



The Nuts and Bolts of Apraxia Therapy

SHAA
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Disclosures

Nonfinancial Disclosure: Cari has a neurodivergent son and shares personal experiences in her trainings.

Financial Disclosure: Cari is co-author of the book, *The SLP's Guide to Treating Childhood Apraxia of Speech*. She is the creator of a variety of speech therapy products including *Cari's Silly Sounds*, *Animal Vowels*, *Talking Letters*, *Apraxia FAQs*, and *Is It Apraxia or...* which she will reference in this training. Cari receives royalties from all book and product sales. She also receives an honorarium and paid travel expenses for presenting at this conference.

The SLP's Guide to Treating Childhood Apraxia of Speech



Effective Therapy Strategies for Toddlers, Preschoolers, and Early School-aged Children



Dave Hammer, MA, CCCSP & Cari Ebert, MS, CCCSP



Is it Apraxia or...
Differential Diagnosis Charts for the Pediatric Speech-Language Pathologist

Cari Ebert, MS, CCC-SP
Pediatric speech-language pathologist specializing in childhood apraxia of speech
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Visual cue cards available at cariebertseminars.com 5

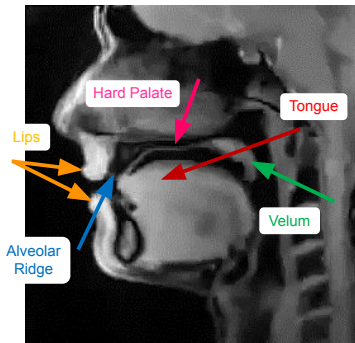
The Complexity of Speech Production

Speech production is one of the most complex and rapid motor behaviors exhibited by humans. It depends on the precise coordination of more than 100 laryngeal, orofacial, and respiratory muscles. (Simonyan et al., 2016)

Speech is one of the most finely tuned motor skills that humans perform. Developmentally, children develop from gross to fine motor.

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MRI of Speech Production



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Speech requires rapid and accurate alternating movements of the articulators (i.e., speed and agility).



When considering the complexity of speech production, it helps us understand why it takes years for kids to become intelligible speakers.

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Definition of CAS

ASHA's 2007 Technical Report

“Childhood apraxia of speech (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)...the core impairment in planning results in errors in speech sound production and **prosody.**”



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Cari's Explanation of CAS

It's as though the brain says 'speak' but the mouth doesn't respond



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Etymology of Apraxia

- The root word of apraxia is **PRAXIS**
- Praxis is a Greek word that means *movement*
- Praxis is the ability to plan and perform purposeful movements...and apraxia is a decrease in the ability to plan and perform purposeful movements
- This is why we describe apraxia as a **motor planning disorder**

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Motor Planning

Relating this to **speech**: Motor planning is what allows the child to create, use, and combine various sounds and syllables to produce new, more complex utterances. After a speech target has been practiced and is well-rehearsed, it can be produced accurately and with ease.

This explains why repetitive speech practice is so critical!

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For children with apraxia of speech, learning to talk is challenging due to difficulties with **speech motor planning**. Therefore, learning to talk will require more time, more focused attention, and more highly specialized practice than other kids need.



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- The only evidence-based treatment for CAS is speech therapy
- But...speech therapy is not a *one size fits all* treatment

The Diagnosis Drives the Treatment Bus



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Speech Sound Disorders

ASHA Speech Sound Disorders Portal

Functional (idiopathic)

- Articulation disorder (motor)
- Phonological disorder (linguistic)

Organic (developmental/congenital or acquired)

- Motor/neurological disorders (CAS, dysarthrias)
- Structural (cleft lip, cleft palate)
- Sensory/perceptual (hearing impairment)

**Mixed speech sound disorder

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Articulation Disorder

- An articulation disorder is the atypical production of speech sounds characterized by substitutions, omissions, distortions, or additions that interfere with speech intelligibility. Speech production errors occur at the **PHONETIC level**, meaning the child has difficulty accurately producing individual speech sounds.
- Articulation errors are considered developmental early on (meaning that some kids outgrow them on their own without speech therapy).

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Phonological Disorder

- A phonological disorder consists of predictable, rule-based errors that affect more than one sound. The child has difficulty organizing speech sounds into a system of rule-based patterns and uses simplifications to modify the adult-speech system. The child can make the speech sounds in isolation (at the phonetic level) but has not yet learned the rules for how sounds fit together to make words. Speech production errors occur at the **PHONEMIC level**.
- The use of most phonological patterns is considered developmental early on (initial consonant deletion and backing are atypical patterns).

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Motor Speech Disorder

- A motor speech disorder occurs when a child struggles to produce speech because of difficulty with **motor** planning or with motor execution.
- Motor planning difficulty (neurological) = apraxia
- Motor execution difficulty (neuromuscular) = dysarthria
- Children do not “outgrow” motor speech disorders and thus using the “wait and see approach” can be detrimental; speech therapy is warranted immediately when CAS is suspected

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For minimally verbal children who are not yet able to participate in a dynamic motor speech evaluation, the SLP may use a working diagnosis of **suspected childhood apraxia of speech (sCAS) until a diagnosis of CAS can be confirmed.



A child may have a **mixed speech sound disorder** that will require different treatment approaches and goals!



