

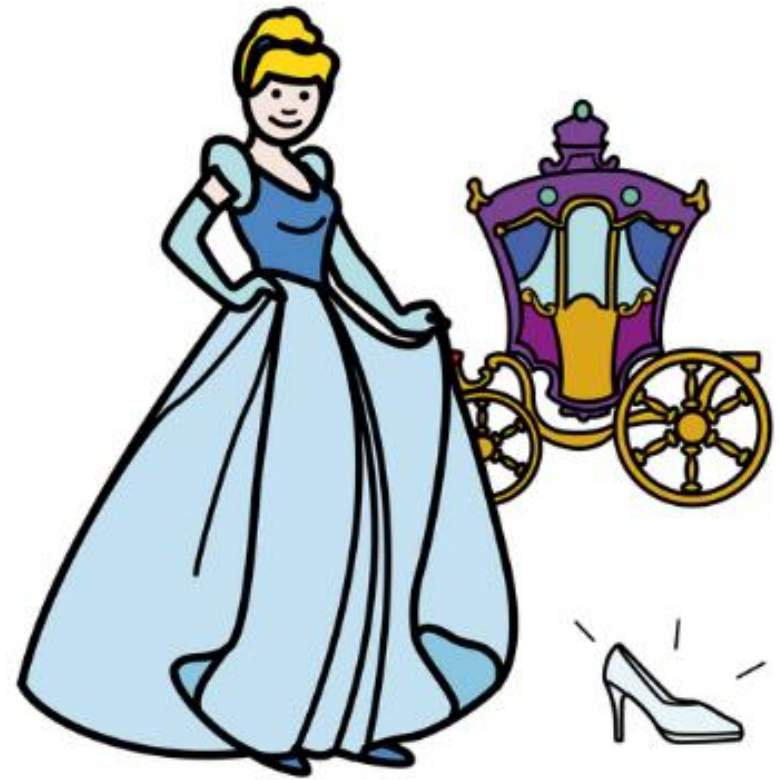
OMD Cinderella Syndrome

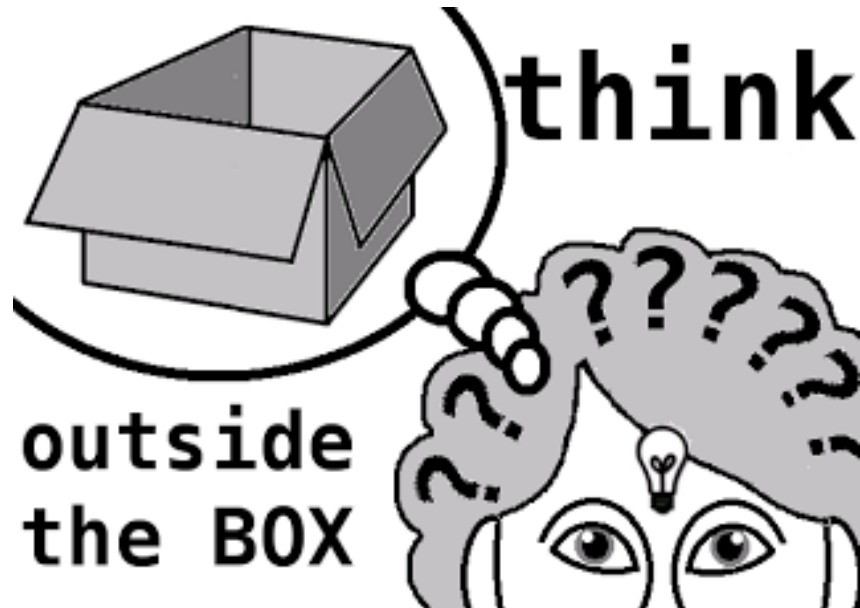
(when the traditional therapy shoe doesn't fit)

BOOK 1

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**Expert therapists approach sound disorders as a puzzle.
They consider multiple elements simultaneously.**

- **traditional articulation issues.**
- **motor plan (apraxia) features.**
- **sound system (phonology) meaningful units.**

Articulation

is the pronouncing of words, or the manner in which they are pronounced. An articulation impairment, includes omissions, substitutions, or distortions of sound, persisting beyond the age at which maturation alone might be expected to correct the deviation.

