A Multi-modal Approach to Treating Childhood Apraxia of Speech

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Session Objectives

- To understand commonly accepted diagnostic criteria of childhood apraxia of speech (CAS)
- To increase awareness of commonly used treatment approaches for CAS
- To gain additional knowledge of resources and ideas for therapy.
What is Childhood Apraxia of Speech?

ASHA suggests the following definition:

• 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).

• CAS may occur as a result of known neurological impairment, in association with complex neurobehavioral disorders of known or unknown origin, or as an idiopathic neurogenic speech sound disorder.

• The core impairment in planning and/or programming spatiotemporal parameters of movement sequences results in errors in speech sound production and prosody.

ASHA position statement and technical report can be found on ASHA’s website at: http://www.asha.org/slp/clinical/Apraxia
Key points from ASHA’s position statement

- CAS is a distinct diagnostic type of speech sound disorder
- CAS occurs in three clinical contexts
  - 1. Known *neurological etiologies* (e.g., intrauterine stroke, infections, trauma).
  - 2. Primary or secondary sign in children with *complex neurobehavioral disorders* (e.g., genetic, metabolic).
  - 3. *Idiopathic neurogenic speech sound disorder*.
- Use of the term *apraxia of speech* implies a shared core of speech and prosody features, regardless of time of onset, whether congenital or acquired, or specific etiology.
- CAS is preferred over alternative terms for this disorder, including *developmental apraxia of speech* and *developmental verbal dyspraxia*, which have typically been used to refer only to the idiopathic presentation.
Breaking it down: 
CAS versus a phonological disorder

Currently, there is no standardized list of diagnostic features of CAS that differentiates it from other types of childhood speech sound disorders.

ASHA notes agreement on the following:
• Inconsistent errors on consonants and vowels
• Difficulty with transitions between sounds and syllables
• Errors in prosody

http://www.asha.org/slp/clinical/ Apraxia
Breaking it down: CAS versus a phonological disorder

- Phonological disorders involve a predictable, patterns of sound errors
  - Fronting, Backing, Final Consonant Deletion, etc.
  - For example, substituting all sounds made in the back of the mouth like "k" and "g" for those in the front of the mouth like "t" and "d" (e.g., saying "tup" for "cup" or "das" for "gas")

http://www.asha.org/public/speech/disorders/speechsounddisorders.htm
Child with Childhood Apraxia of Speech

Video
Warning Signs for CAS:

- Uses only vowel sounds, grunts, or single syllables to communicate at 15 months or older
- Has few words (less than 5) at 15 months or older
- May not have cooed or babbled as an infant
- Makes more errors on longer words or sentences than with single sounds or syllables
- Has difficulty imitating speech, but imitated speech is more clear than spontaneous speech
- Sounds choppy, monotonous, or stresses the wrong syllable or word
- Can understand language much better than he or she can produce through speech.
- May struggle when trying to move their mouth into the right position to make a sound.
- Is hard to understand, especially for an unfamiliar listener
- May have problems when learning to read, spell, and write
Evaluation of CAS

- Diagnoses of CAS is rarely completed in one session → can take months
- Few standardized tools exist
- Diagnosis should be made by a speech-language pathologist experienced in CAS
- Generally, there will be a significant gap between receptive and expressive language scores
How do you treat Apraxia of Speech?

"You gotta learn to talk, Jeffrey — it's part of the aging process."
Why use a multi-modal approach?

- Children with CAS do not all respond to the same treatment approaches/strategies

- SLPs should be aware of and trial multiple approaches to find what works the best for each child

- Often, you may use more than one approach with the same child, in the same session, perhaps simultaneously...
Evidenced Based Practice

ASHA states: “The term evidence-based practice refers to an approach in which current, high-quality research evidence is integrated with practitioner expertise and client preferences and values into the process of making clinical decisions.”
The efficacy of intervention for developmental apraxia of speech/developmental verbal apraxia

The Cochrane Collaboration; Murdoch Childrens Research Institute, Australia

Intervention for Childhood Apraxia of Speech

Conclusion: No treatment recommendations can be made from this review. Additional evidence is needed in order to establish treatment efficacy for childhood apraxia of speech.

Effects of Nonspeech Oral Motor Exercises on Speech

Conclusion: Insufficient evidence to support or refute the use of OMEs. There is a need for well-designed studies using well-described participant groups.

