Childhood Apraxia of Speech (CAS) in the School Setting

2017 Washington Speech Language Hearing Association

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Disclosure

There are no relevant financial relationships which benefit the individuals in this presentation and there are no relevant non-financial relationships that may bias an individual.
Course Objectives

What We Will Do

• How to complete a thorough speech evaluation, especially as it applies to CAS
  • Differentiate between a phonological and articulation disorder
• Learn treatment approaches to use with CAS
• Determine appropriate dosage and service delivery for the school setting
• Determine appropriate target selection and IEP goals for students with CAS

What We (Hope) You Will Do

• Think about
  • What information you usually gather during assessment
  • Why you choose specific assessment tools and techniques
  • How you use information to arrive at a diagnosis and guide treatment
  • When you modify treatment due to lack of progress
  • Why you must have a rationale for clinical decision making
Childhood Apraxia of Speech (CAS) – What is it?!

- CAS is a neurological childhood 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, etc.).
- 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 result in errors in speech sound production and prosody (ASHA, 2007a).
- In human language: CAS is a severe speech sound disorder caused by the motor planning part of speech production. A child may know what they want to say, but when they try to say it, speech gets “jumbled up.” Children with CAS have difficulty with precision and consistency of speech movements even though the muscles and reflexes needed for speech function within normal limits. It is a MOVEMENT disorder.
- THE PROBLEM IS IN THE WIRING.

CAS: What’s in a name?

- The term CAS is a unifying term for ALL presentations of apraxia of speech in childhood.
  - You might see other labels in older literature (e.g., developmental dyspraxia, dyspraxia, etc.). There has been a push in the field to use unifying terminology to set one common term that describes the variety of clinical presentations associated with CAS.
  - It is NOT developmental dyspraxia because the term “developmental” implies that the child will “outgrow” the disorder. That is not case with CAS.
CAS: Co-morbidities (general)

- Phonological impairment
- Delayed language skills
  - Reduced vocabulary
  - Difficulty with syntax and grammar when combining phrases and sentences
- Delayed cognitive skills
  - Difficulty with reading, spelling, writing
- Difficulty with fine and gross motor skills and coordination
- Sensory hypersensitivity

Co-morbidities: Autism Spectrum Disorders

  - 63.6% of kids initially diagnosed with ASD also had CAS
  - 36.8% of kids initially diagnosed with CAS also had ASD
    - Goal of study was to evaluate usefulness of a checklist in the identification of ASD, not to determine co-occurrence of ASD with CAS
    - Study participants were those that were coming to the medical center for diagnosis of CAS or ASD. Not a general sampling of the population
    - CAS diagnosis made by administration of the Kauffman Speech Praxis Test, or by SLP associated with the program
Co-morbidities: Autism Spectrum Disorders

  - Similar, but not identical symptoms as CAS
  - Findings consistent with MSD- NOS (motor speech disorder, not otherwise specified)
  - No higher rate of CAS in verbal children with ASD

Co-morbidities: Autism Spectrum Disorder

- Conclusions
  - Inconsistent findings
  - More research needs to be done in this area
  - Stay tuned!
Co-morbidities: Stuttering

- Children who stutter are more likely than non-stuttering children to exhibit other speech and language problems. (Kent, 2000)
- Most of us have witnessed the grooping behaviors during the motor programming efforts of individuals with apraxia. We have also seen grooping posturing of the articulators in children who stutter as they try to "program" their speech. And it is well known that both CAS and Stuttering present with difficulty in rhythm and melodic intonation patterns.
- Children who stutter or who have "ordinary" phonological disorders may also show some features of CAS (Byrd & Cooper, 1989; McCabe, Rosenthal & McLeod, 1998; Shriberg, Aram & Kwiatkowski, 1997a).

CAS: What is it NOT?