Children develop the ability to produce speech sounds at different rates. This list includes approximate ages at which children normally develop specific speech sounds correctly.

Note: Ages apply for English as a first language. Second language learners often develop sounds later.

<u>Speech Sounds</u>	<u>Ages at which sounds normally develop</u>
p, m, h, w	12 months to 3 years
b	18 months to 3 ½ years
k, g	2 to 4 years
n, ng	2 ½ to 5 years
f, y	3 ½ to 5 ½ years
l	2 ½ to 6 years (7 years for boys)
r	2 ½ to 8 years
t, d	2 to 3 ½ years
s, z	3 to 9 years
sh	4 to 6 years (7 years for boys)
ch, j	3 ½ to 6 years (7 years for boys)
v	4 to 5 ½ years
unvoiced th (as in "thumb")	4 ½ to 8 years
voiced th (as in "that")	5 to 7 years
s-blends: sp, st, sk	3 to 6 years
s-blends: sm, sn	3 ½ to 7 years
l-blends	4 to 6 years
r-blends	4 ½ to 6 years

Compiled by Patricia Gruver Fisher from the following sources [Chart Based upon Smit, Hand, Freiler, Bernthal & Bird (1990), Iowa Articulation Norms Project and its Nebraska Replication. Journal of Speech and Hearing Disorders, 55, 779-798., Goldman, Fristoe and Williams (2000). Goldman Fristoe Test of Articulation: 2nd edition Supplemental Developmental Norms. Circle Pines, MN: American Guidance, and McLeod, van Doorn & Reed (2001), Normal acquisition of consonant clusters. American Journal of Speech-Language Pathology, 10, 99-110. *(Based upon Lynch & Fox (1980), A Parent-Child Cleft Palate Curriculum: Developing Speech and Language. CC Publications. Oregon, Page 102, How Well Words can be Understood)]

Apraxia ?

- An audiologist should perform a hearing evaluation to rule out hearing loss as a possible cause of the speech difficulties.
- A certified-SLP with knowledge and experience with CAS conducts an evaluation. This will assess the child's oral-motor abilities, melody of speech, and speech sound development. The SLP can diagnose CAS and rule out other speech disorders, unless only a limited speech sample can be obtained making a firm diagnosis challenging.

Acquired Apraxia (AOS) and Childhood Apraxia of Speech (CAS) include inconsistent articulatory errors, groping oral movements to locate the correct articulatory position, and increasing errors with increasing word and phrase length.



APRAXIA CHARACTERISTICS (ASHA)

A Very Young Child

- Does not coo or babble as an infant / First words are late, and they may be missing sounds
- Only a few different consonant and vowel sounds /Problems combining sounds; may show long pauses between sounds
- Simplifies words by replacing difficult sounds with easier ones or by deleting difficult sounds (although all children do this, the child with apraxia of speech does so more often)
- May have problems eating

An Older Child

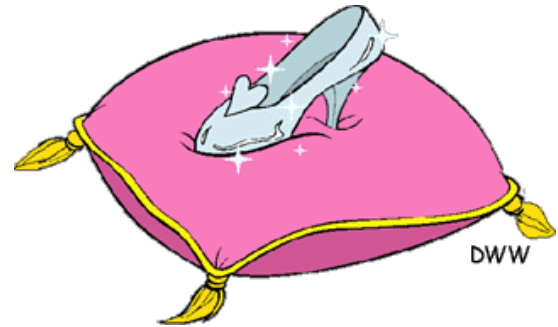
- Makes inconsistent sound errors that are not the result of immaturity /Can understand language much better than he or she can talk
- Has difficulty imitating speech, but imitated speech is more clear than spontaneous speech
- May appear to be groping when attempting to produce sounds or to coordinate the lips, tongue, and jaw for purposeful movement
- Has more difficulty saying longer words or phrases clearly than shorter ones
- Appears to have more difficulty when he or she is anxious Is hard to understand, especially for an unfamiliar listener /Sounds choppy, monotonous, or stresses the wrong syllable or word

