

# Speech Concerns

The speech defect is the most significant functional disturbance of cleft palate. The production of speech is an acquired skill that initially involves sucking, chewing, swallowing, and breathing. It is an imitative, learned activity that depends on a variety of functioning organs. Since a cleft of the palate prevents the usual bony and muscular separation of the oral and nasal cavities, controlling and directing the air stream during speech become impossible. It is this disturbance that is basic to the speech defect of cleft palate. Cleft lip does not usually result in speech problems.

It is estimated that 10% to 25% of children with clefts of the palate have speech problems resulting from *velopharyngeal insufficiency*, or inadequate closure of the oral-nasal orifice. Other conditions related to clefts can cause problems such as: improper functioning of the muscles that move the soft palate; abnormalities in the size and shape of the muscular and skeletal structures that surround the soft palate due to disturbance in growth; physical interferences with the soft palate function, such as adenoids and tonsils; various types of neuromotor difficulties;

faulty speech learning of unknown origin; and submucous cleft palate. The latter condition can be easily missed; it is characterized by a bifid (split) uvula—that is, there is a cleft in the soft palate and posterior portion of the hard palate masked by intact overlying tissue. Not all children with a submucous cleft have speech problems.

In children with clefts of the palate, surgical repair of the cleft allows for proper feeding, swallowing, and the opportunity to develop normal speech. Without closure of the hard and soft palate, it is sometimes possible for speech to develop normally even without the use of an obturator. However, in most instances, until the palate has been closed, air can escape through the nose, affecting speech sounds. Unable to properly direct speech out of the mouth, children with open clefts may also develop *compensatory* sounds, that is, they may replace speech sounds with abnormal sounds. Such sounds are generally characterized by abnormal tongue and throat movements.

Palate repair alone may not assure ordinary speech development. Although the surgeon may close the palate, the child must still learn to coordinate the sounds of normal speech. Therefore, even after the palate is repaired, some children with clefts will still experience hypernasality (excessive escape of speech sounds through the nose) because of inadequate functioning of the soft palate and/or lateral pharyngeal wall.

In children who also have clefts of the lip and the alveolus with teeth in abnormal positions, articulation (the ability to make specific sounds) may also be impaired. This results from abnormal space in the mouth, the inability to position the tongue tip properly in relation to certain teeth, and an imbalanced relationship between the upper and lower lips.

Finally, chronic hearing loss in early infancy and childhood, due to frequent ear infections (otitis

media), may result in impaired acquisition of speech and language skills; that is, without normal hearing ability, a child's speech will be distorted.

Children who have clefts and no other abnormalities should develop language about the same time as other children, and should be encouraged to speak in an uninhibited, natural manner, even if there is excessive nasality and impaired articulation.

Some sounds ordinarily come out of the nose and have a natural nasal resonance, such as *m* and *n*. Therefore, words such as "mama," "no," or "nanny" are generally easier to articulate for the child with a cleft, and they are usually understood by parents without difficulty. Words with sounds that typically do not have any nasal resonance (such as *p*, *b*, *t*, *d*, *f*, *v*, *s*, or *z*) may be difficult for the child to pronounce and for parents to understand—and may therefore go unrecognized.

Difficulty in acquiring normal speech may have negative effects on your child's language development. If sounds cannot be made into words that are understood by others, your child's desire to communicate may be affected. This may delay the development of vocabulary and grammar and sentence construction. If, in your child's case, the onset of speech is late or language acquisition (understanding what is said and expressing oneself) is inadequate, an extensive evaluation should be performed by a speech/language pathologist to determine whether the problem is one of a failure to understand the child's speech, or whether the problem may be related to additional congenital anomalies present in the child.

## Your Child's Speech/Language Development

You may have heard that your child's speech may be affected by the cleft and be difficult to understand, but you may not have specific information about the speed of language development. A basic understanding of speech and language development will be of great value to you as your child's verbal abilities begin to develop.

Most children with cleft palate will display the proper speech and language skills for their age, but some will have problems. As parents, you may not know how to approach your child's speech and language development. You may not know what problems might materialize, how to cope with such problems, or what to do to help your child develop normal speech and language skills. The following describes what you can expect regarding your child's speech and language development and how you can play an extremely important role in preventing and correcting possible speech difficulties.

