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Facilitating /r/ Articulation With Myofunctional Remediation Techniques

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Introductions and Disclosures

- Emily Parks is a graduate student clinician and is a candidate for the Master of Science Degree in Speech-Language Pathology from the University of South Carolina in August 2024. Emily is from Jacksonville, Florida and completed her undergraduate degree at Butler University in Communication Sciences and Disorders, with a concentration in social sciences.
- Angela N. McLeod is a salaried employee of the University of SC as Director of the Montgomery Speech, Language, and Hearing Clinic, a Clinical Associate Professor, and a speech-language pathologist.
- No financial compensation or incentives are provided to either speaker for this presentation.
- Neither speaker has non-financial relationships to disclose.



Background

- Many SLPs would agree that /r/ or some of its variants can be very difficult to remediate.
- Research has explored various interventions (ultrasound, electropalatography, various phonetic placement techniques, shaping and successive approximation strategies, visual feedback, appliances, biofeedback, motokinesthetic cueing, and others) (See ASHA.org)
- Flipsen (2015) reported that distortions of American English /r/ can be difficult to correct and may persist for years, possibly into adulthood.

Background

- Shriberg and Kwiatkowski (1983) reported /r/ as the 4th highest in cumulative frequency in the language, following only /n/, /t/, and /s/.
- The phoneme /r/ occurs frequently in the language and may consequently influence intelligibility.



Background-Why Difficult? (See Secord et al., 2007)

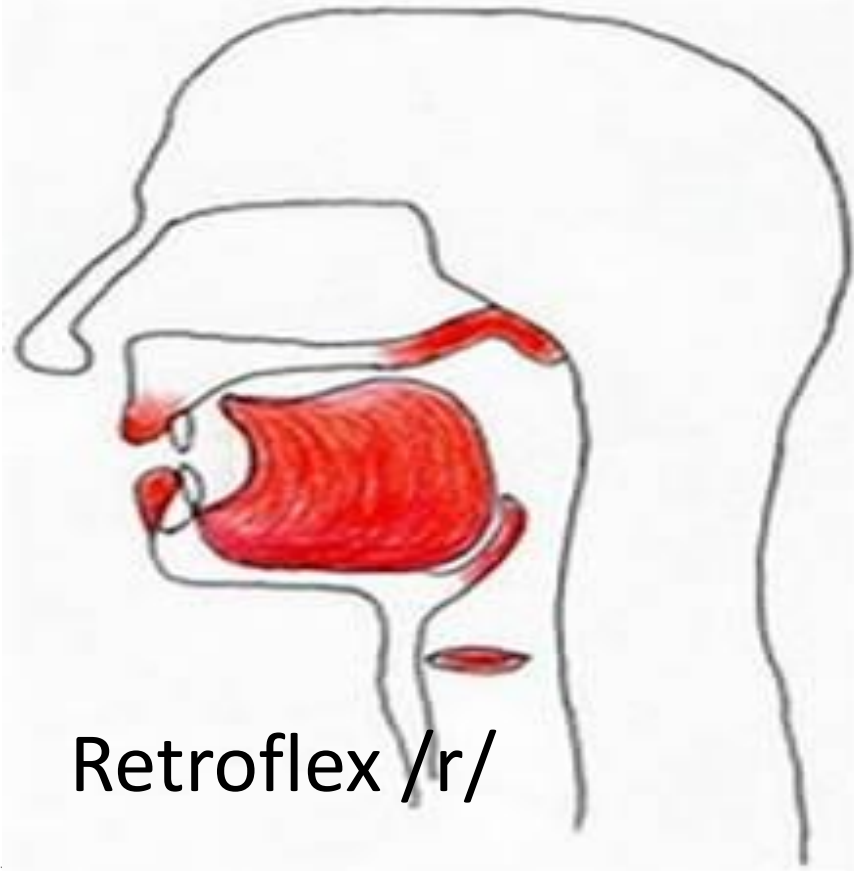
- Many different ways of producing /r/.
- Multiple places of articulation along the vocal tract (front-to-back)
- Precise positioning of sides of tongue
- Lack of tactile feedback
- Variability across syllable position and phonetic contexts

Background-Why Difficult? (See Secord et al., 2007)

- Variability across speakers and dialects
- Lack of acoustic specificity for tongue shape

Background Information

- One variation of /r/ is depicted here.



