

## Annotated Reference List Foundations in Myofascial Release Seminar for Neck, Voice, and Swallowing Disorders

Contained here are the sources of information that formed the foundations of this seminar and my approach to manual care. The evidence pertains specifically to studies that speak to the efficacy of myofascial release as well as the larger community of modalities, including manual circumlaryngeal therapy, manual therapy, and massage. Further still are studies that examine how we approach the patient, many of which may conflict with your current way of thinking. There is no consensus on how manual engagement directly impacts the tissues, as stated in Nelson Roy's 2009 paper (78). However, we can use what is known, what is plausible, and what has been shown to be effective, building a narrative that will continue to evolve.

1. Alghadir AH, Zafar H, Al-Eisa ES, Iqbal ZA. Effect of **posture** on **swallowing**. Afri Health Sci. 2017;17(1): 133-137. https://dx.doi.org/10.4314/ahs.v17i1.17. Demonstrates how changes in posture as a treatment strategy influences swallowing.

"Postural modification may help in rehabilitation of patients with dysphagia by affecting bolus flow to improve speed and safety of swallowing by closure of airways to prevent aspiration."

- Angsuwarangsee T, Morrison M (2002) Extrinsic laryngeal muscular tension in patients with voice disorders. Journal of Voice: Official Journal of the Voice Foundation 16(3):333-343 DOI: 10.1016/S0892-1997(02)00105-4
- 3. Asher, Benjamin (2013). Complementary and Integrative Treatments: The Voice. Otolaryngologic Clinics of North America, Volume 46, Issue 3, June 2013, Pages 437–445. http://dx.doi.org/10.1016/j.otc.2013.02.008

I had the pleasure of co-presenting the first incarnation of this class with Dr. Asher in 2013, describes similar work to the **laryngeal region**. While describing the issue and intervention as trigger point-based, the interventions show marked similarity to those presented here.

"Myofascial release and laryngeal massage are effective in improving vocal function and helping minimize throat pain."

4. Ateras, B., von Piekartz, H. (2017). Integration of a neurodynamic approach into the treatment of dysarthria for patients with idiopathic Parkinson's disease: A pilot study. Journal of Bodywork & Movement Therapies xxx (2017) 1e9. https://doi.org/10.1016/j.jbmt.2017.12.004.

This study is the first to introduce concepts of neurodynamic testing/treatment into the speech language pathology world. Its methods and manner of presentation are to be applauded, as unlike many papers that mention a style/type/brand of manual therapy, much is left to the imagination as to just what was done to constitute the study. This particular paper shows in great detail much of the hands-on work, as well as speak to specific nerves concerning distribution/innervation as well as how best to access/treat it, from a neurodynamic technique perspective. This paper fits my bias, hence the enthusiasm, in that addressing dysfunction from models that are explained from narratives more acceptable to the wider scientific community may be less fitting the older rabbit hole narratives of tissue-specific change and effects.

"The rationale for the integration of neurodynamics into standard treatment is, that it may directly affect the peripheral nervous system, resulting in improved efficiency of the region treated. After a short neural mobilization, the clinician observes an obvious improvement in speech motor skills, e.g. a clearer speaking voice. With the improved speech skills, the subsequent speech therapy exercises can be carried out in a more intensive and more effective manner. Therefore, a speech therapy treatment with the integration of neurodynamic

## techniques may lead to better results than the same treatment without neurodynamics."

"The additional neurodynamic treatment in the IG included mobilization and palpation of peripheral nerves. Palpation and mobilization of the peripheral nerves are painless manual techniques, which may be used as physical examination but also as treatment techniques. Superficial peripheral nerves may be palpated by gentle lateral pulling of the nerve with the fingertip (like plucking a guitar string) (Butler, 2006). The purpose of mobilization of the nervous system supports normal functional movement of peripheral neural tissues, like gliding and stretching without discomfort, and treatment of non-neural structures surrounding the nervous system, like joints, muscles or even scar tissue (Coppieters and Butler, 2008). Detailed palpation and mobilization techniques have been described by Butler (1995, 2006), Maitland (2004), and specifically for cranial nerves by Piekartz von (2007). The following cranial nerves supply the muscles involved in speech: trigeminal nerve (V), facial nerve (VII), glossopharynfpleasegeal nerve (IX), vagus nerve (X), accessory nerve (XI), and hypoglossal nerve (XII) (Wendler et al., 2005; Ziegler, 2006; Ziegler and Vogel, 2010). In addition, motor innervation of the respiratory muscles is effected through the phrenic nerve, the intercostal nerves IeXI, and branches from the cervical and the brachial plexus (Larsen and Ziegenfub, 2012; Schulte et al., 2007; Ziegler, 2006; Ziegler and Vogel, 2010). As part of the clinical reasoning process, the particular choice of which nerves were treated was derived from the outcome of the first evaluation sheet of the BoDyS. The neurodynamic techniques described below were integrated into the standard dysarthria treatment. To improve respiration, thoracic mobilization was performed (Butler, 2006; Jeangros, 2011; Piekartz von, 2011) to mobilize the intercostal nerves. Likewise, palpation and mobilization of the cervical plexus, brachial plexus, and accessory nerve (Butler, 1995, 2006; Shacklock, 2008) were implemented for the treatment of speech-related breathing. Palpation and mobilization of the vagus nerve (Maitland, 2004; Piekartz, 2015) were the neurodynamic treatment techniques used to improve vocal function. Similarly, in patients with articulation disorders, palpation techniques alone were used for the facial nerve (Fig. 2), whereas mobilization and palpation techniques were used for the trigeminal (Fig. 3), hypoglossal, and glossopharyngeal nerves (Butler, 2006; Piekartz von, 2007). The neurodynamic maneuvers within the context of dysarthria treatment are summarized in Table 2."

Baisakhiya, Nitish, et.al. (2017). Study the effect of osteopathic manipulation treatment in **globus pharyngeus** patients. Int J Otorhinolaryngol Head Neck Surg. 2017 Oct;3(4):957-961. DOI: http://dx.doi.org/10.18203/issn.2454-5929.ijohns20174314

Describes manual therapeutic techniques to decrease the globus sensation with targeted treatment to the hyoidal region. "The study suggested that globus pharyngeus is not a single identity but it only represent one of the symptoms of the hyoid bone somatic disorder. GERD was the most common associated condition with globus. PPI is only taking care oesophageal symptoms but for the extra-oesophageal symptoms we require OMT (MFR). It is one of the most effective and less expensive methods to treat the condition. Sensation of a lump in the throat was the symptoms which responded to treatment completely and just after 2-3 sitting of OMT. After full treatment patients requirement to PPI were reduced remarkably. Whenever there is a stress full situation in the life symptoms recur and require antipsychotic treatment along with OMT."

6. Baggi, F., Santoro, L., Grosso, E., Zanetti, C., Boacossa, E., Sandrin, F., Simoncini, M. C. (2014). Motor and functional recovery after neck dissection: comparison of two early physical rehabilitation programmes. Acta Otorhinolaryngologica Italica, 34(4), 230–240.

