

CE Course:

The Function Junction: Critical Role of Bio-Adaptability in Mouth Breathing, Sleep Apnea and Orofacial Myofunctional Disorders

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What is a Function Junction?

A “Function Junction” is the melding of the functional inter-relationships (function) of the airway, orofacial musculature, tongue and mandibular movement patterning, orofacial parafunctional behaviors, resting postures of the tongue, lips, and mandible, the dental freeway space; sleep apnea risk factors; and the impact of nasal or mouth breathing on the hard and soft tissues of the orofacial structures and environment (form).

Orofacial Myology, referred to more often as Orofacial Myofunctional Therapy (OMT), is a therapeutic approach to address breathing, resting postures (of the tongue, lips, mandible, head & neck), chewing patterns, swallowing patterns, and functional speech patterning. OMT is utilized as a therapeutic treatment to:

- harness, reeducate and normalize the relational junction between inadequate or distorted neuromuscular patterning along with facilitating the normalization of a less than ideal structural form.
- reeducate the neuromuscular and behavioral forces on the structural form to enable the bio-adaptability of the soft and hard tissues in the orofacial environment to normalize. (Interventional treatment may also be needed by additional healthcare team members to address additional structural issues.)
- eliminate mouth breathing and establish consistent nasal breathing for a correct breathe-suck-swallow-

breathe cycle; establish and habituate correct resting postures of the tongue, lips, mandible, head and neck; develop consistent correct chewing and swallowing patterns; and retrain functional movements for correct speech patterning (movements of the tongue, lips, and mandible during speaking).¹⁻⁷

OMT Levels of Function

- Nasal breathing / Airway patency
- Resting postures of tongue, lips, mandible
- Swallowing pattern
- Chewing pattern and bolus formation
- Functional movements during speaking
- Sleeping with nasal breathing, tongue on palate, lips closed, dental freeway space maintained

OMT harnesses the orofacial and oromotor functional forces in a positive manner. This correction of FUNCTION eliminates the harmful impact or significantly reduces the systemic risk factors and allows the structural FORM to reach its full potential.

Addressing the ‘Function Junction’ utilizes oromotor and mechanotherapeutic exercises in both a physical and psycho-physiologic manner. These exercises are the initiating facilitators for creating a positive neuro-muscular impact on the orofacial environment. Retraining and/or eliminating the negative, biologic and physiologic become

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neutralized and allow nature's optimum to emerge as its 'function'. Normal, physiologic function is further promoted when nasal breathing training, which must be done with lips gently closed, is combined with retraining of the intrinsic and extrinsic muscles of the tongue and swallowing pattern.

TOTs and Swallowing Patterns



Mouth breathing and TOTs

Tongue ties, or tethered oral tissues (TOTs), must also be released if they are creating a restriction to normal movement. Tethered anterior and mid-tongue tie (posterior tie), labial and buccal frenums must be released. A pre-habilitation program prepares the tethered tissues and a post-operative re-habilitation program reinforces and supports the tongue and retrains the surrounding musculature so it can function correctly. The tongue then has the capacity to act as nature intended as a hydrostatic pump applying appropriate pressures to the hard palate and soft palate. The hydrostatic pressures and retraining of the tongue create a negative air pressure swallow pattern against the hard palate. Saliva, liquids and food bolus are transported into the throat by negative air pressure suction, closing the epiglottis, and allowing the swallow to occur with a smooth, easy elevation of the hyoid with the base and posterior tongue upward lift.

This hydrostatic pump pressure against the hard and soft palate triggers the sinuses and eustachian canals to drain properly. The roof of the mouth is where the negative air pressure function of the anterior, middle, posterior and lateral borders of the tongue occurs and is focused. The roof of the mouth is the floor of the nose.^{2-7,47,52}

The orofacial environment, dentition, temporomandibular joint muscular function, and movements of the tongue, lips and mandible also affect functional speaking patterns (movement during speaking). All require normalized function, working in a correct, but neutral manner, for optimal growth and development to take place.

"Function" refers to the impact of the orofacial muscle balances and harmony created between the oromotor behaviors and the habituated oromotor and muscular movements/patterning. The tongue, lips, and jaw, in addition to their resting postures, the dental freeway space, and nasal breathing should be working together in harmony. Eliminating mouth breathing and creating correct functioning of the tongue, lips, and mandible significantly reduces obstructive sleep apnea risks.^{2,59,63} OMT is also used to address parafunctional habits and/or orofacial behaviors impact on the dentition and surrounding environment.^{1,2,31}

The Epigenetic vs Bio-physiologic Debate

Some have expressed strong opinions about whether form influences growth and development, requiring the function to become adaptive; or if it is morphological function that influences growth, development, and stabilization of form.^{4-8,13-15,25-28}

