



Speech Therapy for Characteristics of Velopharyngeal Dysfunction (VPD)

by Ann W. Kummer, PhD, CCC-SLP

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Children with a history of cleft palate are at risk for resonance and speech problems due to velopharyngeal dysfunction (VPD). Characteristics of VPD can also occur in children with no history of cleft palate for a variety of reasons.

Indications for Speech Therapy

- Therapy CANNOT change abnormal structure (velopharyngeal insufficiency)
- Therapy CAN change abnormal function (velopharyngeal incompetence sometimes, and velopharyngeal mislearning all the time)

Therapy is appropriate if the patient demonstrates the following:

- Compensatory articulation productions
- Mild or inconsistent nasal rustle, since it tends to be due to a small gap
- Phoneme-specific nasal air emission or phoneme-specific hypernasality due to misarticulations
- Hypernasality or variable resonance due to oral-motor dysfunction (dysarthria or apraxia)
- Improvement with change of articulation or with stimulation

Therapy is appropriate following surgical correction of the velopharyngeal mechanism, due to the following:

- Changing structure does not change function
- May need to correct compensatory productions
- Patient may need to be taught appropriate articulatory placement and oral airflow

Therapy is *usually* not appropriate under the following circumstances:

- Hypernasality and unobstructed nasal emission, since these characteristics are typically due to a large velopharyngeal opening. There are some techniques that may encourage oral resonance and improved pressure, however, when the cause is neurological (i.e. dysarthria).

Therapy is not appropriate for the following:

- Obligatory errors, since the problem is not abnormal function, but abnormal structure. In these cases, correcting the structure (i.e. velopharyngeal insufficiency, malocclusion) will correct the speech.

The following is a description of some specific therapy techniques that can be used with the common characteristics of velopharyngeal dysfunction. These techniques are offered as suggestions only. Further research is needed before the efficacy of specific techniques, particularly those designed to alter resonance or nasal emission, can be determined.

Nasality (Hypernasality or Nasal Emission) and Weak Consonants

Auditory Feedback

- Increase awareness of the nasality by presenting different samples of normal speech and speech with nasality on audio clips.
- Have the child listen to his/her own recorded speech.
- Using a straw or listening tube, have the child put one end at the entrance of a nostril and the other end near his/her ear. When nasality occurs, it is very audible and even loud. The child is then asked to try to make adjustments in articulation to reduce or eliminate the nasality on oral sounds.
- To increase oral airflow, put the end of the straw or listening tube in the front of the mouth and the other end at the child's ear. The child will be able to hear the air pressure.



**Listening Tube
(Feedback for nasal emission)**



**Listening Tube
(Feedback for oral pressure)**

Visual Feedback

- The Nasometer¹ is an excellent instrument to provide visual biofeedback regarding resonance.
- Nasopharyngoscopy, when available, can be used as a biofeedback tool to promote velopharyngeal closure.
- Place an air paddle² under the nares during the production of pressure-sensitive phonemes to help the child to see the nasal air emission. Ask the patient to produce the same sounds without moving the air paddle.



Air Paddle

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- Place an air paddle in front of the child's mouth during the production of pressure-sensitive phonemes. Have the child try to produce the sounds with enough pressure to force the air paddle to move.
- Using a See Scape³ put the nasal olive in one nostril and ask the patient to try to produce pressure consonants repetitively without allowing the foam stopper to rise in the tube. (Note that the foam stopper will rise during the production of nasal phonemes and with nasal breathing at the end of the utterance.)
- Using the See Scape, put the nasal olive at the front of the mouth and have the child produce pressure-sensitive sounds. The goal is to make the stopper rise in the tube.



**See Scape
(Feedback for nasal emission)**



**See Scape
(Feedback for oral pressure)**

Tactile-Kinesthetic Feedback

- While the child is producing vowel sounds, preferably /ah/, raise the velum up with a tongue blade. Note: If there is a significant difference in resonance with elevation using the tongue blade, the patient may be a good candidate for a palatal lift.
- Have the child try to raise and lower the velum during the production of vowel sounds to produce nasal/oral contrasts.

Tactile Feedback

- Have the child lightly touch the side of his/her nose to feel for vibration during the production of nasal phonemes versus oral phonemes.
- Ask the child to carefully produce oral sounds or sentences without the vibration.



Tactile Feedback

- Have the child place his/her hand in front of your mouth as you produce plosives in a forceful manner to feel the air pressure. Then have the child place his/her hand in front of his/her own mouth to do the same.

Lower the Back of the Tongue

- Get the back of the tongue down and the velum up by having the child yawn.
- Have the child co-articulate the yawn with vowels and anterior sounds.
- Have the child think of the yawn movements when articulating other sounds.

Increase Volume

- Increasing vocal effort and thus volume can result in an increase in respiratory support, velopharyngeal effort, oral air pressure, and the force of articulation
- The ultimate goal is a normal degree of volume, however.

Increase Oral Activity

- Increasing anterior oral activity increases posterior oral (thus velar) movement at the same time.
- Increasing mouth opening can reduce oral resistance and increase oral resonance.
- The ultimate goal is a normal degree of oral activity, however.

Cul de Sac (Nose Pinching) Technique

- Have the child pinch his/her nostrils during the production of pressure sounds to eliminate the nasal air emission and to work on placement. A nose clip can be used during therapy and practice. Have him/her note the increase in oral airflow and pressure. Have the child try to produce the sounds in the same way with the nostrils unoccluded.