Melodic Intonation Therapy with Young Children with Apraxia

Conclusion: “…the empirical evidence to support Melodic Intonation Therapy with children is meager at best.”
Treatment Approaches and Strategies

- Integration of motor learning principles
- Touch/Gestural Cues
- Backward chaining
- The Kaufman Speech to Language Protocol
- Pacing
- Use of intonation
- Use of AAC
- Prompts for Restructuring Oral Muscular Phonetic Targets (PROMPT)
What is motor learning theory?
How do we apply motor learning to treatment of CAS?

Consider the difference between Performance vs Learning

Learning = generalization
Factors that Affect Motor Learning

1. **Precursors to learning:**

   - the therapeutic relationship
   - motivation
   - understanding
2. **Conditions of Practice:**

- Repetition

- Blocked vs Random
  - 1 target at a time vs multiple targets within an activity
  - Learning a target vs practicing in context
  - In-session results vs generalization
3. **Feedback:**
   - Extrinsic (from clinician)
     - Knowledge of performance
     - Knowledge of results
   - Intrinsic (important in self monitoring)

4. **Influence of Rate:**
   - reduced rate reduces difficulty
How do you apply motor learning theory to your treatment?

1. Motor learning requires a lot of **practice**!
   Consider where the child is in therapy and the best type of practice to use to support learning.

2. When practicing, children require **support** and **feedback**.
   Consider the types of support you are giving (touch cues, gestural cues, pacing board, verbal model etc.) and the type of feedback you give (knowledge of performance vs knowledge of results)

*How can you fade supports to facilitate learning?*
What are touch/gesture cues?

Visual/tactile cues that help a child see how to produce a sound
Many versions exist
- Easy Does It/Vowel Turtles
- Kaufman
- The Source of Down Syndrome
Easy Does It…

• “Easy Does It for Apraxia” refers to gestural speech cues as hand signals

• They provide pictures and a written description of the touch cue for both professional and family education
Kaufman Approach

Kaufman refers to gestural speech cues as both hand signal cues & visual, tactile cues.

Here are some visual/tactile hand signal cues for vowels:

/a/ “ah” Pull down the chin with your index finger.

/e/ “eh” Place your thumb and index finger on the sides of the jaw, aligned with the lateral teeth, and pull down.

/o/ “o” About an inch out from the corners of the mouth, cup your thumb on one side and fingers on the other side of the cheek, and gently squeeze toward the mouth.

/i/ “ee” Place your thumb at one corner of the mouth, and index finger at the other corner and spread.
What are touch/gesture cues?

Video
Meet Liam…
Touch Cues

Video
Touch Cues

*Video*
Touch Cues (with Kaufman cards)

Video
Touch Cues (with sound labels)

Video
Touch Cues (with sound labels)

Video
Touch Cues (with sound labels)

Video
Dynamic Temporal & Tactile Cueing (DTTC)

- Treatment approach developed by Edythe Strand
- Hierarchal approach that utilizes the principles of motor learning theory
- Helps children to systematically improve their speech
- Can integrate any cueing necessary
Backward chaining

Starting at the end of a word, saying the last sound or syllable first and moving backward through the word.
Backward Chaining

Video
Backward Chaining (with touch cues and Kaufman cards)

Video
Backward Chaining (with gestural cues)

Video
Kaufman Speech to Learning Protocol

• A way of teaching children with apraxia of speech the easiest way of saying words until they have increased motor-speech coordination

• Taught the shell of words without including too many of the complex consonants, vowels, or syllables which make a word too difficult to even attempt on a motor basis

• Reflects how children attempt to say their first words
  – For example, the word “bottle” may begin as “ba,” progress to “baba,” later becomes “bado,” and eventually, “bottle.”

Kaufman (with touch cues)

*Video*
Use of Intonation

• Targeting intonation in therapy may help improve overall prosody/fluency
Intonation/Rhythmic 1

Video
Intonation/Rhythmic 2

Video
Pacing Boards

- Pacing boards provide a visual and motoric cuing system

- Can be used at a syllable level or to expand utterance length

- *The Pacing Board: A Technique to Assist the Transition From Single Word to Mutliword Utterances* - by Libby Kumin, Cheryl Councill, & Mina Goodman, 1995

From: http://www.ds-health.com/speech.htm
Pacing Boards
Pacing Board

Video
Pacing (with pictures)

Video
Use of AAC/Sign Language

The use of AAC does not inhibit the production of verbal communication

- The impact of augmentative and alternative communication intervention on the speech production of individuals with developmental disabilities: a research review.