Decades of debate to validate or disprove left the clinician providing orthodontics in the middle, trying to figure out if they must choose a side or ignore the issue. More recently, practitioners in both the oral health and medical communities view *Function and Form* as

Bio-Adaptive Theory

- **Functional Matrix Theory** (Moss, DDS, MS)
 - Functional and environmental influences impact the growth and development of the facial arches
- **Malocclusions are influenced** by imbalances of airway flow, resting postures, oromotor imbalances, chewing and swallowing patterns, and incorrect forces of the lips, tongue, and musculature

significantly inter-dependent dynamic processes where both positions must be taken into full consideration when addressing either position.^{2-20,23-29,31-35, 52, 53}

Regardless of one's initial stance, the question of how the function impacts the form (and vice versa) must not only be considered, but also incorporated into the critical decision-making process with every airway, sleep related breathing disorder (SRBD), orthodontic, parafunction and TMD case.

The challenge facing otolaryngologists, orthodontic clinicians, orofacial myofunctional therapists, and anyone retraining breathing is the use of evidence-based research along with individualized patient treatment goals. The ultimate goal is the long-term stabilization and habituation to make those benefits last!^{2,6,21,22,26-29,31,32}

The Role of “freeway space”

Anatomist, Harry Sicher, advocated the importance of “Normalizing the intricate balance between the teeth, skeletal and muscular system”. Sicher describes creating a balance that includes establishing and maintaining a dental (oral) freeway space.⁷ A dental (oral) freeway space is the mandibular resting posture maintaining a 2-3 mm minimum posterior (molar) inter-dental (inter-occlusal) space with approximately 4-5 mm maintained in the anterior (incisal) segment. When the mandible sits in its most physiologic resting posture, the tongue is resting on the palate with the dental freeway space maintained, the lips are lightly closed at rest, and relaxed breathing is through the nose. A balanced equilibrium is reached between the external forces of the lips, the facial and masticatory musculature against the dentition, and the internal resting posture of the tongue against the palate while normal nasal respiration takes place in a homeostatic environment. Maintaining the dental freeway space allows the uninterrupted physiologic eruption of the teeth. He conveyed that clinicians need to become biological anatomists and more fully take the biologic-physiologic systems into account during treatment.

Moving Forward Based on Evidence

Most academics support and recognize creating and maintaining normalized function is challenging when orofacial muscular or oromotor dysfunction is present. Orofacial myology should be part of a comprehensive treatment consideration. Orofacial Myofunctional Therapy (OMT) methodologies address the orofacial and oromotor functional issues that can create a negative impact. The literature indicates a clear need to incorporate dealing with these functional issues in the treatment of orofacial myofunctional disorders (OMD) in order to establish an ideal functional occlusion, and maintain its long-term stability within the orofacial and dento-facial environment. The scientific evidence depicting function significantly impacting form is widely present throughout the literature.^{2-11,16,25-29,32,53, 56, 59, 60, 61, 63, 64}

Current theories indicate that separating the two philosophies of “Function vs Form” and “Form vs Function” is not only impossible, but unwise to ignore in clinical practice. Moss’ Functional Matrix Theory provided the additional academic support to the inter-relational dependence and stressed that these principles be focused in a multi-dimensional and inter-disciplinary manner. Moss stated one cannot separate the environmental (muscular and behavioral) impact on the structural

Orofacial Myology

- The philosophy of “muscle wins” is fundamental to all phases of mechano-therapies
- Bio-adaptive theories along with nasal breathing/respiration and muscle oriented therapeutics influence the long term success and stable outcomes of oral health treatments associated with malocclusions, muscular TMD, periodontics, and cosmetic restorative therapies
- Oromyofunctional/oromotor issues, resting postures of tongue, lips and mandible, creating an appropriate dental freeway space, functional swallowing/chewing patterns, and elimination of parafunctional habit patterns is required for long term stabilization and balanced orofacial/oromotor myofunctional patterns

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(epigenetic form), and vice versa.²⁵⁻²⁸ Kondo demonstrated this through case studies, and followed them for 25 years. The cases retained their orthodontic corrective integrity when coupled with orofacial myofunctional therapies.⁶ Benkert, Hanson and Andrianopolous, and Smithpeter and Covell studies also demonstrated stability of the orofacial environment and dentition treated with orthodontics is successfully achieved when utilizing orofacial myofunctional therapy.^{31, 32, 53}