Cul-de-Sac (Nose Pinching) Technique

Light, Quick Contacts

- Light, quick contacts during the production of pressure-sensitive phonemes, particularly plosives helps to eliminate the back-up of air pressure in the nasopharynx and reduces the occurrence of nasal air emission and a nasal rustle.

Compensatory Articulation Productions

Compensatory articulation productions are usually developed because there is inadequate oral pressure for normal productions. Compensatory productions may result in better intelligibility. Therefore, changing placement to eliminate compensatory productions in the presence of persistent velopharyngeal dysfunction is not easy. If surgical correction of the velopharyngeal dysfunction is planned, it is often better to wait until after the surgery before beginning therapy.

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If surgery needs to be delayed, therapy can still be done on placement by plugging the nose for better oral air pressure.

Glottal Stops

- Have the child place feel his/her hand on the neck during the production of a glottal stop to feel the “jerk.” Then have the child feel the neck during a prolonged vowel or nasal consonant.
- Have the child produce voiceless plosives slowly, followed by an /h/ before the vowel to eliminate the glottal stop (i.e. p-hhha for pa).
- Have the child whisper the syllable, which will prevent vocal fold adduction for a glottal stop. Then gradually add “smooth” voicing. Once voiceless consonants can be produced, move to voice plosives by first whispering the sound and by drawing out the sound slowly.
- Have the child feel the neck for feedback.

Nasalized Plosives

- Work on the placement of bilabial and lingual-alveolar plosives first. Ask the child to produce a yawn to get the base of the tongue down and the velum up.
- Have the child co-articulate anterior articulation with a posterior yawn movement to produce the sounds. Once these are mastered, work on velar plosives.

Pharyngeal Plosives

- Establish placement for velar plosives by starting with an /ng/. Then have the child build up air pressure behind the tongue and release it to produce the velar plosive.
- If the child doesn't have /ng/, I use an upside down spoon (or tongue blade if necessary) to hold the tip of the tongue down. Then I firmly press my thumb under the at the base of the chin/neck, which is under the base of the tongue.
- Work on an up and down movement of the back of the tongue, rather than a back and forth movement during production. Have the child produce a “click” with the back of the tongue.

Pharyngeal Fricatives or Posterior Nasal Fricatives

- Have the child produce fricative sounds with the nostrils occluded and then open to get the feel for oral rather than pharyngeal airflow.
- Place a straw at the point of the central incisors. Encourage the child to produce the sound until he/she can hear the airflow through the straw.
- /s/: Have the child produce a hard /t/. Then have the child produce the /t/ with the teeth closed. Increase the duration of the production until it becomes /ts/ and then /tsss/. Finally, eliminate the tongue tip movement for the /t/ component.
- /ch/ and /j/: Work on the /ch/ sound by going from a /t/ with the teeth closed and the lips rounded or trying a loud sneeze sound with the teeth closed. Once this sound is mastered, work on the /j/ by adding voicing.
- /sh/: Work on the /sh/ sound by eliminating the tongue tip movement from a /ch/, or by having the child produce a big sigh with the teeth closed and lips rounded. Tell the child to put the tongue tip in the path of the air stream.

ng/l Substitution

- Ask the child to produce a yawn to get the base of the tongue down and the velum up.

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- With the yawn, have the tongue tip go up to co-articulate the /l/. Gradually eliminate the use of the yawn movement but tell the child to think of the movement during production.

Mid-Dorsum Palatal Stops (Palatal-Dorsals)

- Have the patient bite on a tongue blade so that it is between the canine or molar teeth. Make sure it is back far enough to depress the middle part of the tongue in order to prevent a dorsal production.
- Have the child produce lingual-alveolar sounds in front of the tongue blade and velar sounds behind the tongue blade.
- Have the child prolong a nasal sound (/n/ or /ng) for placement. While holding the placement, have the child build up pressure and release.

General Principles

- **DO NOT USE BLOWING OR SUCKING EXERCISES!** These exercises will only improve blowing and sucking (maybe), but not speech!
- Do not use velar “exercises.”
- Use general articulation procedures to work on placement.
- Establish oral airflow through a change in placement.
- Success depends on the frequency and intensity of practice (not just therapy).
- Discontinue therapy if abnormal resonance or nasal emission persist and progress is limited. Refer child to a craniofacial anomaly team for further evaluation of velopharyngeal function. Surgical intervention or revision may be necessary.

Timetable for Intervention

Ages 0 – 3: Concentrate on *Quantity*

- Home program with emphasis on language
- Start language therapy if indicated

Ages 3 - 4: Start working on *Quality*

- Evaluate speech and VP function
- Start speech therapy or consider surgery as indicated

Goal of Treatment: Normal, not just “acceptable” speech

¹ The Nasometer (KayPENTAX, 2 Bridgewater Lane, Lincoln Park, NJ 07035-1488, (973) 628-6200).

² An air paddle is a paddle shape that is cut from a piece of paper.

³ See Scape is a product of PRO-ED, 8700 Shoal Creek Boulevard, Austin, Texas 78757-6897.

For more information:

Kummer AW. *Cleft Palate and Craniofacial Anomalies: Effects on Speech and Resonance*. Albany, NY: Delmar- Thomson Learning, 2001.