American Speech-Language-Hearing Association

SPECIAL INTEREST GROUP 5
Craniofacial and Velopharyngeal Disorders

THERAPY TECHNIQUES FOR SPEECH SOUND DISORDERS ASSOCIATED WITH REPAIRED CLEFT PALATE

Handout to Accompany Poster

Developed by Special Interest Group 5 (2014, Updated 2017, 2025)

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General Goals for Children with Cleft Palate Speech Sound Disorders:

1. Establish correct oral articulatory placement and/or airflow direction using articulation (motor-phonetic), and/or phonological (linguistic-phonological) approaches.
2. Teach place, manner, voicing, and nasal vs oral airflow/resonance during speech sound production.
3. Teach new motor speech patterns to replace compensatory articulation errors.

Definitions used for this handout and accompanying poster

1. **Compensatory errors (active errors):** Learned misarticulations that some children with cleft palate or velopharyngeal dysfunction may use to bypass the velopharyngeal port. These errors required speech therapy to correct and typically persist after VPI surgery.
2. **Obligatory errors (passive errors):** Speech sound distortions caused by a velopharyngeal or oral structural difference. The articulator placement is intact, but the structure causes weakening or distortion of the sound. Surgical or prosthetic management is required, speech therapy alone will not change these. Teach place, manner, voicing, and nasal vs oral airflow/resonance during speech sound production.

Compensatory and obligatory articulation errors CAN co-occur, requiring a combination of surgical/prosthetic management and speech therapy to correct

3. **Velopharyngeal Dysfunction (VPD)**: An umbrella term used to encompass velopharyngeal insufficiency, incompetence, and mislearning; all situations in which the velopharynx does not fully separate the nose from the mouth for non-nasal speech sounds.

General Therapy Guidelines:

1. Non-speech oral motor exercises (NSOMEs) are NOT effective for this population.
2. Target more visible phonemes and more easily cued phonemes first.
3. Rename the target sound, if necessary, to facilitate new motor learning.
4. Obtain target phoneme in isolation with 100% mastery before advancing to higher levels of the hierarchy.
5. Use phonetic placement with multisensory cues to provide auditory, visual, and tactile feedback.
6. If VPD is present, use nasal occlusion to teach oral airflow or prevent nasal escape. Fade from nasal occlusion as oral placement for target phoneme emerges.
7. Possible biofeedback tools include a small mirror placed under the nose, a tissue in front of the mouth,See-scape, or a listening tube/straw between the nose and ear.
8. Speech therapy is appropriate if compensatory articulation errors are present, even if the child has an insufficient velopharyngeal mechanism. Therapy may begin before surgical intervention.
9. Compensatory articulation and obligatory errors MAY co-occur, requiring a combination of surgical management and speech therapy to address.

Compensatory Articulation Errors: Learned misarticulations that some children with cleft palate or velopharyngeal dysfunction (VPD) may use to bypass the velopharyngeal port. These require speech therapy and typically persist after VPI surgery.

1. **Glottal stops** (/ʔ/) generally substitute oral stop consonants [p, b, t, d, k, g] and sometimes /h/ but also can replace any consonant phoneme. Glottal stops can be co-produced with any oral placement, meaning the child postures the tongue or lips so that it looks like she is producing the consonant accurately, but simultaneously is co-producing the glottal stop. Listen closely and be careful not to reinforce co-productions because these are still errors.
2. **Pharyngeal stops** are usually substituted for velar stops /k/ and /g/. They are produced with the base of the tongue against the posterior pharyngeal wall.
3. **Pharyngeal fricatives** often substitute oral fricatives or affricates [f, s, ʃ, ʧ, ʤ] and less often stop/plosive consonants. They are produced using the base of tongue approximating the posterior pharyngeal wall.
4. **Nasal fricatives** are commonly substituted for fricatives or affricates [f, v, s, z, ʃ, ʧ, ʤ] but may also replace other high-pressure consonants. The nasal fricative is a voiceless nasal articulated with simultaneous exclusive audible nasal air emission. The velopharyngeal (VP) port is open, and airflow is directed through the nasal cavity. It can be articulated in any of the three placements for nasals (bilabial, alveolar or velar) or with labiodental placement (like /f/ or /v/). Any of these can be made with co-produced turbulence (snorting sound). Turbulent nasal fricatives are usually produced more posteriorly in the nasal cavity while non-turbulent nasal fricatives are usually produced more anteriorly in the nasal cavity.

Articulatory or Phonological Differences: Other common errors seen in children with cleft palate or VPD that require speech therapy intervention.