Phonology



Phonology is the systematic use of sound to encode meaning in any spoken Language, or the field of linguistics studying this use. Just as a language has syntax and vocabulary, it also has a phonology in the sense of a sound system. Units at all levels of language that are thought to structure sound for conveying meaning.

Clinical Judgment



Professionals in our field have separated themselves from one another and the gap keeps growing. There are specialists in apraxia, dysphagia, phonology, orofacial myology, etc. "Evidence based" materials are quoted in every article, lecture, presentation, and book. In spite of all the talent, research, and information available, clinicians still find themselves working with cases that are the exception to the "rule".

Is clinical judgment still an option?

Swallowing has four different phases. These phases overlap and are influenced by different variables (such as the type of substance, the amount of substance and timing). The following phases are simplified from Medical guide models used in Hospitals, Nursing Care facilities and Trauma Centers:

1. **Oral Preparatory Stage,**

Food is chewed (masticated), mixed with saliva, and formed into a cohesive ball (bolus)

2. **Oral Stage,**

Food is moved back through the mouth with a front-to-back squeezing action performed by the tongue

3. **Pharyngeal Stage,**

The pharyngeal swallowing response:

- Food enters the upper throat area (above the voice box)
- Soft palate elevates
- Epiglottis closes off the trachea, as the tongue moves backwards, the pharyngeal wall moves forward
- These actions help force the food downward to the esophagus.

4. **Esophageal Stage,**

The food bolus enters the esophagus (the tube that transports food directly to the stomach).

The bolus is moved to the stomach by a squeezing action of the throat muscles.

Based on Brain Injury Patient Care and Education Manual, by Pinecrest Rehabilitation Hospital; Neuro section of the Trauma Manual, Jackson Memorial Hospital; and Recovering from Head Injury; a Guide for Patients, by Nova University Neuropsychology Service, and edited for PoinTIS by the Louis Calder Memorial Library of the University of Miami School of Medicine and the PoinTIS Advisory Committee, and on Rehabilitation of Persons with Traumatic Brain Injury, NIH Consensus Statement 1998 Oct. 26-28.

Dysphagia



- Illnesses often connected to dysphagia include strokes, progressive neurological disorders (i.e. Parkinson's disease or multiple sclerosis), brain tumors, head and neck cancers, and reflux. As a person ages or if a person has had head injuries, dysphagia may also develop. Infants born with disorders (i.e. cleft palate, Down Syndrome or cerebral palsy), can be associated with dysphagia.

Orofacial myologist with orthognathic surgery patients

Orthognathic surgery involves the surgical manipulation of the elements of the facial skeleton to restore the proper anatomic and functional relationship in patients. Orthognathic surgery is used for patients with dentofacial malformations affecting the jaw, face. The main goal is to return the function of mastication. This will also improve overall facial structural agreement. (Patel, 2009)



Goals of Dysphagia Treatment

Dysphagia therapy may help patients learn to swallow more safely and effectively. Some patients may nourish their bodies by non-oral methods, including feeding tubes that allow people to feed without putting them in danger of choking or aspirating. Individuals on feeding tubes may benefit from specialized therapy so that they might eat again by mouth one day. Exercises include activities that aim to strengthen muscles, improve movement and improve coordination.

The normal process of swallowing remains the same.

Orofacial myology disorder?

An Orofacial Myofunctional disorder includes abnormal habit patterns that intrude on the oral environment resulting in excessive opening of the freeway space.

