

# Childhood Apraxia of Speech

Childhood apraxia of speech (CAS) appears in early childhood but can continue into adulthood. Children with CAS have problems saying sounds, syllables and words. Although a child with CAS knows what they want to say, their brain struggles to correctly move their lips, jaw and tongue in order to speak clearly and be understood.

Learning to speak is similar to learning to ride a bike: at first you must concentrate on all the steps involved but with practice this process becomes automatic. While most children memorise the steps involved in speaking, children with CAS must continually re-learn how to say a word or phrase by asking themselves:

- Which sounds do I need?
- What order do the sounds come in?
- How do I move my lips, tongue etc to make those sounds?
- Which sounds or words do I stress?

Children with CAS can become frustrated that they cannot communicate clearly or be understood. Families can also find it hard to understand why speech is so difficult for their child when for others it is often automatic or easy.

We don't know exactly how many children have CAS, but we know it is rare. Only one or two children per 1000 enrolled in speech therapy are estimated to have it. CAS used to be known as Developmental Verbal Dyspraxia, Apraxia of Speech or Verbal Dyspraxia.

## What are the signs of CAS?

There are many different signs and not all children will have the same ones. The signs also change as a child gets older and as the severity of the condition changes.

### Young children with CAS may:

- have difficulty feeding
- coo, babble or play with sounds less than other children
- use a limited range of sounds when they do begin to talk
- find it easier to understand others than talk themselves
- visibly struggle to talk, groping or searching for sounds
- be very hard to understand even to people close to them (i.e. family members).

### Older children with CAS may:

- struggle with longer words or phrases
- drop or add sounds to words (e.g., 'copa' for 'helicopter'; 'umbararella' for 'umbrella')
- say the same word in a number of different ways (e.g., 'caterpila', 'catiperla', 'cratapila' for 'caterpillar')

- stress the wrong part of a word or sentence making their speech 'robotic' or 'accented'.

Children with CAS are more likely to have language, reading and spelling difficulties. Some children are also better at understanding what is said to them (called receptive language skills) than talking themselves (called expressive language skills). Sometimes children with CAS will also have problems with small muscle movements (called fine motor skills, e.g. problems handwriting or cutting) or large muscle movements (called gross motor skills, e.g. running). In some instances, children may also have more generalised learning difficulties.

## What causes CAS?

Unfortunately we don't often know. We know that something interferes with messages accurately getting from the brain to the mouth muscles but we don't always know why that is.

CAS may be caused by genetic changes – some of which we can identify (e.g. changes to *FOXP2* gene) and others which we don't yet know.

Some neurodevelopmental or neurogenetic conditions are also associated with CAS. These include, but are not limited to:

- Down syndrome
- Autism spectrum disorder
- Koolen de Vries syndrome
- Floating harbour syndrome
- 16p11.2 deletion syndrome.

Children with these syndromes also have other health, development or cognitive difficulties.

In a small number of cases, CAS may be caused by a problem processing food (e.g. galactosaemia) or by damage to the brain from a neurological lesion or stroke.



## How is CAS diagnosed?

It is important to see a speech specialist (called a speech and language pathologist or speech therapist) to confirm a diagnosis of CAS. This is because CAS is a complex condition with a number of signs and associated conditions and speech pathologists are specially trained to be able to recognise CAS.

Your doctor may refer you to a speech pathologist but your teacher and other health professionals can too. To diagnose CAS, your speech pathologist will get your child to do a number of 'talking tests'.

CAS often cannot be diagnosed until a child is around three or four years of age because the language and speech skills of toddlers naturally vary a lot. This means that before three years of age, many children share some of the early signs of CAS (e.g. slow to talk, poor appetite etc) without actually having CAS. Because CAS is rare, if you or your speech pathologist are unsure about your child's diagnosis, it might be best to see a speech pathologist with experience diagnosing CAS.

## How is CAS treated?

Early therapy with a speech pathologist can improve your child's ability to communicate with others and reduce their frustration at not being understood. Therapy is usually most successful where it happens several times a week. While some children largely overcome CAS with therapy, some find therapy improves their ability to communicate but is unable to change the concentration CAS demands or the tiredness it can cause.

### The type of therapy will depend on:

- the child's symptoms
- their age
- the severity of their condition, and
- any other health or development problems they have.

Two treatment programs have been found to be effective for children using a rigorous research study design: the Nuffield Dyspraxia Program and the Rapid Alternating Syllable Treatment Program. You should ask your speech pathologist about how effective these programs (or the ones they are recommending) will be for your child given their age and symptoms. Therapy may include activities designed to strengthen literacy and language skills, given children with CAS have a greater risk of problems with these skills.

### You or your child may also benefit from seeing:

- Psychologists or counselors if you or they are struggling to cope
- Occupational therapists or physiotherapists if your child also has fine and gross movement challenges
- Neuropsychologists if your child also has trouble with attention, memory or other cognitive issues

## Things to remember

- Children with CAS have trouble correctly moving their mouth muscles so they can speak clearly and be understood.
- CAS begins in childhood but often remains throughout adulthood.
- CAS can be confusing and frustrating for both children and their families.
- It is important to seek help early and get the right treatment and support for your child's symptoms and age.

### For support contact:

Childhood Apraxia of Speech Support Australia Inc. (CASSA Inc).  
[www.casaaustralia.com.au](http://www.casaaustralia.com.au) | [casaaustralia@hotmail.com](mailto:casaaustralia@hotmail.com)

### For more information on causes for CAS contact:

[angela.morgan@mcri.edu.au](mailto:angela.morgan@mcri.edu.au)

### About us:

The Centre of Research Excellence in Child Language is a collaboration of child speech and language experts. The Centre has developed this fact sheet with the key family support groups of Victoria and Queensland, and CASSA Inc.

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