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An Incredible 50-Year Journey: The Application of What We've Learned

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Abstract: If all of the past IAOM officers and staff, members, and allied professionals gathered to attend this celebration, no doubt, they would be amazed and proud. What started as "tongue thrust therapy" has expanded into the broad and beneficial scope of cranio-facial, oral, and respiratory health. Those that have gone before continue to inspire us and provide a foundation on which to build over the next 50 years.

Summary

A Chronical of Our Founders

In 1935 a bright, eager young man named Dick Barrett arrived in Tucson, AZ. Armed with an undergraduate degree in speech, he went on to earn his master's degree, establish the first public school speech program in Tucson, and open a thriving private practice (Barrett, 1988). Most notably, however, Dick with three other dynamic colleagues – Bill Zickefoose, Marv Hanson, and Galen Peachey – created the first, most prominent, and well-respected association dedicated to researching, teaching, and elevating the field of orofacial myofunctional disorders and the professionals who treat them (Mills, 2011).

Orofacial Myology:
Past, Present and Looking Forward

To fully understand present-day orofacial myology, one must be mindful of the ebbs and flows during the early days of the IAOM, and before. The maturity of a high-standards international association such as the IAOM happens slowly and with great effort and cooperation among many hard-working professionals. Current and recent IAOM leaders have increased membership within the last decade by almost three fold, more than any other decade. The IAOM and its research journal, the IJOM, has not only significantly impacted orofacial myologists, allied professionals, and professors and students, but has indirectly influenced numerous clients and patients throughout the world. We acknowledge and greatly appreciate the current and former diligent and devoted individuals who have dedicated themselves to these efforts. What we have learned from them serves as reminders and motivators as orofacial myology moves into the future. There is collective agreement to continue to emphasize high-standards for certification, allied collaboration, the advancement of research and IJOM discoverability, and the inclusion of orofacial myofunctional disorders coursework within universities (Reed, 2016).

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Our Principles:
Motivation, Mindset, and Methods

Being an enthusiastic, busy professional in the field of orofacial myology is nothing new. But in this age of fast-paced multi-tasking, remaining focused on client needs seems to be more challenging. Providing and maintaining high-quality services requires stamina, a mindset that incorporates constructive beliefs and attitudes, and a practical paradigm that embodies a range of analytical and treatment options. Consequently, when day-to-day resilience runs low, there is nothing more simple or more motivating than experiencing the joy in our clients' eyes. Or when confronted with a perplexing problem, we set our minds and doggedly persist to solve it. Most importantly, when there are more tasks than time, we intentionally dedicate ourselves to treat every patient as only they matter at that specific moment. And the treatment paradigm? It may be slightly different for every professional, but certainly having a comprehensive knowledge base to draw from regarding the essential components of the oral resting posture, swallowing, chewing, and speaking is an excellent start.

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Mastication: Breaking it Down

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Abstract: This session focuses on the ontogeny of mastication, the muscles of mastication and task analysis of the underlying oral motor skills to support chewing; as a pre-requisite to developing pre-feeding and therapeutic feeding programs.

Summary

Children diagnosed with pediatric feeding disorders often present with difficulty masticating solid foods (Overland & Merkel-Walsh, 2013). Feeding challenges are red flags for orofacial myofunctional disorders. As therapists working with the 0-4 population, we have the opportunity to mitigate orofacial myofunctional disorders through pediatric pre feeding and therapeutic feeding therapy.

The oral preparatory phase of mastication includes taking food in to the mouth, breaking it down and preparing it for oral transit (Logemann, 1994). Changes in structures, muscles and function over the first 2 years of life supports the development of mastication. The underlying motor plan and muscle-based skills to support chewing have been documented by 2 – 3 years of age (Almotairy et al., 2021; Gisel, 1988).

The treatment of children with challenges breaking down solid food requires understanding of the ontogeny of mastication, the structures which support mastication, and the ability to do a task analysis of the motor skills for chewing. Task analysis of function serves as a foundation for developing pre feeding and therapeutic feeding programs (Overland & Merkel-Walsh, 2013).