Retroflex /r/



Background Information

- Another variation of /r/ is depicted here.



List of /r/ Variability

- /r/ consonant, prevocalic
- /r/ blends: br, kr, dr, fr, gr, pr, tr, shr

-Types of vocalic R:

- AR – as in “star”
- OR – “door”
- EAR – “near”
- ER – as in “fur”
- IRE – as in “fire”
- AIR – as in “hair”
- URE- as in “cure”



Introduction & Terminology

- Orofacial Myofunctional Disorder: “OMD”
- Oro: related to the mouth
- Facial: related to the face
- Myo: related to muscle
- Functional: the way in which these work
- Dys: atypical/disordered

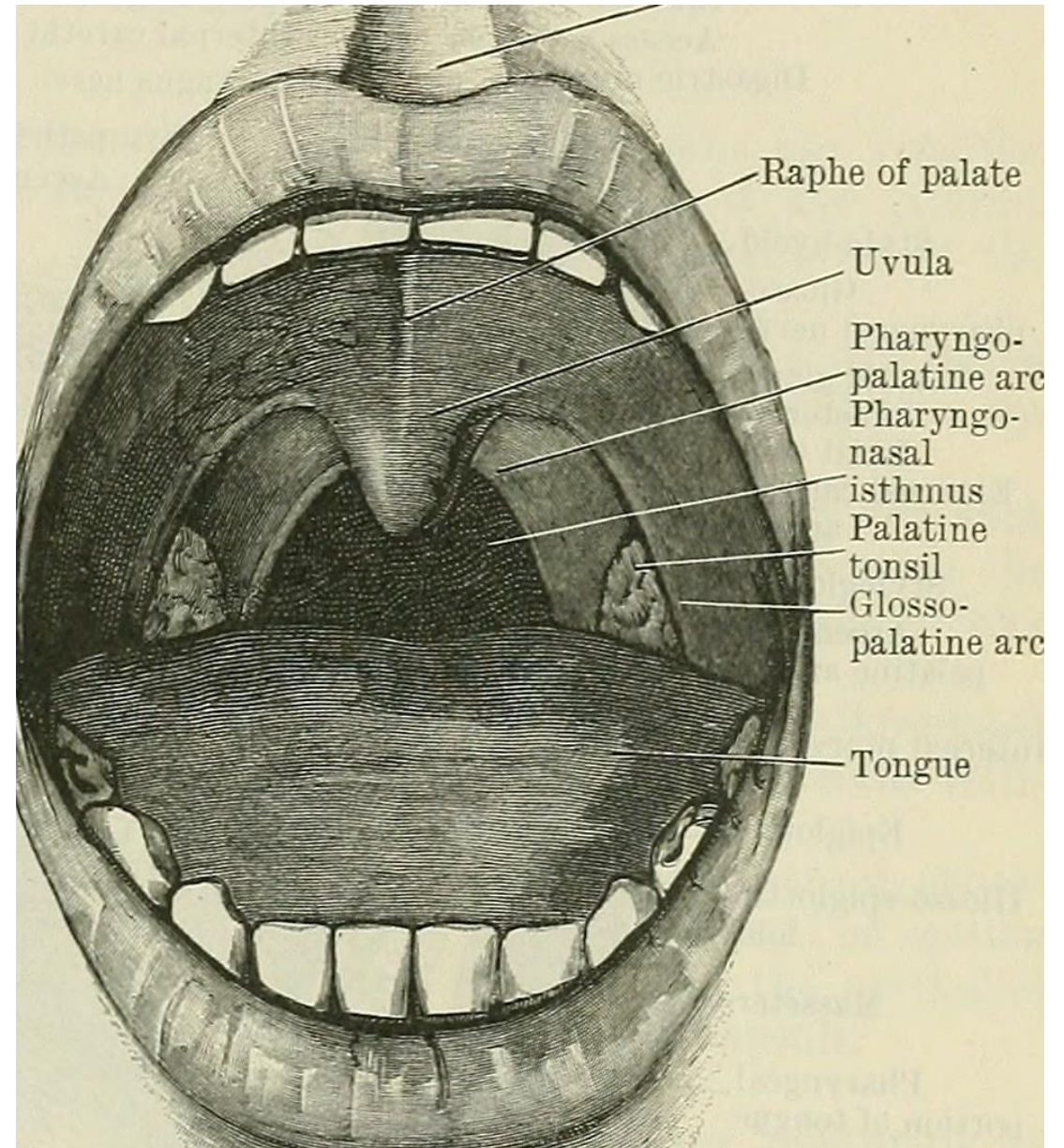


-Orofacial Myofunctional Disorder (OMD) refers to abnormal resting posture of the orofacial musculature (lips, tongue); atypical chewing and swallowing patterns; dental malocclusions; compromised airway.