### ***Infancy***

Though some cleft palate centers or teams may not suggest contact with a speech/language pathologist until a child reaches his or her third birthday, early stimulation and prevention of problems (between birth and three years of age) is extremely important—this is a child's most important time for speech and language development. If you are given few or no suggestions about hearing, speech, and language stimulation, you are left to conclude that nothing can be done for your child's speech until after surgery. This is not the case! Even at this early age, a multidisciplinary approach is needed in which you are the key

component, and the speech/language pathologist, audiologist, pediatrician, and surgeon work together with the family for proper management in the future.

Many cleft palate teams and centers have programs designed to train you in the course of normal speech and language development, how to provide the most enriched speech and language environment for your child, and how to stimulate normal speech development, thus preventing any abnormal speech that may lead to inappropriate sound production by your child. The role of the speech/language pathologist during your child's infant years is to empower you with information so that you and other family members can aid your child's speech and language development. Contact with you and your child soon after birth with continued follow-up to monitor progress and development (every three months until age three) is recommended to provide support and direction to parents, and to allow for therapeutic intervention by the speech/language pathologist as soon as it is judged necessary.

It is important that the speech/language pathologist on the multidisciplinary cleft palate team get to know your child. Frequent contact with him or her can be difficult because of geographical distances, but he or she can coordinate services between the team members and your local speech/language pathologist. The two can work together for the benefit of your child.

### ***What to listen for***

Infants begin to produce sounds at two to four months. These sounds (cooing, babbling, and squealing) are initially produced at the back of the mouth and throat and are known as *nonreflexive consonants*. In an infant with a cleft, it is important that the child does not engage in this stage of initial

sounds for a prolonged period, because this form of speech has the potential to reinforce inappropriate positioning of the tongue, causing sounds to be made permanently in the back of the mouth and throat. In the normal course of development, nearly all sounds come to be produced in the front of the mouth.

Babbling becomes increasingly elaborate as more complex combinations of sounds are made and the length of the utterances increases. You will want to ensure that the “front of the mouth” sounds *p*, *b*, *t*, and *d* are being produced by 14 months.

All sounds are different, so they shouldn’t sound the same. Some children with cleft palate may develop a speech pattern that sounds like they are producing *m* or *n* for most of their sounds. Additionally, an increase in the use of sounds not typically heard in your language may alert you to the development of abnormal speech patterns.

The nasal quality (hypernasality) common in children with cleft palates may be very mild or very severe. It is often accompanied by bursts of air (nasal emission) on certain sounds, or there may simply be a general nasal sound (nasal turbulence). A child may exhibit nasal grimacing or unusual facial movements while making certain sounds.

By the age of twelve months, your child should begin to acquire a small vocabulary. By twenty-four months, he or she should be starting to put words together in two-word sentences with a fairly large vocabulary. If these milestones are not reached within two or three months of the expected age, consult a speech/language pathologist. Early parental involvement and the development of positive attitudes toward early speech and language stimulation are extremely important. This calls for parental training—parents must learn those techniques necessary to stimulate normal infant speech development so that the child may achieve normal speech and language function.

**What you can do**

Accept your child's speech in an atmosphere of warmth and patience. This will provide him or her the best chance to develop normal speech and language. Speak to your child face-to-face so that he or she can see your lips and tongue moving during speech. Exaggerate sounds, making them louder and longer, while using facial expression and inflection in your voice.

Stimulate use of the sounds made at the front of the mouth by using a lot of simple words involving the sounds *p*, *b*, *t*, and *d*, such as "papa," "bye-bye," "top," and "dada." You can do this by talking about what your child is doing and what you are doing, during daily activities such as eating, dressing, bathing, and playing.

You can also have them imitate your labial and dental sounds (*p*, *b*, *t*, and *d*), and reward him or her with attention, smiles, and hugs when these sounds are attempted and made. Engage in sound play with your child using such games as copycat, imitating each other's sounds. You can also engage your child in sound-associated lip and tongue play (making funny faces).