Orofacial Myology Goal

The goal of orofacial myology is to train the tongue and lips to rest in proper positions which should contribute to establishing the freeway space to more normal parameters. Treatment includes counseling, demonstrating, exercising, and supporting the patient through the process. Exercises include activities that aim to strengthen muscles, improve movement, normalize function, and improve coordination.



In a pumpkin shell

Example A: Female, age 19

Row #1: pictures taken May 2014.

Speech errors included /s,z,t,d,l, and n/, starting orthodontic retreat.

Row #2: pictures taken May 2015.

Total treatment time May, 2014 – May 2015, 26 sessions

Example B: Male 49

Seen for 21 sessions in total; treatment
break around surgery.

Orofacial Myologist

- ▶ An orofacial myologist assists in the overall treatment program by assessment, counseling and treatment prior to the surgical intervention. A complete case history obtaining the information about the functions of the mouth, jaw, and closely related structures including habitual postures of the tongue and lips. The mandibular opening angles and pre-existing habits should be recorded.
- ▶ Treatment includes counseling about the musculature physics and the mouth and jaw functions to assist the patient in understanding the expected functional changes that will occur with the surgery.

Possible Etiologies for Atypical Function:

Bottle-feeding is believed to be one source of the problem. If the nipple on the bottle is long or has a large hole, the flow of the liquid could be rapid and abundant. In an attempt to avoid choking, an infant could forward the tongue to handle the rapid flow of fluids. In the past, bottle nipples were long and extended into the back of the throat of the Infant. This made it impossible for the infant to place the tongue up against the palate of the mouth.

Upper respiratory disorders or any obstruction to the airway may be related to the tongue thrust pattern. Allergies, nasal congestion, nasal obstruction or enlarged adenoids which may contribute to the need to breathe through the mouth. When the mouth is open the tongue may rest forward and in the mandible, resulting in open lip posture.

Trauma or disease to the oral mechanism and/or throat including thyroid issues, cancer, Cerebrovascular Accident, Bell's palsy, Multiple Sclerosis, vocal cord damage, Surgery, Epilepsy, Head trauma, or Parkinson Disease

Possible Etiologies for Atypical Function continued

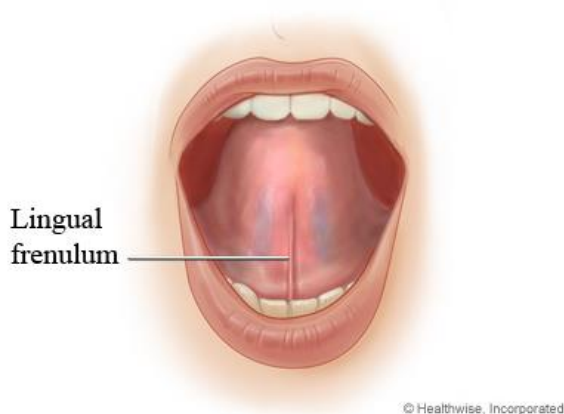
Large tonsils or frequent throat infections may contribute to abnormal swallowing and tongue/lip posturing. When the tonsils occupy more space in the throat, the tongue is forced to move forward in the mouth. This encourages the tongue to rest forward in the mandible, resulting in open lip posture. Forward motion of the tongue is likely to occur during chewing and swallowing.

Structural limitations such as an extremely high, narrow palatal arch or a short lingual frenum may contribute to a tongue thrust pattern because the tongue is unable to easily reach the palate. In the acts of rest, swallowing and speaking the tongue will be limited in range and motion to the mandible.

Thumb, finger or tongue sucking promotes an open lip and forward tongue resting posture. The tongue can't reach or move into the correct area in the act of swallowing if another object is in that space.