A child may have a combination of:

Motor speech goals

Phonological goals

and

Articulation goals

Apraxia is a motor-based speech disorder; therefore, the SLP must use a motor-based speech therapy approach (based on the **principles of motor learning**)

Principles of Motor Learning (PML) in Treatment of Motor Speech Disorders

(Maas et al 2008)

Motor learning is related to several factors:

1. Pre-practice (preparing the learner for the practice session)
2. Target Selection
3. Conditions of Practice (amount, distribution, variability, schedule)
4. Conditions of Feedback (type, frequency, timing, control)

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Motor Learning Begins with Motor Performance

When considering PML, we must use a different therapy approach during the **skill acquisition phase** (motor performance/temporary changes) than we do during the **skill generalization phase** (motor learning/permanent changes).

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Pre-Practice

Prepare the learner for the practice session by ensuring the following skills:

- Focused attention
- Motivation to do the task
- Imitation
- Ability to tolerate cueing
- Visual referencing (not eye contact)

*We must focus on building an authentic connection with the child before working on motor speech skills

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Target Selection

- Speech targets should be selected based on the child's current phonetic inventory, **not** on developmental speech norms
- Choose fewer speech targets (5 is a good goal, although it may be less for a younger child and more for an older child)
- Speech targets should be powerful, high-frequency words and phrases that are relevant and meaningful to the child and naturally occur in daily conversation (e.g., C'mon, Wanna play?, Gotta go, Pizza, Minecraft, French fries, Basketball)

Don't fear phrases!

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*Target selection is key to motivation

Children with apraxia of speech have to become communication risk takers before we can introduce repetitive speech practice in therapy.

So make sure the risk is worth the effort! How? Choose speech targets that are relevant and meaningful to the child (intrinsically motivating)!



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Conditions of Practice

1. Amount of Practice

High vs. Low Number of Trials/Sessions

- High: More practice trials = greater retention (fewer targets, more trials, fewer breaks, more practice sessions); research supports shorter, more frequent sessions over less frequent, longer sessions (Viscomi, 2021)
- Low: Fewer practice trials = poorer retention

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From the ASHA Practice Portal on CAS

Treatment dosage for CAS is consistent with principles of motor learning. Given the need for repetitive production practice in motor speech disorders, intensive and **individualized treatment is recommended.

**If you work in schools, put your artic and phono kids in groups, but your CAS kiddos need individualized sessions!

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Conditions of Practice

2. Distribution of Practice

Massed vs. Distributed (dose frequency/intensity)

- Massed: Practice trials occur in one session (e.g., 100 trials over a 60 minute session); more frequent practice is best for skill acquisition
- Distributed: practice trials spaced out over a longer timeframe/over several sessions (e.g. 100 trials over three 20 minute sessions); better for generalization and maintenance of speech skills

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Conditions of Practice

3. Variability of Practice

Constant vs. Variable (one vs. multiple versions of a movement)

- Constant: Practice the movement pattern in one context (best for skill acquisition)
- Variable: To encourage generalization, adapt the movement pattern by practicing speech targets 1) in different phonetic contexts (such as initial vs. final position of words), 2) with different prosody (loud vs. quiet or statement vs. question), or 3) during different types of tasks (repetition vs. labeling)

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Conditions of Practice

4. Schedule of Practice

- Blocked vs. Random (one vs. multiple targets)
- Blocked: Repetitive practice of one speech target at a time (best for skill acquisition)
 - Random: Intermix speech targets during practice sessions (best for generalization)

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Conditions of Feedback

1. Type of Feedback

- Knowledge of performance (KP) feedback vs. knowledge of results (KR) feedback
- KP feedback: Tells the child specifically *what* they did right or wrong (best for skill acquisition)
 - KR feedback: Tells the child *if* they were right or wrong (best for generalization)



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Conditions of Practice

2. Frequency of Feedback

- Blocked vs. Random (one vs. multiple targets)
- More frequent feedback is best for new skill acquisition
 - Less frequent feedback is important for generalization

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Conditions of Feedback

3. Timing of Feedback

Immediate vs. delayed feedback

- Immediate feedback is best for skill acquisition
- Delayed feedback is important for generalization

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Conditions of Feedback

4. Control of Feedback

Clinician-controlled vs. client-controlled feedback

- Clinician-controlled feedback is best for skill acquisition
- Client-controlled feedback is best for skill generalization

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Evidence-Based Treatment Approaches for CAS

(www.apraxia-kids.org)

For children who can attempt verbal imitation, two motor approaches that have the strongest evidence include:

1. **Dynamic Temporal and Tactile Cueing (DTTC):** This is a *look, listen, do what I do* method that uses a cueing hierarchy. (Developed by Dr. Edythe Strand)
2. **Rapid Syllable transitions (ReST):** This method involves repetition of varied sequences of nonsense syllables to train motor planning flexibility. Use with older kids who have lots of speech but are highly unintelligible. (Developed by Dr. Patricia McCabe at the University of Sydney)

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Trainings

www.childapraxiatreatment.org

DTTC

www.rest.sydney.edu.au

ReST

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DTTC Hierarchy

childapraxiatreatment.org

Add cues as needed

Simultaneous Production

Slow rate Regular rate Vary prosody
Move on after 10-15 correct productions

Direct Imitation

Slow rate Regular rate Vary prosody
Move on after 10-15 correct productions

Delayed Imitation

Regular rate Vary prosody
Move on after 10-15 correct productions

Spontaneous

Mastery: 10 correct productions across 3 sessions



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Assessments

The DEMSS (Dynamic Evaluation of Motor Speech Skill) by Strand and McCauley is the gold standard for evaluating CAS

Bjorem Speech has an informal dynamic motor speech assessment available on their website (very user friendly)

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Motor Planning Goals

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Motor Planning Goal Examples

- Child will accurately plan and sequence simple syllable shapes including CV, VC, and C₁V₁C₁V₁ using sounds in their phonetic inventory with no more than 1 cue, to produce 20 functional words.
- Child will produce accurate vowel sounds in 25 target words, with no more than one cue from the SLP.
- Child will accurately plan and sequence simple syllable shapes comprised of sounds in their repertoire to produce 20 functional phrases, with no more than 1 cue from the SLP.

