

Childhood Apraxia of Speech

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What is Childhood Apraxia of Speech? (CAS)

Childhood apraxia of speech (CAS) is a motor speech disorder. Children with CAS have problems saying sounds, syllables, and words. This is not because of muscle weakness or paralysis. The brain has problems planning to move the body parts (e.g., lips, jaw, tongue) needed for speech. The child knows what he or she wants to say, but his/her brain has difficulty coordinating the muscle movements necessary to say those words. (ASHA, 2008)

Nancy Kaufman's Definition of CAS

“Difficulty executing and/or coordinating/sequencing the oral motor movements necessary to produce and combine consonants and vowels to form syllables, words, phrases, and sentences on volitional control.”

Nancy Kaufman, M.A. CCC-SLP

Family Friendly Definition of CAS

“Your child knows what he/she wants to say, but he can’t get that message from his brain to his mouth. His brain says “talk”, but his mouth can not respond. He can not motor plan how to coordinate production of vowels and consonant combinations to form words.”

What causes childhood apraxia of speech (CAS)?

Childhood apraxia of speech (CAS) is a motor speech disorder. There is something in the child's brain that is not allowing messages to get to the mouth muscles to produce speech correctly. In most cases, the cause is unknown.

However, some possible causes include:

- Genetic disorders or syndromes
- Stroke or brain injury

CAS Causes, con't

It is important to note that while CAS may be referred to as "developmental apraxia," it is not a disorder that children simply "outgrow." For many developmental speech disorders, children learn sounds in a typical order, just at a slower pace. In CAS, children do not follow typical patterns and will not make progress without treatment. There is no cure, but with appropriate, intensive intervention, significant progress can be made.

(ASHA, 2015)

Praxis.....it's complicated

Praxis is the neurological process by which cognition directs motor action (Ayres, 1985). It involves planning what to do and how to do it. In order to know what to do, we must first conceive the idea of what to do (ideation), then plan how we are going to do it (motor organization, or motor planning), perform the movement correctly (execution) and then be able to reflect on feedback so we can adapt our movements in the future (feedback and adaptation).

Neurological “Soft Signs” / Findings for CAS:

-Late to develop hand preference (1937)

Late walking (1957)

*Clumsy, slow muscular activity (1962)

*Crude handwriting (1962)

*Excessive drooling (1975)

*Attention or impulse problems (1984)

*Fine motor function abnormalities (1986)

Developmental “Red Flags”

- *Lack of or minimal cooing/babbling; a quiet baby
- *Limited vowel and consonant repertoire
- *Appears to struggle to produce speech
- *Idiosyncratic speech (the use of a word or expression to refer to something which is unrelated or irrelevant)

Red Flags, con't

- *Better receptive (understanding) language skills than expressive (production) language skills
- *Inconsistent sound productions from day to day (e.g: “She said ‘cat’ yesterday, now I can’t get her to say it today.”)
- *Late transition to solid foods, feeding difficulties

Examples of children with CAS:

https://www.youtube.com/watch?v=_n4CEc9HMXA

<https://www.youtube.com/watch?v=J-kkyuQJNkg>

Prader-Willi Syndrome's impact on overall childhood development:

Children with PWS often have global praxis problems, which is defined as difficulty with motor planning (sequencing and organizing) the body to perform fine and gross motor activities.

As infants, our babies with PWS:

- are hypotonic
- often have feeding difficulties due to problems with suck/swallow/breathe coordination
- are excessively sleepy
- have limited babbling and lack consistent reduplicative patterns (e.g."ba-ba-ba)

******Because our babies lack muscle tone and endurance, they miss opportunities for normal feeding experiences and they miss opportunities to practice vocalizations. Our infants are often described as 'good babies' because they are so quiet.

As toddlers, our children with PWS:

- have limited expressive vocabularies and have difficulty using short phrases
- require extra 'wait time' to process information
- do not easily imitate new sounds
- do not persist with communication tasks (often give up)
- have better receptive (comprehension) skills than expressive (speech) skills

As Preschoolers, our children with PWS:

- often rely on gestures in addition to vocalizations
- use short utterances, often omitting various grammar structures
- have limited vowel productions
- have limited consonant productions
- have difficulty combining consonants and vowels to form words.

Who can diagnose CAS?

Since CAS is a disorder of speech sounds, it is diagnosed by a speech pathologist. It is helpful to document the atypical development and use of speech and how it is different from developmental speech disorders.

Documentation by the pediatrician or other professionals (e.g PT, OT) to support the neurological aspect of CAS is also helpful.

How is CAS Diagnosed:

Formal Assessments: These are tests which have been standardized and generate a score which compares the child to a group of typical peers his same chronological age.

Kaufman Speech Praxis Test for Children (ages 2.0-8.11)

Screening Test for Developmental Apraxia of Speech - 2nd Edition (ages 4-12)

Verbal Motor Production Assessment for Children (ages 3-12)

Informal Assessment

Informal observations are important, because a checklist of symptoms that can be applied to every child does not exist. Instead, a large cluster of symptoms may indicate or suggest apraxia will eventually be diagnosed. (paraphrased from Agin, 2004)

What to look for: Informal Observations

- *Unusually quiet baby
- *Limited cooing and babbling
- *May not have exhibited typical oral exploration as infant
- *Late to produce first word
- *Limited repertoire of consonants and vowels
- *Receptive Language intact or mildly delayed when compared to Expressive Language
- *Many vowel errors
- *Overuse of neutral vowels (e.g.: 'uh', 'ah')
- *Limited (or complete absence) of verbal imitation skills
- *Limited number of syllable productions