- It is NOT
- a medical diagnosis
- diagnosed by a doctor (it is diagnosed by trained SLPs)
  - Refer out to trained SLP if you are uncomfortable making the diagnosis
## Comparisons of CAS, Dysarthria, & Severe Phonological Disorder

<table>
<thead>
<tr>
<th>Verbal Apraxia</th>
<th>Dysarthria</th>
<th>Severe Phonological Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>No weakness, incoordination or paralysis of speech musculature</td>
<td>Decreased strength and coordination of speech musculature that leads to imprecise speech production, slurring and distortions</td>
<td>No weakness, incoordination or paralysis of speech musculature</td>
</tr>
<tr>
<td>No difficulty with involuntary motor control for chewing, swallowing, etc. unless there is also an oral apraxia</td>
<td>Difficulty with involuntary motor control for chewing, swallowing, etc. due to muscle weakness and incoordination</td>
<td>No difficulty with involuntary motor control for chewing and swallowing</td>
</tr>
<tr>
<td>Inconsistencies in articulation performance—the same word may be produced several different ways</td>
<td>Articulation may be noticeably “different” due to imprecision, but errors generally consistent</td>
<td>Consistent errors that can usually be grouped into categories (fronting, stopping, etc.)</td>
</tr>
<tr>
<td>Errors include substitutions, omissions, additions and repetitions, frequently includes simplification of word forms. Tendency for omissions in initial position. Tendency to centralize vowels to a “schwa”</td>
<td>Errors are generally distortions</td>
<td>Errors may include substitutions, omissions, distortions, etc. Omissions in final position more likely than initial position. Vowel distortions not as common.</td>
</tr>
</tbody>
</table>

## Comparisons of CAS, Dysarthria, & Severe Phonological Disorder

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<th>Severe Phonological Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of errors increases as length of word/phrase increases</td>
<td>May be less precise in connected speech than in single words</td>
<td>Errors are generally consistent as length of words/phrases increases</td>
</tr>
<tr>
<td>Well rehearsed, “automatic” speech is easiest to produce, “on demand” speech most difficult</td>
<td>No difference in how easily speech is produced based on situation</td>
<td>No difference in how easily speech is produced based on situation</td>
</tr>
<tr>
<td>Receptive language skills are usually significantly better than expressive skills</td>
<td>Typically no significant discrepancy between receptive and expressive language skills</td>
<td>Sometimes differences between receptive and expressive language skills</td>
</tr>
<tr>
<td>Rate, rhythm and stress of speech are disrupted, some groping for placement may be noted</td>
<td>Rate, rhythm and stress are disrupted in ways specifically related to the type of dysarthria (spastic, flaccid, etc.)</td>
<td>Typically no disruption of rate, rhythm or stress</td>
</tr>
</tbody>
</table>
### Comparisons of CAS, Dysarthria, & Severe Phonological Disorder

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<th>Dysarthria</th>
<th>Phonological Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generally good control of pitch and loudness, may have limited inflectional range for speaking</td>
<td>Monotone voice, difficulty controlling pitch and loudness</td>
<td>Good control of pitch and loudness, not limited in inflectional range for speaking</td>
</tr>
<tr>
<td>Age-appropriate voice quality</td>
<td>Voice quality may be hoarse, harsh, hypernasal, etc. depending on type of dysarthria</td>
<td>Age-appropriate voice quality</td>
</tr>
</tbody>
</table>

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### CAS: Assessment

- Informal Language Sample - spontaneous speech
- Structural Functional Examination
- Motor Speech Examination with Stimuability
- Elicited Speech Sample
  - Standardized Tests
  - Norm-referenced Assessments
Informal Language Sample

• Early childhood and preschool SLPs: obtain a language sample both during free, unstructured play and during structured play tasks. Note differences (language and speech).
• Elementary and Secondary SLPs: obtain a language sample both during unstructured conversation and during structured tasks (e.g., narrative retelling with wordless picture book). Note differences (language and speech).
• Rate intelligibility in known and unknown contexts.
• Were there groping or awkward movements?
• Pay attention to vowel productions!
• Pay attention to prosody!

