



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)

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General Goals for Children with Cleft Palate Speech Sound Disorders:

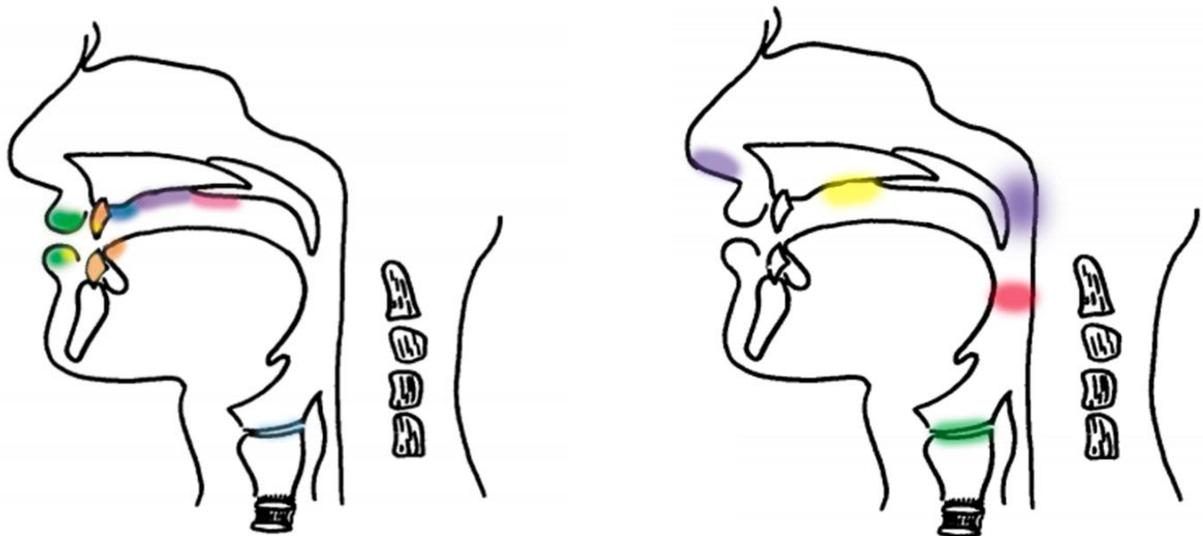
1. Establish correct oral articulatory placement and/or airflow direction and pressure build up using behavioral, articulation (motor-phonetic) therapy
2. Maximize the intra-oral air pressure build up during speech sound production
3. Teach new motor speech patterns to replace compensatory maladaptive articulation errors

General Therapy Guidelines:

1. Target more visible phonemes and more easily cued, stimutable phonemes first.
2. Generally, voiceless phonemes are easier to produce than voiced phonemes.
3. Name or rename the target sound, as necessary. For example, if teaching the /s/ sound, refer to this sound as the “snake sound” or just the “ssssss sound” to avoid triggering the “old” pattern by calling it “S.” This will facilitate new motor learning.
4. Obtain target phoneme in isolation with 100% mastery before advancing to higher levels of the treatment hierarchy.
5. When a phoneme is established, use an /h/ to combine the consonant to the vowel. This will open up the glottis and promote oral airflow and help to eliminate compensatory errors, especially glottal stop substitutions and co-productions.
6. Use phonetic placement techniques with multisensory cues to provide auditory, visual, and tactile feedback.
7. If audible nasal emission or weak oral pressures are present, nasal occlusion is beneficial to teach oral airflow and/or redirect nasal airflow and release. Wean from nasal occlusion as oral placement for target phoneme emerges, which may be appropriate within a single session.
8. Speech therapy is appropriate if compensatory misarticulation errors are present, even when the child has an insufficient velopharyngeal mechanism. Therapy to teach oral placements can be done even though further surgery may be indicated.
9. Non-speech oral motor exercises (NSOMEs) such as blowing, whistling, sucking, etc. have not been shown to improve articulation, reduce/eliminate nasal air emission or resonance disorders, nor change compensatory articulation errors. Motor learning is task specific. Speech problems require speech therapy!
10. A child with a repaired cleft palate or other cause of velopharyngeal dysfunction should always be followed by an interdisciplinary cleft team—not just one individual.
11. The cleft palate team SLP is your friend and resource! Don’t hesitate to ask parents for reports from the team and ask to be able to speak to the team SLP directly. The cleft palate team SLP needs to know your therapy goals and child’s progress because it is helpful in the cleft team diagnostic process
12. Avoid focusing on problems that arise from a physically inadequate velopharyngeal closure mechanism—when hypernasal resonance and audible nasal emission are present despite normal articulation, this is due to a structural problem and needs a physical management solution. When unsure of whether nasal emission is obligatory or learned, collaborate with the cleft palate team SLP.

Commonly Used Compensatory Maladaptive Articulation Errors: In general, compensatory errors involve moving the placement of articulation to a level along the vocal tract where pressure build-up can be accomplished.