Don't *demand*, however, that your child imitate your correctly produced sounds or words. This will frustrate your child, and you may lose his or her attention. Providing the appropriate sound environment is the key!

Reinforce normal receptive (comprehension) and expressive (verbal) language development by stimulating verbal requests and comments and by increasing your child's vocabulary knowledge and use. Incorporate these recommendations into activities throughout the day, and encourage other family members to use these strategies. Consistency is the key.

If you suspect your infant has a problem in speech and language development, have him or her examined

by a speech/language pathologist. Don't wait! It is also important to ensure that your child has adequate hearing by having his or her ears checked by physicians and audiologists. Follow their recommendations. A child needs to *hear* speech sounds for normal speech and language to develop.

## Toddlers and School-Age Children

As children approach their third birthday, they should reach certain milestones in their speech and language development. This includes understanding all that is said to them, expressing themselves in one- to three-word sentences, using a vocabulary of approximately one thousand words, and producing most verbal sounds with near accuracy.

By the time a child is twenty-four to thirty months of age, he or she should be producing sounds such as *p, b, t, d, s, f, k,* and *g* fairly clearly. If you suspect your child is having difficulties with articulation (how various sounds are made)—speech is persistently unclear, there is a fair amount of hypernasality, or your child does not sound like others of the same age—a full speech/language evaluation is required.

## The Speech/Language Pathologist's Role

The speech/language pathologist will determine your child's speaking ability and distinguish any errors in sounds that may exist. If there are problems with certain sounds, it is important to determine whether these sounds are developmental errors (those that can exist in the speech of any

child at a certain age) or errors directly related to the cleft palate.

Along with articulation, the speech/language pathologist will evaluate the amount of air emitted from the mouth and nose (resonance) while your child is speaking. If an excessive amount of air is being emitted from the nose (hypernasality), a determination must be made about whether your child is obtaining adequate closure of the soft palate and side wall muscles (lateral pharyngeal walls) at the opening into the back of the nose (velopharyngeal port). This closure is very important for the production of sound.

### ***Compensatory articulation***

If your child is unable to obtain velopharyngeal closure, there may exist a leakage of air through the nose during speech. This may contribute to poor overall understanding of your child's speech by others, and, because of poor muscle "learning," may contribute to your child's use of inappropriate muscles in the throat to produce sounds instead of using the lips and tongue. Such sounds are often regarded as substitutions and you may hear them referred to as "compensatory articulation." The most common compensatory sounds are known as *glottal stops* and *pharyngeal fricatives*. Glottal stops are made with the muscles of the throat (pharynx) and vocal folds (larynx) in an attempt to make the following sounds: *p*, *b*, *t*, *d*, *k*, and *g*. Glottal stops sound like a grunt, a hard *h*, or a throat sound. Pharyngeal fricatives are sounds that are made at the back of the mouth and throat for *s*, *z*, *f*, *v*, *sh*, and *ch*. These may sound like a hiss, a lisp, or a friction noise.

The speech/language pathologist will likewise examine the areas of voice, fluency, and language with clinical observation and standardized tests. If

there are difficulties in comprehension and expression of language, appropriate recommendations will be made regarding language therapy.

If difficulties in speech production and resonance occur, several clinical studies are required to further diagnose the degree of severity. Videofluoroscopy (an x-ray motion picture of tongue and palate movement during speech) and nasoendoscopy (the use of a fiber-optic scope allowing a direct view of the velopharyngeal muscles during speech) are the two most common diagnostic studies. These studies are usually not performed until the child is four years old and is able to provide an adequate speech sample.

## Speech Therapy and Surgical Options

Speech therapy is necessary when your child is producing sounds with distortions or substitutions and when it is difficult to understand more than 20% of what he or she is saying. If a developmental articulation disorder exists, articulation therapy may be recommended. However, if compensatory articulation exists, usually accompanied by hypernasality, the speech pathologist will determine the appropriate course of management in conjunction with rest of the cleft palate team. Several options exist depending on the nature and severity of the compensatory articulation and hypernasality.

