**What is Childhood Apraxia of Speech?**

Childhood Apraxia of Speech (CAS) is a motor speech disorder that first becomes apparent as a young child is learning speech. For reasons not yet fully understood, children with apraxia of speech have great difficulty planning and producing the precise, highly refined and specific series of movements of the tongue, lips, jaw and palate that are necessary for intelligible speech.  Apraxia of speech is sometimes called verbal apraxia, developmental apraxia of speech, or verbal dyspraxia.  No matter what name is used, the most important concept is the root word “praxis.” Praxis means planned movement. To some degree or another, a child with the diagnosis of apraxia of speech has difficulty programming and planning speech movements.  Apraxia of speech is a specific speech disorder.  This difficulty in planning speech movements is the hallmark or “signature” of childhood apraxia of speech.

The challenge and difficulty that children with apraxia have in creating speech can seem very perplexing to parents, especially when they observe the skill of learning to speak developing seemingly without effort in other children.

**How Does Speech “Happen”?**

The act of speech begins with an intention to communicate.  Next, an idea forms, outlining what the speaker wants to say.  The words for the desired message are put in the correct order, using the correct grammar.  Each word contains a specific sequence of sounds (also called phonemes) and syllables that must be correctly ordered together.  All of this information is translated from an idea and information about order of sounds and syllables into a series of highly coordinated motor movements of the lips, tongue, jaw, and soft palate.

The brain must tell the muscles of these “articulators” the exact order and timing of movements so that the words in the message are properly pronounced. Finally, the muscles themselves must work properly with enough strength and muscle tone to perform the movements needed for speech.  Amazingly, all of this happens in the blink of an eye.

When speech is developing in a normal way, children make word attempts and get feedback from people around them and from their own internal sensory systems regarding how “well” the words they produced matched the ones that they wanted to produce.  Children use this information the next time they attempt the words and essentially are able to “learn from experience.”  Usually once syllables and words are spoken repeatedly, the speech motor act becomes automatic and less effortful.  The child doesn’t have to think about how to say the word or phrase they want to say. At this point, speech motor plans and programs are stored in the brain and can be quickly accessed and put together effortlessly when they are needed.  Children with apraxia of speech have the most difficulty in this aspect of speech.  It is believed that children with CAS may not be able to form or reliably access speech motor plans and programs or that these plans and programs are faulty for some reason.  Unlike children developing typical speech, speech motor plans and programs for children with CAS fail to become automatic and easily accessed when they wish to speak.

Recent research also suggests that, to some degree or another, the sensory feedback loops needed for learning and acquiring accurate speech may not work well in children with apraxia of speech.  There are several forms of feedback children use to learn speech and the complex series of movements underlying it.  First, children use auditory information (through their hearing system) to judge whether their word attempt was correct.   Researchers believe that the child’s speech processing system “couples” (or ties together) an auditory event – what they hear themselves say – with the movements of the oral structures needed to produce an utterance.  Secondly, sensory feedback called proprioception is used so that the child knows where speech structures like lips, jaw, tongue, palate are physically located and how they relate spatially to one another during speech movement.  So, for example, during speech attempts the child may not be aware of where their tongue is within the oral cavity or how its position relates to other structures like the lips.  Sensory feedback is especially important during the learning of motor plans such as in early speech learning or speech acquisition.  If these two feedback mechanisms are not working properly, speech intelligibility is affected.

## Summary: Approaches, Methods, and Goals of Speech Therapy for CAS

Many experienced SLPs use multiple methods and approaches rather than a “one approach fits all” notion, taking many of the ideas mentioned above and using them based on the individual child’s needs. There is no one “program” that is right for every child with apraxia of speech.  Commercial products, programs, apps or kits can be great tools for use in therapy by an SLP who understands the nature of apraxia and how to treat it. However, such programs alone are not the solution.  Excellent therapy for children with apraxia involves much more than an SLP buying a manual or app and doing activities in it.  Your child’s SLP needs to know precisely what to work on and specifically how to do it based on your child’s particular needs and abilities.  A packaged program, kit or an iPad app cannot do that kind of thinking!  Only a skilled, “thinking” professional can apply their special knowledge and then use “tools” to work on goals that will help your child achieve intelligible speech.

Children with apraxia of speech reportedly do not progress well in their actual speech production with therapy tailored for other articulation problems or solely with language stimulation approaches. Additionally, in young children the speech motor/sensory techniques and repetitions of words and target phrases should be woven into play activities that are highly motivational to them. What experienced therapists and families report is that children with apraxia need frequent one-on-one therapy and lots of repetition of sound sequences, and speech movement patterns in order to incorporate them and make them automatic.

Parents and caregivers are critical to success for children with apraxia of speech.  Parents should look to their child’s SLP as a coach, tutor and guide so that the practice they encourage at home is appropriate for their child’s current ability level.  Children with apraxia need to gain confidence in the speech therapy process and in themselves.  Appropriate speech therapy and home practice, woven with support and understanding, can go a long way to assist children to become “risk-takers” in their speech.