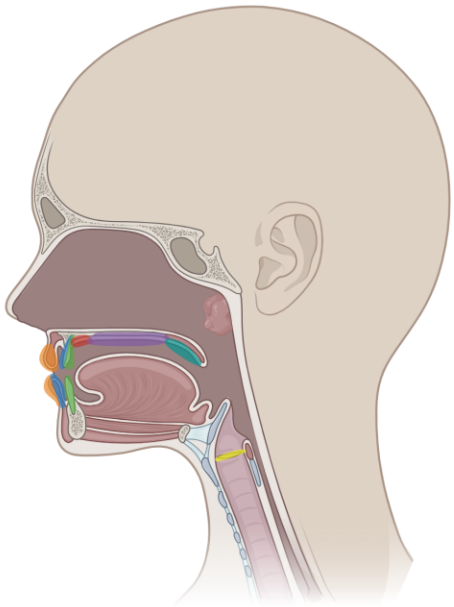
1. **Mid-dorsum palatal stops** substitute alveolar and velar stops. The sound is produced by the mid-dorsum of the tongue contacting the middle of the hard palate in the approximate place of /j/.
2. **Mid-dorsum palatal fricatives** are commonly substituted for alveolar fricatives /s/ and /z/ and may also replace /ʃ/. The tongue tip is dropped, tongue grooving is reduced and the mid-dorsum of the tongue approximates the mid-portion of the hard palate.
3. **Lateral distortions** often substitute [s, z, ʃ, ʒ, ʧ, ʤ]. The sound is produced with air flowing laterally over the tongue instead of in a single anterior path, due to inappropriate tongue raising.
4. **Ingressive airflow** can substitute any phoneme (including nasal fricative errors). Affected phonemes are produced with inappropriate ingressive (inhalatory) airflow.
5. **Lip pops** replace [p, b] and are produced by smacking or popping the lips together.
6. **Tongue clicks** may replace orals stops. This sound is produced by creating suction between two articulators such as the tongue and hard palate.
7. **Phonological processes** as seen with many children without clefting are the most common error types in children with clefts. These are treated with linguistic-phonological approaches as use in other populations.

SPECIFIC SPEECH THERAPY TECHNIQUES

How to Achieve Bilabial Stop Consonants

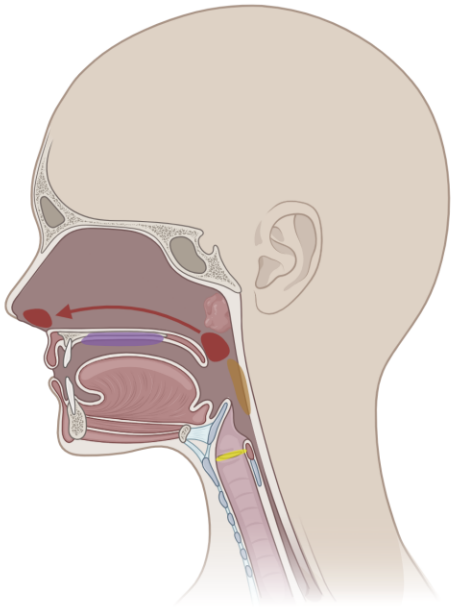
1. **Produce /m/ with nasal occlusion to achieve /b/:** Model the syllable /ma/. When the child imitates "ma" praise them to reinforce the imitation. Model /ma/ again and when the child repeats it occlude their nostrils using two index fingers to redirect the airflow orally. Praise this, "good job! That air came out of your mouth!" After a few turns with this, then model /ba/ and occlude their nostrils for their turn, each time praising the oral airflow. Next, model /ba/ but this time, don't occlude their nostrils, and move your hands towards their face as if you will. If the production sounds like /ma/ say "Oops! That came out your nose! Try it again!" and repeat the model, this time covering their nostrils so you can provide positive reinforcement. Continue in this manner to see if he can improve with more orally directed airflow while maintaining correct placement.
2. **Maximize oral pressure by "puffing" cheeks** (takes focus off the larynx): Pair this with speech production immediately, cueing the child to puff the cheeks, then release into a /p/ or /b/ approximation.

3. **When the error is a glottal stop substitution, whisper the target phoneme/word**: It can be easier to start with voiceless phonemes for a variety of reasons: 1) it pushes less airflow into the system and 2) it does not involve voicing and so is less likely to trigger an /m/ or glottal stop substitution, if this is the child's error pattern. We can use this principle to teach children to feel oral airflow on their hand. Hold the child's hand in front of your own mouth and whisper "puh puh puh." Tell them the air is coming out of your mouth and that they get to take a turn. Hold their hand in front of their mouth and model a whispered /p/. If the airflow is nasal and it sounds like a whispered /m/, say "Oops! The air came out your nose!" and repeat the model, this time covering his nostrils when it's their turn until they produce the correct target.
4. **Use a visual cue to represent air "popping" from the mouth** (tissue, cotton ball): This works best for voiceless phoneme /p/. Holding a tissue close to the mouth and cueing the child to produce /p/ with airflow release will cause the tissue or cotton ball to move. Reinforce this with a lot of enthusiastic praise.
5. **Produce /h/ and close and open lips lightly:** This will cause the child to produce a medial /p/ approximation, which can then be reinforced and stabilized.