The Importance of Referral

Licensed professionals who take the training and specialize in Orofacial Myofunctional Therapy may become a Certified Orofacial Myologists (COM). The Orofacial Myologist provides a comprehensive assessment and jointly determines treatment timing along with the other dental professionals, MD, ENT, or other licensed healthcare professionals. They also plan and implement an orofacial/oromotor treatment and behavioral program and evaluate the progress of the orofacial myofunctional systems. Dentists and dental specialists, Dental Hygienists, MD, ENT, Speech-Language Pathologists, PT, OT, and Lactation consultants refer the greatest number of patients. Patients also find therapists online. Regardless how the patient initially connects with the Orofacial Myologist, an interdisciplinary team approach keeps the patient at the center of all treatment modalities and leads to the most stable outcome.^{1,2,6,9,10,12,18,31,52,53,63}

Individuals have been addressing orofacial/ oromotor dysfunction with orofacial muscle exercise since the early 1900's. Providing a program of therapeutics became better known in the 1950's through Walter Straub's efforts, and became an organized specialty focus in the 1970's through the organizational formation of the International Association of Orofacial Myology (IAOM).^{1,2,4,6,7,9-12,16,19-20, 35-40} However,

a disparity still exists in the number of Certified Orofacial Myologists in comparison to the numbers of individuals who would benefit from their potential treatment. This can pose a dilemma for dentists, orthodontists, MDs, ENTs, and other health care professionals not located in close proximity to an orofacial myologist. Leaving orofacial myofunctional disorders untreated due to lack of access to care increases the risk factors for SRBD, obstructive sleep apnea, speech disturbances and orthodontic relapse.^{49, 51, 53, 63, 64}



Incorrect tongue resting posture and open mouth breathing

A bigger dilemma exists when the orofacial myofunctional disorders remain unnoticed and referral doesn't occur. Sadly, many practitioners observe and recognize that the dysfunction is present, but take no action. This leaves the patient at increased risk for problems and places the non-referring practitioner in both an ethical and potentially legal dilemma.⁴⁸⁻⁵¹ The American Dental Association adopted a policy statement at their 2017 House of Delegates validating issues related to sleep related breathing disorders (SRBD), obstructive sleep apnea (OSA), and upper airway resistance syndrome (UARS) and stated it requires working collaboratively with colleagues in medicine and dentistry utilizing various methods to mitigate these issues.⁵¹ The practitioner becomes even more vulnerable to clinical liability regarding the

patient who continues to endure risk factors added onto the clinician's lack of awareness of the patient's increased relapse potential.^{6,7,25-28,31,51,53,63}

Dental, medical, and speech practitioners can no longer claim a lack of therapists in their area for non-referral. Some experienced orofacial myologists are capable of tele-therapy. It's a viable therapeutic option for patients without an orofacial myologist in their area or when a more advanced expertise is required.

The Orofacial Myologist or Orofacial Myofunctional Therapist, is also considered a Mechanotherapist, defined under the National Uniform Claim Committee Code as a practitioner who examines patients by verbal inquiry, examination of the musculoskeletal system by hand, and visual inspection and observation. In the treatment of patients, mechanotherapists employ the techniques of advising or supervising exercises; neuromuscular stimulation; massage or manipulation; or using air, water, heat, cold, sound, or infrared therapy.

Shifting Paradigms

Many practitioners must go through a personal paradigm shift to begin including orofacial myofunctional therapeutics into their routine patient assessments and treatment planning. They may have to learn how and when to work with an orofacial myologist. This shift occurs especially if their past referral and/or treatment patterns relied only on the most traditional dental, orthodontic, otolaryngologic, speech or medical modalities. Many practitioners are transitioning by incorporating orofacial myofunctional therapy (OMT) concepts more frequently. Those having the easier time transitioning are those medical and oral health practitioners who embraced concepts of 'muscles always win' and/or functional behavioral therapy during their formative development or during their own self-discovery as a professional. Sadly, some professionals only arrive at this realization after noting relapses or failures of medical, dental, or speech 'finished' cases and where delayed patient growth or the original form can no

longer be blamed. Long face vertical growth syndrome is an example of years of the patient's life passing with failure to improve the airway and address orofacial myofunctional imbalances present.

Acceptance Increases Success Factors

Conceding that 'function' can positively impact 'form' allows medical, oral health, and speech practitioners to take advantage of increased orofacial myofunctional capacity. Normalizing the increased capacity occurs when OMT concepts are included. One cannot ignore the systemic impact of proper orofacial and oromotor functional processes when coupled with proper nasal respiration and the elimination of mouth breathing. These are dynamic processes. These biophysiological processes impact the on-going oxygenation of the brain, and the evolving dento-cranio-facial functional environment over a lifetime and, they begin in utero. The importance of 'function' and how to apply its concepts clinically is occurring more often in the literature and is being transferred for practitioner's use.^{6,41-47,53, 63} Medical and oral health practitioners are improving their own assessment abilities in and recognition of the many orofacial myofunctional disorders as the scientific evidence increases in support.