Structural Functional Examination

• Examination (This is most useful in determining dysarthria or oral apraxia.
• Look for:
• Dysarthria?
• Check jaw, lips, tongue, and velum for weakness, reduced range of motion, speed, and strength.
• Oral Apraxia?
• Have the child blow, pucker, smack lips, cough, and sequential imitation. Do diadokokinetic tasks-puh-tuh-kuh.
• Note: Low tone?
• We often see this in reports, but often incorrectly used. Tone is how much muscle contraction there is at rest. You can have low tone but normal strength. Low tone is not weakness.
Speech Motor Examination with Stimuability: Dynamic Assessment

Look at movement gestures in varied contexts. Attempt a variety of cuing methods (e.g., verbal, tactile, gestural, etc.) to determine what supports are needed to facilitate success.

<table>
<thead>
<tr>
<th>Motor Speech Hierarchy</th>
<th>Stimuability</th>
</tr>
</thead>
<tbody>
<tr>
<td>• CV: with all vowel variations</td>
<td>• Direct imitation</td>
</tr>
<tr>
<td>• VC: with all vowel variations</td>
<td>• Look at me, Watch me, do what I do</td>
</tr>
<tr>
<td>• CVC: with all vowel words</td>
<td>• Let’s do it together</td>
</tr>
<tr>
<td>• CCVC: with all vowel words</td>
<td>• Slow model but don’t segment syllable</td>
</tr>
<tr>
<td>• Syllables- (1-3)</td>
<td>• Verbal Feedback with directions (elementary/secondary)</td>
</tr>
<tr>
<td>• Phrases</td>
<td>• Gestural or Tactile cues</td>
</tr>
<tr>
<td>• Sentences (of increasing length)</td>
<td></td>
</tr>
</tbody>
</table>

Elicited Speech Sample: standardized and norm references tests

• Use speech test that analyzes speech sounds with phonological patterns, or do your own phonological processes analysis with speech testing alone.
  • Clinical Assessment of Articulation and Phonology 2nd Edition (CAAP-2)
  • Hodson Assessment of Phonological Patterns 3rd Edition (HAPP-3)
  • Goldman Fristoe Test of Articulation 3rd Edition (GFTA-3) or the Photo Articulation Test 3rd Edition (PAT-3) with
    • Khan Lewis Phonological Awareness 3rd Edition (KLPA-3)
    • clinician performed phonological analysis

• Dynamic Evaluation of Motor Speech Skills (DEMSS) – norm referenced
• Imitation Tasks for Movement
Differential Diagnosis

• Is it a motor speech impairment?
  • Praxis Motor planning of skilled voluntary movements
  • Praxis is at the heart of CAS
• Or is it a phonological impairment? Is it motor speech, is it apraxia or dysarthria? These all result in unintelligible speech, so how do we sort it out?
• Differential diagnosis refers to the process of determining the appropriate classification or label for the speech sound disorder.
• Why is this so important?
  • It directly affects the most relevant treatment approaches.
• Clear As Mud: You assess a highly unintelligible child. Is it CAS? Dysarthria? What is it?
  • linguistic (phonology or language)
  • Cognition
  • motor impairment

Assessment: Putting It All Together

• With a Phonological Impairment, the consideration is thought to be linguistic/ cognitive implications, rather than motor, and the etiology is mostly unknown.
• In Dysarthria, there is difficulty with the execution of movements, as well as weakness, paralysis, or abnormal tone resulting in decreased range of motion, speed, or impaired articulatory movements. This is usually caused by an impairment to the central or peripheral nervous system.
• In Childhood Apraxia of Speech CAS, the primary consideration is thought to be praxis-planning/programming movements. There is no apparent weakness or inability to move articulators. CAS can be acquired (brain injury) or of unknown etiology (idiopathic).
• Assessment procedures are used to determine the relative contribution of the motor planning/programming impairment
• What is the biggest hindrance to communication? Approach treatment planning with THIS in mind.
  • For example, a student might (or may always) have CAS with a phonological impairment. Which disorder contributes to speech difficulty most? Prioritize treatment based on these findings.
  • Be mindful that the relative contribution can change over time and you may need to change your treatment approach and label as needed.
Evidence- Based Treatment Approaches