Prognostic Factors in Treatment

First, consider the **oral structure and muscular function of the mechanism**. During the diagnostic examination the oral structures and their functions should be assessed during eating and non-eating (rest and speech) activities. Finding a limited lingual frenum (tissue attached under the tongue) is a prognostic concern because sometimes the tongue cannot physically move correctly for eating or speech



Prognostic Factors



The **attitude/motivation of the patient and their family** must be considered. Patients can usually achieve anything they really want to achieve. Therapists may find themselves as the key motivators in the therapeutic process. Somehow, the therapist must transfer this responsibility to the patient early in the treatment process. If there is a negative attitude or resistance to the treatment process, change will be limited. The clinician must educate the patient and family about the problem and remedial process. The orofacial myologist may become the coordinator of the training.

Prognostic Factors Continued

Consider breathing patterns/airway accommodation. An open mouth posture promotes the lower jaw to hang open. The constant downward pull on the muscles of the face often results in a long, narrow, flatter facial appearance. The nasal-sinus area may be underdeveloped decreasing air availability. The lip tissue presents full and flaccid. The lax lips chap easily and are likely to develop corner lip sores. There may be a restriction of the movement of the upper lip.

Prognostic Factors Continued

Fourth, the **age and maturity** of the patient will directly impact the treatment program. If the patient is too young to understand or cooperate in the treatment process, progress will be limited. Some patients are just not able to recognize the problem until they are older. Lack of awareness will diminish their success using new skills too.

Prognostic Factors Continued

- **Sucking habit behaviors** must also be considered in a prognostic statement. Including thumb sucking, digital sucking, knuckles, pacifiers, blankets, or tongues. If a normal occlusion is disturbed by a sucking habit pattern, the dental equilibrium is disrupted and the same musculature affects speech production.



Treatment Considerations: (How do we get invited to the Ball?)

Normal swallowing/eating patterns indicate musculature development that supports accurate sound production.

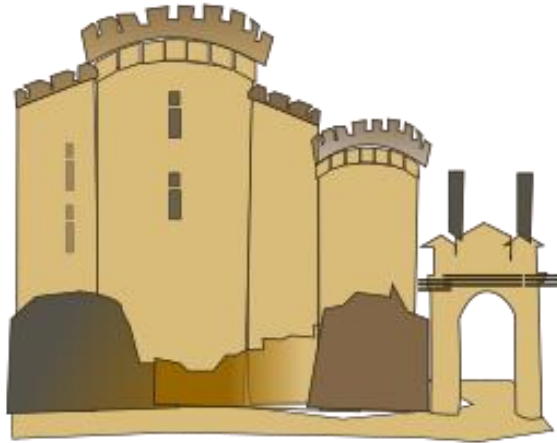
Treatment should include pragmatic language, sound production, & eating/swallowing issues simultaneously. Eating is a social experience.

Treatment of a Swallowing disorder should consider multiple aspects.

Oral motor use augments speech sound refinement.

Expert Clinical experience/judgment precedes research.

Form or Function?



This controversy is one of the great debates. Does the oral structures (teeth, jaw, palate-form) influence the way musculature works (tong, oris, masseter, etc.-function) or does the oral musculature ue (function) influence the formation of the structure (form)?

- In simple terms, did the oral structure (form) cause the muscle movement patterns (function)? Or did the muscle movement patterns (function) cause the structure development (form)?
- Probably, both concepts have merit. The structure probably encourages the muscles to adapt and function in a certain pattern. The muscle pattern probably exacerbates the structure issues. (Manilla, 2010)

Why provide OFM treatment?

Treatment before orthodontics provides an opportunity correct habits (i.e. develop closed lip posture, increase nasal breathing, and eliminate sucking patterns) before the braces are in place.

Treatment in concurrence with orthodontics may be beneficial when certain structures need to change to create space for the tongue to function effectively.

Treatment should be pre-emptive to decrease the negative influences on the structure and muscle function. Consistent patterns tend to intensify with use. Increase use of normalized tongue function patterns to reduce abnormal patterns. Treatment improves the oral musculature and environment which allows for accurate speech sound training and use.

