

Treatment of Articulation Disorders in Children with Cleft Palate/VPI

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Goals of Speech-Language Therapy

- Readily intelligible
- Age-appropriate articulation skills
- Age-appropriate language skills
- Socially acceptable speech

Speech Therapy for Children with Cleft Palate/VPI

- Start therapy first, don't wait for cleft team evaluation to start therapy
- Focus on articulation placement
- Frequent/Intensive (minimum of 2x per week)
- Individual (especially when compensatory articulation errors are present)
 - Language goals may be targeted in group sessions if indicated
- Should include a home practice program
- Focus on articulation placement skills → traditional articulation therapy

Therapy Principles

- Only one sound is targeted and stabilized at a time in a hierarchical progression of speech contexts
- Start with isolation, syllable level, words, multisyllabic words, phrases, sentences, then spont/conv speech

Therapy Principles

- Target sound selection → where to start therapy?
 - Start with the sounds causing the most negative impact on intelligibility
 - Target sounds for which the child is stimutable
 - Keep developmental progression in mind, but don't be afraid to deviate from it
 - Start with the sounds that are most visible (anterior)
 - Usually, it is easier to start with voiceless sounds before voiced ones
 - For some children, fricatives may be easier than stops

Therapy Principles

- Average age for surgical management of VPI is 4-6 years
- What is treatable with therapy? What is not?
- NOT: Obligatory errors
 - Consistent (audible) nasal air emission across virtually all plosives and fricatives
 - Consistent hypernasality
 - Weak pressure consonants
 - Some articulatory distortions secondary to dental-occlusal hazards

Therapy Principles

- TREAT:
 - Misarticulations (placement, manner, voicing errors)
 - compensatory articulation errors
 - placement errors (substitutions, distortions)
 - omissions
 - backing of phonemes and other phonological errors
 - nasal fricatives and phoneme-specific nasal emission

Therapy Principles

- Traditional Articulation Therapy is the preferred method of treatment
 - In most cases, this is NOT phonological therapy, at least not initially
 - NOT oral-motor therapy
 - This is therapy focused on phonetic-based approaches, with perceptual training using auditory, tactile, and visual cueing, and self-monitoring techniques
 - Also utilizes motor-learning principles

Therapy Approaches

(Peterson-Falzone et al., 2006)

- Teach identity, location, and actions of oral structures
 - Teeth, lips, tongue
 - Use a picture, mirror, Mr. Potato, Mighty-Mouth
 - Teach sounds and their corresponding structures
 - /p/: lip sound, popping sound, poof sound
 - /t/: tongue sound or teeth sound
 - /s/: snake sound
 - “sh”: quiet/windy sound

Therapy Approaches

(Peterson-Falzone et al., 2006)

Expand the child’s phonetic inventory

1. Teach placement for those consonants the child has not yet acquired
 - Start with the most visible/anterior sounds (e.g., p, b)
 - Provide visible placement cues, then tactile and auditory cues
 - Keep developmental order of speech sound acquisition in mind but...
 - Some fricatives OK to teach at younger age since they are longer in duration and may have more anterior placement (e.g., /f/)

Therapy Approaches

(Peterson-Falzone et al., 2006)

- Get the target sounds into the inventory
 - Use traditional phonetic placement techniques
 - Use easier sounds to elicit new sounds
 - /w/ or /m/ → /p, b/
 - /l/ or /n/ → /d/
 - “y” → “sh”
 - Provide auditory, visual, and tactile cues
 - Use nasal occlusion as needed
- Teach correct oral target vs error sound contrasts (auditory discrimination, negative practice)
- Establish reliable self-monitoring

Therapy Approaches

(Peterson-Falzone et al., 2006)

- Teach them a “place map” for consonants
 - Give the sounds new “names”
 - Have the child identify where the sounds are made

Place Map

Therapy Approaches

(Peterson-Falzone et al., 2006)

2. Teach the child the letter/symbol for the sound (Ages 3-4+)
3. Teach speech sound production contrasts
 - Start with contrasts in place (vs manner)
 - Mouth vs throat sound, front vs back, etc.