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Let's E-X-P-A-N-D Your knowledge

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Abstract: Over the past century we have noted a decrease in jaw size, and an increase in underdeveloped jaws, which fail to accommodate teeth. This has affected how the tongue, the primary oral structure, fits in the mouth. Over time many treatment modalities have been made to expand the upper arch or the maxilla to help accommodate the teeth and the tongue. This seminar will focus on different orthodontic appliances used to achieve palatal expansion.

Summary:

Palatal expanders are orthodontic appliances that create more space in the mouth by widening the palate over time. The goal of palatal expansion is to accommodate and align the upper teeth. Expanders are uniquely made for each patient based on their dental arch and palate size. The two main types of expansion appliances are removable or fixed appliances.

Expanders can be used to treat crossbites, impacted teeth, and crowding of the teeth.

There are four main types of expanders:

1. Rapid Palatal Expanders: These are fixed appliances cemented onto the upper back teeth. These appliances have a screw in the middle of the appliance that is adjusted with a key at certain intervals to widen the upper jaw by promoting separation of the midpalatal suture. These expanders achieve rapid palatal expansion and are used in cases where a large amount of jaw widening is required.
2. Removable Palatal Expander: These devices are removable but should be worn for most of the day. These expanders also have a screw in the center that must be adjusted at certain intervals to achieve palatal expansion. Removable devices are usually used in cases where only a small amount of jaw widening is needed, and expansion happens at a less rapid rate.
3. Implant-supported expanders: Once the jaw is almost fully developed, heavier forces are necessary to successfully widen the jaw and palate. This expansion treatment consists of four mini implants that apply force directly to the maxillary bone, instead of the teeth.
4. Surgically assisted palatal expansion: Once a person reaches full maturity (puberty), they typically have a fully developed jaw. Although, some jaws do not fully mature until age 21 to 25. If this is the case, an orthodontist must surgically insert an expander into the mid-palatal suture (palate bone).

Within these categories of fixed or removable appliances there are many different types of expanders which we will discuss during the seminar.

More recent removable appliances such as the Myobrace,® (www.myobrace.com) Healthy Start® (www.thehealthystart.com), and VIVOS® growth guides (www.vivoslife.com) can also be used to achieve palatal expansion in children. These devices work to achieve lip closure, nasal breathing and correct tongue rest posture. These appliances GUIDE the growth and development in young children so that their oral structures grow and develop ideally. This in turn helps to create a wider airway and prevent sleep apnea and malocclusions created by narrow jaw development. These appliances have also been created to help eliminate abnormal oral habits and non-nutritive sucking habits. However, these appliances do not replace myofunctional therapy and are best used in conjunction with myofunctional therapy. Many patients cannot tolerate the size of these appliances and keeping them in all night as recommended. Muscle

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function and strength are important in the use of these appliances and for compliance.

The VIVOS DNA® appliance and mRNA® appliance (www.vivoslife.com) are newer appliances shown to achieve palatal expansion in children as well as in adults and older children without surgical intervention. These are removable expansion devices used only at nighttime and for an average of 12-16 hours a day with most of the hours being during sleep. The DNA appliance has shown to reduce obstructive sleep apnea in adults and children and is a promising non-surgical intervention for palatal expansion in adults.

A Functional Approach to TMD

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Abstract: Despite the fact that disc displacement and poor occlusion *can* contribute to temporomandibular disorder (TMD), the evidence is showing that the majority of TMD sufferers have a functional condition that requires a functional solution. Education, functional retraining and addressing parafunctional habits are the areas on which evidence-based therapists need to focus.

Summary

TMDs are thought to be caused by internal joint/disc derangements and masticatory muscle imbalances in strength and/or motor control. These biomechanical dysfunctions have historically been attributed to poor dental occlusion and/or bruxing, however a causative relationship between TMD and occlusion/bruxing has been overestimated (Manfredini & Lobbezoo, 2010). TMD appears to be related more closely to a combination of lifestyle factors including anxiety (Baad-Hansen, 2008), parafunctional oral habits and poor sleep quality (Slade et al., 2016).

