

5 Things Every SLP Should Know About Cleft-Related Speech Sound Disorders

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Shout Out!

- Shout out to all of you SLPs who work in schools and outpatient clinics that see individuals with a variety of speech disorders and you treat them all!

Phonetics, It Matters!

Phonetics

- When assessing and treating articulation and resonance, it is important to understand the placement, voicing and manner for each phoneme.
- This base information will aid in assessing and treating cleft related speech sound disorders and is important for decision making.

Velopharyngeal Closure (VPC)

- Cannot be seen or felt but is the foundation for normal:
 - Feeding
 - Resonance
 - Articulation

Resonance

- When air enters the nasal cavity on voiced, oral phonemes, this is referred to as hypernasality
- When air enters the nasal cavity on voiceless oral phonemes, this is referred to as nasal emission
- When not enough air enters the nasal cavity on nasal phonemes, this is referred to as hyponasality

Hypernasality

- Increased nasal resonance on vowels and/or voiced consonants
/ē, ī, ū, ē, ʃ/

Nasal Emission

- Nasal air emission: Audible rushes of air during high pressure sound production
- Includes nasal turbulence
 - /p̃, s̃, f̃, ʃ̃/

VPI

- When an individual presents with hypernasality and/or nasal emission, this is referred to as Velopharyngeal Insufficiency/Inadequacy (VPI) or Velopharyngeal Dysfunction (VPD)
- This is because the individual is unable to achieve velopharyngeal closure
 - The palate is not making enough contact with the posterior pharyngeal wall during oral sound production!

Cleft Palate

The goal of the initial palate repair in infancy is to restore normal anatomy for speech purposes.

However, in some individuals with cleft palate, the initial palate repair is not enough and they may require a second surgery to improve speech

Articulation

- Individuals with cleft palate may also present with compensatory speech patterns such as:
 - Glottal stop substitutions
 - Nasal fricative substitutions
 - Pharyngeal substitutions
 - Phonological processes
 - And more. . .

5 Things Every SLP Should Know
About Cleft Related Speech Sound
Disorders

1) Your fingers are your best tool!

Evaluation

- A perceptual evaluation is the gold standard for assessing resonance
 - Single word articulation test such as the GFTA-3 to assess articulation errors
 - Perceptual evaluation
 - American English Sentence Sample
 - CAPS-A-AM rating scale

Listen!

3a Hypernasality

Rating	Description
0	Absent
1	Borderline/ Minimal – some perceptible increase in nasal resonance
2	Mild – hypernasality is evident on high vowels
3	Moderate – hypernasality is evident on all vowels
4	Severe – increased nasal resonance on vowels and voiced consonants

Back to phonetics. . .

- High vowels
 - /i/
 - /u/
- All vowels
- Voiced consonants
 - /b/
 - /d/
 - (ng)

Cul de sac/Nasal fluttering testing

- Have the individual say, “eeeeeeee” with no nasal occlusion
- Plug the individual’s nose and then repeat, “eeeeeeee.”
- You SHOULD NOT hear a difference.
- If you do, hypernasality may be present
- Do occlusion testing across vowels and on ORAL sentences
- Nasal sentences can be utilized to assess hyponasality

Other low-tech assessment tools

- Nasal mirror testing
 - Place mirror under nose on oral sentences, if the mirror fogs, nasal emission is present
 - You SHOULD see fogging on nasal sounds, if not, there may be concern for hyponasality

Goal of Assessment

- The goal of assessment is to determine:
 - Are resonance distortions and articulation errors anatomically and/or behaviorally based?
 - What type of treatment is needed?
 - Surgery? Therapy? Both? Neither?
- Evaluation should determine what is possible for the speaker considering current anatomy and physiology.

2) SLP versus MD, Who's Who in Management

Role in Management

SLP

- Assess articulation and resonance
- Make recommendations if therapy or surgery is needed or both
- Provide articulation therapy
- Assess outcomes after surgery

MD

- Review with SLP findings from the speech evaluation and imaging obtained
- Decide what type of surgery is needed to correct VPI/D
- Complete surgery
- Follow-up with family after surgery regarding healing, airway concerns, etc.

SLP Decision Making

- Does the individual have an articulation disorder?
 - Therapy!
- Does the individual have VPI/D?
 - Surgery!
- Does the individual have an articulation disorder and VPI/D?
 - Both!
- Does the individual have articulation WNL and resonance WNL?
 - No intervention needed!