Normal Place of Articulation

- Bilabial: /p, b/
- Labiodental: /f, v/
- Interdental: /θ, ð/
- Alveolar: /t, d, s, z/
- Palatal: /ʃ, ʒ, tʃ, dʒ/
- Velar: /k, g/
- Glottal: /h/



Altered Place of Articulation

- Glottal Stops
- Nasal Fricatives
- Pharyngeal Fricatives & Stops
- Mid-Dorsum Palatal Fricatives & Stops

How to Achieve Alveolar Stop Consonants:

1. **Produce /n/ with nasal occlusion to achieve /d/:** This procedure is identical to that listed for shaping /m/ to /b/, with the only difference being that /n/ is modeled instead of /m/, and the desired result is a /d/ instead of a /b/. (/n/ and /d/ differ only in that /n/ is nasal and /d/ is oral, just as /m/ and /b/ differ only in that /m/ is nasal and /b/ is oral).
2. **Whisper /n/ with nasal occlusion to achieve /t/**
3. **Produce /s/ and "stop" the airstream:** Instruct the child to produce a "short /s/." Model production of /t/ into /s/ (tsss, tsss, tsss) and have the child imitate you. Then focus on shaping the /t/ and removing the production of /s/ following it.
4. **Produce /θ/, retract tongue, and "stop" the airstream:** This is similar to the previous strategy, but uses /θ/ followed by /t/ like this [θt, θt, θt] and shaping from there.
5. **Use sound shaping from /p/ to produce /t/:** Start by modeling a /p/ sound, then tell the child to make a "funny /p/" with the tongue. Protrude the tongue between the lips, and make a "p" sound again. Next, move the tongue to the upper lip only, then the upper teeth, then finally behind the upper teeth.
6. **Include minimal pairs activities**: Particularly if the child is collapsing multiple high-pressure consonants into one compensatory error. Contrast "mouth sounds" for correct high-pressure phonemes from "throat sounds" for glottal or pharyngeal productions or "nose sounds" for nasal fricatives.

How to Achieve Velar Stop Consonants:

1. **Produce /ŋ/ with nasal occlusion to achieve /g/:** Like /m/ to /b/ and /n/ to /d/ described above.
2. **Produce /t/ or /d/ while depressing the tongue tip**
3. **Have child pretend to "gargle" with head tilted back:** Instruct the child to "gargle" after modeling /k/ or /g/ production with head tilted back. When error is anterior to velar placement, be cautious to not reinforce pharyngeal placement, which can be difficult to differentiate from /k/ in children.
4. **Attempt VC syllable with high vowel and velar:** Using syllables like [ik, ig] can help find the correct back placement by contrasting the velar placement of the consonant with the high front vowel.
5. **Whisper technique if child is substituting glottal stops:** Similar to technique described for bilabials.
6. **Use a velar fricative approximation:** Sometimes a fricative approximation is easier than a stop for velars. Teach this in isolation, then change the manner to a stop.
7. **Minimal pair activities:** as described above for alveolars.

How to Achieve High-Pressure Oral Fricatives:

1. **Use "Long-t" technique (t-t-t-tss) to produce /s/:** Use cognitive reframing and rename /s/ as a new sound called "long T." to avoid triggering the compensatory error associated with /s/. Consider adding tactile cues by tapping an outstretched arm for rapid production of /t/ and then sliding down the arm for /s/ when producing t-t-t-tsss. Once production is accurate in isolation say "Hey, this sounds like the sound we make when we say "see" or "so." Let's use our 'long t sound' to say those words."
2. **Bite the lip and blow for the /f/:** This provides tactile input on child's hand.
3. **Protrude tongue for /θ/ and retract for /s/**
4. **When a nasal fricative is substituted:** Occlude the nostrils to show the child they are sending airflow through the nose. This can be upsetting at first to the child but explain their "nose sound got stuck" and to make it a "mouth sound to get it unstuck." Explain and reinforce that "it came out of your mouth, not your nose" like with the minimal pair activity.
5. **Be careful not to reinforce a mid-dorsum palatal fricative** as this is an error. We want children to use anterior placement for /s/ and /z/ and feedback needs to be specific regarding anterior oral place features. Make sure this error is not related to dentition (e.g., malocclusion, ectopic or supernumerary teeth), but rather to backed placement of articulation.

If ingressive airflow is used to build oral pressure for [p, b, t, d, s, z, ʃ]: Describe both ingressive and egressive airflow demonstrating both directions of airflow. Find a high-pressure consonant that the child correctly produces with egressive airflow and use that as an example. Use the tactile cue of their hand by their mouth to feel egressive airflow. Use a mirror to show how air fogs the mirror. A handheld mirror can be placed in cold water so the outgoing air "fogs" the mirror. Make sure your cues are specific about the direction of the airflow, "coming out of the mouth" or "sucking air into the mouth".

Final Note: Most techniques described in this handout fall under a motor-phonetic approach to intervention, which was the preferred method of treatment for these errors for decades. Recent research has shown that linguistic-phonological (such as the minimal pairs activity mentioned here) or combined (motor-phonetic and linguistic-phonological) approaches may also be effective to address these errors—provided the correct motor pattern is taught first. See references for additional information on these approaches.

Use of this Handout, or information it contains, should be cited as follows:

ASHA Special Interest Group 5. Therapy Techniques for Speech Sound Disorders Associated with Repaired Cleft Palate. Handout to accompany Poster. Developed in 2014, updated in 2017 and 2025.

Resources

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