Many children benefit when provided with augmentative or alternative communication modes (AAC).  AAC can be either “low tech”, such as pictures or sign language or can be “high tech” as is the case of an iPad app or another communication device.  Sign language can also be used as a form of visual cueing for proper placement for the production of words.  Children should work to pair their best spoken attempt with a sign so that the two get associated with one another.  According to research, the proper and thoughtful use of AAC does not inhibit a child’s speech.

Finally, it is important for parents and others to understand that many children will have other needs, above and beyond the specific speech practice mentioned above.  Many children will also need to work on using language, such as how to put sentences together appropriately; use verb tenses; word endings; and so forth.  Some children may have some degree of difficulty understanding language and that will need addressed in speech therapy, in addition to the speech production practice that is needed for the apraxia part of their difficulty.  Most children will need to learn conversational skills like turn-taking, staying on topic, giving eye contact, and other “pragmatic” skills.  All of these areas would require their own approaches and are above and beyond what is needed to improve speech production.  These other areas are very important to your child’s overall success in various settings.  Be sure that your child’s SLP is planning for and addressing all areas in which your child needs speech, language, and communication help.

## How Will My Child Do Over Time? Will My Child Speak Normally?

The question of how one’s child will do over time and if he or she will speak normally is perhaps the biggest question of all for parents of children with CAS.  While there are no hard and fast statistics, professional articles and experienced SLPs report that most children with CAS, with appropriate help, eventually learn to speak clearly.  Some children may have some minor differences in their speech patterns, such as less than crisp /r/ sounds or slightly “off” vowels.  In some children, their intonation may not be perfect or others may perceive some sort of accent.  However, most children will speak in a way that others understand.  Some children progress to the point that no one would be able to tell that at one time they had a significant speech problem.  A few children, despite the best efforts of all, may not develop into primarily verbal communicators.  These children will also make progress but may need augmentative or alternative methods for the long term to help them communicate.

There are a number of factors that are likely to influence progress for children with CAS.  Some of these factors are:

* the severity of the problem
* The existence or co-occurrence of other disorders or problems, such as other speech or language diagnoses, poor health, attention issues, and cognitive problems
* the age at which the child began appropriate intervention
* the child’s ability or opportunity to practice speech outside of direct therapy time
* the child’s intent to communicate and willingness to make speech attempts

Although research is needed, it may be that CAS which is associated with genetic, metabolic, or neurological conditions may be more challenging than for children that have CAS for unknown reasons (idiopathic CAS).  It does appear that each issue, in addition to CAS, and which is layered over top of it contributes to more uncertain progress and long-term outcome.  There is much to learn and research is needed to identify children who are most in need of help and those who are likely to need long term communication support.

No one can totally predict the child’s ultimate success at becoming a verbal communicator.  Thus, be wary if you are told that your child will never learn to speak or conversely that it won’t be long until your child is speaking perfectly.  The act of learning to speak clearly is typically long and challenging for children with truly do have apraxia of speech, but they can and do make great strides and much progress with speech therapy appropriate to their needs.  With appropriate help, there are many reasons to be hopeful!

## How Fast Will My Child Progress in Speech?

First, there obviously is no “guaranteed” outcome for a child with apraxia of speech. However, many, many children can learn to speak quite well and be entirely verbal and intelligible if given early appropriate therapy and enough of it.

However, children with apraxia of speech often make **slower** progress **than** children with other types of speech sound disorders. (Note: **slower than** other types of disorders; **not slow in and of itself.**)

Children suspected to have CAS but who make very rapid progress in speech therapy that generalizes easily to new contexts, both in and outside of the therapy room, **most likely** have a different type of speech sound disorder and **NOT CAS**..

With appropriate goals, informed by detailed assessment – **AND** – appropriate, well executed speech therapy that incorporates principles of motor learning, children with apraxia of speech **can be expected to make good, steady progress** in therapy, **especially** those with age appropriate or near age appropriate cognitive, behavior and language skills.

Neither parents nor SLPs should blindly accept that, “progress will be or is slow because the child has apraxia.”

Speech progress may be very slow, even with appropriate planning and therapy, **when other co-existing problems add to the challenges**, including delayed cognition and/or receptive language, poor attention or behavior, and other significant speech diagnoses such as dysarthria (muscle weakness & low muscle tone). Additionally, children with CAS who are in poor health and not able to take full advantage of the learning and practice opportunities available to them, may demonstrate very slow progress in gaining speech production skills.

With appropriate goals and intervention, parents of children with apraxia as the *primary*diagnosis should expect progress in their child’s use of intelligible words within a three-month period. (Children with apraxia **plus other complex challenges** likely will have slower progress.)