It is Finally Happening!

Clinicians from many disciplines are increasing their awareness of the overall impact of the risk factors related to sleep and systemic health from birth throughout the lifetime. Identifying sleep disordered breathing at any age has become crucial.

Practitioners are asking how/when to incorporate orofacial myofunctional therapies to help their patients and make their cases more predictable. This increases the orthodontic, dental, medical, and speech therapy practitioner's ability to monitor, successfully treat and complete cases, and maintain their outcomes with less relapse. Early recognition of orofacial myofunctional issues along with appropriate therapeutics is fundamental to achieving long-term stability goals.

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Defining Moments and Creating Parameters

Understanding a definition of Orofacial Myology (OM) is essential when conducting a comprehensive orofacial myofunctional and temporomandibular muscular assessment and examination. This understanding is essential when introducing these concepts to the patient. Defining OM/OMT allows one to label the dysfunction for placement into the international coding and nomenclature systems.

Benkert defines orofacial myology as: Orofacial Myology/Myofunctional Therapy is the treatment of the orofacial musculature to establish nasal breathing, increase muscle balance and tonicity while establishing correct activities of the tongue, lips, and mandible so that normal growth and development may take place in a homeostatic environment. This includes treatment of tethered oral tissues (TOTs), elimination of parafunctional habits and noxious oral habit behaviors, reducing or eliminating temporomandibular muscular dysfunction, bruxism, clenching, muscle bracing, and retraining range of motion (ROM) activities of the mandible, and postural habits.^{1,2,5,6,29,31,41-47,52}

The initial core of this definition was adopted by the IAOM Board of Directors and Membership in 1992.⁴⁸ The American Dental Hygienists' Association (ADHA) adopted a policy statement in 1992 under the area of Practice, Patient Care Services 9-92: The ADHA acknowledges that the scope of dental hygiene practice includes the assessment

and evaluation of orofacial myofunctional disorders; and further advocates that dental hygienists complete advanced clinical and didactic continuing education prior to providing treatment.⁴⁹

The parameter of treatment provided by an orofacial myologist depends on their formative core professional accredited education and licensure, and the extent of their post-licensure didactic and clinical training. It is important for the orofacial myologist to understand airway assessment, TOT assessment and treatment, infant to adult eating - feeding - chewing - swallowing, understand the mechanics of movement of the TMJ and screen the occlusion, recognize periodontal disease issues, understand sleep related breathing disorders (SRBD), obstructive sleep apnea (OSA), functional speech patterning, speech development and posture, especially of the head, neck and upper body. In general, orofacial myofunctional therapy treatment should include:

- Establishing nasal breathing and normalized respiration using the diaphragm;
- Referring for release of tethered oral tissues (TOTs) of lingual anterior and mid-tongue (posterior) tongue ties, along with labial and/or buccal ties;
- Establishing a correct breathe-suck-swallow-breathe cycle in infants to adults
- Correction of resting postures of the tongue, lips, and mandible;
- Establishing a consistent oral (dental) freeway space;
- Balancing and equalizing the muscle function and tonicity of the tongue, lips, muscles of mastication and deglutition, including muscles of the face, head and neck;
- Eliminating oral habits/behaviors of oromotor and orofacial functional behaviors negatively affecting muscle tone and/or impacting the growth and development of the face and dentition;



Establish a tongue on the palate resting posture: "The Spot"

- Correcting abnormal chewing and deviated swallowing patterns; correcting muscular deficiencies of resting postures of the tongue, lips, mandible, head and neck; correcting 'tongue thrusting' swallowing (preparatory, oral, and oropharyngeal phases); eliminating parafunctional habit patterns that may cause destruction of the dentition (especially bruxism, muscle bracing, and/or clenching); providing neuromuscular reeducation and retraining to eliminate impairment in muscle tone and function; eliminating deviated range of motion muscular and functional deviations of the mandible especially those related to resting postures, chewing, open/closure patterns, speech functional movements/patterning of the tongue, lips and mandible, and orofacial/oromotor functions of related activities of daily living.

Orofacial Myology concepts and principles are rooted between professional domains in physical medicine, dentistry, dental hygiene, and speech pathology. Although many professionals still refer to orofacial myology as only being 'tongue thrust therapy', references to orofacial myofunctional disorders (OMD) have appeared in the literature under many names and for many years. The correct name determined by the International Association of Orofacial Myology in 1978 is: orofacial myofunctional therapy or orofacial myology. Nomenclature consistency will facilitate communication and research across professional domains. It also allows consistency with respect to taxonomy, international coding and insurance submissions.