The best evidence demonstrates clearly that chronic pain is a biopsychosocial phenomenon (BPS). In other words, pain is functional, and the solution is a functional one for most patients with chronic pain, including those with TMD. A biopsychosocial understanding of TMD makes it clear that lifestyle factors, parafunctional habits and poor stomatognathic function are all interdependent factors that may contribute to the perpetuation of TMDs. As such, a wholistic approach and specific neuromuscular retraining like that which Orofacial Myofunctional Therapy (OMT) delivers, makes OMT a natural adjunct to the treatment of common TMD presentations.

OMT utilises active functional movements to retrain the muscles of the tongue, lips, jaw and face in order to aid in the stomatognathic functions of mastication, swallowing, respiration and speech. In contrast to traditional physical therapy exercise prescriptions, orofacial myofunctional exercises are focused on the tone and posture of the tongue, are active (unassisted), do not encourage painful movements and have a high emphasis on control and proprioception. OMT to treat TMD presentations has been researched in several studies, De Felicio et al. (2010) perhaps the most well-conducted RCT to date.

This lecture will help you to understand the parafunctional habits that contribute to TMD as well as the role of structural / mechanical contributing factors. More importantly, this lecture will give you an understanding of TMD that makes it clear that functional retraining, including OM neuromuscular retraining has a significant role to play in helping patients with TMD.

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Saturday, October 23

Conducting Your Very Own Clinical Research

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Abstract: Clinical studies provide the E in EBP (Evidence-Based Practice)! This session includes information about rules and regulations for conducting human-subjects research and describes article types and research designs that may be considered feasible in a clinical setting. Published research will be used to illustrate various research designs.

Summary

Clinical practice includes data collection, data analysis, data interpretation, treatment interventions, and data outcomes. These are the same elements required for clinical research. As such, the practicing orofacial myofunctional therapist has the opportunity to contribute clinical data to the research literature on a regular basis. There are, however, certain additional procedures required for the ethical conduct of clinical research and objective dissemination of clinical data. This session will focus on the role of an Institutional Review Board (IRB) and the design and reporting of clinical research studies as intended for the practicing clinician.

Institutional Review Board

The IRB provides you with the required mechanism to ethically and legally evaluate and disseminate the results of your treatment approaches in real-life clinical settings. This session includes an overview of the purpose and functions of an IRB for Human Subjects Research, descriptions of the three levels of review, and explanations of IRB requirements for case reports, case series, and retrospective and prospective chart reviews. In some cases, IRB approval is not required but the IRB committee needs to make that determination. The IAOM has its own IRB, which is a wonderful service for those members who do not have access to another IRB through their own or one of their collaborators' institutions.

Clinical Research Designs

Well-formed clinical questions follow the PICO process, wherein the Patient or Problem, Intervention, Comparisons, and Outcomes are clearly defined. Reports of one or a few cases can take the form of case reports or case studies, where case studies incorporate elements of single-subject experimental design. Larger sets of patient data can be assembled through chart reviews and summarized using database informatics. This session includes descriptions of each of these methods while providing examples from the existing literature.

As evidence-based practice research has proliferated in many clinical fields, helpful guidelines have emerged to improve research design and reporting. In particular, case reports are expected to follow CAse REport (CARE) guidelines, as developed by international

experts and endorsed by many medical journals (www.care-statement.org). Case studies should follow a single-subject experimental design (SSED) (Byiers et al., 2012). Criteria have been developed to evaluate the quality of evidence from intervention studies, such as those by the What Works Clearinghouse (WWCH; Kratochwill et al., 2010). Including multiple cases for a case series demonstrates replicability of an intervention effect (Byiers et al., 2012). Chart reviews involve culling data from clinical records and developing a database (e.g., Solomon et al., 2016, 2020). These efforts are most successful if standard protocols are used so that comparable diagnostic criteria and functional measures are accessible across patients and over time. This session includes breakout activities to brainstorm ideas involving case studies and database development.

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Examples Used to Illustrate Research Designs

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Measure Twice, Cut Once: 6 Keys to TOTS Success from a Whole Body PT Perspective

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Abstract: Concerned by an 866% increase in US frenotomies[6] and questions outlined in the European Journal of Pediatrics 2020 review of lingual frenotomy for breastfeeding problems[7]. the presenter outlines six keys essential for optimal timing and results including scar remodeling, breathing, optimal oral and body postures, cranial nerves and nervous system function.