Top of Form





Bottom of Form

### [Holly Leder, MA, CF-SLP](https://www.apraxia-kids.org/speech-pathologists/holly-leder/)

#### Business Information:

Innovative Services NW   
9414 NE Fourth Plain Blvd.   
Vancouver, Washington 98662   
(360) 892-5142   
[holly.leder@gmail.com](mailto:holly.leder@gmail.com)   
<http://www.innovativeservicesnw.org/>

[**More Information**](https://www.apraxia-kids.org/speech-pathologists/holly-leder/)

### [Elyse Lambeth, CCC-SLP, BCS-F](https://www.apraxia-kids.org/speech-pathologists/elyse-lambeth/)

#### Business Information:

Seattle Children's Hospital   
4800 Sand Point Way NE   
Seattle, Washington 98107   
(206) 987-5630   
[elyse.lambeth@seattlechildrens.org](mailto:elyse.lambeth@seattlechildrens.org)   
[http://www.seattlechildrens.org](http://www.seattlechildrens.org/)

[**More Information**](https://www.apraxia-kids.org/speech-pathologists/elyse-lambeth/)

### [Nikki Cole, MA CCC-SLP](https://www.apraxia-kids.org/speech-pathologists/nikki-cole-2/)

#### Business Information:

Nikki Cole SLP LLC   
1520 Brighton Way SE   
Olympia, Washington 98501   
(360) 352-6235   
[nikkicoleslp@gmail.com](mailto:nikkicoleslp@gmail.com)   
[http://www.nikkicoleslp.com](http://www.nikkicoleslp.com/)

[**More Information**](https://www.apraxia-kids.org/speech-pathologists/nikki-cole-2/)

### [Carmen Glasgow, MA CCC-SLP](https://www.apraxia-kids.org/speech-pathologists/carmen-glasgow/)

#### Business Information:

Engaged Speech & Language Therapy   
16641 157th Ave SE   
Renton, Washington 98058   
(425) 243-2607   
[carmen@engagedspeechtherapy.com](mailto:carmen@engagedspeechtherapy.com)   
[http://www.engagedspeechtherapy.com](http://www.engagedspeechtherapy.com/)

[**More Information**](https://www.apraxia-kids.org/speech-pathologists/carmen-glasgow/)

### [Susan Chapel, M.SP., CCC-SLP](https://www.apraxia-kids.org/speech-pathologists/susan-chapel/)

#### Business Information:

Listen First Speech Therapy, LLC   
655 Golf Club Place SE Suite A   
Lacey, Washington 98503   
(425) 686-9520   
[susan@listenfirstspeechtherapy.com](mailto:susan@listenfirstspeechtherapy.com)   
[http://www.listenfirstspeechtherapy.com](http://www.listenfirstspeechtherapy.com/)

[**More Information**](https://www.apraxia-kids.org/speech-pathologists/susan-chapel/)

### [Mariya Burrows, M.S., CCC-SLP](https://www.apraxia-kids.org/speech-pathologists/mariya-burrows/)

#### Business Information:

Olympic View Children's Therapy   
Dexter Ave N   
Seattle, Washington 98109   
(425) 409-9351   
[mariya@ovctherapy.com](mailto:mariya@ovctherapy.com)   
<http://www.ovctherapy.com/>

[**More Information**](https://www.apraxia-kids.org/speech-pathologists/mariya-burrows/)

### [Jessica Abawag, M.A., CCC-SLP](https://www.apraxia-kids.org/speech-pathologists/jessica-abawag/)

#### Business Information:

Fluens Children's Center   
3680 S. Cedar Avenue, Ste. A   
Tacoma, Washington 98409   
(253) 254-6713   
[info@fluenschildrenstherapy.com](mailto:info@fluenschildrenstherapy.com)   
[http://www.fluenschildrenstherapy.com](http://www.fluenschildrenstherapy.com/)

[**More Information**](https://www.apraxia-kids.org/speech-pathologists/jessica-abawag/)

### [Nancy Potter, Ph.D., CCC-SLP](https://www.apraxia-kids.org/speech-pathologists/nancy-potter/)

#### Business Information:

Washington State University   
PO Box 1495, 412 E Spokane Falls Blvd.   
Spokane, Washington 99210   
(509) 599-1001   
[nlpotter@wsu.edu](mailto:nlpotter@wsu.edu)   
<https://medicine.wsu.edu/directory-faculty/nancy-potter/>

[**More Information**](https://www.apraxia-kids.org/speech-pathologists/nancy-potter/)

### [Nithya Siva, M.S.; CCC-SLP](https://www.apraxia-kids.org/speech-pathologists/nithya-siva/)

#### Business Information:

NIthya Siva M.S.; CCC-SLP PLLC   
20304 11th Ave W   
Lynnwood, Washington 98036   
(425) 931-5550   
[slpsea@gmail.com](mailto:slpsea@gmail.com)   
[http://www.nithyasiva.com](http://www.nithyasiva.com/)

[**More Information**](https://www.apraxia-kids.org/speech-pathologists/nithya-siva/)

### [Alice Stroutsos, M.S., CCC-SLP; CASANA Recognized for Advanced Training and Expertise in Childhood Apraxia of Speech](https://www.apraxia-kids.org/speech-pathologists/alice-stroutsos/)

#### Business Information:

Alice Stroutsos, MS CCC-SLP   
19401 40th Ave. W. #310   
Lynnwood, Washington 98036   
(425) 582-2473   
[Astroutsos@comcast.net](mailto:Astroutsos@comcast.net)   
[http://www.lynnwoodspeechandlanguageservices.com](http://www.lynnwoodspeechandlanguageservices.com/)