- 7. Bialosky, J.E., Bishop, M.D., Clelandm J.A. (2010). **Individual Expectation**: An overlooked, but Pertinent, Factor in the Treatment of Individuals Experiencing Musculoskeletal Pain. Phys Ther. 90(9) 2010; 1345-1355. Doi: 10.2522/ptj.20090306.
- 8. Bittar, C., Nascimento, O. (2014). **Placebo and nocebo effects in the neurological practice**. Arq Neuropsiquiatr 2015;73(1):58-63 . DOI: 10.1590/0004-282X20140180
- 9. Boldoman, D., Vandenbrink, R. 2018. **Physical Therapy Challenges in Head and Neck Cancer**, pp 209-224. From Maghami, Ellie, Ho, Allen S. (Eds.) 2018. Multidisciplinary Care of the Head and Neck Cancer Patient, Cancer Treatment and Research 174. <a href="https://doi.org/10.1007/978-3-319-65421-8">https://doi.org/10.1007/978-3-319-65421-8</a> 12.

States general challenges of interventions with the head neck cancer patient, and while presented from a physical therapy perspective, speaks to the general need for early mobilization through movement, exercise, and soft tissue manual therapy.

10. Bordoni, B, Zanier, E. (2013) Anatomic connections of the diaphragm: influence of respiration on the body system. Journal of Multidisciplinary Healthcare 2013:6 281–291. http://dx.doi.org/10.2147/JMDH.S45443 (Full text:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3731110/)

In an interesting paper also speaks to the, "information on the nonrespiratory functions of the diaphragm muscle and its analgesic and emotional response functions. It also aims to highlight and reflect on the fact that when the diaphragm is treated manually, a daily occurrence for manual operators, it is not just an area of musculature that is treated but the entire body, including the psyche. This reflection allows for a multidisciplinary approach to the diaphragm and the collaboration of various medical and nonmedical practitioners, with the ultimate goal of regaining or improving the patient's physical and mental well-being." The authors also speak at length to the relationship of multiple/overlapping and autonomous functions of the diaphragm and the crossroads function it performs.

Bordoni, B., Marelli, F., & Morabito, B. (2016). The tongue after whiplash: case report and osteopathic treatment. *International Medical Case Reports Journal*, 9, 179–182. http://doi.org/10.2147/IMCRJ.S111147

(Speaks to the utilization of **myofascial release to the tongue** in post-whiplash injuries) "The osteopathic (myofascial release) techniques led to a disappearance of pain and the complete recovery of the normal functions of the tongue, such as swallowing and mouth opening."

- 12. Bordoni, Bruno & Varacallo, Matthew. (2018). Anatomy, Fascia.
- 13. Bordoni B, Morabito B, Mitrano R, et al. (December 05, 2018) The **Anatomical Relationships of the Tongue** with the Body System. Cureus 10(12): e3695. doi:10.7759/cureus.3695

  Presents a very nice overview of the **tongue** from a whole-body perspective, including anatomic and neurological contexts
- Bourgeois JF, Gourgou S, Kramer A, Lagarde JM, Guillot B. (2008). A randomize, prospective study using the LPG (note: mechanical massage) technique in treating **radiation-induced skin fibrosis**: clinical and profilometric analysis. Skin Res Technol, 14(1), 71-6. DOI: 10.1111/j.1600-0846.2007.00263.x
- 15. Braga, D, et al. 2016. **Manual therapy in diaphragm muscle**: effect on respiratory muscle strength and chest mobility. Man Ther, Postur, & Rehab J. 14, 302. doi: http://dx.doi.org/10.17784/mtprehabjournal.2016.14.302

"Conclusion: Manual therapy techniques performed on the **diaphragm** exert an influence on muscle strength due to the increase in **maximum expiratory pressure** and in the mobility of the thoracic cavity, reflected in the increase of the coefficients of the circometry."

- 16. Broom, Brian. (2016). **Naming what we do**. Europ J for Person Centered Healthcare 4(2), 265-270. <a href="http://wholeperson.healthcare/wp-content/uploads/2016/10/Naming-what-we-do-a-512-BROOM-y3.pdf">http://wholeperson.healthcare/wp-content/uploads/2016/10/Naming-what-we-do-a-512-BROOM-y3.pdf</a> *Discusses narrative medicine*.
- 17. Bruno B, Fabiola M, Giovannni B (2016). A review of **analgesic and emotive breathing**: a multidisciplinary approach. Journal of Multidisciplinary Healthcare 2016:9 97–102 http://dx.doi.org/10.2147/JMDH.S101208
- 18. Burks, M., Bailey, S., and Jefferson, Manual Therapy May Improve Swallowing Outcomes in Post-Treatment Head and Neck Cancer Patients. Poster presentation at 2014 Triological Society. <a href="http://www.triomeetingposters.org/wp-content/uploads/2014/05/C100.pdf">http://www.triomeetingposters.org/wp-content/uploads/2014/05/C100.pdf</a>

"The primary objective of this small case series was to demonstrate the **potential application of myofascial release in the treatment of dysphagia in HNC survivors** following definitive therapy."

"Conclusion: Dysphagia is a common post-treatment sequela in HNC patients. Our descriptive observational data preliminarily suggests that the novel approach of manual therapy may have role for the treatment of HNC patient dysphagia. Future study will further investigate the effects, the long-term benefits, and ideal regimen of myofascial release in this patient population."

- 19. Calixtre, L. B., Moreira, R. F. C., Franchini, G. H., Alburquerque-Sendín, F., Oliveira, A.B. (2015) Manual therapy for the management of pain and limited range of motion in subjects with signs and symptoms of **temporomandibular disorder**: a systematic review of randomised controlled trials. Journal of Oral Rehabilitation, 42(11) 847–861. DOI: 10.1111/joor.12321. <a href="http://onlinelibrary.wiley.com/doi/10.1111/joor.12321/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage="http://onlinelibrary.wiley.com/doi/10.1111/joor.12321/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage="http://onlinelibrary.wiley.com/doi/10.1111/joor.12321/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage="http://onlinelibrary.wiley.com/doi/10.1111/joor.12321/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage="http://onlinelibrary.wiley.com/doi/10.1111/joor.12321/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage="http://onlinelibrary.wiley.com/doi/10.1111/joor.12321/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage="http://onlinelibrary.wiley.com/doi/10.1111/joor.12321/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage="http://onlinelibrary.wiley.com/doi/10.1111/joor.12321/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage="http://onlinelibrary.wiley.com/doi/10.1111/joor.12321/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage="http://onlinelibrary.wiley.com/doi/10.1111/joor.12321/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage="http://onlinelibrary.wiley.com/doi/10.1111/joor.12321/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage="http://onlinelibrary.wiley.com/doi/10.1111/joor.12321/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage="http://onlinelibrary.wiley.com/doi/10.1111/joor.12321/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage="http://onlinelibrary.wiley.com/doi/10.1111/joor.12321/abstract?userIsAuthenticated=false&deniedAccessCustom
  - "Myofascial release and massage techniques applied on the masticatory muscles are more effective than control (low to moderate evidence) but as effective as toxin botulinum injections (moderate evidence)."
- 20. Campagnoli, R. R., Wieser, M. J., Gruss, L. F., McTeague, L. M., Boylan, M. R., & Keil, A. How the **visual brain detects emotional changes in facial expressions**: Evidence from driven and intrinsic brain oscillations. Cortex, 111, 35–50. <a href="https://doi.org/10.1016/J.CORTEX.2018.10.006">https://doi.org/10.1016/J.CORTEX.2018.10.006</a> (Reinforces the nuanced ability to judge emotions from facial non-verbal visualization.)