Summary

As professionals dedicated to "First, Do No Harm", are there pieces of the puzzle we may be missing? A multi-disciplinary team approach should be considered before and after lingual frenuloplasty [8] as optimal timing and function are necessary for success. This presentation explores six often overlooked pieces of the tongue tie puzzle.

Is 2-3 weeks or wound rubbing adequate to optimize the length and strength of surgically released TOTS? How long does scar tissue really take to remodel [9] and how much tensile strength regained?[10] A scar remodels just as fast from 3-6 week as it does in weeks 1-3 and then remodeling slows down, but continues for up to one year. Only 80% of the original tissue strength can be regained after an incision.[10] Physical therapists use mechanotransduction to promote tissue repair, [11] as well as dry needling[12] and cold lasers[10 13 14].

The tongue is connected fascially and functionally with other body systems. [15] Adequate oral volume is essential for lingual frenuloplasty success. [8] Two glosso-postural syndromes demonstrate connections between low tongue posture and occipito-atlantoid extension; scapular, shoulder, and pelvic girdle dysfunction; abdominal weakness, valgus of the lower extremities and foot pronation. [16] There are also correlations between posture, the jaw and teeth.[17] The tongue position even impacts knee strength.

Breathing dysfunction such as OSAS are connected with postural dysfunction such as cervical spine hyperextension with compensatory hyperkyphosis.[18] Head hyperextension and anteriorization correlates with severity of OSA [19]Nasal breathing is required for optimal orofacial function,[20] rest posture and healing if surgery is needed.

Shorter maximum breath holds are indicative of high loop gain and predicts a less favorable response to anatomical interventions such as surgery and oral appliances.[21] There are connections between the respiratory diaphragm, trigeminal system, floor of the mouth and pelvic floor.[22]

Abdominal breathing tends to increase intra-abdominal pressure and diaphragmatic movement creating inspiratory negative pressure, which improves inspiratory tidal volume.[23]

Lip competence plays an important role in growth and development of craniofacial complex.[24]

Physical therapists Mariano Rocabado and Annette Iglarsh describe how the orbicularis oris, buccinator and superior pharyngeal constrictor form a ring attaching to the occiput, thus the jaw and lips are influenced by the cranio-cervical posture.[25]

Healthy nerve and nervous system are essential for optimal orofacial function.[26] Tongue elevation activates several areas related to sensorimotor integration.[27] Feedback from the incisive papilla influences central regulation mechanisms of muscle tone and posture.[28] The hypoglossal nerve may have premotor neurons that bifurcate with connections to the tongue, phrenic nerve, & diaphragm influencing respiratory activity.[29 30]

For a newborn to suck, swallow, and breathe requires not only complex coordination of the muscles of the face, head, and neck regulated by neural pathways traveling from brainstem through several cranial nerves. An infant's feeling of safety, social engagement and self-regulation including vagal braking to turn off their fight-flight defenses is important. A biobehavioral model explains the neurobiological mechanisms through which vagal regulation of heart via the respiratory sinus arrhythmia.[31]

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Collaboration Care for Complex Cases

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Abstract: This multidisciplinary team including a speech-language pathologist, neurologist, dentist, and orthodontist presents a case of an adult male with complex orofacial myofunctional issues. Issues are discussed from the patient's point of view, and each professional provides detailed assessments and treatment recommendations. The collaboration and consideration of myriad life issues ultimately led to an intervention journey that met the patient's needs.

An Integrative Approach to Functional Nasal Breathing Rehabilitation

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Abstract: Despite the importance of nasal breathing, nasal disuse and associated conditions remain common, even after treatment. An integrative approach to functional nasal rehabilitation addresses multiple functions of the nose, considers the whole breathing system as well as mind-body aspects of nasal disuse. A recent pilot study of a nasal rehabilitation protocol designed around integrative approaches to breathing training was found to reduce nasal symptoms and improve patients' ability to breathe nasally.

Summary

Nasal breathing is fundamental to the development of normal craniofacial structure and oral motor function. The basic nasal functions of filtration, humidification and hydration have important implications for airway and lung health. Additional and lesser-known functions of the nose are important for emotional regulation, cognitive processes, infection control, regulation of inflammation and microbiome regulation.