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- Child will add 25 target words, that are easily understood by caregivers and peers, to their expressive vocabulary by _____.
- Child will accurately plan and sequence 20 different CV combinations, using at least 5 different vowel sounds.
- Child will produce accurate vowel sounds in 25 pairs of rhyming words.
- Child will accurately plan and sequence 25 target words during structured play time with no more than 1 cue from the SLP.
- Child will produce 20 relevant 2-word phrases that are intelligible to a familiar listener.

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- Child will produce 20 different 2-word phrases that are intelligible to an unfamiliar listener.
- Child will accurately plan and sequence 20 target words using a variety of prosodic variations.
- Child will produce 3- to 5-word intelligible utterances, accurately planning and sequencing all syllables when provided with no more than one cue.
- Child will produce CCVC syllable shapes in words and phrases, when provided with no more than one cue.
- Child will self-correct errors on target words following *Knowledge of Results* feedback from the adult listener.
- Child will self-evaluate the accuracy of productions on 20 well-rehearsed target words/phrases.

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For Older Children

- Encourage older children to help select their targets to be addressed in speech therapy
- Help them identify high frequency words and phrases that naturally occur during their day (include names, favorite things, and vocabulary from the curriculum and homework)
- Make sure older children know specifically *why* they are in speech therapy and empower them to collect their own data and monitor their own productions (this is when technology is a powerful tool!)

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21 Motor-Based Therapy Strategies and Activities

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- For children with apraxia, repetitive motor-speech practice is the key to acquiring intelligible speech—but repetitive speech practice isn’t exactly fun.
- What do SLPs do to make something intrinsically not fun, fun? This is the million-dollar question!
- What strategies and activities do you currently use to make your therapy sessions for children with CAS/sCAS more engaging and effective?

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1. Establish Robust AAC

Before addressing motor speech skills in children with limited speech, we need to provide consistent and reliable communication by offering robust AAC until their motor speech system “kicks in.”



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What Makes an AAC System Robust

(Kate McLaughlin, The AAC Coach)

- Lots of words and lots of different kinds of words
- Used for a wide range of functions (not just to request or get basic needs met)
- Supports grammar and literacy
- Option for pre-programmed messages for high frequency phrases and responses
- Well organized
- Able to grow language over time
- Access to full alphabet and word prediction
- Always available

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Robust AAC systems to consider...

- LAMP Words for Life
- TouchChat
- CoughDrop
- Proloquo2Go
- TDSnap
- Avaz AAC
- PODD Books



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Prerequisites for AAC

Kate McLaughlin, @the.aac.coach on Instagram

- There are no prerequisites for AAC use!
- There may be skills to consider and barriers to overcome, but there are NO prerequisites for AAC use.
- The child does not need to be able to match pictures, discriminate pictures, receptively label pictures, be able to point, be a certain age, prove cognitive abilities, be non-speaking, or be “ready” in any way.

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Hierarchy of teaching considerations for emergent AAC device learners:

- begin by building an authentic connection with the child; learn all about their special interests and sensory preferences
- then move to modeling AAC use without any performance expectations from the child (having a partner device is helpful)
- when the child is ready, set up opportunities for the child to use the device in therapy, in the classroom, at home, in the community, etc.

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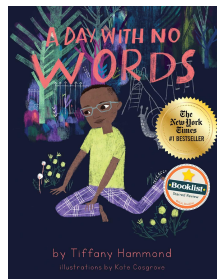
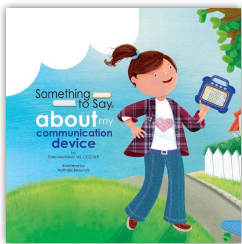
Remember, the primary goal is **communication**.
When writing AAC goals, be sure to explicitly honor **all** forms of communication.

Example:

When given unrestricted access to multi-modal language, child will communicate...

****Don't take their device away just because the child is talking more!**

AAC Awareness Books



PECS is outdated



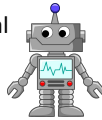
Why PECS is NOT Recommended

- The icons are always moving, which makes it difficult for the child to establish a motor plan for using the communication system.
- This outdated system focuses primarily on requesting in the initial levels, and does not provide options for other communication functions (commenting, asking questions, protesting, expressing ideas, socializing, etc.).
- PECS books are cumbersome, and icons are often difficult to locate and keep track of.

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- The PECS sentence strip creates unnatural prosody/robotic-sounding speech.

I _want _ a _ cookie



- PECS encourages hand-over-hand assistance, which is a violation of body autonomy.
- PECS focuses on compliance and is based on operant conditioning (modifying behavior through the use of rewards and punishments). Neurodiversity-affirming practices are not aligned with this behaviorist approach.
- PECS is difficult for communication partners to model with.

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2. Reduce the pressure to speak

- Pressuring the child to talk may cause them to have a stress response.
- Pair talking tasks with AAC.
- Meet the child where they are at with their motor speech development.
- Avoid instructing the child to say words. Instead, provide opportunities for the child to talk, but without any pressure to do so (*Rule of 3*).
- Limit the number of test-like questions and use more declarative language. Life is not a quiz!