-These patterns interfere with normal growth, development, or function of orofacial structures, or call attention to themselves (Hanson & Mason, 2003).

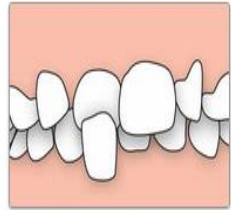


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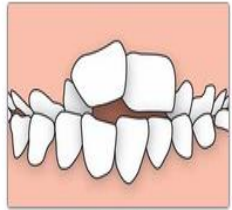


Orofacial Myofunctional Disorder (OMD)

Problems to watch for in children



Anterior Crossbite
(Scissor bite arrangement)



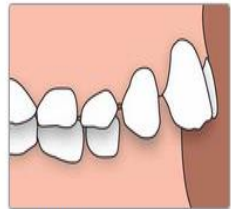
Posterior Crossbite
(Upper arch too narrow)



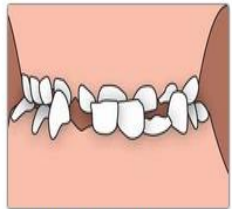
Crowding
(Overlapping teeth)



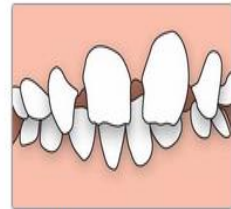
Open Bite
(Teeth don't meet at the front -
can be caused by thumb
sucking)



Protrusion
(Goofy - upper jaw too far
forward)



Complete Class III
(Lower jaw protrudes forward of
upper jaw)



Diastema
(Spacing)