- Integral Stimulation: relies on auditory and visual target modeling
  - Dynamic Temporal and Tactile Cueing (DTTC)
    - Strongest available evidence in the remediation of CAS
  - Biofeedback
- Tactile/Gestural: relies on tactile or gestural cues to teach articulatory placement
  - Tactile cues such as Prompts for Restructuring Oral Muscular Targets (PROMPT)
  - May use other tactile or gestural cueing systems – doesn’t need to be PROMPT exclusively
- Prosodic: relies on melody or rhythm to promote articulatory precision
  - Melodic Intonation Therapy (MIT)
  - Rapid Syllable Transition (ReST)

Non EBP Approaches for CAS

- Babbling and non-speech oral behaviors are dissociated from speech
- Activation patterns for eating and speaking are dissociated from speech
  - Practicing non-speech movements (e.g., blowing bubbles, lip closure, etc.) may improve non-speech movements, but they will not improve speech movements
  - Muscle movements are task specific, not muscle specific
    - Practice with speech to improve speech movements
    - Use tongue depressions, lollipops, etc. to teach tongue placement but always pair these movements with speech
- Speech is a sequence of movements, not isolated movements
  - CAS is a disorder in sequencing movement gestures. Working on isolated movements will not help a child with CAS because they have difficulty sequencing the movement gestures needed to produce speech (as opposed to single sounds in isolation.)
Frequency, Dosage, and Intensity

- Shorter, but more frequent sessions are recommended
- 3-5 sessions per week is optimal
- Intensity: high frequency target repetitions are needed
- Aim to get 100-200 production attempts during 20-30 minute sessions; 50 production attempts per 5 minute sessions
- Therapy should be intensive, without seaside time for games or other off task activities/conversations
- Reduce your unnecessary verbal comments during practice

Frequent Intensive Therapy (FIT)

- What is FIT?
  - Short, individual sessions multiple times per day or week
- What kind of goals can you target with FIT?
  - Articulation, grammar, syntax
- Why use FIT?
  - Children are dismissed sooner and lose less classroom instructional time when being serviced under this model (small scale studies)
- Take home message:
  - Many children may benefit from FIT
  - Students with CAS need FIT in order to get the recommended dosage, frequency, and intensity
Principals of Motor Learning

• What is motor learning?
  • Motor learning is a process of acquiring capability for producing skilled action

• Prerequisites for motor learning:
  • There must be a relationship established between you and the child
  • You must have the child’s attention and motivation.
  • Pre-practice for stimuability.

CAS: PML

• Why is motor learning important for treating CAS?
  • High frequency repetition based on PML has been effective in treating CAS
  • These PML positively influence the way a child acquires and generalizes movement gestures and sequences needed to produce speech
    • Children with phonological delays do not need to practice targets with PML in mind because they do not have motoric difficulties
### PML Chart

<table>
<thead>
<tr>
<th>Motor Learning Principle</th>
<th>Condition</th>
<th>Clinical Use</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of trials</td>
<td>Small # Trials</td>
<td>More trials = more opportunities to learn and stabilize movement gestures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Large # Trials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice Distribution</td>
<td>Massed</td>
<td>Massed: practice of a set number of targets over a short period of time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Distributed</td>
<td>Distributed: practice of a set number of targets over a longer period of time</td>
<td></td>
</tr>
<tr>
<td>Practice Variability</td>
<td>Constant</td>
<td>Constant: practice the same target in the same context repeatedly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Variable</td>
<td>Variable: practice on different targets in different contexts</td>
<td></td>
</tr>
<tr>
<td>Practice Presentation</td>
<td>Block</td>
<td>Blocked: different targets are practiced in separate, successive sets</td>
<td>Blocked practice may lead to overgeneralization. Try to move on quickly from blocked practice with the goal of moving on to distributed practice as soon as possible</td>
</tr>
<tr>
<td></td>
<td>Modified Block</td>
<td>Modified Block: each target is produced in varying lengths of blocks, with blocks repeated 1-3 times per session</td>
<td>Modified blocks work well with younger children and children with severe CAS</td>
</tr>
<tr>
<td></td>
<td>Random</td>
<td>Random: different targets are presented randomly during practice</td>
<td>Move to random practice when target is accurate, natural, and can be produced in response to a question</td>
</tr>
</tbody>
</table>
### PML Chart