Best Practice - Incorporating a Process of Care

Behavioral studies add to the evidence that function can impact form across categories of age, race, culture, and pre-/post-orthodontics in a similar manner.^{6,16,18,29,31,44,53} The challenge of discovery for each clinician/practitioner begins in a similar manner, through their experience gained by treating cases in a collaborative manner with an orofacial myofunctional therapist. Learning about airway, orofacial

function and how to refer is best accomplished while still a pre-licensed professional student. Sadly, this training is still sorely missing in most professional education programs. The post-licensed clinician is left to figure it out through clinical trial and error or professional continuing education as a life-long learner. Best practice, regardless of when or where one begins this journey, requires each case be considered utilizing a similar process of care.

Best practice process of care includes:

- Completing a comprehensive orofacial myofunctional assessment and examination
- Developing a differential diagnosis
- Incorporating airway, function and form into the treatment planning process
- Integrating an inter-disciplinary therapeutic team approach
- Continuing an on-going evaluation process throughout the rehabilitation and habituation phases

Maintaining the long-term stability of airway patency, orthodontics, orofacial orthopedics, and functional speech patterning is achieved by combining these treatment processes with OMT. The collaborative treatment of airway issues, releasing tethered frenums and restricted oral tissues, addressing sleep disordered breathing, snoring and sleep apnea symptoms, and orthodontic/orthotropic processes with orofacial myofunctional therapy fully incorporates treating function and form in the most comprehensive manner. Mechanotherapy, orofacial myofunctional therapy, should be incorporated by facilitating the individual's neuromuscular and bio-physiologic capacity while reducing, redirecting, and reeducating the negative orofacial/oromotor myofunctional and neuromuscular imbalances, and eliminating noxious

Process of Care

- Assessment
- Differential Diagnosis
- Treatment Planning
- Implementation
- On-going Evaluation

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parafunctional behaviors/patterns. Establishing nasal breathing and evaluating airway considerations always takes first priority with swallowing, nutritional intake and speaking function coming close behind. And, in the end, to achieve the stability... muscles and their function always win! So, it is better to work with and reeducate the muscles than be surprised by their ability to unravel the good work of professionals later! ^{2,6,7,29,31,32,42,53,63}

Incorporating OMT as a fundamental element in treatment planning when orofacial myofunctional imbalances or parafunctional behaviors are identified assists in successfully completing and producing more desirable outcomes. Addressing long-term stability should actually begin during every assessment and examination process by recognizing all factors that can present issues down the road. Cases with functional disorders detected at any stage of the pre- or post-treatment process will benefit from incorporating orofacial myofunctional therapy. Incorporating

Assessment & Examination

- **Structural**
 - Anatomical: airway, head, neck & face, dentition
 - Muscular: capacity/tonicity
 - Neurological: responses motor/sensory
- **Functional**
 - Breathing: nasal/oral mouth breathing
 - Resting postures of tongue, lips, mandible, head/neck
 - Mastication patterns
 - Deglutition: infant/toddler to adult
 - Range of Motion (ROM) of mandible and TM joints
 - Functional speech patterning
- **Behavioral**
 - Habit patterns – present or past
 - Parafunctional habits/patterns

OMT as early as possible is advised as a best practice policy in order to reduce/eliminate the risk of orofacial functional imbalances/interferences impeding or slowing the growth and developmental processes, or orthodontic relapse. Occasionally, OMT should be completed in stages (phases) based on the patient's age, their structural form, or the other types of dental or medical treatment collaboratively taking place.

Raising the Bar on the Standard of Care

Dental and medical treatment processes, including a comprehensive orofacial myofunctional assessment and examination, raise the bar on the standard of care delivered to the patient. A comprehensive assessment and examination for all orofacial myology patients includes:

- Take a detailed medical and dental history;
- Assess the dental occlusion with measurements of the open bite, overjet, crossbite, diastemas and Angle classification;
- Determine the severity of the orofacial myofunctional disorders (OMD);
- Assess the breathing patterns;
- Assess the oral and nasal airways with a visual inspection;
- Analyze the breathe-suck-swallow-breathe pattern, analyze the chewing pattern utilizing a food item and the degree of functional dysphagia (difficulty swallowing and 'tongue thrust' swallowing pattern);
- Assess resting postures of the tongue, lips, and mandible;
- Measure philtrum, lip, lingual frenum stretch (LFS), and inter-labial gap (ILG);
- Identify and measure the dental freeway space;
- Analyze noxious oral behaviors;
- Assess the impact of temporomandibular muscle dysfunction (TMD) including palpation of the head, neck, facial and TMJ musculature;
- Review airway/imaging reports; review self-reported pain scale;