"In conclusion, information on another person's affective state as communicated through facial expressions is a crucial element which is constantly monitored, for social and survival purposes"

- Cardoso, R., R. and Lumini-Oliveira, J. (2017). The Effectiveness of Physiotherapy and Complementary Therapies on Voice Disorders: A Systematic Review of Randomized Controlled Trials. Front Med (Lausanne). 2017; 4: 45. Published online 2017 Apr 24. doi: 10.3389/fmed.2017.00045
- 22. Cardoso, R., Lumini-Oliveira, J., & Meneses, R. F. (2017). Associations between **Posture, Voice, and Dysphonia**: A Systematic Review. Journal of Voice. doi:10.1016/j.jvoice.2017.08.030
- 23. Chaitow, L., Lederman, E. (2011). Is a postural-structural-biomechanical model, within manual therapies, viable?: A JBMT debate on: **The fall of the postural-structural- biomechanical model in manual and physical therapies**: Exemplified by lower back pain. Journal of Bodywork & Movement Therapies15, 130-152. doi:10.1016/j.jbmt.2011.01.004
- 24. Chaitow, Leon. "What's in a name: Myofascial Release or Myofascial Induction?" *Journal of bodywork and movement therapies* 21 4 (2017): 749-751

- A short review of the various beliefs behind the work, from fascial change to neurophysiological responses. Points to specific efficacy studies, including TMJ, scar-related pain.
- 25. Chapelle, Susan L. Understanding and Approach to Treatment of Scars and Adhesions. Full text link: <a href="http://www.squamishintegratedhealth.com/wp-content/uploads/Evidence-Based-Scars-Adhesions.pdf">http://www.squamishintegratedhealth.com/wp-content/uploads/Evidence-Based-Scars-Adhesions.pdf</a>.
- 26. Clayton, N. A., Ledgard, J. P., Haertsch, P. A., Kennedy, P. J., & Maitz, P. K. M. (2009). Rehabilitation of Speech and Swallowing After Burns Reconstructive Surgery of the Lips and Nose. Journal of Burn Care & Research, PAP.doi:10.1097/bcr.0b013e3181bfb907

  Describes a slow, prolonged stretch to the oral region after severe burns/reconstructive surgery by the SLP to assist in restoring more normal range of motion.
- 27. Craig, J., Tomlinson, C., Stevens, K., Kotagal, K., Fornadley, J., Jacobson, B., Garrett, C.G., Francis, D.O. (2015) Combining voice therapy and physical therapy: A novel approach to treating muscle tension dysphonia. J. of Communication Disorders. 58, p. 169-178. doi:10.1016/j.jcomdis.2015.05.001.
  - http://www.sciencedirect.com/science/article/pii/S0021992415000325
    - "Manual physical therapy techniques consist of a combination of joint mobilizations, passive range of motion, contract-relax stretches, and myofascial release." "This preliminary study suggests that physical therapy techniques may have a role in the treatment of a subset of MTD patients."
- 28. Cruz-Montecinos, C et al. (2017) The immediate effect of soft tissue manual therapy intervention on lung function in severe chronic obstructive pulmonary disease. Int J of COPD, 2017:12 691-696. doi <a href="http://dx.doi.org/10.2147/COPD.S127742">http://dx.doi.org/10.2147/COPD.S127742</a>
  - "A single application of an STMTP appears to have the potential to produce immediate clinically meaningful improvements in lung function in patients with severe and very severe COPD."
- 29. da Silva, et al. (2013). Increase of lower esophageal sphincter pressure after osteopathic intervention on the diaphragm in patients with gastroesophageal reflux. Dis Esophagus. 26(5), 451-6, doi: 10.1111/j.1442-2050.2012.01372x.
  - Shows that through manual therapy interventions we have the ability to effect changes in measurable outcomes of disorders of the thorax.
- 30. Dehqan, A., & Scherer, R. C. (2018). Positive Effects of Manual Circumlaryngeal Therapy in the Treatment of Muscle Tension Dysphonia (MTD): Long Term Treatment Outcomes. Journal of Voice.doi:10.1016/j.jvoice.2018.07.010
  - "Conclusion. These results suggest that MCT can be an effective method for voice rehabilitation in patients with MTD and the changes due to the therapy were persistent over a 6-month duration following the termination of treatment sessions."
- DePietro, J. D., Rubin, S., Stein, D. J., Golan, H., & Noordzij, J. P. (2018). *Laryngeal Manipulation* for *Dysphagia with Muscle Tension Dysphonia*. *Dysphagia*, 33(4), 468–473. doi:10.1007/s00455-018-9875-x
  - "The goal of CMT is to stretch the affected paralaryngeal muscles, thereby lengthening scar contractures, lengthening the muscle belly, and increasing blood flow and lymphatic drainage. Successful CMT will cause a relaxation of paralaryngeal musculature, lowering the relative position of the larynx, thereby improving phonation."
  - "We hypothesized that patients with muscle tension dysphagia, which we defined as those patients with difficulty swallowing and evidence of muscle tension dysphonia with a normal

swallow evaluation, would report an improvement after at least one session of CMT with our voice therapist. These data indeed show that 34 of 44 patients found improvement of dysphagia after CMT (77.3%), with no significant differences seen based on gender, race, or presenting symptoms. These findings are not surprising given the pathophysiology of MTD and that CMT is aimed at relaxing hyperfunctioning muscles and restoring the larynx to its proper anatomic position. One could expect dysphagia symptoms to improve with such an intervention, especially given that abnormal laryngeal position and limited hyolaryngeal elevation could contribute to muscle tension dysphagia."