Synthetic Speech has been show to facilitate verbal speech

- “Synthetic speech can facilitate the segmenting of speech into word units since the boundaries are more clearly defined than in human speech, and stress is not an important aspect of synthesized speech.” - Parsons & LaSorte, 1993
Using AAC/Sign Language

**Systematic Review**
Effects of augmentative and alternative communication intervention on speech production in children with autism: a systematic review.


***Continue to work on both speech and AAC to increase language knowledge***
AAC

Video
AAC

Video
PROMPT

• Prompts for Restructuring Oral Muscular Phonetic Targets a tactile-kinesthetic approach that uses touch cues to a patient’s articulators (jaw, tongue, lips) to manually guide them through a targeted word, phrase or sentence

• Develops motor control and the development of proper oral muscular movements, while eliminating unnecessary muscle movements, such as jaw sliding and inadequate lip rounding

• The therapist attempts to “teach” the patient’s muscles to produce a phoneme correctly by stimulating all of these through touch

PROMPT

Video
Deborah Hayden
Where do I start?

- Choose sounds that are stimulable
- Choose syllable shapes (CV, CVC, CVCV)
- Choose functional vocabulary words
- Choose motivating activities
- Introduce AAC as necessary- PECS, sign, speech generating device, choice boards
Ideas for Therapy

Tabletop Activities:

- Therasimply “search and finds”
- Paint target words with watercolours
- Play-doh make pretend foods with target sound
- Make an animal craft with the target sound and give it items to eat
- Mailbox-mail pictures with target sound
- Potato Head
- Books with target sound
- Sink or float game-find items with target sound and guess if it will sink or float
- Chain links with pictures
- Fruit loops and decorate a picture with the sound
- Hopping frogs on pads with hidden pictures underneath
Movement Activities:

- Basketball
- Bounce on therapy ball
- Drums, shakers
- Pretend you’re a frog and hop on lily pads practicing the sound
- Pretend to Mop the floor and clean up sounds around the room
- Ring toss
- Crawl through a tunnel
- Say the name of an animal that has your sound and act out the animal
- Play charades and act out people, places and things with sound targets
- Sing songs and act out movements
Pretend Play:

- Play with the little people house and act out play schemes that incorporate target vocabulary
- Restaurant and have items on the menu that have target sound
- Pretend to have a birthday party and open presents with target sounds
- Make a wand with the target sound on the top and the child will turn the clinician into something that has their target sound—can use this with the magic castle
- Grocery Store and buy items with target sound
- Train has to pick up and deliver items with target sound.
- Vehicles are going to different stores that have the child’s target sound
- Blue’s Clues and use a magnifying glass and find clues around the room.
Resources/Materials

- Easy Does It for Apraxia Preschool/Easy Does It® for Apraxia and Motor Planning - Robin Strode Downing and Catherine Chamberlin
- The Kaufman Speech to Language Protocol Workout Book - Nancy Kaufman
- Say and Do® Sound Production - Jennifer Perkins Faulk and Lisa Priddy
- Word FLIPS® - Rhonda Granger
- Phrase FLiPS® - Julie A. Daymut, Clint Johnson, and Liz Wright
- Moving Across Syllables Training Articulatory Sound Sequences - Jill Kirkpatrick, Pamela Stohr, and Deborah Kimbrough
- Syllable Drilling™ Card Deck - CarolAnn C. Hammar
- Music in My Mouth - Cincinnati Children’s Hospital
- Computer games
Resources/Materials

- Kaufman Cards- basic and advanced
- Word Flips by Rhonda Granger
- Multi-syllabic drill cards-Super Duper Publications
- Vowel Turtles from Easy Does It Series
- Magne Talk Match Up-Super Duper Publications
- CD- “Sounds at the End”
- Music in My Mouth Cincinnati Children’s Hospital
- iPad apps/computer games
- Photographs/digital camera to discuss
- Pacing boards
- Flip Book and Activities for Apraxia
- Say and Do® Sound Production and More
Websites

ASHA
www.asha.org

CASANA-The Childhood Apraxia of Speech Association of North America (CASANA)
http://www.apraxia-kids.org/
Questions?
References