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3. Establish a trusting relationship

- Create a safe, positive learning environment to foster attention, motivation, and trust. Focus on building a growth mindset (*talking is hard, but you can do hard things...and I'm here to help*)
- Avoid using behaviorist strategies in an attempt to coerce speech (such as withholding items from the child because they didn't say the target word). Use dynamic cueing strategies instead!
- When the child is struggling, become their voice and say the word(s) you think they would say in the moment if they could.

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4. For children who don't yet have verbal imitation, start by establishing non-verbal imitation

- Nonverbal imitation is a foundational skill—it is essential for learning and developing new skills.
- Developmentally, children imitate what we do before they imitate what we say.
- As we build the child's confidence, they are more willing to become a risk taker. And creating communication risk takers is what it's all about.

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Strategies and activities to support non-verbal imitation skills

- Imitate what the child does and says (technically called contingent imitation)
- Encourage the child to imitate others during play by using declarative language ("Look, he's jumping!")
- Introduce songs and fingerplays with action
- Encourage imitation of gestures and signs
- Play "Simon Says" or "Follow the Leader"
- Read books that encourage imitation skills (Where's Spot?, Hi-Five Animals, Elmo Says...)

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Cari's favorite books for establishing nonverbal imitation skills



Suggested Action Songs and FingerPlays

- Teddy Bear, Teddy Bear
- Row, Row, Row Your Boat (with additional verses)
- Wheels on the Bus/Animals on the Bus
- If You're Happy and You Know It
- Baby Bumblebee
- Twinkle Twinkle Little Star
- Itsy Bitsy Spider
- Head, Tummy, Knees & Toes
- 5 Little Monkeys Jumping on the Bed

Teddy Bear

Teddy Bear Teddy Bear Turn Around
Teddy Bear Teddy Bear Touch the Ground
Teddy Bear Teddy Bear Show Your Shoe
Teddy Bear Teddy Bear That Will Do

Teddy Bear Teddy Bear Go Upstairs
Teddy Bear Teddy Bear Say Your Prayers
Teddy Bear Teddy Bear Turn Off the Light
Teddy Bear Teddy Bear Say Good-Night

5. For the child who rarely vocalizes, help them find their voice

- Before working on talking, SLPs need to help silent children become communication risk takers.



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Strategies and activities to help children find their voice

- Respond to all vocalizations produced by the child
- Encourage vocal turn taking using voice amplifying toys, such as an empty bucket, echo microphone, or megaphone

voice
amplifying
toys



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- Play the “ahhh” game with a toy doctor kit and a flashlight
- Use kazoo to elicit intentional vocalizations (kazoos are awesome tools because they require the child to motor plan air flow + simultaneous phonation)
- Encourage vocal play (blowing raspberries, clicking tongue, blalling, etc.)
- Pair attention getting sounds with movement activities (ooohhh, grunting, ewwww)
- Sing additional verses to Row, Row, Row Your Boat



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Additional Verses to Row Your Boat

Row, row, row your boat
Down the jungle stream
If you meet a crocodile don't forget to scream!
AAAHHHHHHHHH!



Row, row, row your boat
Gently back to shore
If you meet a lion
Don't forget to roar!
ROOOAAARRR!

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6. For children with poor body awareness, increase awareness of their articulators

- By increasing awareness of their lips, tongue, and jaw, (i.e., their articulators) we hope that phonetic placement cues will be more effective.
- NOTE: We are NOT doing non-speech oral motor exercises (NSOME).

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NSOME

- NSOME are **not recommended** to improve speech motor planning skills (McCauley et al., 2009).
- Speech is not a series of isolated movements (Nip et al., 2010), which is why speech therapy for CAS addresses movements between sounds, syllables, and words as opposed to individual sounds.

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Strategies and activities for increasing articulator awareness

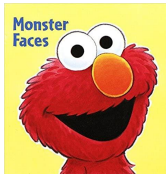
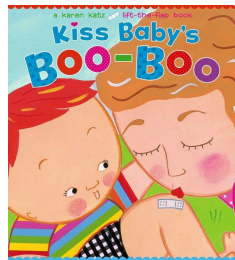
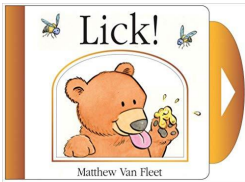
- Introduce modified animal “sounds” (fish, dog, giraffe) to increase awareness of lips and tongue – Cari’s Silly Sounds cards



- Engage in mirror play while making funny facial expressions
- Offer lip balm to increase awareness of the lips
- Play the “Blah” game to increase awareness of the tongue

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- Use books that emphasize oral-facial movements.



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7. Establish focused attention to the speaker's mouth

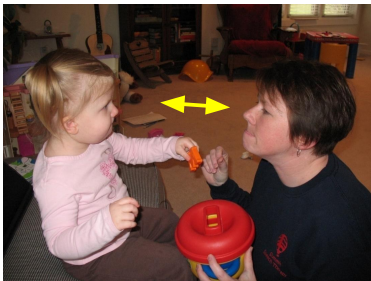
- Encourage the child to attend to the speaker's mouth as speech targets are modeled so they can **visualize** the speech movements.
- If children with apraxia could acquire intelligible speech by just *hearing* other people talk, they wouldn't need speech therapy.
- Hold desired items next to your mouth to draw the child's attention to how you move your lips, tongue, and jaw.

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- Use exaggerated facial expressions and an animated voice to draw attention toward the speaker's face.
- Engage face to face with the child when modeling speech.
- Be specific...instead of saying, "Look at me" it may be more beneficial to say, "Look at me for help" or "Watch how I move my mouth." (Don't ever focus on eye contact!)
- Play games that involve the child looking at your face (e.g., the A-CHOO! game with littles or Hedbanz game with older kids).