- "Surprisingly, the number of therapy sessions was not significantly associated with improvement in dysphagia symptoms. We would expect that patients who receive an increased number of therapy sessions would be more likely to show improvement in subjective dysphagia symptoms because of the increased likelihood that the paralaryngeal muscles are relaxed. However, it is possible that more sessions are necessary to achieve the same effect in patients with more severe muscle tension dysphagia and an increased number of sessions does not equate to increased likelihood of improvement. Based on our results there was a trend toward improvement in dysphagia based on the number of sessions with the median number of sessions for the group experiencing improvement to be 4"
- Dev, K., Singh, S., Nambi, G.. 2018. A case study: **Effect of myofascial release in intercostal and paravertebral muscles on oxygen saturation, dyspnea, and respiratory rate among COPD patients**. IJCRT 6(1): 1483-1487.
  - Conclusion: From the result, it has been concluded that myofascial release in intercostals and paravertebral muscle is effective on respiratory rate, oxygen saturation, and dyspnea in chronic obstructive pulmonary disease subject.
- 33. Diener, I., Kargela, M., Louw, A. (2016). **Listening is therapy**: Patient interviewing from a pain science perspective. Physiotherapy Theory and Practice. http://dx.doi.org/10.1080/09593985.2016.1194648.
- Diwan, S. J., Bansal, A. B., Chovatiya, H., Kotak, D. & Vyas, N. (2014) Effect of anterior chest wall myofascial release on thoracic expansion in children with spastic cerebral palsy. International Journal of Contemporary Pediatrics, 1 (2), 94-99. doi:10.5455/2349-3291.ijcp20140802 <a href="http://www.scopemed.org/?jft=119&ft=119-1408343476">http://www.scopemed.org/?jft=119&ft=119-1408343476</a>
  - "Myofascial Release (MFR) is a form of soft tissue therapy used to treat somatic dysfunction and accompanying pain and restriction of motion. Hence some intervention is required to improve chest expansion. So this study was conducted in an effort to improve the chest expansion using MFR techniques to the respiratory muscles." "Conclusion: The result shows that the chest expansion increased significantly at all the three levels. The expansion improved maximally at the nipple level."
- 35. Dunphy, C. (2013). Critical Review: The Hands On Approach: **Perilaryngeal Manual Therapies** in the Treatment of **Muscle Tension Dysphonia**. <a href="https://www.uwo.ca/fhs/lwm/ebp/reviews/2012-13/Dunphy\_C.pdf">https://www.uwo.ca/fhs/lwm/ebp/reviews/2012-13/Dunphy\_C.pdf</a>
  - Concludes, "Despite methodological flaws and smaller sample sizes in some of the studies reviewed, there appears to be sufficient evidence to support the cautious clinical use of these therapies in treating muscle tension dysphonia, especially manual circumlaryngeal therapy."
- 36. Dworkin, S. F., LeResche, L., DeRouen, T., Von Korff, M. (1990). Assessing clinical signs of temporomandibular disorders: Reliability of clinical examiners. The Journal of Prosthetic Dentistry. Volume 63, Issue 5, May 1990, Pages 574-579. https://doi.org/10.1016/0022-3913(90)90079-R.

"many clinical signs important in the differential diagnosis of subtypes of TMD were not measured with high reliability. In particular, assessment of pain in response to muscle palpation and identification of specific temporomandibular joint sounds seemed to be possible only with modest, sometimes marginal, reliability. These modest reliabilities could arise from examiner error because the clinical signs are themselves unreliable, changing spontaneously over time and making it difficult to find the same sign on successive examinations. The finding that, without calibration, experienced clinicians showed low reliability with other clinicians suggests the importance of establishing reliable clinical standards for the examination and diagnostic classification of TMD."

- 37. Ercole B, Antonio S, Julie Ann D, Stecco C. (2010). **How Much Time is Required to Modify a Fascial Fibrosis?** J Bodyw Mov Ther. 14(4):318-25. doi: 10.1016/j.jbmt.2010.04.006. (**Outcomebased, not histologically-based. Much conjecture, but an interesting point of view**)
- 38. Fernandez, Lecrissa Hyacinta. (2017). Efficacy of **myofascial release technique on anterior chest wall muscles in children with restrictive lung diseases** on spirometric parameters and quality of life-A randomized controlled trial. <a href="http://182.48.228.33:8080/jspui/handle/123456789/2584">http://182.48.228.33:8080/jspui/handle/123456789/2584</a>
  - "Conclusion: MFR is a beneficial and an efficient technique in the treatment of RLD's (Restrictive Lung Disease) in children. It significantly increased the chest expansion due to release of the fascial restrictions and improved the lung function which was evident through significant increase in the spirometric parameters. The QoL improved significantly improved in these children"
- 39. Fischera, M, Gutenbrunnera, G, Ptok, M. (2009). **Intensified voice therapy**: a new model for the rehabilitation of patients suffering from **functional dysphonias**. Int J Rehab Research, June, 2009, 348-355. DOI: 10.1097/MRR.0b013e32832c0d8f
- 40. German, R. Z., Campbell-Malone, A.W., et al. (2011). The Concept of **Hyoid Posture**. Dysphagia (2011) 26:97–98 DOI 10.1007/s00455-011-9339-z. (A counterpoint to Pearson, 2011.)
- 41. Gupta, A., Arora, B., Rishi, P. (2017) Int. J Yoga, Physiotherapy, and Phys. Ed. 2017 2(5): 126-131. Recovery from **temporomandibular joint dysfunction**: An overview of different physiotherapy approaches.
  - "Results of the study includes the 3 weeks of treatment program resulted in significant improvement in reduction of pain (NPRS p < 0.05) & increase in mouth opening (p < 0.05) & increase the functional status in TMJD patients. However, was found to be more clinically effective compared to MFR (Myofascial Release) in all outcome scores. Conclusions of the study is that both MFR & PRT (Positional Release Technique) are effective in reducing pain and increasing mouth opening in TMJD subjects. However MFR was found to be superior to PRT."
- 42. Gugliotti, M. (2011) The Use of Mobilization, Muscle Energy Technique, and Soft Tissue Mobilization Following a Modified Radical Neck Dissection of a Patient with **Head and Neck Cancer**. "Rehabilitation Oncology 29(1); . 2011. Retrieved April 01, 2016 from HighBeam Research: <a href="https://www.highbeam.com/doc/1P3-2342376511.html">https://www.highbeam.com/doc/1P3-2342376511.html</a>
  - "Manual therapy techniques such as joint mobilization, muscle energy technique, and soft tissue mobilization were safely and effectively applied to this patient with head and neck cancer." "Soft tissue mobilization was chosen due to its reported ability to reduce pain and increase tissue extensibility."
- 43. Halim, E., Serry, Z., Ahmad, A., Sadek, M. 2018. Acute Effect of Pectoralis Minor Muscle Myofascial Release on Ventilatory Function in Patients with Chronic Obstructive Pulmonary Disease. World J of Med Sci. 15(1): 14-19, 2018. DOI: 10.5829/idosi.wjms.2018.14.19

Conclusion: Myofascial release of pectoralis minor muscle can be very beneficial therapy for patients with COPD, improving their ventilatory function and chest expansion; which can represent a different method of manual therapy that is introduced in pulmonary rehabilitation programs.