Diagnostics?

An orofacial evaluation of the oral mechanism includes visual inspection of the physical structure, observation of muscular function and interviewing/counseling procedures.

Photographs of the client at rest, eating and speaking help establish a baseline. Video recording is also a good method of capturing the form and function of the mechanism.

The range and function of the lips, tongue, palates and facial musculature should be observed in eating and non-eating activities.

Diagnostics

Diagnostic procedures should obtain the background and history, identify the concern/problem, determine etiologies, rate the severity/regularity and direct the design of an appropriate treatment plan. General observations should be noted when a new patient is unaware so that true behavior patterns are verified. Notice the rest posture of the lips and the tongue. Watch the patient swallow saliva, record if there is protruding or puckering of the lips or tightening of the mentalis region. Make a cursory observation of the face noting the condition of the skin, facial musculature used in expression, coloration and form.

Example C: 8 year old male

TREATMENT PROGRAMMING

- Level I: Education.
- Level II: Training of Musculation/Mechanics.
- Level III: New Pattern Incorporation
- Level IV: Daily Living Activities.
- Level V is Retention



Level I: Education



Level I includes discussion of the evaluation results and guidance in considering the various treatment procedures. The basis of successful treatment is established by cultivating a partnership for treatment with the family and patient. Education is critical to each Level in the treatment process. During this phase of treatment the family's feelings (guilt or fear) can be calmed or dismissed. The patient and family can be guided to concentrate on the importance of correction for dental health, muscle function, eating and speech production.

Level II: Training Musculation/Mechanics

Level II continues the education phase and addresses the beginning of musculation training to establish correct lip closure (lip competence), to increase nasal breathing, and to establishment of independence of tongue movements.

Treatment Goals at Level II (add %)

- ▶ To identify/eliminate noxious oral habits (i.e. thumb, digit, pacifier, blanket or tongue sucking).
- ▶ To increase awareness of oral vs. nasal breathing habits.
- ▶ To increase nasal breathing.
- ▶ To identify and achieve bilabial closure.
- ▶ To increase lip closure and resting posture of the lips. (lip competency).
- ▶ To identify and use correct resting posture of the tongue.
- ▶ To identify and use correct resting posture of the jaw.
- ▶ To establish tongue mobility without mandible assist.
- ▶ To accurately elevate the tongue tip/medialportion/posterior portion.

Level III: New Pattern Incorporation

- Level III focuses on the pattern precision and accuracy of movement of the tongue to initiate the swallow in union with the lower facial muscles of expression (Orbicularis oris, Quadratus Labii Superior, Caninus, Zygomatic, Buccinator, Risorius, Triangularis, Quadratus Labii Inferior, and Mentalis).
- At Level III, specific attention is given to functional activities of eating; saliva swallows at rest and between speech production and the resting postures of the tongue, lips, and jaw.

Treatment Goals at Level III (add %)

- ▶ To establish relaxed muscles of expression during swallowing.
- ▶ To eliminate facial grimacing or puckering during swallowing.
- ▶ To suction (saliva, liquids, solids) to center of tongue for swallowing.
- ▶ To establish chewing actions using the molars.
- ▶ To increase control and strengthen lingual accuracy.
- ▶ To use the intrinsic transverse muscle to narrow the tongue at will.
- ▶ To use the styloglossus muscle to elevating tongue sides.
- ▶ To identify/use placement of bolus/liquids on tongue for swallowing.
- ▶ To use correct tongue movement patterns for eating/drinking.
- ▶ To establish the tongue resting position against the upper gum ridge.
- ▶ To suction saliva & use correct tongue movement to swallow during rest.

Tx Goals for Level III continued

- ▶ To suction saliva and use correct tongue movement to swallow between speech production
- ▶ To establish lingual contact accuracy for production of _____ sounds.
- ▶ To establish central airflow, friction or air stoppage for the production of _____ sounds.