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- Seat the child higher than the adult to establish natural face to face interactions.



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- Put a sticker on your nose.
- Wear a silly hat or giant clown glasses.
- Wait silently until the child looks toward your mouth.
- Read books with child facing the adult.



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- If the child is hesitant to watch your mouth when you speak, try playing in front of a mirror to encourage indirect eye gaze. Mirror use should be low pressure. The goal is to get the child to watch your speech movements indirectly through the mirror.



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8. Engage in playful interactions

- Making learning to talk fun and engaging, not boring and monotonous.
- Be interesting and animated.
- Follow the child's lead (limit themed-base therapy activities).
- Know the child's special interests and sensory preferences (figure out what gives each child their "brain tingles").
- Design attention-grabbing activities that fascinate young children.

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Attention-Grabbing Therapy Activities

- Toys that do unexpected things
- Things that pop, go, stack, and fall
- Toys that connect (marble runs, Magna-Tiles)
- Miniature toys
- Themed toys from child's favorite movies/shows
- Music, songs, and fingerplays
- Interactive books
- Silly sound effects
- Play-based movement
- Sensory-based play

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9. Use verbal shaping

- Use verbal shaping early on to teach the child to simplify words...allowing them to produce word approximations.
- We are teaching kids with apraxia to talk the same way typically developing children learn to talk—by using simplifications/phonological patterns) and then verbally shaping them into the adult versions of words.
- Explain to parents the difference between speech simplification and baby talk (“wawa” vs. “dwinkie poo”).

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Use the Speech Simplification Strategy to Teach Word Approximations

Target Word	Simplification	Phonological Pattern
Eat	ee	Final consonant deletion
Cookie	tootie	Velar fronting
Water	wa-wa	Reduplication
Blue	boo	Cluster reduction
Butterfly	bu-fy	Cluster reduction; syllable reduction
Potato	tay-doh	Weak syllable deletion

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10. Pair play-based movement with talking tasks

- Incorporate play-based movement into talking tasks to help regulate the child’s nervous system.
- Speech is a motor skill...so movement is a powerful strategy to support motor planning.
- Movement is a better choice than tangible reinforcers to address diminishing attention and participation in repetitive speech practice. Sliding and rhythmical swinging are powerful speech therapy activities!

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11. Use multisensory cues

- Commonly used cues by SLPs include visual, verbal, tactile, semantic, and kinesthetic.
- When cues are used in combination, this is referred to as multisensory cueing.
- Multisensory cues allow the SLP to fade the cues systematically, one at a time.

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Multisensory, Dynamic Cueing to Support Speech Motor Planning Skills:

- a. **Verbal cues:** model the target word, provide the first sound of the target word, say target words in unison, add prosodic cues, use verbal shaping, model correct vs. incorrect (I say...You say), use forward chaining (won-wonder-wonderful) and backward chaining (na-nana-banana)
- b. **Tactile cues:** touch child's face, use tongue depressors or lollipops, PROMPT
- c. **Semantic cues:** sound metaphors, phrase completion/cloze procedures, phonetic placement cues

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- d. **Kinesthetic cues** (body awareness and movement cues): Turtle Vowels, Sounds in Motion (www.soundsinmotionprogram.com), Visual Phonics, Lively Letters, Talk Yoga, transition cues, pair movement with talking tasks (*Whee!* on a slide or *Boing!* while bouncing on a ball)
- e. **Visual cues:** oral posturing, gestures, signs, hand cues, graphic cues, make sounds more visible/exaggerate articulatory movements, hold desired items next to speaker's face, mirror use, face-to-face seating during talking tasks, mouth the target word without voicing, pair talking tasks with pictorial cues (Bjorem Speech Sound cues, Cari's Silly Sounds cards, Talking Letters)

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CARI'S SILLY SOUNDS
Visual cue cards to support early speech development

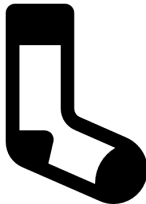


ooooh!

85

Example of Multisensory Cueing + Fading

Target word: SOCK



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- There is neurophysiologic evidence that motor systems are activated by observing or imagining movement. (Smith & Goffman, 2004)
- Dr. Strand's recommendation: Maximize the child's attention to your face
 - Use objects that can be held near your mouth
 - Avoid using pictures and games on the table that take the child's attention away from observing your visual model
- SLPs use visual cue cards to support speech motor planning. Avoid calling them flashcards!

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12. Focus on coarticulatory transitions

- Coarticulation refers to the interweaving movements between sounds, syllables, and words. (The opposite is segmentation.)
- The spaces used in written language are not present in spoken language because of coarticulation. Example: Come_on = written; cmon = spoken
- Coarticulatory transitions are the focus when supporting kids with apraxia. Think speech MOVEMENTS, NOT individual speech SOUNDS.

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Coarticulation

Segmented



I_am_three

Wa_ter

Pa_tty

Bu_tter

Got_to_go

I_don't_know

I_want_to

Pacing boards
often lead to
segmented
speech

Coarticulated

Iyamthree

Wadder

Paddy

Budder

Goddago

Idohno

Iwanna

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Avoid segmentation!

- Avoid separating speech movements into individual sounds and syllables
Ex: b-a-t (NO!)
- Temporarily draw out the vowel sounds in the word to allow more time for the child to plan the speech movements (but speed up as soon as possible to keep prosody in check)

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Example: Target word "bat"



No segmentation!