Management

- The evaluation is completed and now it is time for intervention. . .

SLP and “Resonance Therapy”

- ~~Resonance Therapy~~
 - There is little to no evidence therapy can improve resonance
 - Therapy should focus on improving articulation and decreasing compensatory errors
- Palatal dysfunction is a structural concern
 - There are no exercises that can improve palatal strength or length
 - Speech therapy cannot change anatomy

From ASHA regarding VPI/D

- The primary components of treatment are **surgical repair** and **behavioral intervention** (i.e., speech therapy).
- The goal of surgery is to repair affected structures to establish adequate VP function.
- The goal of speech therapy is to establish normal articulation behaviors.

Why does it matter?

- Not all individuals with a cleft require speech therapy or secondary surgery for speech purposes
 - Individuals who do not have VPI/D should not have an additional surgery that is not necessary
 - Individuals should not spend time/resources in therapy due to a structural concern that needs to be corrected surgically

3) It's Articulation Therapy, You Can Do It!

From ASHA. . .

- Direct speech therapy is appropriate for **treatable** speech problems (i.e., articulation errors), including compensatory misarticulations and phoneme-specific nasal air emission.
- Objectives of therapy are to:
 - correct oral placements for consonant misarticulations (e.g., bring backed oral articulations forward, teach correct oral place, and establish oral pressure buildup and release) and establish oral pathway/direction of airflow and appropriate valving of airflow at target place during production of oral sounds (Golding-Kushner, 2001; Ruscello, 2017; Trost-Cardamone, 2013).

I don't know how to fix that. . .

- Know your phonetics!
- Even if you are not familiar with the compensatory error the individual is making, you know how it should be produced
- In order to be effective at providing articulation therapy services, you **MUST** know how each phoneme is made
 - Where is the placement?
 - What is the voicing?
 - What is the manner?

Do more!

- Produce target sound and see if individual can imitate
- If not, provide cuing! Do not just assume the individual is not stimulable for production of that sound just because s/he does not readily imitate

Modeling

- Give visual cues
 - Over exaggerate placement and draw attention to your mouth
 - Use a mirror for feedback
- Tactile cues
 - Touch cues for /k/ and /g/
 - Feel air on your hand for /f/
- Verbal cues
 - Tell the individual where to put his/her tongue/lips

Shaping

- Look at the child's existing phonemic inventory and shape existing sounds into new ones!
 - Shape /s/ from /t/
 - Shape /f/ from /h/
 - Shape voiced sounds from voiceless
 - Shape /t/ and /d/ from /n/ with nasal occlusion
 - Shape /k/ from /a/
 - Shape /k/ and /g/ (ng)

Use the phonetic context

- Target /s/ in final /ts/ words
 - Bats
 - Mats
- Use (ng) to elicit /k/
 - Monkey

Trial/start with words with low phonetic complexity

- Don't work on /s/ in words like "princess"
 - /pr/ blends
 - Multi-syllabic word
 - Repeated /s/
- Try words like:
 - See
 - Sew
 - House
 - Ice

Practice, practice, practice!

- A hierarchal approach is recommended for targeting articulation in individuals with a cleft
 - Isolation, syllables, all word positions, phrases/sentences, spontaneous utterances
- Shoot for a minimum of 50 practice targets in a session and provide cuing as needed

Example therapy for /s/

- Elicit /s/
- Encourage individual to do it independently. If accurate, request 3-5 more repetitions
- Give reward (turn in game, puzzle piece, etc.)
- Continue in isolation until 80%+ accuracy is reached
- Move to syllables
- Ask for 3-5 repetitions before each "reward."

What if the patient is hypernasal and has difficulty establishing placement?

- Use your fingers! Again, one of your best tools
- If the patient has difficulty creating pressure for consonants and establishing placement, work on targets with nasal occlusion
- While the target may not sound the same without occlusion, you are working on establishing placement
- You will notice huge gains after surgery

Case Study

- 4 year old girl
- Repaired cleft palate
- Severe hypernasal resonance
- Obligatory nasal substitutions
- Phonological process of nasalization for other phonemes as a compensatory pattern due to VPI

Case Study

- Started speech therapy for 6 months
- Worked on /p/, /b/, /t/, /d/, /k/ and /f/ with nasal occlusion prior to surgery
- She had a secondary palate surgery (posterior pharyngeal flap)
- Sounds targeted prior to surgery were mastered within 2 weeks after surgery
- Continued therapy after surgery
- Discharged 6 months after surgery and had mastered all phonemes

4) Know What a Nasal Fricative (Phoneme Specific Nasal Emission) is and How to Treat It

What is a nasal fricative/PSNE?