- Assess and measure the range of motion (ROM) of the TMJ and mandible and neuro-muscular patterning;
- Assess postural/functional relationships;
- Assess functional deviations in the mechano-physiologic move-ments of the tongue, lips and mandible during speaking patterns (as related to dental interferences, occlusal and incisal attrition patterns, and/or anterior/posterior/lateral functional patterns);
- Review behavioral and sleep questionnaire responses;
- Assess attrition of the dentition and abfractions as related to parafunctional patterns of bruxism, muscle bracing and clenching;
- Assess the impact on the periodontium and oral hygiene.^{1,2,31,33,42-47}

What are the Goals? Relationship to Orthodontics

It is most ideal to begin OMT prior to the onset of orthodontics/orthotropics especially in cases where the dysfunction is more severe as this will usually make early phases of orthodontics/orthotropics progress at a more predictable speed. Oral habits, especially digit or lip sucking/propping, should be eliminated prior to beginning ortho to eliminate potential interferences that would slow the dental process.

If the patient is referred while the orthodontics are in progress, it is best to do so with enough time remaining in their treatment to reduce risks prior to debanding. New patterns should be well established prior to debanding.

If referral occurs after relapse is noticed, it is wise to make a strong referral as quickly as relapse appears. When OMD is noted early in a relapse situation, often correcting the function will allow the dentition to return to its pre-debanded orthodontic form. If retreatment is planned, OMT should be initiated prior to retreatment. However, parafunctional habit patterns may be successfully corrected

at any point along the lifetime continuum of pre- to post-orthodontics. As establishing new orofacial myofunctional patterns is similar to a rehabilitative process, habituation levels increase in depth the longer and more often the new patterns/functions are correctly repeated.^{1, 2,6,30,31,41-47,52}

How to find OMT Treatment?

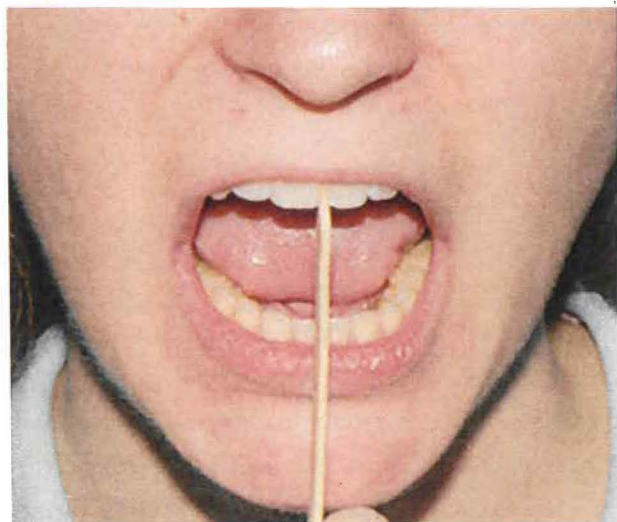
Orofacial Myologists are the licensed professionals whose focus on treatment issues are related to the orofacial/oromotor functional, dento-facial functional aspects, and oral-related parafunctional and behavioral issues. Referral for orofacial myofunctional therapy is primarily to a Registered Dental Hygienist (RDH), Dentist (DDS), Speech Pathologist (SLP), Physician (MD) or other licensed healthcare professional specifically trained in Orofacial Myology.

The International Association of Orofacial Myology (IAOM) recognizes the education and licensure of the RDH, DDS, MD, and SLP as having the pre-requisite education in the areas of orofacial/dental anatomic, biologic and physical/medical sciences to train in Orofacial Myology and becoming Certified (COM). Other licensed professionals may train and apply to take the Certification examination on a case-by-case basis determined by their education, licensure and experience. Very few pre-licensure educational programs provide OMT training or integrate this area of study across their professional curricula.

The IAOM is currently the only not-for-profit international, inter-disciplinary accrediting body administering a blinded written and on-site clinical Certification examination culminating with a COM. The IAOM membership consists of practitioners or supporting member professionals from around the globe. The IAOM is the current respected certifying body since Orofacial Myology specialty licensure is non-existent in any USA state/territory or Canadian territory or province.

The RDH in Japan is the preferred OMT practitioner. The SLP in Brazil completes OMT training in their formative professional post-graduate educational programs.

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These exercises 1) Develop an appropriate lingual-palatal seal and Lingual frenum stretch; 2) Reeducate the ROM patterning; 3) Re-tone the intrinsic and extrinsic muscle of the tongue. Exercises developed by author in the late 1970s – early 1980s.

In the USA and Canada licensed professionals are trained through post-graduate continuing education programs. Courses are available in seminar format, internship style, and web-based.^{1,2,48,52} Other countries may have fewer practitioners, but are discovering the OMT concepts and recognizing these therapeutics are desirable.

How Long Is Therapy and What Happens?