"b - a - t"

We want coarticulation!



"baaaat"

"baaat"

"bat"



Be careful about target selection...try to avoid voiced final consonants



"buuuuug-uh"

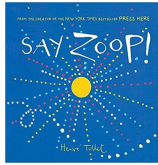
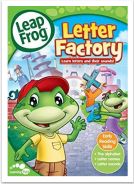
13. Increase the child's phonetic inventory

- We need to teach the child *how* to move their articulators to make all the speech sounds (both consonants AND vowels!)
- The focus should be on eliciting NEW movements with the articulators and reducing reliance on the default sound or word.
- Be sure not to drop your jaw when saying consonant sounds in isolation (it's /b/ not "buh", /t/ not "tuh").



Strategies and activities for increasing the child's phonetic inventory

- Watch the Letter Factory video to teach letter sounds with letter names
- Use books that emphasize single sounds



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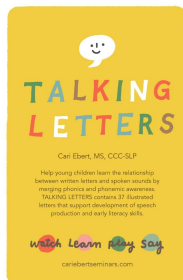
- Use the Bjorem Speech Sound Cues to elicit a variety of speech sounds; get a container to “mail” the cards into and then have the child attempt to imitate each speech sound



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Talking Letters

- Teach letter sounds with letter names using Cari's *Talking Letters*
- Each card is held next to the speaker's mouth as visual cues when modeling the letter name and its sound



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14. Consider facilitative contexts

- Inconsistent speech productions may be a result of contextual influences (Kent, 1982). In other words, neighboring sounds can influence the production of each other.
- “Vowels can create a naturally facilitative context for accurate consonant production” (Farquharson, 2024).
 - Be sure to follow Dr. Kelly Farquharson from FSU [@classlab_kelly](#) for her [Phonetics Friday](#) posts on Instagram!

Facilitative Contexts: Front Vowels

Dr. Kelly Farquarson (2024)

Front vowels facilitate accurate production of alveolars /t, d, n, l/ and help avoid lip rounding (because all front vowels are unrounded)

- /i/ as in “beet”
- /ɪ/ as in “bit”
- /eɪ/ as in “bait”
- /ɛ/ as in “bet”
- /æ/ as in “bat”

Facilitative Contexts: Back Vowels

Dr. Kelly Farquarson (2024)

Back vowels facilitate accurate production of velars /k, g/ and encourage lip rounding (because 4 of the back vowels are rounded)

/u/ as in “boot”

/ʊ/ as in “book”

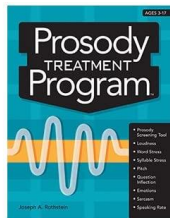
/oʊ/ as in “boat”

/ɔ/ or /ɑ/ as in “bought” (depending on dialect)

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15. Address prosody

- Consider using *The Prosody Treatment Program* by Joseph Rothstein (there is a section for preschoolers and a section for school age children).
- Practice target words by varying the prosody/ suprasegmental aspects of speech (question vs. comment; loud vs. quiet; daddy bear vs. mommy bear vs. baby bear).



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- Focus on sound effects (animal sounds, vehicle sounds, and people sounds) during play time and story time. Sound effects are a fun and effective way to:
 - elicit intentional sounds
 - make talking tasks fun and interesting
 - transition from pre-speech to speech sounds
 - develop verbal imitation skills
 - support prosodic variation
- Use “Cari’s Silly Sounds” cards designed to draw attention to the speaker’s mouth while making fun and engaging sound effects.

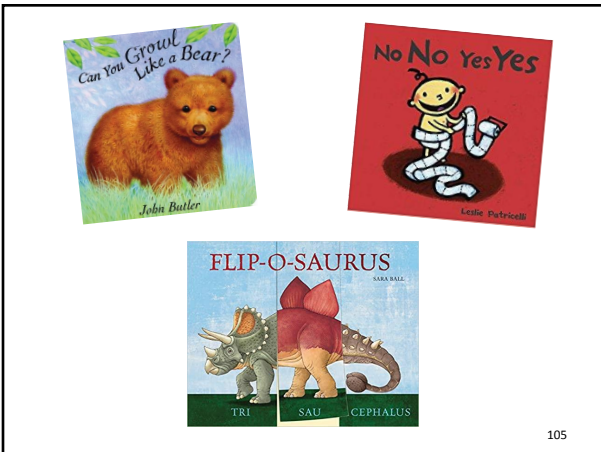
102



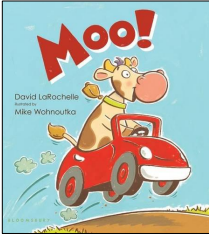
16. Use books and songs that support speech motor planning

- Look for books and songs that...
 - emphasize sound effects
 - contain repetitive text
 - encourage prosodic variation
 - increase the flexibility and reliability of the speech motor planning system (flip books)
- As the child's speech motor planning skills improve, the adult should reduce the cues and allow the child to take over.

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Fun and effective books for addressing prosody



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17. Use real objects to represent speech targets

- It is easier to engage in child-led, play-based therapy when toys are present.
- Consider pairing real objects with visual cue cards, books, and songs to make talking tasks more relevant and meaningful.