<table>
<thead>
<tr>
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<th>Condition</th>
<th>Clinical Use</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attentional Focus</td>
<td>Internal</td>
<td>Internal: focuses on one’s own body movements such as tongue placement for articulation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>External: Focus on the effects of the acoustic signal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>External</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target Complexity</td>
<td>Simple</td>
<td>Simple: easily acquired movement gestures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complex</td>
<td>Complex: difficult to acquire movement gestures</td>
<td></td>
</tr>
</tbody>
</table>

### Feedback Chart

<table>
<thead>
<tr>
<th>Feedback Type</th>
<th>Condition</th>
<th>Clinical Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback Performance:</td>
<td>Low</td>
<td>Feedback Performance: biofeedbackfeedback EX: “You rounded your lips to say shhhhh”</td>
</tr>
<tr>
<td>Feedback Results:</td>
<td>High</td>
<td>Feedback Results: result discrimination – was the result correct or incorrect</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EX: “You said it correctly 3/5 times”</td>
</tr>
<tr>
<td>Feedback Frequency</td>
<td>Low</td>
<td>Low Frequency: provide infrequent feedback re: production accuracy, regardless of client accuracy. Allows time for self correction.</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>High Frequency: frequent feedback, after use production, regardless of accuracy.</td>
</tr>
<tr>
<td>Feedback Timing</td>
<td>Immediate</td>
<td>Immediate: feedback given immediately after client production of each target</td>
</tr>
<tr>
<td></td>
<td>Delayed</td>
<td>Delayed: Feedback about target production provided after a delay</td>
</tr>
</tbody>
</table>
PML: Quick Guide

<table>
<thead>
<tr>
<th>Principle</th>
<th>Acquisition</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice Distribution</td>
<td>Mass</td>
<td>Distributed</td>
</tr>
<tr>
<td>Practice Variability</td>
<td>Consistent content, consistent prosody, pitch, and rate</td>
<td>Varied context, varied prosody, pitch, rate</td>
</tr>
<tr>
<td>Practice Schedule</td>
<td>Blocked, Modified Block</td>
<td>Random, unpredictable order</td>
</tr>
<tr>
<td>Feedback Type</td>
<td>Knowledge of performance</td>
<td>Knowledge of results</td>
</tr>
<tr>
<td>Feedback Frequency</td>
<td>Often, Immediate</td>
<td>Inconsistent, delayed</td>
</tr>
<tr>
<td>Rate</td>
<td>Slow</td>
<td>Normal, Varied</td>
</tr>
</tbody>
</table>


PML: Summary

- In motor learning it is important to have many repetitions of a skill to learn the motor movement
  - Distributed practice is better than mass practice
  - Random practice is better than block practice
- Proprioceptive feedback is very important in motor learning

There are other principles of motor learning, but these are the most important ones we wanted to touch on today
Dynamic Temporal and Tactile Cuing (DTTC)

• One type of Integral Stimulation
  • Currently has the strongest evidence backing
  • May incorporate tactile/gestural approach within this framework as needed
• Most appropriate for severe cases of CAS
• Initially offer maximal supports and fade these supports when appropriate
  • Allows for opportunities for increased independence and generalization in motor planning/programming
• Utilizes PML
  • Crucial to build comfort and familiarity with these principles
• Focuses on movement gestures, and movement transitions that result in accurate auditory signals for sound sequence productions

IT IS NOT FOCUSED ON PHONEMES!

DTTC: Treatment Prerequisites

• Is intelligibility the biggest hindrance to the student’s communication skills?
• Is the student a primary verbal communicator?
  • If child is minimally verbal, increasing verbal imitation, responses, and/or introducing AAC may be a better use of therapeutic time
  • Does the student have joint attention?
    • Bigger hindrance to communication than articulation
• Is the child able to attempt direct imitation?
  • Necessary for this approach
• Does the child have the receptive language and cognitive skills needed to participate in integral stimulation therapy?
DTTC: Sliding Scale (with a moving target)

- Increase and reduce supports whenever needed for each target
- Move up and down scale repeatedly throughout sessions
- Initial procedure: clinicians models the target word or utterance
  - Child repeats the target word or utterance
  - If a child is successful with the imitation, repeat this procedure until the child is consistent with this step (PML), then reduce support
  - If child is unsuccessful with the direct imitation, practice with simultaneous productions
    - May need to add additional proprioceptive supports.

