

**Childhood Apraxia of Speech
A Multi-Sensory Approach to
Achieving Speech Outcomes**

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CASANA
www.apraxia-kids.org

- My role: "Director of Professional Development and Speech Services"
- CASANA Speech Center (Videos with parent obs)
- Apraxia Boot Camps 2011, 2012, 2014
- Webinars (my advanced webinar) and workshops
- iPad program, treatment research grants, and funds for Small Steps in Speech (.org)

Evaluation Questions

- Is childhood apraxia of speech being over-diagnosed? [insurance denial letter and email from therapist]
- How young is too young to diagnose childhood apraxia of speech (CAS)?
- [Video - Lilah, age 2]

Evaluation Questions

- Do you have to be an apraxia “expert” to make a CAS diagnosis? [Email]
- Can a child be diagnosed with apraxia if he/she is nonverbal? [GF example]

What are critical features in diagnosing CAS?

- Sound inventory restrictions and distortions
- Imitation much better than on-demand skills [Later description of DTTC approach]
- Sequencing struggles [trapeze transition]
- Word/Sentence Complexity breakdown [Videos - Caleb, age 8 and Sarah, age 4]

Multi-syllable word Therapy Techniques

- Use Backward Chaining/Build-Up (“anatomy”)
- [Video – Johnny, age 6-3]

Multi-syllable word Therapy Techniques

- Use spondees (baseball, popcorn, meatball) to demonstrate word not as complex as think.
- “Moving Across Syllables” program
- One therapist uses “push on” lights with colored tissue paper covering for stressed syllable.
- As syllable complexity increases, use cues, pictures/print, and signs to mark syllables
- [Video - Zachary, age 9 2:25-end]

Multi-syllable word Therapy Techniques

- ReST (Rapid Syllable Transition) program for 4-12-year-olds, Tricia McCabe, University of Sydney, Australia [Read description]
- 2-11 Syllables “Utterances of Increasing Length” 2005, LinguSystems, Inc. in [The Source for Children’s Voice Disorders](#)
- “Early Apraxia of Speech Stories Backward Build-Up 8 Book Set”, 2011, Linguisystems, Inc.

What are critical features in diagnosing CAS?

- Inconsistency in various forms
- Have child repeat words 3 times (later in therapy “Rule of 3”).
- Try words with similar sound features (initial /m/).
- [Video - Jacob, age 3]

What are critical features in diagnosing CAS?

- Sound harmony/variegation
- Vowel distortions/centralization
 - Having any vowel errors other than vocalic /r/ after age 5 is rare.
- Vowel screener in the “No-Glamour Vowels” from Linguisticsystems. Looks at isolation through sentence level. (ages 4-12)

What are critical features in diagnosing CAS?

- Voiced/Voiceless sound errors
- Prosodic deviancies
- “Groping” behaviors [not always seen at level of evaluation]
- Sound omissions but...

ASHA AdHoc Committee’s 2007 3 Consensus Features

- Inconsistent errors on consonants and vowels in repeated productions of syllables or words
- Lengthened & disrupted coarticulatory transitions between sounds & syllables
- Inappropriate prosody, especially in relation to lexical or phrasal stress

ASHA AdHoc Committee's Definition of CAS

- “Childhood apraxia of speech (CAS) is a neurological childhood (pediatric) speech sound disorder in which the precision and consistency of movements underlying speech are impaired in the absence of neuromuscular deficits (e.g. abnormal reflexes, abnormal tone).”

Which children tend to be over-diagnosed or misdiagnosed?

- Comment by Cari Ebert, EI therapist specializing in CAS, “If I leave an eval saying “That was fun!”, it is likely a delay. If I leave an eval saying “I’m nervous and need to do something right away!”, it’s likely a disorder.
- (1) the nonverbal child
- (2) the dysarthric child

How do you differentiate apraxia of speech from dysarthria?

- Per Edy Strand regarding motor speech disorders: “It is impossible to completely differentiate these disorders”.
- At least one reason is that the speech characteristics overlap.
- Per Ray Kent: “Our knowledge of dysarthria in children is woefully inadequate”.