Informal Observations, con't

- *Use of one syllable for all words
- *May add a vowel sound to the end of words (e.g.: “I-uh wan-uh cup-uh” for “I want a cup.”)
- *History of saying a word/phrase clearly one time and then never repeating it
- *Errors with voicing (e.g.: /b/ for /p/ such as ‘bin’ for ‘pin; /d/ for /t/ such as ‘dop’ for ‘top’
- *Inappropriate speech prosody (the melody of speech)

Associated Characteristics

- *Can have elaborate gesturing skills
- *Often silent during play time - even during gross motor activities
- *May have poor eye contact. This limits the amount of information they observe from speaking partners on how others move their jaw, lips, and tongue to form sounds and words
- *May avoid watching self in mirror
- *Response to intervention can be slow

Academic Difficulties associated with CAS

“A child who demonstrates communication delays as a toddler and during preschool is at greater risk for later language-based learning difficulties.” (Agin, 2004)

“Between 40% and 75% of children who have trouble with language development present with reading difficulties later in life.” (Bashir 1992)

What treatments are available for children with apraxia of speech?

Research shows the children with CAS have more success when they receive frequent (3-5 times per week) and intensive treatment. Children seen alone for treatment tend to do better than children seen in groups. As the child improves, they may need treatment less often, and group therapy may be a better alternative.

ASHA 2015

Treatment

The focus of intervention for CAS is on improving the planning, sequencing, and coordination of muscle movements for speech production. Isolated exercises designed to "strengthen" the oral muscles will not help with speech. CAS is a disorder of speech coordination, not strength.

ASHA 2015

What is Oral Motor Therapy?

Oral-motor therapy is an important intervention beginning in infancy to help build oral muscles and lay down neural pathways necessary to help the baby learn to babble, a precursor skill to the development of clear speech.

“Non-speech Oral Motor Exercises are a procedure and not a goal. The goal of speech therapy is NOT to produce a tongue wag, to have strong articulators, to puff out the cheeks, etc... Rather the goal is to produce intelligible speech.”
(Velleman, 2003)

The objective is to learn imitative speech movement patterns. Oral-motor exercises can be used to increase confidence and regain ‘lost participation’.

Treatment

To improve speech, the child must practice speech. However, getting feedback from a number of senses, such as tactile "touch" cues and visual cues (e.g., watching him/herself in the mirror) as well as auditory feedback, is often helpful. With this multi-sensory feedback, the child can more readily repeat syllables, words, sentences and longer utterances to improve muscle coordination and sequencing for speech.

ASHA, 2015

Treatment

Some clients may be taught to use sign language or an augmentative and alternative communication system (e.g.: a portable computer that writes and/or produces speech) if the apraxia makes speaking very difficult. Once speech production is improved, the need for these systems may lessen, but they can be used to support speech or move the child more quickly to higher levels of language complexity.

ASHA, 2015

Therapyit has to be fun in order to be effective

Young children learn best through play! It must be meaningful and relevant to their world. They need to move and touch and see and hear and explore. They should not be expected to engage in flash cards or intense drill work.

(The Power of Play - Effective Play-Based Therapy & Early Intervention, C. Ebert, M.S. CCC-SLP)

We need lots of repetition to master a sound/syllable/word. Some ideas.....

- *Roll toy cars, marbles, etc. through empty paper towel/wrapping paper tubes and say/model “whee”, “go”, etc.
- *Throw small balls through a basketball hoop and say/model: “Ball”, “in”, “up”, etc.
- *Use velcro play food, say/model “cut” each time you cut with a toy knife

Therapy ideas, con't

*Make playdoh balls and say “roll” as rolling or “poke” as poking

*Stack blocks and say/model ‘up’/’on’/’here’,etc. as each block is added

*When walking up or down stairs, say/model “Up” or “down” with each step

Therapy ideas, con't

- *Find everyday objects that target words or sounds (e.g.: animals such as cows, sheep, dog, etc. to elicit “moo”, “moo-moo”, “baa”, “baa-baa”, etc.)
- *Collect small toys, cars, trains, dollhouse items, puzzle pieces, play food, Mr. Potato Head, Play Doh, etc.
- *Look for some unusual storage containers: (e.g.: mailbox, pillowcase, flower pot, bucket, muffin tin, etc.) to place the objects inside.

Therapy ideas, con't

- *Find bubbles to blow and say “pop” as you pop each bubble with your finger
- *Let bubbles fall to the floor and say “boom” as you try to stomp on them
- *Use a toy hammer and work bench, say/model “boom” as you hit toy nails

Therapy ideas, con't

- *Use bingo stampers and say “dot” each time the child stamps

- *Say “bye” (or “bye bye”) repeatedly as you clean up activities (e.g., blocks, cars, puzzle pieces, etc.

Family Participation and Intervention

*For young children, the SLP's job is to model strategies for the family to teach their child how to speak. The caregivers must be able to engage and carryover activities with the child

*Your clinician needs to integrate activities into the family's daily routine, such as mealtime, bath time, activities of daily living (ADL's), playtime, etc.

Organizations / websites which provide CAS information:

www.apraxia-kids.org

<http://www.asha.org>

National Institute on Deafness and Other Communication Disorders

Speechville Express

www.kidsspeech.com

www.cherabfoundation.org

Books / Resources For Families

The Late Talker by: Marilyn C. Agan

Speaking of Apraxia: A Parents' Guide to Childhood Apraxia
of Speech by: Leslie Lindsay

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