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Despite the importance of nasal breathing and advances in surgical, medical, dental and behavioral treatment approaches, mouth breathing continues to be common in adults as well as in children.

Treatments that address pathological and structural causes of airway obstruction often need to be supported by functional and behavioral treatment elements [1, 2].

Simple encouragement of nasal breathing and the use of saline nasal rinses and sprays are widely used and can be very helpful for restoring nasal breathing if used appropriately. However, the consequences of "nasal disuse" can be widespread leading to loss of regulatory and health-maintaining functions of the nose, resulting in a cascade of events that perpetuate mouth breathing [3, 4]. These is evidence that certain techniques of nasal rehabilitation such as nasal muscle training, functional breathing retraining, olfaction training and humming can be helpful for patients with nasal disuse.

These techniques can have variable success and are dependent on appropriate patient selection. Success can also be improved with individualized treatment that is targeted, appropriate and sufficiently intensive.

An Integrative Approach to Nasal Breathing Rehabilitation

Principles underlying an integrative and functional approach can be summarized as:

- Address multiple functions of the nose and nasal breathing
- Address factors that perpetuate vicious cycles of nasal disuse
- Recognize the nose as part of a unified airway and integrated breathing system
- Recognize that biochemical, biomechanical and psychophysiological factors that disrupt breathing regulation and control can perpetuate mouth breathing

A comprehensive assessment of the patient should guide treatment for nasal breathing rehabilitation. A systematic approach to assessment and follow up should guide technique choice, track patient progress and identify patients needing referral.

A range of techniques can be used for nasal rehabilitation. These include adaptive stress techniques that promote health of the nasal mucosa, nasal muscle training, techniques for reducing nasal hypersensitivity, limbic system retraining and generalized retraining to address dysfunctional breathing.

Feasibility and Effectives of Integrative Nasal Breathing Rehabilitation

Recently unpublished observations from a pilot study of patients undergoing 4 weeks of a structured nasal breathing rehabilitation program using the principles outlined above showed that patients were highly compliant with the formal and informal practices taught in this program. Their symptoms of nasal obstruction were reduced ($p < .001$) and they reported less mouth breathing during the day and the night ($p < .001$) (Courtney, unpublished observations).

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Sunday, October 25

Nights of the Living Dead

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Abstract: Sleep, our state of suspended activity and metabolic depression, is best characterized by the word hibernation. However, there are instances where abnormal or undesirable activities occur. Talking, walking, cooking, paralyzation, and hallucinations are a few presentations. This presentation will facilitate an understanding of parasomnias and their correlation with nocturnal breathing disturbance and sleep deprivation.

Summary

Parasomnias are a group of sleep disorders that are characterized by abnormal, unpleasant motor, verbal, or behavioral events that occur during sleep or wake to sleep transitions. Explained, unexplained, controversial, and dangerous, parasomnias plague the young, the vibrant, and the adult. These strange happenings occur during our deep stage of sleep and the lighter REM stage. And, while explanations range from immature sleep-wake cycle to neurological to sleep deprivation, the commonality lies in stress and sleep deprivation. When sleep deprivation is continuous, a daytime phenomenon arises in hallucinations.

Sleep deprivation is a broad term most commonly understood as lack of quantitative sleep. Lacking a number of hours of sleep truly does result in sleep deprivation, however not necessarily due to conscious reduction of hours. Blue light, stress, sickness, lack of good sleep hygiene, and nocturnal breathing disturbance may contribute to deprivation. To understand sleep deprivation, we must understand these truths. Our sleep pattern changes and evolves to suite our habitual lifestyle. The body would really like to restore itself and the brain, and when given the chance will go into overdrive to do so; it is here parasomnias take center stage.

As sleep deprivation tiptoes through the night, daytime sleepiness becomes a loving companion during sunny hours. Vivid “sightings” may be a presentation of sleep deprivation and/or excessive daytime sleepiness (hypersomnolence). Sleep hallucinations may be had in two flavors; hypnagogic and hypnopompic. Hypnagogic hallucinations occur at sleep onset, and hypnopompic hallucinations occur upon awakening. These hallucinations are “dream-like” and may be nice, diabolical, or neutral. As the frequency of our brainwaves tap dances in and out of very light sleep, REM sleep, and wake, these hallucinations rear their heads.