- 44. Hamdan, A.-L., Ziade, G., Khalifee, E., Al Souky, N., Jaffal, H., & El Natout, T. (2018). *Prevalence of MTD among Patients with Functional Dysphagia*. *OTO Open*, 2(3), 2473974X1879246.doi:10.1177/2473974x18792469
  - "Conclusion. The high prevalence of laryngeal muscle tension pattern among patients with functional dysphagia supports the notion that laryngeal tension may be one of the underlying causes of dysphagia."
- 45. Heredia-Rizo, A. M., Oliva-Pascual-Vaca, Á., Rodríguez-Blanco, C., Piña-Pozo, F., Luque-Carrasco, A., & Herrera-Monge, P. (2013). Immediate Changes in Masticatory Mechanosensitivity, Mouth Opening, and Head Posture After Myofascial Techniques in Pain-Free Healthy Participants: A Randomized Controlled Trial. Journal of Manipulative and Physiological Therapeutics, 36(5), 310–318.doi:10.1016/j.jmpt.2013.05.011
  - "Myofascial induction techniques in the masseter and temporalis muscles show no significant differences in maximal VMO (vertical mouth opening), in the mechanical sensitivity of the masticatory muscles, and in head posture in comparison with a placebo intervention in which the therapist's hands are placed in the temporomandibular joint region without exerting any therapeutic pressure." But, "A continuous manual contact (about 20 minutes) without applying any therapeutic intention showed positive effects in the CG, by means of modifying the tissue threshold to painful stimuli, which also had an impact on head posture. For Butler and Moseley (26) "a light and soft skin contact is a way to refresh the "virtual" and real body and may lead to changes in pain perception. Besides, the mere weight of the therapist's hands may have activated the propioceptive receptors of the TMJ region, although the therapist tried not to exert any pressure. Hence, we must question if the proposed placebo intervention is not really a powerful intervention itself, and it should not be considered as a sham intervention."
- 46. Heo, S. Y., & Kim, K. M. (2015). Immediate effects of **Kinesio Taping on the movement of the hyoid bone and epiglottis during swallowing by stroke patients with dysphagia**. *Journal of Physical Therapy Science*, 27(11), 3355–3357. <a href="http://doi.org/10.1589/jpts.27.3355">http://doi.org/10.1589/jpts.27.3355</a> (Low level evidence)
  - Showed that the application of **therapeutic taping** (kinesiotaping) to the neck region **improved dysphagia symptoms** in stroke patients. While the study suffers from some fatal flaws, including pay-to-publish issues, I appreciate what it may indicate. The application of stretchy tape, no matter what deeper tissue-specific effects might be claimed, stretches the skin. If simple skin stretching can improve dysphagia, I am in favor of a trial. In many ways, it also provides some lower level validation of the more generically defined effects of manual therapy. At the most basic level, we are stretching the skin. All else is conjecture.
- 47. Hojan, K., Milecki, P. Opportunities for rehabilitation of patients with **radiation fibrosis syndrome** (2014). Reports on Oncology and Radiotherapy, 19(1), 1-6.

DOI: http://dx.doi.org/10.1016/j.rpor.2013.07.007

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4056465/pdf/main.pdf

"RFS (radiation fibrosis syndrome) may cause deformation and function disorders of the fascial system that exerts a crucial influence on the mobility of joints, abdominal and lumbar tissues, and consequently, of chest walls. The fascial techniques consisting in expanding the skin, subcutaneous connective tissue and deep fascia make it possible to restore normal shifting of

- particular layers of soft tissues. The myofascial relaxation was found to influence the general homeostasis thanks to the loosening of tense soft tissues enabling to reduce pain and improve circulation in the region with RFS."
- 48. Holzman Weppler, C. and Magnusson, S. P. (2010) Increasing Muscle Extensibility: A Matter of Increasing Length or Modifying Sensation? Phys Ther. 90:438-449. doi: 10.2522/ptj.20090012

  I believe that the line of reasoning applied in this paper can be applied to many of the effects of myofascial release and manual therapy. While lacking a specific narrative of tissue impact, it probably more accurately describes the general nature of how awareness and sensation may be more relevant that our tissue-specific effects.

"Various theories have been proposed to explain increases in muscle extensibility observed after intermittent stretching. Most of these theories advocate a mechanical increase in length of the stretched muscle. More recently, a sensory theory has been proposed suggesting instead that increases in muscle extensibility are due to a modification of sensation only. Studies that evaluated the biomechanical effect of stretching showed that muscle length does increase during stretch application due to the viscoelastic properties of muscle. However, this length increase is transient, its magnitude and duration being dependent upon the duration and type of stretching applied. Most of these studies suggest that increases in muscle extensibility observed after a single stretching session and after short-term (3- to 8-week) stretching pro- grams are due to modified sensation. The biomechanical effects of long-term ( $\square 8$  weeks) and chronic stretching programs have not yet been evaluated. The purposes of this article are to review each of these proposed theories and to discuss the implications for research and clinical practice."

- 49. Howard, J.M., Howard, Howard, J.M., & M., J.. (2014). **Postural and Spinal Disorders: Do They Affect the Normal Swallow?** 
  - http://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=1088&context=gs\_rp
- 50. Hsieh, C.J., Hong, C.Z., Adams, A.H., Platt, K.J., Danielson, C.D., Hoehler, F.K., Tobis, J.S. (2000). Interexaminer Reliability of the Palpation of Trigger Points in the Trunk and Lower Limb Muscles. Arch Phys Med Rehabil 2000;81:258-64. DOI: https://doi.org/10.1016/S0003-9993(00)90068-6 "Conclusions: Among nonexpert physicians, physiatric or chiropractic, trigger point palpation is not reliable for detecting taut band and local twitch response, and only marginally reliable for referred pain after training."
- 51. Kang, C. H., Hentz, J. G., & Lott, D. G. (2016). **Muscle Tension <u>Dysphagia</u>**: Symptomology and Theoretical Framework. *Otolaryngology–Head and Neck Surgery*, 155(5), 837–842. https://doi.org/10.1177/0194599816657013
  - "Conclusion. The study results suggest that laryngeal muscle tension may be a factor in the underlying etiology in patients with idiopathic functional dysphagia. We propose the diagnostic term muscle tension dysphagia to describe a subset of patients with functional dysphagia. Further prospective studies are needed to better evaluate potential gastroesophageal confounders in this group of patients and to identify an effective paradigm for treatment. In our limited series, speech-language pathology intervention directed toward unloading muscle tension appears effective."
- 52. Kennard, E. J., Lieberman, J., Saaid, A., & Rolfe, K. J. (2015). A Preliminary Comparison of Laryngeal Manipulation and Postural Treatment on Voice Quality in a Prospective Randomized Crossover Study. Journal of Voice, 29(6), 751–754. doi:10.1016/j.jvoice.2014.09.026

"This pilot study provides evidence of the benefit for both SLM and PMT in (asymptomatic) singers. A significant difference was found in the voice quality of the participants involved in both PMT and SLM."