Pair the Silly Sounds cards with books and toys to make learning to talk fun and meaningful

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Use small toys to increase engagement during child-led play

Cari's "Junk Drawers" full of Tiny Toys



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Color matching with silicone baking cups

Tiny Toys



Use 2.5 gallon Hefty Sliders to create sound and syllable bags to support speech motor planning skills during child-led play



Syllable Bag



Reduplication Syllable Bag Using Real Objects

Ba-ba, Beep-beep, Neigh-neigh, Choo-choo,
Papa, Moo moo, Boo-boo, Ho-ho

Syllable Bag



CVCV Syllable Bag Using Real Objects

Pony – Potty – Minnie – Monkey –
Woody – Dino – Table – Hippo

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Sound Bag

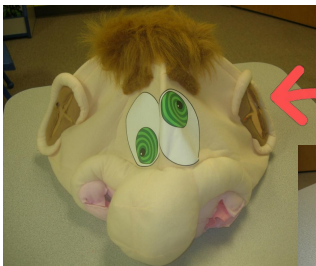


Vowel Sound Bag Using Real Objects
"oo"

shoe – boo – Blue – moo – Pooh – glue –
choo choo – two- boo boo – blue – roo

113

Put objects from the sound/syllable bag inside Ned's Head



114

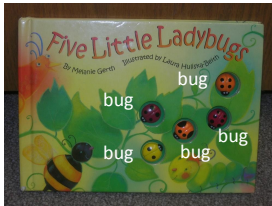
18. Elicit multiple repetitions of target words (without drill work!)

- Focus on repetitive speech practice through child-led, adult-guided play.
- We want meaningful repetition of speech targets as opposed to non-functional drill work.
- SLPs should elicit multiple repetitions by designing engaging activities that have multiple, identical pieces (the number of identical pieces = the potential number of repetitions).

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Activities for Eliciting Multiple Repetitions

- When looking at counting picture books, touch objects on the page repeating the object name instead of rote counting “1-2-3-4-5.”

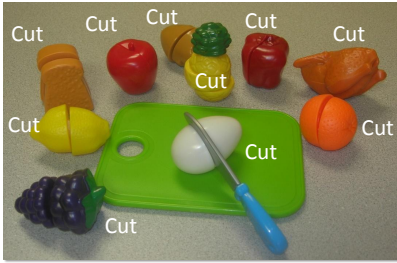


116

- When walking up/down the stairs, say “up-up-up” or “down-down-down” instead of counting each stair.
- Use predictable books with repeating phrases and have the child fill in the same word each time. For example, “Brown bear, brown bear what do you _____? I see a purple cat looking at _____.”
- Play the knock-knock game.
- Use puzzles or other toys that contain identical pieces (such as a puzzle with lots of mommy animals and lots of baby animal).

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→ Use Velcro play food saying “cut” each time the child cuts with the toy knife



118

→ Use a muffin tin to elicit 12 repetitions of the target word.



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→ Make boo-boo art by sticking band-aids on paper saying “boo-boo” each time.



→ Have toy animals walk, eat, and sleep repeating key words “walk-walk-walk, eat-eat-eat, night-night.”



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→ Throw small balls into a basketball hoop or laundry basket saying "ball" each time.



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→ Hammer golf tees into Styrofoam saying, "boom-boom."

→ Use anything that pops - bubbles, Moo Popper, bubble wrap, party poppers - saying "pop-pop-pop."



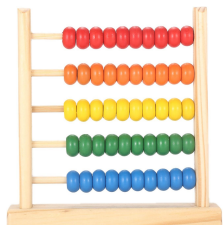
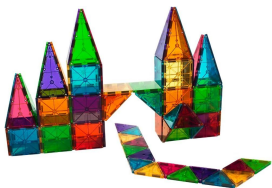
→ Roll balls/cars down a slide saying "whee" each time.

→ Roll a die to determine the number of repetitions.

→ Use an abacus or pop-it to elicit multiple repetitions.

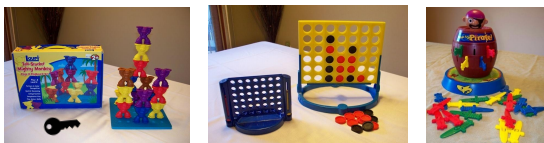
→ With older kids, use connecting toys, such as Lego's, marble runs, or Magna Tiles to get repetitive speech practice (5 reps per Lego, for example)

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- Say “bye-bye” repeatedly as you put blocks into a tub or say “night-night” repeatedly as you put dollhouse figures to bed.
- Look for games with multiple identical pieces, such as Mighty Monkey Pegs, Connect Four and Pop-Up Pirate. Have the child say the specified target word each time a piece is placed.



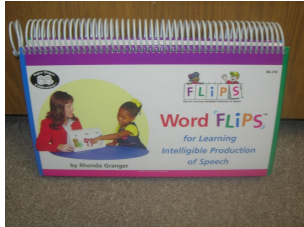
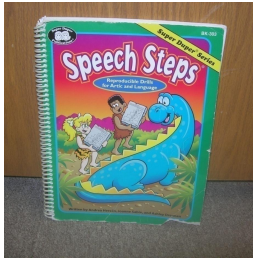
19. Establish accurate vowel sounds

- It is common for kids with apraxia to have vowel errors, so be sure to address syllable shapes with vowel differentiation.
- We want “bay-bee-buy- bo-boo” not just “/b/.”
- Vowels shape the oral cavity and strongly affect intelligibility.
- Consider facilitative contexts and coarticulation when focusing on vowels (think about your mouth position when saying *car* vs. *key*).