1. **Glottal stops** /ʔ/ are generally substituted for oral stop consonants /p/, /b/, /t/, /d/, /k/, /g/ and sometimes /h/ but also can replace fricatives and affricates. The place of articulation is the glottis, using vocal fold valving. Glottal stops can be co-produced with any oral placement, meaning the child postures the tongue or lips so that it looks like s/he is producing the consonant accurately, but simultaneously is producing (co-producing) the glottal stop. Listen closely and be careful not to reinforce co-productions because these contribute to decreased speech intelligibility and can slow therapy progress.
2. **Pharyngeal stops** are usually substituted for velar stops /k/ and /g/. The place of articulation is the base of the tongue against the posterior pharyngeal wall.
3. Pharyngeal fricatives can be substituted for oral fricatives or affricates /f/, /s/, /ʃ/, /tʃ/, /dʒ/ and less often for stop/plosive consonants. The place of articulation is in the pharynx, with the base of tongue approximating the posterior pharyngeal wall.
4. **Mid-dorsum palatal stops** are substituted for tip-alveolar and back-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/.
5. **Mid-dorsum palatal fricatives** are commonly substituted for blade 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.
6. **Nasal fricatives** are commonly substituted for sibilant fricatives and fricatives or affricates /s/, /z/, /ʃ/, /tʃ/, /dʒ/ but may also replace other high pressure consonants such as /f/ and /p/. The nasal fricative is a voiceless nasal articulated with simultaneous exclusive audible nasal air emission. The VP port is open and airflow is intentionally sent into and through the nasal cavity. It can be articulated in any of the three oral placements for nasals: bilabial, alveolar or velar. So there is the bilabial nasal fricative, alveolar nasal fricative and velar nasal fricative. Any of these can be made with co-produced turbulence (snorting sound). Turbulent nasal fricatives are the result of a small velopharyngeal opening such that the VP port is the source of the turbulence. Non-turbulent nasal fricatives are made with a more widely open VP port.



Normal Place of Articulation

p, b		Bilabial
f, v		Labio-dental
θ, ð		Lingual-dental
t, d, s, z		Alveolar
tʃ, dʒ, ʃ		Palatal
k, g		Velar
h		Glottal

Compensatory errors and altered place of articulation

Substituted for:	Type of Error:
p, b, t, d, k, g, h	 Glottal Stops
s, z, ʃ, ʒ, dg, f, v	 Nasal Fricatives
s, z, ʃ, ʒ, dg, f, v, k, g	 Pharyngeal Fricatives & Stops
t, d, k, g, s, z	 Mid-dorsum Palatal Stops & Fricatives

Figure adapted from Peterson-Falzone et al. (2006)

SPECIFIC SPEECH THERAPY TECHNIQUES

How to Achieve Bilabial Stop Consonants

1. **Produce /m/ with nasal occlusion to achieve /b/:** Start with modeling /m/ in syllable /ma/. When the child imitates "ma" praise him or her to reinforce the imitation. Model "ma" again and this time, when the child repeats it, occlude the nostrils using two index fingers. This will direct some of the airflow out of his or her mouth, and feedback should be given to praise this-"good job! That air came out of your mouth!!!" Take a few turns with this, then model "ba" and occlude his nostrils for his turn, each time praising the oral airflow when the nostrils are occluded. Next, model "ba" and this time, don't occlude his nostrils, but move your hands towards his 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 his 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:** Sometimes it is easier to start with productions of the 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. As such, 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 him the air is coming out of your mouth, and tell him he gets to take a turn. Hold his hand in front of his mouth and model a whispered /p/. If the airflow is nasal and it sounds like a whispered /m/, say "Qops! The air came out your nose!" and repeat the model, this time covering his nostrils when it's his turn. If he's successful, say "wow!!!! Did you feel that air on your hand! It came out of your mouth!!!!"
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.

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/ sound, 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**
4. **Produce /θ/, retract tongue, and “stop” the airstream**
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 /t/, /d/, /k/, and /g/ into one phonemic category of the mid-dorsum palatal stop. Contrast /t/ and /d/ versus /k/ and /g/ and give feedback about front of the mouth versus back of the mouth.