"Postural manual therapy (PMT) is an umbrella term coined by the authors for this study. It relates to the therapeutic manipulation of the structures found to have an influence voice production. 18 These include stretching and massage of the scaleneus, sternocleidomastoids, and the trapezius muscles and articulation of the cervical and thoracic spine. The articulation of the cervical and thoracic spine helped to enhance posture, therefore influencing airway flow and easing the tension on the vocal structure. There was also a secondary effect on stabilizing muscles including the semispinalis capitus, iliocostalis cervicis, and the longissimus cervicis. PMT therefore indirectly targets both mobility and stabilizing structures to promote optimal postural alignment leading to changes in the shape and structure of the soft tissue surrounding the vocal mechanism. PMT is a more indirect approach than SLM. PMT improves vocal function through posture rather directly on the vocal structures."

"Specific laryngeal manipulation (SLM) is a manual treatment of tight structures of the larynx that may restrict movement. As a consequence, there is an alteration in the vocal mechanism causing suboptimal laryngeal function. 16 SLM was first developed as an approach in the management of hyperfunctional voice disorders that take place due to excessive muscle tension requiring more effort in voice use. 6,17 Muscles and joints, including temporomandibular and jaw function, the floor of the mouth, the middle constrictor thyrohyoid, cricothyroid muscles, and the rest of infrahyoid muscles are assessed and targeted manually using the Lieberman Laryngeal Assessment protocol (Table 1). Tight hypertonic muscles are stretched using various techniques, and joints with limited range of movement are articulated to improve suboptimal laryngeal function."

Khoddami, Seyyedeh Maryam et al. (2015). Review on <u>Laryngeal Palpation Methods in Muscle Tension Dysphonia: Validity and Reliability Issues.</u> Journal of Voice, Volume 29, Issue 4, 459 – 468. DOI: <a href="https://doi.org/10.1016/j.jvoice.2014.09.023">https://doi.org/10.1016/j.jvoice.2014.09.023</a>.

"There were five main as well as miscellaneous palpation methods that were different according to target anatomical structures, judgment or grading system, and using tasks. There were only a few scales available, and the majority of the palpatory methods were qualitative. Most of the palpatory methods evaluate the tension at both static and dynamic tasks. There was little information about the validity and reliability of the available methods."

54. Krisciunas, G.P., Golan, H., Marinko, L.N., Pearson, W., Jalisi, S. and Langmore, S.E. (2016), A novel manual therapy programme during radiation therapy for head and neck cancer – our clinical experience with five patients. Clinical Otolaryngology. doi: 10.1111/coa.12535 <a href="http://onlinelibrary.wiley.com/doi/10.1111/coa.12535/abstract">http://onlinelibrary.wiley.com/doi/10.1111/coa.12535/abstract</a>

Used a multidisciplinary approach (SLP, PT) to during radiation therapy for head and neck cancer.

"SLP Treatment Protocol Overview: MyoFascial Release on muscles of mastication. Lateral tongue stretch pulling the hyoid down and push to contralateral side. Geniohyoid and posterior mylohyoid (from body of hyoid laterally to mandible) are especially targeted.

In contrast to concerns that manual therapy would be painful/intolerable during radiation

therapy, all patients felt that manual therapy lessened their throat pain."

"Collectively, this suggests that clinicians properly trained in manual therapy techniques, who also have significant experience with head and neck cancer patients, can deliver such treatment during radiation therapy."

- "Overall, this clinical experience demonstrated that manual therapy during radiation therapy can be tolerated by patients, and that it attenuated generalized neck/throat pain during the course of each treatment session."
- 55. Langmore, S. E., McCulloch, T. M., Krisciunas, G. P., Lazarus, C. L., Daele, D. J., Pauloski, B. R., Rybin, D. and Doros, G. (2016), Efficacy of electrical stimulation and exercise for dysphagia in patients with head and neck cancer: A randomized clinical trial. Head Neck, 38: E1221-E1231. doi:10.1002/hed.24197
  - "CONCLUSIONS This large, randomized controlled clinical trial determined that NMES did not add any benefit to traditional dysphagia therapy in post-radiated HNC patients. It also suggested that traditional swallowing-specific exercises and stretching may not help rehabilitate dysphagia in this group of patients with chronic dysphagia. Interestingly, all patients reported significant improvements in diet and quality of life. For the majority of patients, it appears that once post-radiation dysphagia is well-established, current interventions are limited in reversing the decline in swallow function."
- 56. Lau, A (2010). Effects of Massage Therapy on Vocal Tract Discomfort Associated with Muscle Tension Dysphonia: A Case Study. Clinical Case Report Competition West Coast College of Massage Therapy
- 57. **Lemley**, D. (2014). . Master's Thesis. OCLC #907648851
  - "Findings from this investigation suggest that myofascial release reduces muscle activity resulting in decreased tension noted on videostroboscopy, EMG measures, and perceptual ratings of the participant's voice. Results from this case study indicate that MFR is a viable treatment modality for voice clinicians when treating MTD"
  - "Based on the results of this study, it can be concluded that MFR improved MTD symptoms in this case study."
- 58. Leppänen, K., Laukkanen, A., Ilomäki, I., & Vilkman, E. (2009). A comparison of the **effects of Voice Massage and voice hygiene** lecture on self-reported **vocal well-being and acoustic and perceptual speech parameters in female teachers.** Folia phoniatrica et logopaedica: official organ of the International Association of Logopedics and Phoniatrics, 61 4, 227-38.
  - "In the VM<sup>TM</sup> (Voice Massage) group, the perceived firmness of loud reading decreased (p = 0.026). The results suggest that VM may help in sustaining vocal well-being during a school term." (Note: subjects were asymptomatic individuals)
- 59. Leppänen, K., Ilomäki, I., & Laukkanen, A.-M. (2010). One-year follow-up study of self-evaluated effects of Voice Massage<sup>TM</sup>, voice training, and voice hygiene lecture in female teachers. Logopedics Phoniatrics Vocology, 35(1), 13–18.doi:10.3109/14015430903552360
- 60. **Lewin, J.**, Woodall, H., Porsche, C., Barrow, M., & Hutcheson, K. (2017). *Manual Therapy: Integration into a Speech and Swallowing Rehabilitation Program for Head and Neck Cancer. Archives of Physical Medicine and Rehabilitation*, 98(10), e3. doi:10.1016/j.apmr.2017.08.006
  - "Conclusions: Patients with HNC often experience devastating long-term treatment-related problems associated with fibrosis and neuropathy that can severely impact function.

Preliminary data show significant benefit when manual therapy is provided with other functional therapies that target deficits and patient perception"

- 61. Lewit, K., Olsanska, S. (2004), **Clinical importance of active scars**: abnormal scars as a cause of myofascial pain. J Manipulative Physiol Ther 27(6), 399-402. http://www.eugenept.com/pdfs/clinicaimprtance.pdf
- 62. Lumau, A., Schinocca, L., Chessa, G. (2011). **Influence of posture on swallowing**. Europ J of Paediatric Dentistry. 12(3), 171-174, 2011.

This paper paints an interesting role for the hyoid as "the main component in the cranio-cervical-mandibular relationship" and reverses the usual relationship, postulating from their findings that improving tongue position and swallowing will allow better body/head position posture to be seen. In a bit of a reversal from traditional reasoning, this small study sets a tone for tongue corrections as a basis for overall change.