Strategies and activities for vowels

- Do not inadvertently reinforce overuse of the neutral vowel (ex: “bu-bu-ball or “du-du-down”); say the vowel sound before the word to establish the correct oral shape (ex: “ow - down” or “oo - boot”)
- Begin shaping single word approximations with consonants and vowels that the child has success with
- Use *Speech Steps* and *Word Flips* that focus on consonant-vowel combinations
- Play with *Vowel Owls Sorting Set*
- Introduce Cari’s *Animal Vowels* and her Boom Cards that focus on establishing simple syllable shapes

Speech Steps and Word Flips



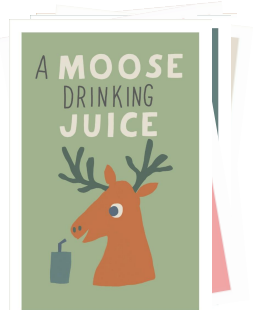
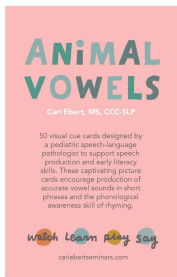
127

Vowel Owls Sorting Set by Learning Resources



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Cari's Animal Vowels



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Cari Ebert Seminars' Store on
www.boomlearning.com

Silly Sounds Bundle - CVCV

bye-bye



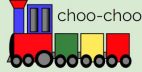
boo-boo



mama



pee-pee

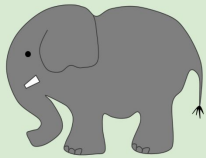
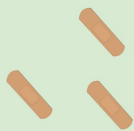


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Boom Card for CVCV Reduplication

Silly Sounds for New Talkers

BOO-BOO



Repeat 'boo-boo' after placing each bandage on the animal.

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Boom Card for Vowel Differentiation

Old MacDonald



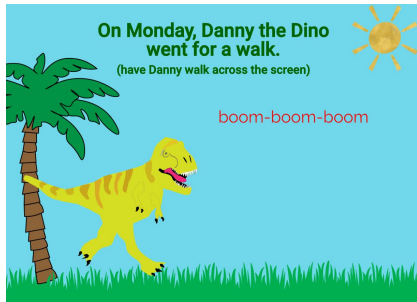
E-I-E-I-O

(be sure to say each vowel sound in a slow and exaggerated manner)



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Boom Card for C₁V₁C₂V₂ Syllable Shape



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20. Expand syllable and word shapes

- We need to focus on establishing more complex syllable and word shapes using the segments of speech (consonants and vowels) to improve the child's speech motor planning skills.

CV CVCV VC CVC
 CCVCC CCVC CVCVC
 VCVCC

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Systematically increase complexity of the word shape:

- Reduplicated utterances (mama, dada, papa, wawa)
- 1 syllable words (go, no, eat, up)
- Two syllable words with same consonant and variable vowels (puppy, baby, daddy, mommy)
- Two syllable words with variable consonants and vowels (monkey, happy, dino, hippo, potty)
- Three syllable words and phrases (banana, potato, apple pie)
- Functional 4+ syllable words (watermelon, helicopter)
- Simple phrases (bye bye mama = CV.CV.CVCV)

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Because of coarticulation, we don't have to select rarely used multisyllabic target words such as *celebration, certificate, or transportation*

Non-functional multisyllabic target word:

Kaleidoscope
CVCVCVCCVC

Functional, multisyllabic phrase:

"Play with Lego's"
CCV.CVC.CVCVC

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21. Use target word therapy to establish a functional vocabulary

- Select individualized high-frequency target words (as opposed to random words from commercialized speech therapy products) to make talking more powerful for the child.
- Understand that the target words will not be the same for each child.
- Focus on about 5 speech targets at a time. For older kids, you can work on a few more. We want fewer targets with more reps!

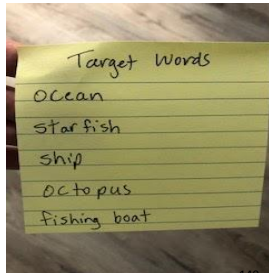
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- Encourage parents and teachers to assist with the target word selection by creating a WISH LIST of words and phrases.
- The SLP will select the target words/phrases from the WISH LIST. Target words will be selected based on the child's current phonetic inventory, preferred syllable shapes (e.g., CV, CVC), and how functional they are.
- Start with meaningful words such as the child's own name as well as names of family, pets, and friends, favorite foods, favorite toys, and other powerful words (e.g., *no, mine, help*).

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- For children who are in the educational setting, be sure to consider target words from the curriculum and classroom activities.
- Teach the child how to produce these target words during the speech therapy session by focusing on the movement patterns; then coach parents and teachers on how to use cues to elicit these target words so practice can occur at home and in the classroom as well.
- Post target words in a prominent location at home or in the classroom, so all communication partners know which words are currently being addressed.

Hang a list of the target words on the wall or fridge at home; give the teacher a list of target words on a sticky note



Don't forget about verbs...

- We tend to focus on names, core words, and nouns, but verbs are necessary too



Data Collection

- Don't get hung up on collecting data during every activity in the therapy session
- Take baseline data on your target words at the beginning and the end of the session to gather data on spontaneous productions; but your goal during the practice session is 100% accuracy (what changes is how many and what types of cues are necessary for success)
- Collecting data on every activity doesn't lend itself to teaching the movement patterns and getting the number of repetitions needed to establish new motor plans

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In Conclusion...

- Children with CAS/sCAS need to have specific motor speech goals that address the core impairment (which is difficulty moving between sounds, syllables, and words).
- Because CAS rarely occurs in isolation, there will need to be other goals written to address the co-occurring issues.
- Children with motor planning struggles can and do make progress...when treatment is based on the principles of motor learning.

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Thanks for joining me today!

I hope you have some new tools
for your CAS toolbox!

Cari

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