Depending on the degree of orofacial/oromotor dysfunction, an average orofacial myology program usually consists of weekly appointments, approximately 30-60 minutes in length (depending on appointment goals) and ranging from 3-7 sessions (visits) to approximately 24-36 sessions (visits) usually over a 12-24 month period.

Patients begin with closed mouth nasal breathing training and orofacial neuro-muscular retraining with muscle toning and development, and conditioning phases. Dysfunctional processes are broken down into all of the bio-physiologic movements and activities of daily living (ADLs). Each muscle group activity, functional movement, and muscle functional pattern is retrained using correct bio-physiologic movements, patterning, and actions in a manner to normalize them or achieve breathing patterns and muscles performing in a neutral environment.

Orofacial Myologists must incorporate diaphragmatic breathing with the tongue correctly postured on the palate with the lips closed and a dental freeway space present. The tongue creates a seal within the oral environment and

facilitates nasal breathing. Therapists must incorporate orofacial concepts of breathe-suck-swallow-breathe with a negative air pressure swallow, centric occlusion (CO), centric rest (CR), and balancing functional use of anterior/posterior/lateral group actions along with speech movement concepts of correct tongue positioning for the on/off glide of the tongue on the palate and the functional mandibular range of motion (ROM) movements during speaking. Lingual, labial and buccal frenums must be stretched through exercise and referred when needed for surgical release procedures (frenectomy) of the tethered oral tissues (TOTs).

Those referred for frenectomy releases should have stretching, toning and functional conditioning exercises in a pre-habilitation and post-surgical rehabilitation process. ROM patterning of the mandible must incorporate normalized jaw and tongue mechanics with patient-specific dental freeway space emphasizing nasal breathing, increasing the end tidal CO₂, and training respiration. The intrinsic and extrinsic muscles of the tongue, soft palate, lips, facial muscles, muscles of mastication, and neck muscles with hyoid elevation are exercised as needed to achieve treatment goals. As needed, chewing and swallowing exercises are incorporated and noxious oral habits and parafunctional habits must be addressed.

Many articulation errors/lisping patterns improve significantly once the tongue, lips, and mandibular patterns function correctly. Infant patient therapy focuses treatment on breathing through the nose and suck-swallow-breathe with the tongue on the palate and lips closed. Infants are treated very briefly prior to surgical release of TOTs and post-surgically to address the latch onto the breast or bottle and habituate their therapy goals.

As treatment progresses and patients habituate, the orofacial myofunctional environment and SRBD with OSA risk factors reduce, the OMT activities and exercises wean away. The goal is maintaining corrected function. An annual re-assessment is ideal for 1-5 years post completion of a comprehensive OMT program to monitor long-term stability.

Digit sucking habits can be eliminated completely or significantly reduced on their way to extinction within the first 24-72 hours of therapy. The OMT digit program is literally a 'Quit in A Day' behavior modification program that works effectively for 90% of the individuals. Continued monitoring for 30-60-90 days insures full extinction of the behavioral habit. A TMD patient with pain symptoms or a patient with special needs treatment program may take less/more time than other OMT patients to successfully complete. Their patient-centered program must be individualized and based on complexity.^{1,2,43,46,47,52}

Most parafunctional patterns are addressed during the course of the OMT orofacial program. The background and training of the orofacial myologist will determine the extent and ability to address the orofacial myofunctional disorders and parafunctional habits present. Not all orofacial myologists are trained to address muscular TMD and parafunctional habits/patterns.

As with any case assessment, the time and intensity of treatment is determined by the severity and complexity of the orofacial myofunctional disorders. As a best practice, orthodontists should also include the orofacial myologist in the re-evaluation of the patient for 1-5 years following the completion of an orofacial myofunctional therapy program. MD primary care providers, general dentists and dental hygienists are able to continue monitoring their patients' long-term stabilization once orofacial myofunctional therapeutic services conclude.^{1,2,5,9-12,16,31,36-39,41-47,52}

Advancing the Discipline and Cross -Training

Orofacial myology/myofunctional therapy (OM/OMT) continues to evolve and grow in a patient-centered, interdisciplinary, specialty-focused manner. Cross training of professionals provides an overall knowledge base, with needed concepts and theories integrated from dentistry, dental hygiene; speech pathology, otolaryngology and areas of physical medicine. Therapeutic principles are rooted with a foot in dentistry/speech and a foot in medicine. Many