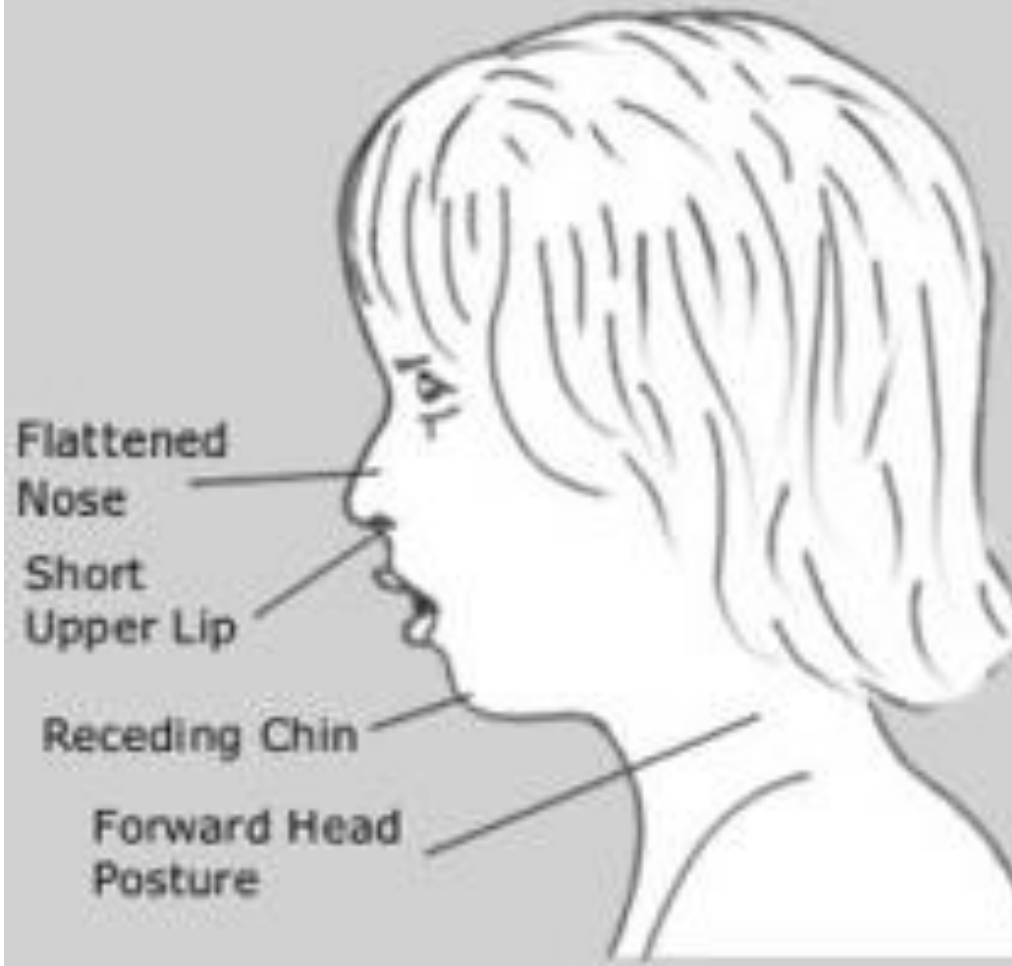
- inappropriate thrusting of the tongue in swallowing and/or speaking
- Anterior rest posture of the tongue between the teeth
- Anterior rest position of the tongue against the upper (maxillary) incisors
- Lateral or bilateral posterior tongue rest posture between the teeth
- Inappropriate open lips and open mouth habitual, resting posture
- Atypical habits of sucking (thumb, fingers, tongue, cheeks, pacifier)

Tongue Thrust

- Tongue thrust is a forward position of the tongue during rest, and a thrust against or between the teeth during swallowing and speech.
- A tongue thrust condition is sometimes called an orofacial (mouth and face) myofunctional (muscle function) disorder (OMD).
- “Tongue thrust” was ASHA’s original term to describe the broad range of features/characteristics now known as an orofacial myofunctional disorder. In other words, the more modern and ASHA’s preferred term is oral myofunctional disorder.
- Every person with tongue thrust is considered to have an OMD. However, a person can have an OMD and not have tongue thrust.



Chronic Mouth Breather Profile



Etiology of OMDs

-Mouth breathing rather than nose breathing. Long-term mouth breathing changes the natural resting position of the jaw, tongue and lips. Improper growth patterns of the jaw and maxilla can result, and this contributes to malocclusion. Long-term mouth breathing impedes normal nose breathing, which is designed to purify air for the pulmonary system.



