

## Speech Sound Disorders

**Articulation** is the formation of distinct sounds in speech. Children with speech sound disorders have difficulty producing speech sounds correctly.

Sometimes, it is hard for children with speech sound disorders to be understood, and their socialization and learning may be affected.

The following are speech sound disorders that can be seen in children with 22q11.2DS.

### Compensatory Articulation Disorders

Children with a compensatory articulation disorder have difficulty making certain sounds the usual way in the mouth due to a structural abnormality such as a cleft palate or velopharyngeal dysfunction (VPD). They make the sounds by **using other parts of the speech mechanism (usually the throat or the nose) differently**.

Example 1: The fricative **/s/** is normally made by constricting the airflow out of the mouth and producing friction at the front of the mouth. Watch [this video](#) for /s/ and two errors involving /s/:

- **Nasal fricative** /s/: Air escapes through the nose
- **Pharyngeal fricative** /s/: The tongue is at the back of the throat, and the friction point is low in the throat

Example 2: The stop (or plosive) **/k/** is normally made when the back of the tongue goes to the roof of the mouth, and the closed palate cuts off the airflow. Then the tongue drops and pushes the sound out in a quick burst. Watch [this video](#) for /k/ and an error involving /k/:

- **Glottal stop** /k/: Instead of stopping at the palate, the airflow stops at the the vocal cords.

Compensatory articulation makes speech hard to understand and affects velopharyngeal closure. **Speech therapy** can correct these errors, improving intelligibility and velopharyngeal function. See this [Speech Therapy Techniques \(pdf\)](#) from Cincinnati Children's Hospital for details.

### Obligatory Articulation Disorders (Passive Errors)

Children with an obligatory articulation disorder **put their speech structures in the right place** when they talk, but their speech is distorted because of structural problems such as cleft palate and VPD.

Obligatory articulation disorders include:

- Nasal emission of air
- Reduced pressure on consonant sounds
- Nasal sounding speech sounds, such as /m/ for /p/ and /b/
  - Example: Saying "maymee" instead of "baby"

Surgery is often needed to correct anatomical issues and improve speech production. See the **Palate Series** in the [Health Conditions Explained](#) section of our website.

### Speech Intelligibility

Speech intelligibility refers to how well someone's speech is understood. Those closest to a child with poor speech intelligibility may understand their speech best. Knowing the context (what the child is speaking about) often helps with speech intelligibility.

### How common are articulation errors in 22q11.2DS?

Compensatory and obligatory articulation errors are common in 22q11.2DS and occurs in the presence of structural differences, such as cleft palate and/or velopharyngeal dysfunction.

Phonological/developmental speech sound disorders are common in children with 22q11.2DS.

### Speech Production in 22q11.2DS

Many children with 22q11.2DS show a limited and delayed use of speech sounds. In fact, compared to children with children with cleft palate or Trisomy 21 (but not 22q11.2DS), children with 22q11.2DS perform worse in speech sound production.

## Speech Sound Disorders (continued)

### Phonological Speech Sound Disorder

Normal speech sound development usually follows a [predictable](#) pattern. It is typical for young children to make errors such as omitting and misplacing sounds in some words; they will grow out of this problem. On the other hand, despite following a normal pattern of speech development, children with a phonological speech sound disorder continue to make errors that should have disappeared earlier. These errors are predictable, rule-based, and often affect more than one sound. Two examples include:

- **Fronting:** Making a sound that should be made at the back of the mouth (/g/) in the front of the mouth instead (/d/): “doe” instead of “go”
- **Final consonant deletion:** Being able to say sounds, such as /k/ but omitting them at the end of words, e.g. “lie” instead of “like”

Speech therapy can help correct these errors.

### Developmental Articulation Disorders

Children who have developmental articulation disorders may show:

- **Substitutions:** A sound is replaced: “thing” for “sing”, “wabbit” for “rabbit”
- **Omissions:** Certain sounds are left out: “cu” for “cup”, “poon” for “spoon”
- **Distortions of the sounds of speech:** A sound is altered or changed: When making an /s/ air flows out of the sides of the back teeth instead of out of the front of the tongue between the front teeth.
- When speech problems result from a structural abnormality, it is important to correct the structural condition.

### References / Resources

#### Clinical practice recommendations / Medical research reports

- [Updated clinical practice recommendations for managing children with 22q11.2 deletion syndrome](#) – 2023
- [Speech-Language Disorders in 22q11.2 Deletion Syndrome: Best Practices for Diagnosis and Management](#) – 2019
- [Treatment of Speech Sound Errors in Cleft Palate: A Tutorial for Speech-Language Pathology Assistants](#) – 2023 (American Speech-Language-Hearing Association, ASHA)
- [Children's English Consonant Acquisition in the United States: A Review](#) – 2020
- [Speech-language pathologists and prosody: Clinical practices and barriers](#) – 2020

#### Websites of medical or academic institutions

- [Articulation Disorder](#) – Cleveland Clinic
- [Intro to Compensatory Articulations](#) – a video by Smile Train Programs (Charity for cleft lip and cleft palate)
- [Speech problems – articulation and phonological disorders](#) – The Royal Children's Hospital Melbourne
- [Speech Therapy Techniques: For Errors due to Clefts or Velopharyngeal Dysfunction](#) – Cincinnati Children's Hospital
- [Speech Sound Disorders-Articulation and Phonology](#) – American Speech-Language-Hearing Association (ASHA)
- [Sound Development Chart](#) – Wisconsin Department of Public Instruction (2021)

### Abnormal Speech Prosody

In addition to consonants and vowels, prosody of speech is the variation in speech rate, intonation, rhythm, and stress patterns. It helps convey meaning, emotions, and social cues.

Abnormal speech prosody has been observed in children with motor speech disorders, such as apraxia, as well as autism spectrum disorder, which can be a part of 22q11.2 deletion and duplication syndromes.