"This study showed that swallowing is able to modulate postural control and it can be a determining factor in postural syndromes that, if not promptly intercepted, may evolve into full-blown and irreversible musculoskeletal disorders for which treatment often proves ineffective."

- 64. Marszalek, S. (2008). Estimation of influence of myofascial release techniques on esophageal pressure in patients after total laryngectomy. European Archives of Oto-Rhino-Laryngology, 266(8), 1305-1308. Doi: 10.1007/s00405-008-0861-z
  - http://link.springer.com/article/10.1007%2Fs00405-008-0861-z?LI=true#page-1
    - "The application of myofascial manual techniques decreases esophageal pressure, thus allowing patients to learn esophagus speech at a faster pace."
- 65. Marszalek, S., Niebudek-Bogusz, E., Woznicka, E., Malinska, J., Golusinski, W., & Sliwinska-Kowalska, M. (2012). Assessment of the influence of osteopathic myofascial techniques on normalization of the vocal tract functions in patients with occupational dysphonia. International Journal of Occupational Medicine and Environmental Health, 25(3), 225-235. doi: 10.2478/S13382-012-0041-7 (osteopathic myofascial rehabilitation)

"The voice therapy, scheduled and supervised by a laryngologist-phoniatrician and conducted by a speech-language pathologist, was supplemented with osteopathic myofascial rehabilitation of the larynx."

"Conclusion: The use of osteopathic (myofascial) therapy helps significantly improve the functions of the vocal tract in patients with occupational dysphonia."

- 66. Marszalek S., Pienkowski P., Golusinski P., Pazdrowski J., Szewczyk M., Luczewski L., Szybiak B., Golusinski W. (2015). Evaluation of manual myofascial release techniques in head and neck cancer patients with trismus following extensive surgical treatment. http://www.fasciacongress.org/2015/Abstracts/95\_Marszalek.pdf
  - "Conclusions: The use of myofascial release techniques in patients with disorders of the masticatory apparatus significantly increased the range of mandible opening."
- 67. Mathieson, L., Hirani, S., Epstein, R., Baken, R., Wood, G., & Rubin, J. (2009). Laryngeal manual therapy: a preliminary study to examine its treatment effects in the management of muscle tension dysphonia. J Voice, 23(3):353-66. Epub 2007 Nov 26. DOI: 10.1016/j.jvoice.2007.10.002
  - "Thus, the removal of myofascial trigger points would reduce cervical tension and also allow for

- better breath support in phonation."
- 68. Mathieson, L. (2011) The evidence for laryngeal manual therapies in the treatment of muscle tension dysphonia. Curr Opin Otolaryngol Head Neck Surg. 2011 Jun;19(3):171-6. doi: 10.1097/MOO.0b013e3283448f6c.
- 69. McGarey, P. O., Barone, N. A., Freeman, M., & Daniero, J. J. (2018). Comorbid Dysphagia and Dyspnea in Muscle Tension Dysphonia: A Global Laryngeal Musculoskeletal Problem. OTO Open, 2(3), 2473974X1879567.doi:10.1177/2473974x18795671
- 70. Nee, R., Butler, D. (2006). Management of peripheral neuropathic pain: Integrating neurobiology, **neurodynamics, and clinical evidence**. Phys Ther in Sport, 7(1) 36-49. DOI: <a href="http://dx.doi.org/10.1016/j.ptsp.2005.10.002">http://dx.doi.org/10.1016/j.ptsp.2005.10.002</a>
- 71. Nee, R., Gwendolen, A.J., Vicenzino, B., Coppielters, M. (2012). The validity of upper-limb neurodynamic tests for detecting peripheral neuropathic pain. <u>J Orthop Sports Phys Ther.</u> 2012 May;42(5):413-24. doi: 10.2519/jospt.2012.3988 Updated 02/05/17
- 72. Nijs, J., Lluch Girbés, E., Lundberg, M., Malfliet, A., & Sterling, M. (2015). **Exercise therapy** for chronic musculoskeletal pain: **Innovation by altering pain memories**. Manual Therapy, 20(1), 216–220.doi:10.1016/j.math.2014.07.004
- Delves into how narratives beyond the weakness model can explain change, in this case, pain.

  Pearson, W.G., Langmore, S. E., Zumwalt, A. C. (2011). Evaluating the Structural Properties of Suprahyoid Muscles and their Potential for Moving the Hyoid. Dysphagia. 2011 December; 26(4): 345–351. doi:10.1007/s00455-010-9315-z.

Looks at a muscle-specific narrative to explain **hyoid positioning** in regards to **dysphagia/treatment** 

- 74. Pittman, E (2007). A History of Manipulative Therapy. The Journal of Manual & Manipulative Therapy Vol. 15 No. 3 (2007), 165–174.
- 75. Purcell, A. (2013). Head and neck lymphoedema management practices. 8. 8-15.
- 76. Roy N, Leeper HA. (1993) Effect of the manual laryngeal musculoskeletal tension reduction technique as a treatment for functional voice disorders: perceptual and acoustic measures. J Voice 1993;7:242–9.
- 77. Roy, N., Bless, D., Heisey, D., and Ford, C. (1997). Manual Circumlaryngeal Therapy for Functional Dysphonia: An Evaluation of Short- and Long-Term Treatment Outcomes. Journal of Voice, 11(3); 321-331.DOI: 10.1016/S0892-1997(97)80011-2
  - "Briefly, this treatment involved kneading the extralaryngeal musculature in an anterior-posterior direction at specific locations while exerting a downward pull on the larynx. Target voice stimuli were presented concurrently while changes in voice quality were noted. The assessment and treatment protocol were completed in a single session that ranged in duration from 50 minutes to 3 hours."
  - "(iv) Manual circumlaryngeal therapy (the manual laryngeal musculoskeletal tension reduction tech-nique) was undertaken according to the description of Aronson (3): (a) the hyoid bone was encircled with the thumb and index finger, which were worked posteriorly until the tips of the major horns were felt; (b) light pressure was exerted with the fingers in a circular motion over the tips of the hyoid bone; (c) the procedure was repeated beginning from the thyroid notch and working posteriorly; (d) the posterior borders of the thyroid cartilage just medial to the sternocleidomastoid muscles were located and the procedure was repeated; (e) with the fingers over the superior borders of the thyroid cartilage, the larynx was worked downward, and moved laterally at times;"

- (Roy describes techniques and methodologies that are nearly identical to many aspects of myofascial release in the neck region. The difference appears to be the titled given the work. This is the case in many forms of manual therapy, massage, and myofascial release in the physical therapy/massage therapy communities.)
- 78. Roy, N. (2008). Assessment and treatment of musculoskeletal tension in hyperfunctional voice disorders. Int J of Speech Lang Pathol., 10(4): 195-209. DOI: 10.1080/17549500701885577
- 79. Roy, N., Nissen, S. L., Dromey, C., & Sapir, S. (2009). Articulatory changes in muscle tension dysphonia: Evidence of vowel space expansion following manual circumlaryngeal therapy.