With mild-to-severe hypernasality and good oral articulation, several treatment options exist. Some centers and cleft palate teams may suggest a prosthetic obturator to block the cleft space. This acrylic device inserted into the cleft area will stop the air flow into the nose (nasal cavity) and redirect it into the mouth (oral cavity). An alternative is surgical management of velopharyngeal insufficiency. This

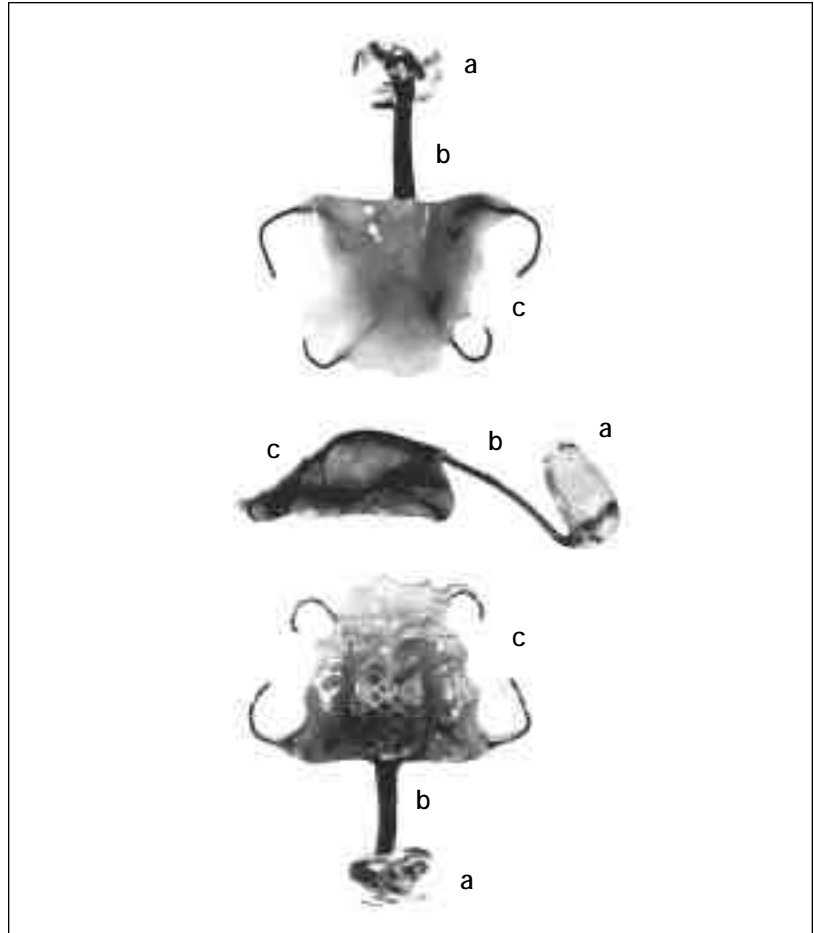
procedure, often referred to as *pharyngeal flap surgery*, provides a permanent bridge of tissue to limit and direct air flow away from the nose and through the mouth. A pharyngeal flap, which is a sail-like structure, restricts food, liquids, and much of the air from entering the nose. The surgery is a treatment option for hypernasality only; it does not treat articulation problems. An examination performed before surgery helps the surgeon determine what type of flap is required (wide or narrow), the location of the flap, and the direction of the flap (centered or shifted to the right or left). This information ensures greater success in the elimination of hypernasality.

One appliance, the palatal lift appliance, is used in the treatment of palatopharyngeal incompetency only for those cases where the soft palate has been identified as being of inadequate length. Traditionally, palatopharyngeal incompetency has been managed by means of pharyngeal surgery, appliances, or a combination of both. The appliance is recommended when the patient or caregivers do not wish to pursue surgical management. A palatal lift appliance elevates the soft palate with the objective of decreasing the opening of the valve space to normal proportions during speech. Some believe that the appliance improves palatopharyngeal function by constant and continuous stimulation of the soft palate muscle.

The palatal lift appliance may be used from one to four months (continuous or part-time wear) along with articulation therapy. Speech therapy is initiated once the appliance is inserted, and for school-age children the appliance is usually worn only during school hours. A part-time wear schedule can be used on weekends and holidays, or over the summer. It must be stressed that treatment with the palatal lift appliance is not for all patients and is not always successful.