How to Achieve Velar Stop Consonants:

1. **Produce /ŋ/ with nasal occlusion to achieve /g/**
2. **Produce /t/ or /d/ while depressing the tongue tip**
3. **Have child pretend to “gargle” with head tilted back** (when error is fronted placement, be cautious of not reinforcing the pharyngeal stop substitution, which can be difficult to differentiate from /k/ in little bodies)
4. **Attempt VC with high vowel such as /i/ paired with velar**
5. **Whisper technique if child is substituting glottal stops**
6. **Sometimes a velar fricative approximation is easier to establish in isolation**, or in syllables with a high front vowel. Teach this in isolation, then change the manner to a stop.
7. **Again, include minimal pair activities, as described above.**

How to Achieve Alveolar/Post Alveolar Fricative/Affricates:

1. **Use “Long-t” technique (t-t-t-tss) to produce /s/:** Remember to stabilize the sound in isolation as a phonetic event prior to reminding the child that this is a sound they have mislearned—call the sound the “long t” and complete multiple trials in isolation and nonsense syllables before saying “Hey, this sounds like the sound that I make when I say “see” or “so.” Let’s use our long t sound to make the “s” come out of our mouths when we say those words.”
2. **Bite the lip and blow for the /f/ providing 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 s/he is sending airflow through the nose. This can be upsetting at first to the child, that you have trapped the airflow in his nasal cavity. Explain and reinforce that “it came out of your mouth, not your nose” even though the oral place feature may not be correct.
5. **Be careful to not reinforce a mid-dorsum palatal fricative** as this is a compensatory 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., occlusion, ectopic or supernumerary teeth), but rather to backed placement of articulation.

If ingressive airflow may be used to build oral pressure for /p/, /b/, /t/, /d/, /s/, /z/, or /ʃ/, describe both ingressive and egressive airflow demonstrating both directions of airflow. Find a high pressure consonant that the individual habitually produces with egressive airflow and use that as a facilitator for that discussion. Use your hand next to the 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. Practice egressive airflow at the sound and syllable levels, making sure that the individual understands the desirable phonetic feature of outgoing air. Find a word context in which the individual can create outgoing, egressive airflow, and practice, practice. Introduce new words for practice, making sure you are being specific about the direction of the airflow, “coming out of the mouth” or “sucking air into the mouth”.

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.

Resources:

1. American Cleft Palate Craniofacial Association (ACPA) and Cleft Palate Foundation (www.acpa-cpf.org) Free downloads available at www.acpa-cpf.org/teamcare
2. Trost-Cardamone, J. (2013). *Cleft Palate Speech: A comprehensive 2-part set*. American Speech Language and Hearing Association Professional Development Course.
<http://www.asha.org/eweb/OLSDynamicPage.aspx?Webcode=olsdetails&title=Cleft+Palate+Speech%3a+A+Comprehensive+2-Part+Set>
3. Golding-Kushner K. (2001). *Therapy Techniques For Cleft Palate Speech And Related Disorders*. San Diego: Singular-Thompson Learning.
4. Kummer AW (2008). *Cleft Palate And Craniofacial Anomalies, Effects On Speech And Resonance*. Second Edition. Clifton Park, NY: Thompson-Delmar Learning.
5. Peterson-Falzone SJ, Trost-Cardamone JE, Karnell MP & Hardin MA. (2006). *The Clinician's Guide To Treating Cleft Palate Speech*. St. Louis, MO: Mosby Elsevier.
6. Morley ME. (1970). *Cleft Palate and Speech*. Seventh Edition. London, UK.
7. Henningsson GE, Kuehn D, Sell D, Sweeney T, Trost-Cardamone J, Whitehill T. (2008). Universal parameters for reporting speech outcomes in individuals with cleft palate. *Cleft Palate-Craniofacial Journal*, 45, 1-17.
8. Lof GL. (2006). Logic, theory and evidence against the use of non-speech oral motor exercises to change speech sound productions. Invited presentation, ASHA Convention, Nov. 17, Miami Beach, FLA.
9. Lof GL. (2008) Introduction to the controversies about the use of non-speech oral moto exercises for childhood speech disorders. *Seminars in Speech and Language*, 29 (4), 253-256.
10. Lof GL & Watson MM. (2008) A nationwide survey of nonspeech oral motor exercise use: Implications for evidence-based practice. *Language, Speech and Hearing Services in Schools*, 39, 392-407.
11. Lof GL. (2009) The nonspeech oral motor exercise phenomenon in speech pathology practice. In C. Bowen, *Children's speech disorders*. Oxford, UK: Wiley-Blackwell, 181-184.
12. Lof GL (2010). Five reasons why nonspeech oral motor exercises (NSOME) do not work. *Perspectives on School-Based Issues, ASHA Division 16, Vol 11 (4)*, 109-117.
13. Lof GL, Ruscello D. (2013). Don't blow this therapy session! *ASHA SIG 5 Perspectives*, October.
14. Downloaded From: <http://sig5perspectives.pubs.asha.org/>
15. McCauley R, Strand E, Lof GL, School T, & Frymark T. (2009). Evidence-based systematic review: Effects if non-speech oral motor exercises on speech. *American Journal of Speech-Language Pathology*, 18, 343-360.
16. Ruscello DM. (2008a). Oral motor treatment issues related to children with developmental speech sound disorders. *Language, Speech and Hearing Services in Schools*, 39, 380-391.
17. Ruscello DM. (2008b). An examination of nonspeech oral motor exercises for treatment of children with velopharyngeal inadequacy. *Seminars in Speech and Language*, Vol 29(4), 294-303).