DTTC Sliding Scale

**Hierarchy**
- Simultaneous production
  - Tactile/Gestural cues
  - Phonetic Placement
  - Hold initial articulatory position longer
    - BUT gradually move towards natural rate of speech
- Immediate repetition (Direct imitation)
- Once accuracy is established, add and vary the prosody
- Move to next step if able to produce target with variability scale
- Repetition after delay
  - Clinician models target and child repeats after a 2-3 second delay (no additional clinician support)
    - No hesitation
    - Normal rate
    - Varied Prosody
    - If accurate in all areas, move on to Spontaneous speech
- Spontaneous production

**Rationale**
- Provide maximal support at first
- This helps the child to participate in motor planning, which results in increased accuracy
- When you begin to fade cues, the child is improving motor learning
DTTC: Take-Aways

- Intensive practice with focus on proprioceptive feedback
  - NO GAMES...because they distract attention away from your face
  - Don’t forget PROSODY and VOWELS
- PML
- Move up and down the sliding scale of supports
- Focus on movement, not individual phonemes

Target Selection Considerations

- Choose targets that build upon student’s success
  - Good to be aware of developmental progression of speech sounds, but do not feel the need to be limited by them
    - EX: If the student is very young but is able to produce /s, r/, choose targets that contain these sounds to build off student’s accurate movement gestures
- Use speech sound system analysis from assessment to determine target selection
  - What are the sounds in student’s phonetic inventory? In what syllable shapes do these sounds occur?
    - Try using existing correct productions in new syllable shapes
    - Try using new sounds in existing syllable shapes
  - Does the child breakdown in sequencing sounds in single words, sentences or connected speech?
    - Add phases/sentences of increasing complexity
  - Don’t forget to consider prosody
    - What is the student’s stress/prosody patterns?
- General Considerations
  - Incorporate functional phrases/sentences, curriculum vocabulary, and social phrases for school
- Severity
  - Start with smaller number of targets with more time for shaping the movement accuracy
Target Selection Considerations

- Can you incorporate functional vocabulary targets
  - Motivating words (e.g., cookie, my, Peppa, etc.)
  - Requesting/controlling words (e.g., yes/no, can I, I want, etc.)
  - Social words (e.g., hi/bye, etc.)
- Choose targets that allow you to build combinations
  - Go on, go off, I go, etc.
  - My _____
  - Hi/Bye _____ (name)
- Consider syntax and grammar
  - Increased length and complexity of utterance = increased syllable sequencing demands

Treatment Considerations: VOWELS

- Vowels are significant contributors to intelligibility
  - Speakers with accurate vowel productions and prosody are often perceived as being more intelligible
- Vowels are extremely important to target in your therapy. Address from the beginning
- Do not target vowels in isolation
Treatment Considerations: PROSODY

- Address prosody very early
  - Changing prosody helps with increasing flexibility in motor planning
- When child has mastered movement gestures in a word/phrase/sentence, etc., try the following prosodic elements:
  - Change volume up or down
  - Change with emotion (e.g., say it angry, happy, confused, confident, etc.)

Treatment Considerations: Multilingual Populations

- Bilingual treatment may result in better outcomes than English-only treatment
- Pick targets that found in both languages spoken by a child. This approach has been most successful in promoting cross-linguistic carry-over
- Movements gestures that are impaired in only one language are unlikely to improve intelligibility in the other language(s)
Creating IEP Goals:

1st Draft Goal
• Long Term Goal: Sally will produce accurate movement gestures/ motor planning/ programming in a variety of syllable shapes (variety of vowels, consonants with varied prosody) in connected, conversational speech.
  • Sally will produce accurate movement gestures in VC, CV syllable shapes containing: m, t, n, ee, oo, for the following stimuli (me, eat, no) for 4-6 weeks.