**Speech aid appliances can help those with clefts improve their speech.**

This appliance carries the speech bulb to the pharynx behind and above the soft palate in order to channel more air through the mouth. The speech bulb (a) fits into the nasopharynx, above the level of the hard palate. The shank (b) carries the speech bulb on one end and is attached to the body of the appliance. The body of the appliance (c) has wire tooth clasps to hold the appliance in place. False teeth may be attached if teeth are missing. It also helps maintain the corrected palatal arch form.



Mild-to-severe hypernasality accompanied by a mild-to-severe compensatory articulation pattern may call for intensive articulation therapy (three to five times per week) to facilitate front-of-the-mouth sounds, air flow through the mouth, and strong sound production. In some cases, intensive articulation therapy may be used in conjunction with a speech bulb appliance. This acrylic bulb on an extended palatal ball-like addition (made by the orthodontist or prosthodontist) fits into the space of the insufficiency. It is used in conjunction with articulation therapy. Some believe it stimulates muscle wall movement, thus reducing the size of the hole.

**A palatal lift appliance.**

This appliance is used to elevate the soft palate to improve palatopharyngeal function by continuous stimulation of the soft palate muscle. It is used only when the soft palate is slightly short. The rear extension of the appliance makes contact with the soft palate.



This in turn reduces the hypernasality and, with articulation therapy, facilitates normal sound production. The bulb's size is reduced over time as muscle movement improves. This course of treatment is viable because it can reduce the size of the muscle flap required. This is very important for children with small airways or other congenital anomalies that may affect breathing. Pharyngeal flap surgery may still be an option once the speech bulb reduction program and articulation therapy have been completed (that is, when the maximal potential for velopharyngeal closure will have been achieved).

Speech therapy can be extremely helpful before secondary palatal (pharyngeal flap) surgery. It has been shown to decrease hypernasality, facilitate good front-of-the-mouth articulation, and decrease the complexity of the procedure to be used. At times it eliminates the need for surgery altogether.

## Articulation Therapy

Articulation therapy should be structured according to your child's attention span, intellectual and motivational capabilities, and therapeutic needs. Sessions are individualized (one-on-one) and intensive (three to five visits per week) and typically last at least thirty minutes per visit. Parental involvement in the therapeutic process, within the therapy setting as well as in the home, is encouraged as it provides continuity and assures consistency of sound-producing technique. Also, the speech pathologist should be in constant contact with the cleft palate team, as well as with schoolteachers, to update each professional on your child's progress and to discuss future management.

Although many speech pathologists continue to support "muscle training exercises" such as blowing, sucking, and swallowing, such activities *do not* assist in speech production. Good, normal sound production is best facilitated by normal speaking tasks.

### ***Does Orthodontic Therapy Affect Speech?***

A highly integrated multidisciplinary team is vital in the care of a child with a cleft because many procedures and treatments may occur at the same time. You may find your child in articulation therapy at the same time orthodontics is being performed. During orthodontic therapy, many appliances are placed in the mouth that may temporarily affect sound production and/or change the tone of the sound (oral resonance). However, that should be of no concern to you at this time.

Braces do not have long-term effects on sound production. Once placed, temporary sound distortions may occur due to displacement of the tongue

and lips, but the lips and tongue quickly accommodate the braces and the child easily compensates in speech. If maxillary expansion appliances are used, the place where the tongue contacts the palate for certain sounds may change temporarily. However, the child usually compensates and sounds may be only slightly affected. Maxillary expansion appliances, because they move the palatal segments apart, may expose a small hole (fistula) in the palate. This fistula, which was hidden, may now contribute to hypernasality, decreased air pressure in the mouth, liquids seeping from the nose (nasal regurgitation), or to a compensatory sound pattern. However, fistulas can be temporarily corrected by speech appliances (obturators) or surgically repaired when necessary.

The role of speech/language pathology is an extremely important one in the health care management of your child with a cleft lip and/or palate. Preventing problems in language development is easier than trying to treat them once they are established. The best time to begin preventive measures is during the first few years of life. Keep in mind that a multidisciplinary approach is necessary, one in which you the parent as well as the team members are an integral part of aiding your child's development of normal speech and language skills.