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Benkert Pearls

- Chart and document all orofacial myofunctional and oral parafunctional behaviors/patterns in patient records
- Inform and discuss your findings with the patient/parent
- Refer patient to an Orofacial Myologist for collaborative treatment
- Take an OMT course for self-knowledge to gain a better understanding
- Contact an Orofacial Myologist to discuss their practice philosophy
- Collaboratively treat your patient with the RDH or SLP certified in OMT to achieve their optimum homeostatic breathing, orofacial function
- Request CE programs on Orofacial Myology through professional associations

individuals possess knowledge and clinical skills gleaned through cross training. These well-trained interdisciplinary therapists are capable of providing treatment, thereby interfacing and collaborating with practitioners across professional disciplines. Collaborative practice with disciplines outside of their original licensed profession benefits their shared patients by widening the boundaries of their therapeutic team.^{1,2,6,9,10,12,16,18,29,34,47,52,53,62,64}

Research points to the significant impact of sleep related breathing disorders (SRBD), and tethered oral tissues (TOTs) on the normal growth and development of the face in infants to adults. These issues place them at risk for feeding/eating and food aversion issues, cardiovascular risk, impaired human growth hormone release as well as learning and behavioral issues. These issues can continue as toddlers grow into teens and adults. In addition to the medical/dental/speech issues it also disrupts their quality of life.

More collaborative medical and dental related research incorporating OMT is needed. The nomenclature utilized

by dental and medical professions needs greater consistency when describing orofacial myofunctional disorders/dysfunctions. Consistent identification of orofacial myofunctional concepts will encourage more practitioners to identify similar issues for their patients and within the literature. Practitioners must become more aware of dysfunctional interferences, SRDB, OSA, functional damage to the dentition, unwanted changes in growth and development, TMJ muscular dysfunction, functional speech disturbances and parafunctional habit patterns.

Conclusion

A variety of orofacial myofunctional issues can be present for the clinical practitioner to observe and assess. The issues are usually multi-factorial and the patient must be assessed from the structural, functional and behavioral aspects to determine which levels of function are affected.

So, it is no wonder many practitioners become confused about the topic of treating orofacial function and orofacial parafunctional behaviors. Embarking on this journey begins with identifying the licensed OMT professional to work with them in a collaborative manner. OMT services coordinate well with other dental and medical services in a preventive, interceptive and/or restorative manner. The OMT treatment planning may include referral to determine airway obstructions or eliminate impairments with an ENT, allergist, or MD.

OMT treatment programs require on-going re-evaluation throughout treatment and during the habituation/follow-up phases. Re-evaluation or follow-up may take place in a phased manner depending the age at which a patient is referred and if orthodontics/orthotropics/orthognathic surgery take place. Long term stability of a patent airway, the primary to adult dentition, and management of the orofacial and head/neck environment should be a team effort among practitioners utilizing best practice methods.

Orofacial Myofunctional Therapists can be a key member of the dental/medical team and their services are critical

to the long-term stability of the orofacial environment structural, functional and behavioral health. Orofacial myofunctional therapy plays a critical role in reduction of pediatric sleep disordered breathing and reducing OSA, plus reducing risk factors in both children and adults. Continued on-going research across disciplines is needed to further document and validate the vital role of the therapist. The rest of this story ends with providing collaborative care for patients, reducing health risk factors, improving orofacial-system health, and enjoying the results!

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for information regarding patient services, consulting, and OMT training/lecturing.

Go to the IAOM website: www.iaom.com for a directory of orofacial myologists.

References in online version

About the Author

Kimberly K. Benkert, RDH, BSDH, MPH, COM, FAADH is owner of Midwest Orofacial Myology and MYO USA, Inc. She lives and practices in the western suburban area of Chicago, IL. A graduate of Loyola University, College of Dentistry, with a BS in Dental Hygiene, she holds a Masters of Public Health in Health Policy and Administration majoring in Dental Public Health. She is Certified in Orofacial Myology through the International Association of Orofacial Myology and holds Fellowship status in Orofacial Myology, and in Temporomandibular Dysfunction with the American Academy of Dental Hygiene.

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Dental Hygiene program. Kimberly is a past president of the American Dental Hygienists' Association, the Illinois Dental Hygienists' Association and the West Suburban Dental Hygienists' Society. She served on the Board of Directors of the IAOM, ADHA, IDHA, and Scientific Core Committee of the International Federation of Dental Hygiene. Currently, she is a member of the IAOM Education Committee, American Academy of Dental Hygiene Bylaws Committee, and the IDHA Governmental Affairs and Ethics Committees.

She is the recipient of the ADHA/J&J Award of Excellence, ADHA/Discus Dental Distinguished Service Award, ADHA Outstanding Service Award as President, ADHA Irene Newman Award, IAOM Connie Painter Award, IAOM President's Award for Outstanding Commitment and Service, and the IDHA Hygienist of the Year Award of Merit. Kimberly lectures and provides training courses for dental hygienists, dentists, physicians, speech-language pathologists and other healthcare professionals in Orofacial Myology on a national and international basis.

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