Therapy Principles

- Ensure understanding of oral pressure and airflow
- As fricatives begin to emerge (e.g., /f, s/) and if demonstrate nasal fricatives → encourage and teach oral airflow, use nasal occlusion as needed

Therapy Approaches

- Teach the difference between oral vs nasal airflow
 - Sparingly you can use low resistance blowing toys (not balloons or whistles) like a cotton ball or tissue or See-Scape
 - You are not strengthening anything, just teaching the concept of oral airflow
 - Contrast air from the nose vs mouth
 - Use this activity to shape into speech sounds that the child is stimulable for (e.g., /h, w/)
 - Aim for 100% accuracy

Therapy Approaches

- Ensure understanding of oral pressure and airflow
- As fricatives begin to emerge (e.g., /f, s/) and if demonstrate nasal fricatives
 - nasal occlusion
 - Teach oral vs nasal airflow contrasts
 - Try the “long /ttt/” approach
 - Shape another fricative into the target (e.g., th → s, sh → s, etc)
 - Use low-tech biofeedback as needed: See-Scape, Oral-Nasal Listener, straw (high-tech = nasopharyngoscopy)

Therapy tip

- Design your target words around target phonemes (P, B, W, H, Y, M, N, etc.)
 - E.g., B: bubble, boo, bye, baby, baa, beep
 - P: pop, papa, hop, pooh, push
- Use words with a functional purpose as much as possible

Therapy Approaches

For the child with persistent glottal stops, pharyngeal fricatives, nasal fricatives, etc.,...

- Teach the child to discriminate normal oral productions from maladaptive compensatory errors and abnormal nasal productions
 - Nose sound vs mouth sound
 - Throat sound vs lip/tongue sound
 - Old sound vs new sound
- Give the child sufficient practice to solidify the “new sound” → aim for high accuracy (90%+)

Therapy Approaches

- If targeting glottal stops:
 - Teach “throat” sounds vs “mouth” sounds
 - Start teaching most visible or anterior sounds (e.g., /w, h, p, t/) and shape into early oral stops, voiceless first
 - Nasal occlusion to provide sensation of oral pressure
 - Try /h/ words with final consonants as targets (e.g., hi, hop)
 - Use overaspiration and whispering as needed
 - Avoid words with nasal sounds, vowel initial words, or velars at first

Therapy for “learned nasal emission” (nasal fricatives)

- Illustrate and explain oral vs nasal airflow
 - Practice oral vs nasal breathing
- Teach the child to monitor and control oral vs nasal release of airflow
- Establish and practice the oral target in isolation (long /tt/ → /s/)
 - Use nasal occlusion if needed to facilitate production, then fade this cue
 - Can also try “th” or “f” to facilitate “s”, “sh”, etc.

Therapy: When there are “dental-occlusal hazards” to speech

- Many children with dental-occlusal problems will still benefit from traditional articulation therapy approaches
- Some children will not be able to eliminate the distortions until the dental-occlusal situation improves
- Always initiate a trial period of therapy for all the affected phonemes before assuming that therapy will not be successful
- May defer therapy if dental/orthodontic/surgical correction of the hazard will occur soon

Therapy in the presence of dental-occlusal hazards

For children with severe malocclusion:

- May need to use adaptive/compensatory strategies (not *compensatory articulation errors*)
 - Class II: difficulty with bilabials, may use labiodental placement
 - Class III: difficulty with labiodentals and bilabials, may use reversed labiodental placement; tongue-tip down for /s, z/

Articulatory distortions related to dental-occlusal hazards

- Most commonly affected sounds =
 - S, Z, then SH, CH, J
- Anterior Crossbite or Underbite (Class III malocclusion)
 - Distortions of S, Z, SH, CH, J
 - Reversed placement for F, V sounds
- Overjet (Class II malocclusion)
 - May make P, B, M, like a F or V instead
- Missing, excessively spaced, or malpositioned teeth (or due to some orthodontic appliances) and openbite
 - Distortions of S, Z