“Translated” IEP Goal
• When given structured speaking tasks, Sally will produce simple syllable shapes (VC, CV, CVC) with varied vowels and prosody, improving accurate movement gestures/ motor planning/programming for speech, from 0/10 opportunities presented to 7/10 opportunities.

Case Study #1

• Zoe is a 1st grade student diagnosed with with CAS. Your evaluation revealed the following:
  • Monotonicity of speech
  • Numerous vowel distortions
  • Plosives in CVC syllable single words
  • CVC syllable shape present, but degrades in 3+ word utterances
  • Reduces multisyllabic goals
  • Socially motivated but avoids verbal discussion/participation in class

• Approach
• Goals
• Targets
Case Study #1 continued

- **Approach:**
  - DTTC

- **Targets:**
  - I’m Zoe (prosody, good vowels)
  - I see ____ (prosody, good vowels, 3+ word utterances)
  - Hi/Bye ____ (prosody, good vowels)

- **Long Term Goal:** Zoe will produce accurate **movement gestures/ motor planning/ programming** in a variety of syllable shapes (variety of vowels, consonants with varied prosody) in connected, conversational speech.

- **Short Term Goal:** Zoe will produce accurate **movement gestures** for production of (2 vowels) in the coarticulatory contexts (b, m, n) with varied prosody at 100% accuracy in direct imitation and 80% in spontaneous speech, over 4 weeks.

Case Study #2

- **Bobby is a 4th grade student with CAS**
  - Diagnosed at age 3
  - Lingering difficulty with glides /r, l/
  - Very motivated to improve productions
  - Accurate vowel productions
  - Monotonicity of speech
    - Previous therapy focused on **movement gestures for CAS**

- **Approach**
- **Goals**
- **Targets**
Case Study #2 continued

• Approach:
  • DTTC for prosody
  • Phonological approach to /r, l/
  • Primary Long Term Goal: Bobby will increase variability of pitch, volume, and length in conversational speech.
  • Primary short term goal: Bobby will write and produce the syllable structure for multi-syllabic words, increasing volume on the stressed syllable with 90% accuracy on lexical stress in 4-6 weeks.
  • Secondary Long Term Goal: Bobby will eliminate the phonological process of gliding /l, r/ in conversation.
  • Secondary Short Term Goal: Bobby will reduce the phonological process of gliding /l, r/ in single words from 60% of occurrences to 30% of occurrences within a 6-week interval.

• Targets
  • (te le phone, ad ven ture, Ka la ma zoo)

Practical Data Collection

Always take data the same way
  E.g., beginning or end of the session, supported or independent
  Doesn’t matter as long as data methodology is consistent
  Easier to take data based on independent level of functioning as you will be changing your supports often

Index cards: Use to emphasize syllables and stress

Stoeckel, R & Strand, E. handout for Assessment/ IEP/Progress Reporting [see reference list]

Voicemail (student leaves a message on your voicemail saying targets, 2-3x a week. You take data on recording).
Helpful Links and Apps


• Parent/teacher handouts and excellent CEUs: [https://www.apraxia-kids.org/apraxia-information-downloads/](https://www.apraxia-kids.org/apraxia-information-downloads/)


• [https://www.youtube.com/watch?v=WhtuEM9tE-k](https://www.youtube.com/watch?v=WhtuEM9tE-k) Differentiating Apraxia of Speech from Other Speech Sound Disorders (Strand, E-series)


Helpful Links and Apps Cont’d

• Edythe Strand YouTube series through the Mayo Clinic: [https://www.youtube.com/watch?v=x15nL_MicOw](https://www.youtube.com/watch?v=x15nL_MicOw)


• Rehab Seminars 2018 with Barbara Hodson: [https://rehabseminars.org/seattle-conference/](https://rehabseminars.org/seattle-conference/)

• Articulation Station - app

• Speech Flip Book (Tactus Therapy) - app

• Slow Tunes (Brian Stokes) - app

• Speech Tutor – app
References


References Cont’d


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