- A NF/PSNE is when air is entering the nasal cavity secondary to misarticulation and not secondary to palate dysfunction
- Is most common to be produced for /s/ and /z/
- Can occur on other phonemes

Case Study 1

- 5 year old girl
 - No history of clefting
 - Parents were concerned, "S comes through her nose."
 - Referred for palate testing
 - Had surgery
 - She sounded the same after surgery and the family wanted to know why

Listen

- A further reason to use the sentence samples
 - Tease out each sound

Speech Therapy

- She initiated speech therapy
- All errors were corrected in 3 months and stable in conversation
- Audio sample after surgery

Case Study 2

- 7 year old male
- VPI/D secondary to 1p36 deletion syndrome
- ALSO produced nasal fricatives
- Audio sample

Continued

- Had speech therapy for 4 months to correct nasal fricatives
- Had surgery to correct VPI/D
- Discharged from therapy after surgery

Who produces NF/PSNE?

- Individuals with VPI/D as a compensatory error
 - They may produce nasal fricatives AND be hypernasal
 - It is best to correct NF prior to any secondary palate surgery
- Any individual!
 - Some argument that there is a higher incidence in individuals with a history of hearing loss or ear infections

- Individuals without a cleft frequently get referred to a cleft team or ENT by SLPs who are unfamiliar with the error type for “palate testing.”
- Individuals who have NFs ONLY **do not require palate surgery**. Surgery will not correct the error, as it is a misarticulation!
 - This goes for both individuals with and without a cleft

How can I be sure it is a nasal fricative?

- Get those fingers back out!
 - Occlude the individual's nose on sounds you feel are coming through the nose
 - If it is a nasal fricative, the sound will be "stuck" in the nose and the sound will not be produced
 - If it is hypernasality/nasal emission, the sound will be redirected through the oral cavity and can still be produced

How do I fix it?

- Articulation therapy!
- Again, get those fingers back out.
- Occlude the nose and cue the individual to redirect the air through the mouth
- Shape sounds from existing sounds such as /s/ from a repeated and sustained /t/
- Shape from (sh) or /f/ and then to a smile
- Teeth together and "pretend to blow bubbles"

5) Know that Every Individual with VPI/D or a Cleft Needs a Team

Team Based Care

- Many individuals with cleft palate require multiple surgeries throughout their lifetime
 - Lip repair
 - Palate repair
 - Ear tube placement
 - Palate surgery for speech
 - Bone graft
 - Jaw surgery
 - Nasal revisions
 - Others . . .

Coordinated Care

- Most individuals with a cleft require services from the following disciplines:
 - Plastic Surgery
 - Orthodontics
 - Speech Language Pathology
 - Psychology
 - Audiology
 - Otolaryngology
 - Others

VPD Related to a Syndrome

- If you see an individual with no history of clefting and presents with VPD, it could be an indicator of a syndrome such as 22q11.2 deletion syndrome

VPD as Part of a Syndrome

- These individuals may require even more medical professionals as a part of their care such as:
 - Genetics
 - GI
 - Nutrition
 - Cardiology
 - Neurology
 - And more

Goal of Care

- The goal of team based care is to:
 - Coordinate surgeries
 - Fewer times under anesthesia because surgeries can be coordinated at times
 - Input is provided from multiple disciplines to look at the entire individual
 - How will speech surgery impact airway? Requires input from surgeon, ENT, and SLP
 - What if the child has a syndrome? Do they have cardiac clearance?
 - Provide a medical home
 - Records housed and tracked in one place
 - Create a comprehensive plan of care for improved outcomes

The Team and You!

- You are a part of the team!
- You might be the professional who made the referral
- Your input is invaluable
 - You provide updates on progress and provide services and treatment
 - You work in conjunction with the cleft team SLP in decision making

Resources

- ACPA
 - Cleftline.org
- ASHA
 - <https://www.asha.org/Practice-Portal/Clinical-Topics/Cleft-Lip-and-Palate/>

Thank you!

- Questions?
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