Speech Therapy “Myths” (Golding-Kushner 2001)

- “*Speech therapy will not be effective until after surgery (e.g., pharyngeal flap)*”
 - The better the child’s articulation (placement) is before the surgery, the more noticeable the improvement will be after surgery
 - Elimination of glottal stops and nasal fricatives will result in better surgical outcomes, better movement of VP structures
 - Nasal occlusion can help “simulate” the immediate effects of surgery

Myth

- “*Children with CLP/VPI have apraxia.*”
 - “cleft palate speech” is characterized by compensatory articulation errors that may be produced without (or with decreased) lip/tongue movement → may appear to be lip/tongue weakness, however, is NOT
 - This may be an issue of omission of the lip/tongue movement to articulate, but is not an issue of inability to learn to do this
 - Very very few children with CL/P have apraxia

Myth

- “*You have to wait several weeks after surgery to start speech therapy again.*”
 - As soon as the child feels better and the surgeon feels they are able to resume therapy
 - Usually this is 1-2 weeks after surgery

Myth

- “*After a pharyngeal flap surgery, your child will have to re-learn how to talk*”
 - There is no re-learning. The child will be able to articulate as they did prior to the surgery.
 - In the immediate post-op period, the child may sound hyponasal or have more normal-sounding resonance, and this may change over the first few weeks post-surgery
 - The child should have improved oral pressure for consonants and elimination of nasal emission

Myth

- “*My child with CLP/VPI only uses vowels and omits consonants.*”
 - When in doubt, the child is likely using glottal stop substitutions, not just omissions
 - Assume and attempt to treat the glottal stops in therapy first

Myth

- *I would need to buy fancy, expensive equipment to treat “cleft palate speech”*
- You need:
 - Ears, Eyes, Mouth, Ability to model appropriate articulation
 - Fingers (nasal occlusion)
 - Mirror
 - Some motivating toys and games
 - Creativity and a good “cleft palate speech” book to reference
 - Contact information for your local cleft team SLP

Myth

- “Children with CLP need oral-motor therapy because they have weak muscles or need to make the lips/tongue/palate stronger “
 - A repaired cleft lip is not necessarily weak
 - A repaired cleft palate is not necessarily weak
 - Lack of muscle movement may just signal of lack of, or error in, learning how to use the muscles for speech
 - Speech requires very little strength
 - There is no evidence that lip/tongue/palate exercises can improve their function or the child’s articulation or resonance

Children with CLP/VPI will NOT benefit from these treatment approaches:

- horn-therapy program
- straw blowing/lip strengthening program
- palate massage/stimulation program
- yawning/sighing exercises
- whistle blowing exercises
- tongue movement exercises
- “cookbooks” to improve resonance

Therapy Ideas that have NOT been helpful to children with CLP/VPI

<http://www.talktools.net/s.nl/sc.23/category.1333/f?range=51%2C100%2C107>



Suggested Reading

- Lof, GL, and Watson, MM. (2008). A Nationwide Survey of Nonspeech Oral Motor Exercise Use: Implications for Evidence-Based Practice. *Language, Speech, and Hearing Services in the Schools*, 39, 392-407.
- Ruscello, DM. (2008). Nonspeech oral motor treatment issues related to children with developmental speech sound disorders. *Language Speech and Hearing Services in the Schools*, 39, 380-391.
- Moore, CA, and Ruark, JL. (1996). Does speech emerge from earlier appearing oral motor behavior? *Journal of Speech and Hearing Research*, 39, 1034-1047.
- Hardin-Jones, M, and Chapman, KL. (2008). The Impact of Early Intervention on Speech and Lexical Development for Toddlers With Cleft Palate: A Retrospective Look at Outcome. *Language, Speech and Hearing Services in the Schools*, 39, 89-96.