Which children tend to be over-diagnosed or misdiagnosed?

- (2)the dysarthric child
 - [Handout – Comparison Chart]
 - [Video - Anna, age 8-1]

Which children tend to be over-diagnosed or misdiagnosed?

- (3) the severely phonologically disordered child
- (4) the confounding diagnosis child.
 - Video Modeling for children on the autism spectrum
 - Teresa Cardon at Utah Valley University
 - WordToob app for video modeling
 - Inner Voice app using video self-modeling concept
- [Videos – William, age 3 and Zachary, age 6]

What are the challenges with other languages/dialects?

- Australia challenges with use of Amerind signs and vowel differences
- Spanish speakers (1) have more restricted vowels (2) tend to use glides (3) don't enunciate final sounds.
- "Intervention for Bilingual Children with CAS" by Kohnert & Stoeckel on Apraxia-Kids.org - no evidence to "pick a language"

What about language processing & memory issues?

- Study by Shriberg, et al looked at “encoding” and memory (input) as well as “transcoding” (output).
- “Encoding, Memory, and Transcoding Deficits in Childhood Apraxia of Speech”, Clinical Linguistics & Phonetics, May 2012
- Do children with CAS have “processing” deficits as well as speech planning/programming deficits? [Research findings (40 subjects)]

Why is Early Intervention so Critical for Suspected CAS?

- During first 3 years of life, the number of neurons stay the same, but the number of synapses increases. By age 3, 85% of “wiring” established. (www.classbrain.com article 30)
- Focus on speech sound system better ensures a foundation that is not fraught with “habits” that are challenging to break.
- Have a chance to “rework” missed stages such as mouthing of objects while vocalizing.

What does my evaluation include?

- For young children, most is informal, but formal tests available. [McCauley & Strand, 2008]
- Tests now including repetition of words, vowels, oral-motor screen, etc but...
- “Language Neutral Assessment for Motor Speech (LAMS) for Down Syndrome by Velleman, et al
- “Dynamic Evaluation of Motor Speech Skill” (DEMSS) by Strand, et al (Brookes Publishing) [36-79 months] [Was expected fall of 2015]

What does my evaluation include?

- Securing in-depth parent information. (ProEFA's/specialized diets/"Speak Smooth")
 - [CASANA response]
 - [Handout - additional parent questionnaire]
- Investigating other apraxic features.
- Looking at nonspeech oral skills. [May have mixed oral/verbal apraxia.

Can CAS totally resolve?

- Pilot study with three 16-year-olds.
- One had "resolved apraxia"
- One had resolved mild articulation deficit
- One had normal speech and language
- Put through a battery of extremely challenging speech-motor tasks.
- Study conclusions

What do we need to talk with parents about at diagnosis?

- First, find a way to describe apraxia.
- Like trapeze – problem lies in letting go and transitioning - the "ahh" moment.
- Discuss anticipated therapy intensity and type (individual/group) changes.
- Prepare them for the "plateau effect".
- Discuss prognostic indicators [Handout].

What do we need to talk with parents about at diagnosis?

- AdHoc committee documents support “suspected apraxia” or “working dx”.
- There is a low percentage of children with CAS, so most therapists don’t see a lot of cases.
- “7 Things I Always Ask/Tell Parents During an Apraxia of Speech Evaluation” [Handout]
- Varied outcomes [Pilot Study - Tom Campbell]

Pilot Outcome Findings

- Pilot Outcome Study looked at “less than half” - “about 3/4” **functional** clarity change
- On average, ____ therapy sessions were needed to produce a “functional” intelligibility outcome for children with phonological disorders compared to an average of ____ sessions for children with apraxia!!!

How do we communicate CAS information with teachers?

- 1-page information flier for teachers of preschool-age children with CAS that are available on the apraxia-kids.org website.
- 2-page “Letter to a Teacher” available also through apraxia-kids.org.
- Both can be modified and personalized.
- New CASANA card decks