Addressing sound production errors is logical at Level III

Level IV: Daily Living Activities

- Level IV concentrates on establishing the new swallow and resting postures into life routines. Goals of Level I (education), Level II (musculature training), and Level III (pattern precision) are reinforced in daily activities.
- Level IV requires the family, patient and therapist to look seriously at the daily living routines and integrate the new skills in all daily activities.

Treatment Goals at Level IV (add %)

- ▶ **To use nasal breathing**
 - ▶ while reading, watching TV, listening to music.
 - Encouraging lip closure posture
 - Utilizing correct tongue posture
- ▶ **To use correct lip, tongue, and jaw positions**
 - ▶ in resting postures.
 - creating appropriate freeway space
 - Building strength habits to support correct speech production
- ▶ **To swallow with correct tongue action, lip closure, jaw stability.**
 - Liquids/ Solids/ At rest
- ▶ **Amid Speech Utterance**
- ▶ **To establish nasal breathing at subconscious level (i.e. nighttime).**
 - Encouraging lip closure posture
 - Utilizing correct tongue posture
- ▶ **To transfer responsibility of using new patterns to patient.**

Level V is Retention

At Level V the patient begins to teach his new patterns and skills to his family, therapist and other beginning clients. When the patient is able to clearly communicate the concepts and demonstrate the techniques to others, they are more likely to have mastered the skills. Retention is a positive phase for the patient. They now see themselves as being their own therapist. A variety of suggestions are given to the patient, but the treatment plan is now up to them.

Example D: 8 year old female

22 sessions

Example E: Unilateral swallow pictures 11/24/10

17 year old male

Tongue rests to the right front teeth. Patient has slow and sluggish movements of his tongue from the anterior to the posterior part of the oral mechanism. He also presents with an articulation disorder affecting the production of his speech sounds including /s,z,dʒ,t,d,n,l/. Patient reports lifelong negative comments about his “speech, open mouth posture, and distracting eating habits.”

Pictures taken 2/2012

Treatment 22 sessions

Treatment Plan for _____

GOALS:

- To identify/eliminate noxious oral habits (i.e. thumb, digit, pacifier, blanket, tongue sucking)
- To increase awareness of oral vs. nasal breathing habits
- To increase nasal breathing
- To identify and achieve bilabial closure
- To increase lip closure and use of correct resting posture of the lips (lip competency)
- To identify correct resting posture of the tongue
- To identify correct resting posture of the jaw
- To establish tongue mobility without mandible assistance
- To establish relaxed muscles of expression during swallowing
- To eliminate facial grimacing or puckering during swallowing

To suction (saliva, liquids, solids) to the center of tongue for swallowing
 To use of the intrinsic transverse muscle to narrow the tongue at will
 To identify & use correct placement of bolus on tongue for swallowing
 To identify & use correct placement of liquids in the mouth for swallowing
 To use correct tongue movement patterns for eating, drinking, speech & rest
 To suction saliva, use correct tongue movement to swallow (rest & between speech)
 To establish lingual contact accuracy for production of /t, d, l, n/
 To establish central airflow and/or friction for the production of /s, z, dʒ/
 To correctly produce and use speech sounds as follows:

Sounds	Isolation	Words	Phrases/sentences	Reading	Spontaneous
/s/					
/z/					
/t/					
/d/					
/l/					
/n/					
/dʒ/					

Example F: 13 year old male
10 sessions

15 year old female, 2/2011

8 years of orthodontia

Medical history was positive for snoring, glasses, predominant mouth breathing, 2 sets of braces, and a tonsillectomy and adenoidectomy in 2001. A history of pacifier use was also reported. She demonstrated a moderate orofacial myology issue affecting her speech production of /t, d, l/ and oral rest posture. (Speech with lower jaw jet)

2/2012 Recheck visit.
Completed treatment in
19 Sessions (9/2011)



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