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Image from <https://sleepqplus.com/blogs/blog/mouth-breathing-can-change-the-shape-of-your-childs-face>

Etiology of OMDs

- Dysphagia
- Craniofacial disturbances
- Prolonged pacifier usage
- Inappropriate sucking and chewing habits
- Restricted oral frenula (early nursing difficulty with labial, lingual, and buccal movements for latching, sucking, lingual retraction, cupping, and elevation)
- Unknown etiology



Features and Characteristics

from AOMT website <https://aomtinfo.org/orofacial-myofunctional-disorders/>

1. MOUTH BREATHING VS. NASAL BREATHING
2. OPEN MOUTH POSTURE
3. DROOLING/POOR SALIVA MANAGEMENT
4. TONGUE THRUST – ANTERIOR
5. BI-LATERAL TONGUE THRUST
6. TONGUE TIE/RESTRICTED FRENULUM
7. LIP TIE
8. ATYPICAL SWALLOWING/DYSPHAGIA
9. POOR HABITS (NAIL BITING, LIP BITING, THUMB-SUCKING, ETC.)
10. CHEWING DISORDERS
11. FACIAL MUSCLE DYSFUNCTION
12. HYPOTONIC MASSETERS
13. SPEECH MISARTICULATIONS (INCLUDING LISPS)
14. TONSILS / ADENOIDS ENLARGEMENT
15. TMJD AND PAIN/HEADACHES
16. SLEEP DISORDERS / SLEEP APNEA



Image from: <https://omtofyork.com/products/>



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Features and Characteristics

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17. BRUXISM/CLENCHING
18. LOW TONGUE REST POSTURE
19. SNORING
20. MALOCCLUSIONS
21. CAVITIES AND GUM DISEASE
22. CHANGES IN SALIVA QUANTITY & QUALITY
23. RESTRICTED MAXILLA / HIGH PALATE
24. TONGUE SCALLOPING
25. CRANIOFACIAL DYSFUNCTIONS
26. ALLERGIC SHINERS / VENOUS POOLING
27. EUSTACHIAN TUBE DYSFUNCTIONS
28. MACROGLOSSIA
29. ABNORMAL BREATHING
30. TINNITUS
31. INFANT FEEDING PROBLEMS
32. FORWARD HEAD POSTURE



Case Description

- Male child, formally identified with SSD at age 6
- GFTA-3, scored in 8th percentile when tested at age 6.
- Errors at that time were /r/, vocalic /r/, and /l/
- 7 years old when presented on caseload of current clinicians
- Parent was concerned with his /r/ articulation; /l/ had resolved
- He had no semblance of /r/, vocalic /r/, or /r/ blends (was not stimulable). This was determined by administering probes and listening to a speech sample.



Case Description

- Feeding problems during infancy
- Tongue tie revision (lingual frenulum clipped) during infancy
- Lip tie revision (labial frenula clipped) during infancy
- Frequent colds throughout development
- One episode of respiratory distress in development
- Dental crowns
- Drooling that required wiping his mouth at age 7



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31. **INFANT FEEDING PROBLEMS**
32. FORWARD HEAD POSTURE



Interventions

- Based on case history data, revealing several features related to myofunctional disorder, OMT techniques were implemented in weekly sessions.
- Please see sample lesson plan for myofunctional exercises.
- Due to great stimulability for /ʒ/, clinician used shaping/successive approximation techniques to teach various versions of /r/.

Sample Lesson Plan

- Long-term myofunctional objective statement: When presented with instructions and/or models by the clinician, patient/client will complete the designated exercises and tasks from a client-specific orofacial myofunctional remediation program (myofunctional exercises) with the specified criteria for each task (90% accuracy for most tasks/exercises).

