attempting to produce speech sounds or coordinate articulators for purposeful movement;
- altered and/or inconsistent suprasegmental characteristics (rate, pitch, loudness);
- increased difficulty with longer or more complex syllable and word shapes (often resulting in omissions, including word-initial consonant deletion);
- predominant errors of consonant, vowel, syllable, and/or word omissions;
- atypical levels of regression (e.g., words or sounds mastered, then lost);
- sequencing errors affecting sounds (e.g., metathesis, migration), syllables, morphemes, or words.

Co-Occurring Characteristics

Speech Characteristics:

- Language delay
- Expressive language issues: grammar and word order
- Issues with reading, writing, spelling
- Pragmatic difficulties

Non Speech Characteristics:

- gross and fine motor delays;
- motor clumsiness, oral apraxia;
- limb apraxia
- feeding difficulties
- abnormal orosensory perception (oral hyper- or hyposensitivity)

How is it different than artic/phonology

Phonology - predicted and patterned errors. Children simplify to make it easier on themselves. Highly unintelligible.

Articulation - Difficulty producing sound motorically are usually substitutions, omissions, distortions.

Apraxia - Disconnect between the brain and the mouth. Errors on vowels and inconsistent errors.

How is it different than dysarthria?

Dysarthria - decreased strength and coordination which leads to imprecise speech production. Also have difficulty with chewing, swallowing, etc.

Apraxia - No weakness or incoordination of speech musculature. No difficulty with chewing or swallowing unless the also have oral praxis.

Assessment

- Case history
- Expressive/receptive language testing
- Assessment of phonological awareness skills
- Speech sample
- Oral-motor examination
- Test melody and intonation
- Test vowels and consonants
- Check syllables, words, phrases, and sentences

*difficult to assess children under the age of 3

Treatment Approaches

- Motor planning approaches
- Augmentative and alternative communication
- Linguistic approaches
- Sensory cueing
- Prosodic facilitation

Motor Planning Approaches

Provide frequent and intensive practice of speech targets and focus on accurate speech movement.

- Kaufman Speech to Language Protocol
- Dynamic Temporal and Tactile Cueing
- Nuffield Dyspraxia Program
- Training Syllable Sequences

Linguistic Approaches

Focus on speech function and target speech sounds and groups of sounds with similar patterns. Meant to supplement motoric approaches.

- Cycles Approach
- Integrated Phonological Awareness Intervention

Sensory Cueing

Many other CAS treatment approaches utilize sensory cueing to teach the movement sequences of speech. Feedback is important to motor learning.

- Integral Stimulation
- Tactile Facilitation
- Visual Cueing

Prosodic Facilitation

Uses melody, rhythm, and stress is used to improve speech production.



Considerations for Planning Treatment

- How intelligible are the child's utterances? Is their expressive communication functional?
- Are the child's language complexity, word order, and/or utterance length affected by his/her apraxia?
- What are sounds and sound sequences that the child can produce?
- How well does the child understand words and sentences?
- What are the immediate communication needs?
- Keep sound development in mind

Considerations for School Age Children

- Still important to determine if his/her utterance length and complexity and communicative intent.
- Assess their social skills
- How are the child's reading abilities?
- Prosody

Common Goals for Younger Children with CAS

The goal is develop a pathway from the brain to the mouth

Example Goals:

- **Child will increase phonemic repertoire from X to X by October 2019.**
- **Child will imitate CV, VC, and CVC combinations with 90% accuracy given tactile cues.**
- **Child will spontaneously use CV, VC, and CVC combinations with 90% accuracy of the opportunities presented.**

Impact on Literacy

“Children with CAS are particularly susceptible to phonological awareness and reading delay. Intervention for children with CAS must facilitate skills underlying reading development in addition to resolving speech deficits in order to improve the spoken and written language outcomes of this population.” (McNeill, B. C., Gillon, G. T., & Dodd, B.,2009)

“There needs to be awareness and vigilance to the literacy development of children with spoken language problems, especially those who have apraxia of speech.” (Gretz,)

CAS, Reading, and Writing

Signs of difficulties reading and writing:

- Difficulty moving from reading words as wholes to breaking them into individual sounds
- Struggles to segment words into syllables and syllables into sound.
Atypical spelling attempts.
- Difficulty with rhyme detection and production
- Struggles to blend sounds

CAS, Reading, and Writing Cont'd

Tools and activities include:

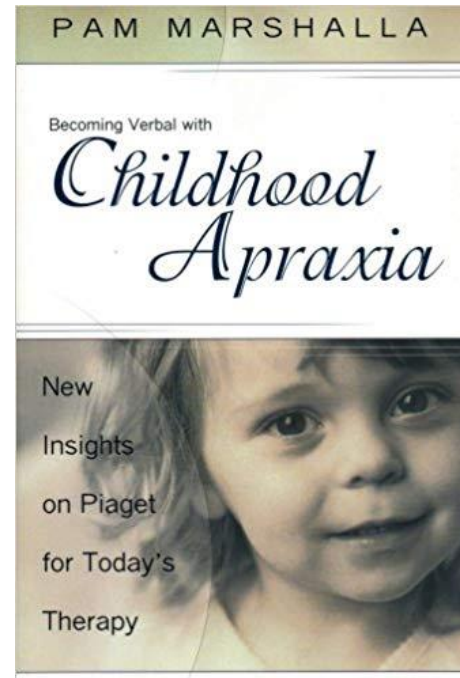
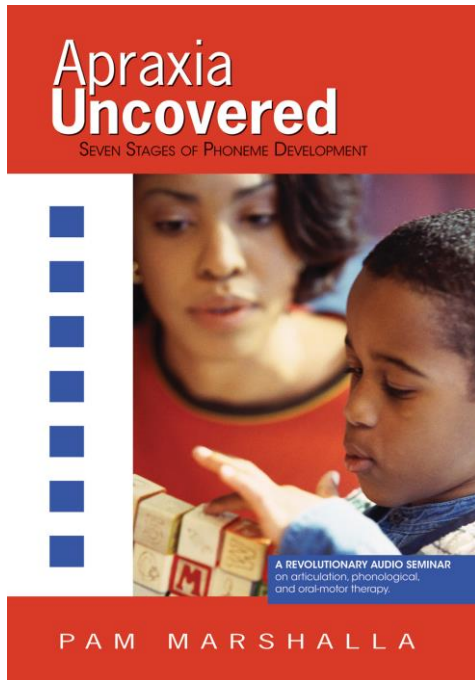
- phoneme-grapheme matched cards (cards with pictures that represent sounds)
- color coded systems as visual reminders of language structures or of sound groups
- sound categorization activities using multi-sensory approaches
- syllable and sound segmentation activities
- rhyming work
- explicit teaching of reading and spelling rules

Repetitive Books for Children with CAS

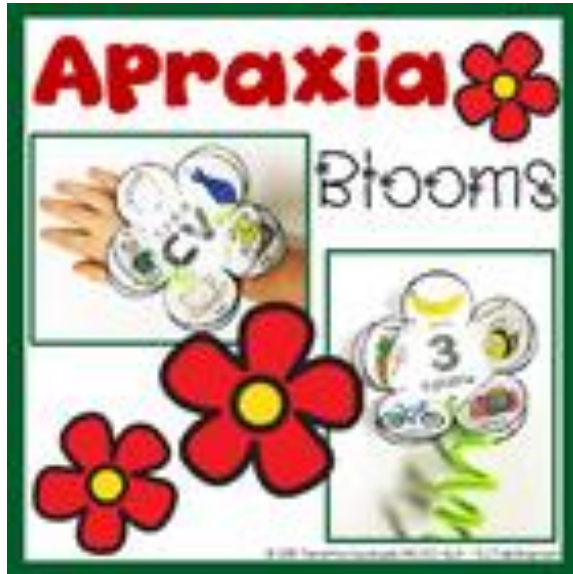
Repetitive books are an excellent therapy idea for children with CAS. Most effective way to use:

- Use pauses so the child can fill in the blank
- Allow additional time for the child to attempt a production
- Adapt the book to use additional pictures that go with the text
- Read a favored book multiple times so the child feels comfortable and gets extra practice
- Call the child's attention to the print
- Use inflection

Therapy Resources



Additional Resources



Additional Resources Cont'd

Apraxia Kids - <https://www.apraxia-kids.org/>

List of Repetitive Books - <https://pridereadingprogram.com/apraxia-speech-reading-books/>

CAS, Dysarthria, Phonology Handout -

<http://www.arksha.org/Convention/Handouts/2014%20Handouts/HammerAdditionalHandoutsBoth.pdf>

Parent Handout -

https://www.superduperinc.com/handouts/pdf/160_ChildhoodApraxia.pdf

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