Focusing on breathing, understanding the impact of airway architecture and sleep hygiene lead to better understanding of these zombie attacks and hallucinations. Managing the ability to achieve sound consolidated sleep may be key in reducing parasomnias.

Evolution, comparative zoology, and the (sleeping) pharyngeal airway

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Abstract: Evolution and comparative zoology provide a framework within which we can understand the functional units of feeding and breathing and the muscles of the airway. Imaging data suggest that the stylopharyngeus muscle plays an underappreciated role in airway stability during sleep. There is a need to target stylopharyngeus for myofunctional rehabilitation.

Summary

Obstructive sleep apnea (OSA) is a common disorder in which the soft tissues of the upper airway lose the tone needed to maintain airway patency during sleep, leading to sleep disruption and a variety of adverse health consequences. It has been recognized as a clinical entity for over 50 years, but despite extensive research, its etiology remains a mystery. A major barrier to understanding airway stability during sleep is the anatomic and functional complexity of upper aerodigestive tract.

Sleep appears to be universal among animals; this means that the mechanisms for maintaining

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respiration during sleep were conserved and adapted throughout evolution. Hence, studying how fish breathe, and how feeding and respiration evolved to support life on land, can provide unique insights into the structure and function of the upper aerodigestive tract, including during sleep. Understanding why we have a hyoid bone, an epiglottis, a muscular pharynx, and a soft palate are all fundamental questions that need to be answered if we are to understand OSA.

Fish initially had no jaws and relied on movements of the gill arches to ventilate the respiratory exchange epithelium; these movements are under the control of homologues to cranial nerves (CN) V, VII, IX, and X in humans, and the primordial gill arches evolved into our jaws and facial and pharyngeal muscles. The development of jaws and the hyoid apparatus led to the migration of muscles controlled by CN XII to power a novel respiratory pump. The evolution of air breathing and lungs led to the formation of a glottis, controlled by CN X, and the muscles innervated by CN XII were repurposed as a tongue, for use in feeding. An array of respiratory pumps evolved in land animals; these pumps recruited a variety of other muscle groups to power them. However, it is important to recognize that the tissues derived from the ancient gill arches retained important respiratory sensory and muscular activity.

The evolution of warm-bloodedness in mammals was accompanied by an increase in the density of blood vessels in the lung tissue to increase gas exchange; this led to a denser and less compliant lung compared to cold-blooded ancestors. Because the tongue is attached to the hyoid apparatus, and the hyoid apparatus is attached to the glottis, there developed a need to stabilize the glottis against the downward pull of the negative inspiratory pressure caused by lung inflation. Maintaining stability of the glottis with respiration is required for precise control of the tongue and jaws, which is necessary for precise dental occlusion. The longitudinal muscles of the pharynx are situated to provide this support, and may have provided the scaffolding for the development of the muscular pharynx.

Failure of the normal function of the longitudinal muscles can explain many of the features of OSA that are not explained by the current model based on the genioglossus muscle. Further research into the normal function and rehabilitation of the longitudinal pharyngeal muscles will likely be critical for successful treatment and prevention of OSA.

Engaging the Reticent Child in Orofacial Myofunctional Treatment

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Abstract: Some children are reluctant to open their mouths and/or imitate oral movements and change their swallows. Strategies will be presented that make therapy irresistible to both foster the children's trust and enthusiasm. Non-reticent children also love these techniques.

Summary

How do you work with children who are not on board with orofacial myofunctional therapy? A combination of letting the child get his bearings in your office, as well as using exciting toys makes therapy irresistible for a lot of kids. This session is not meant to apply to children on the autism spectrum, but can be helpful for children who have some sensory differences.

This session will cover these topics: (1) establishing the child's autonomy, (2) explaining posterior tongue tie to parents, (3) before and after frenectomy, (4) moving the tongue in three different directions, (5) engaging facial muscles, (6) mouth closure, (7) lingual-palatal posture, (8) jaw stability, (9), tongue stabilization, (10) tongue strengthening and fine motor control, (11) the tongue wave, and (12) lip rounding.

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