Sample Lesson Plan

- Short-term objectives:
 - a. Waggle Spot
 - b. Flat tongue
 - c. Skinny tongue
 - d. Taco
 - e. Tick tock
 - f. Jaw breaker
 - g. Tongue resistance
 - h. tongue bowls
 - i. anterior tongue release
 - j. knotty straw
 - k. diagonal straw
 - l. recoils

Exercises

- Suction

<https://www.youtube.com/watch?v=cZeK-Jbcvyc>

- Video depicting some of the exercises

<https://www.youtube.com/watch?v=T-uCtvQTrv0>

Sample Lesson Plan-Early Therapy

- Speech sound objectives:
- When presented with visual stimuli and phonetic placement cues, X
- a. will produce single-syllable words containing 'ar' with 70% accuracy.
- b. will produce various single-syllable words containing /ɜ:/ with 70% accuracy.
- will produce various single-syllable words containing 'air' with 70% accuracy



Sample Lesson Plan-Later Therapy

- When presented with visual stimuli, X will produce words containing multiple vocalic /r/ words with 70% accuracy at the sentence level.
 1. Jerry and Larry eat peppermint patties.
 2. I see a long beard on a grizzly bear.
 3. I wear pearls on Thursday.
 4. We will exercise first.
 5. Hurry to work, the doctor needs you.
 6. In my purse, I have a mirror.
 7. Terry is an attorney.

Summary of Speech Sound Interventions

- Implemented myofunctional therapy
- Followed Van Riper's Traditional Stimulus Approach, moving from smaller to larger speech targets, simple to complex
- Implemented various phonetic placement strategies, pointing out aspects of production, e.g., "tight, skinny tongue", provided models, offered visuals, used a mirror so client could view face/mouth
- Applied principles of motor learning, eliciting many trials per session
- Used StaRt app to provide visual feedback for tongue placement during "er" productions.

Outcomes

- Treatment took place for a duration of approximately 20 weeks of therapy; Sessions were one hour in length.
- Developed ability to self-correct almost any /r/ error, including those in blends and multisyllabic words.
- He could refer to /ɜ:/ as the foundation and could modify it to any intended target word with /r/.
- Was ultimately dismissed from therapy after approximately 5 months.

Important Notes

- Myofunctional exercises are not the equivalent of NSOMEs.
- Not every client who has an /r/ production problem is a candidate for myofunctional remediation.
- Conduct myofunctional evaluation or at least consult the AOMT Checklist referenced in this presentation to screen for possibility that SSD has myofunctional association.
- ASHA states that SLPs need to receive special training in assessment and treatment of orofacial myofunctional disorders.



References & Resources

- ASHA.org Orofacial Myofunctional Disorders
[https://www.asha.org/practice-portal/clinical-topics/orofacial-myofunctional-disorders/#:~:text=Orofacial%20myofunctional%20disorders%20\(OMDs\)%20are,children%2C%20adolescents%2C%20and%20adults.](https://www.asha.org/practice-portal/clinical-topics/orofacial-myofunctional-disorders/#:~:text=Orofacial%20myofunctional%20disorders%20(OMDs)%20are,children%2C%20adolescents%2C%20and%20adults.)



References & Resources

- *Eliciting Sounds: Techniques and Strategies for Clinicians* by Wayne A. Secord, Suzanne E. Boyce, Richard E. Shine, JoAnn S. Donohue and Robert A. Fox (2007, Revised)
- Flipsen, P. (2015). Emergence and prevalence of persistent and residual speech errors. *Seminars in Speech and Language*. 36. 217-223. 10.1055/s-0035-1562905.
- Landis, C. F. (1994). Applications of orofacial myofunctional techniques to speech therapy. *International Journal of Orofacial Myology*, 20(1), 40-51. DOI: <https://doi.org/10.52010/ijom.1994.20.1.6>



References & Resources

- Myofunctional Therapy Treatment Manual

<https://orofacialmyology.com/product/treatment-program-myo-kit/>

- Shriberg LD, Kwiatkowski J. (1983) Computer-assisted natural process analysis (NPA): Recent issues and data. *Seminars in Speech, Language, and Hearing*. 1983;4:389- 406.
- staRt app for visual feedback

<https://wp.nyu.edu/byunlab/projects/start/>



Questions and Comments



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