Therapy Approaches for Reducing Hypernasality and ANE?

- Best candidates have mild/inconsistent hypernasality and/or audible nasal emission
- Decrease listener perceptions of hypernasality:
 - Increase oral excursion (mouth opening)
 - Light articulatory contacts
 - Decrease speech rate
- Nasal Occlusion and try to perceptually “match” the productions

Biofeedback Approaches for Therapy

- See-Scape: Useful for treating learned nasal emission (nasal fricative substitutions)
 - Downside: reinforcement of the wrong behavior
- Oral-Nasal Listener
- Nasopharyngoscopy: Useful for treating learned nasal emission (nasal fricative substitutions), nasal substitutions, glottal stop substitutions
 - If the patient is capable of producing some oral stop or fricative consonant first
 - Downside: requires high cooperation and tolerance

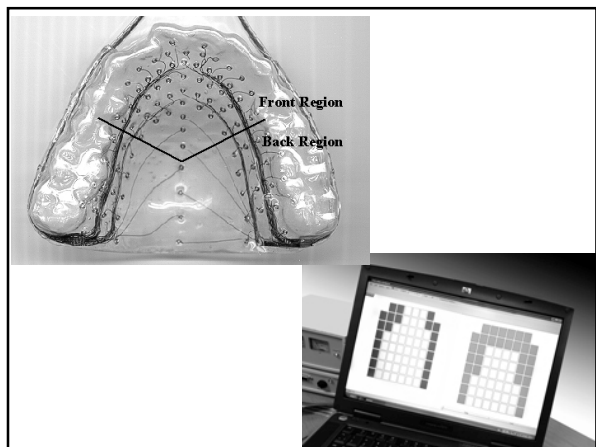
Biofeedback Therapy

- Nasometer: Useful for reducing hypernasality
 - Downside: requires greater maturity and cognition (meta-awareness)



Other approaches...

- CPAP (Continuous Positive Airway Pressure) (Kuehn 1991, Kuehn et al., 2002)
 - Aims to improve VP closure by “working” the muscles against artificially increased nasal resistance (nasal pressure) during speech for longer durations of time
 - Clinical trials have yielded mixed results
- Electropalatography
 - Aims to improve articulation placement skills and eliminate compensatory errors



(Physical) Therapy for the VP Mechanism?

- The principles of physical therapy do not apply to the muscles of the oral and velopharyngeal mechanism for speech
- Not effective:
 - Tactile stimulation, massage, electrical stimulation, repeated muscular contraction, force/resistance training
 - Swallowing, blowing, sucking, cheek puffing, blowing against resistance (horns/whistles)

When therapy is not enough...

As soon as it is apparent that the child does not have the *potential* to achieve consistent VPC for speech, physical management is recommended.

- SLP should play a primary role in this decision
- Decisions are typically made when the child is age 4-6 (or older)
 - Surgical approaches
 - Prosthetic approaches

Physical Management Decision-Making

- Speech therapy (at least a trial period) is typically the first “line of defense”
- Imaging of the velopharyngeal mechanism can be pursued before and/or after therapy attempts, but the child must be able to produce a minimal speech sample for the information to be useful
- Physical management decisions are made depending on patient age, speech profile/severity, compliance, medical condition, family and cultural factors

Case Examples and Discussion

Helpful Resources

- Peterson-Falzone, SJ, Trost-Cardamone, JE, Karnell, MP, Hardin-Jones, MA. (2006). **The Clinician's Guide to Treating Cleft Palate Speech**. Mosby: St. Louis.
- Golding-Kushner, KJ. (2001). **Therapy Techniques for Cleft Palate Speech and Related Disorders**. Thomson-Delmar: Clifton Park, NY.
- Moller, KT, and Glaze, LE. (2009). **Cleft Lip and Palate: Interdisciplinary Issues and Treatment**. 2nd Ed. Pro-Ed: Austin, TX.