  Journal of Communication Disorders, 42(2), 124–135.doi:10.1016/j.jcomdis.2008.10.001

  (Well describes the uncertainty in the causal nature of MTD) "Although muscle tension dysphonia (MTD) is properly regarded as a "voice" disorder associated with excessive muscle tension in the laryngeal and perilaryngeal muscles, tension in these muscles could also constrain articulatory movements and vocal tract dynamics, by virtue of the mechanical linkage of the articulators to the hyolaryngeal complex, central nervous system influences (e.g., heightened muscle tension in the jaw muscles), orolaryngeal sensorimotor interactions, or a combination of these. Despite some ambiguity surrounding its causal mechanisms, the clinical voice literature is replete with evidence that symptomatic voice therapy for primary MTD can often result in rapid and dramatic voice improvement"
- 80. Rushton A, Rivett D, Carlesso L, Flynn T, Hing W, Kerry R. (2012). International Framework for Examination of the Cervical Region for potential of Cervical Arterial Dysfunction prior to Orthopaedic Manual Therapy Intervention. www.ifompt.org
- Russell, B.A. (2010). Using Manual Tension Reduction Treatment in treating Pediatric Functional Dysphonia. Contemp. Issues Commun. Science and Disorders. 37, 131-140 Fall 2010, <a href="https://www.asha.org/uploadedFiles/asha/publications/cicsd/2010F-Using-Manual-Tension-Reduction-Treatment.pdf">https://www.asha.org/uploadedFiles/asha/publications/cicsd/2010F-Using-Manual-Tension-Reduction-Treatment.pdf</a>. Includes technique-specific suggestions.
- 82. Schneider, S., Sataloff, R. (2007) Voice Therapy for the Professional Voice, Otolaryngol Clin N Am 40 (2007) 1133–1149. doi:10.1016/j.otc.2007.05.013
- 83. Seffinger, M. A., Najm, W., Mishra, S. I., Adams, A., Dickerson, V. M., Murphy, L. S., Reinsch, S. (2004). Reliability of Spinal Palpation for Diagnosis of Back and Neck Pain: A Systematic Review of the Literature. Spine: October 1st, 2004 Volume 29 Issue 19 p E413-E425 doi: 10.1097/01.brs.0000141178.98157.8e
  - "Conclusion: The quality of the research on interreliability and intrareliability of spinal palpatory diagnostic procedures needs to be improved. Pain provocation tests are most reliable. Soft tissue paraspinal palpatory diagnostic tests are not reliable."
- 84. Silvério KCA, Brasolotto AG, Siqueira LTD, Carneiro CG, Fukushiro AP, de Jesus Guirro RR. (2015) Effect of application of transcutaneous electrical nerve stimulation and **laryngeal manual therapy in dysphonic women**: clinical trial. *J Voice* (2015) 29(2):200–8. doi:10.1016/j.jvoice.2014.06.003
  - "After LMT (Laryngeal Manual Therapy), there was improvement of the "sore throat," significantly lower incidence of pain in the anterior neck, and the pain intensity in the posterior neck decreased."
- 85. Smékal, D., Velebová, K., Hanáková, D., Lepšíková, M., The effectiveness of specific physiotherapy in the treatment of temporomandibular disorders. (2008) Acta Universitatis Palackianae Olomucensis. Gymnica . 2008, Vol. 38 Issue 2, p 45-
  - 53. http://www.gymnica.upol.cz/pdfs/gym/2008/02/05.pdf

"Utilizing a physiotherapy protocol that included **myofascial release**, it was found that after treatment (t)he range of **mouth opening increased significantly** (from 37.3 mm to 41.3 mm, p < 0.001).. The finding shows that **this state was maintained two months later**:.. mouth opening (p < 0.003). Pain was ameliorated, the intensity of sounds reduced, and the range of movement significantly improved after specific physiotherapy."

- 86. Staes, F. F., Jansen, L., Vilette, A., Coveliers, Y., Daniels, K., & Decoster, W. (2011). **Physical Therapy as a Means to Optimize Posture and Voice Parameters in Student Classical Singers**: A Case Report. Journal of Voice, 25(3), e91–e101.doi:10.1016/j.jvoice.2009.10.012
- 87. Stepp, C, Heaton, J., Braden, M., Jetté, M., Stadelman-Cohen, T., and Hillman, R. (2012). Comparison of neck tension palpation rating systems with surface electromyographic and acoustic measures in vocal hyperfunction. J Voice. 2011 January; 25(1): 67–75. doi:10.1016/j.jvoice.2009.08.001.

"Summary: The purpose of this study was to evaluate current neck tension palpation rating systems to determine interrater reliability and possible correlation with necksurface electromyography (sEMG, collected from three electrode recording locations) and to measure the third formant for /a/ during various vocal behaviors. This prospective study examined the neck muscle tension of 16 participants before and after a single session of voice therapy. Interrater reliability and relationships between palpation ratings and objective measures of sEMG (anterior neck) and the third formant for /a/ were assessed using Pearson's correlations (r). Interrater reliability was relatively low as measured by Pearson's correlations, although Wilcoxon signed-rank test results were similar as those in a previous study. Correlations between palpation ratings and sEMG and between ratings of laryngeal height and the third formant for /a/ were generally low. Correlations increased between anterior neck sEMG and ratings of suprahyoid muscle tension when examined in a reduced set of individuals with higher interrater reliability. Palpation rating scales do not reliably capture changes that may occur in neck muscle tension of typical voice therapy patients over one session. Consequently, little can be concluded from correlations between sEMG and palpation ratings."

88. Such, G. **Manual care of the hyoid complex** (2016) Topics in Clinical Chiropractic Sept. 2002: 54+. Academic OneFile. Web. 8 Sept. 2016.

Described successful manual interventions targeting the region of the hyoid bone.

- 89. Tacani, R.E., Machado, A.F.P., Goes, J.C.G.S., Marx, A.G., Franceschini, J.P. & Tacani, P.M., (2014). Physiotherapy on the Complications of Head and Neck Cancer: Retrospective Study. International Journal of Head & Neck Surgery, 5(3), p.112. DOI: 10.5005/jp-journals-10001-1195
- 90. Tacani, P.M, Franceschini, J.P., Tacani, R.E., Machado, A.F., Montezello, D., Góes, J.C., Marx, A. (2016) Retrospective study of the physical therapy modalities applied in head and neck lymphedema treatment. Head Neck. 38(2):301-8. doi: 10.1002/hed.23899. Epub 2015 Jun 16. http://www.ncbi.nlm.nih.gov/pubmed/25332118

Conclusion: Physical therapy in morbidities of head and neck cancer was effective in reducing pain and lymphedema, combining manual lymphatic drainage, transcutaneous electrical nerve stimulation (TENS), mechanical massage therapy, stretching exercises and patient education, with an average of 19 sessions and discharge after treatment.

- Taylor AJ, Kerry R, A 'system based' approach to risk assessment of the cervical spine prior to manual therapy, Int J Osteopath Med (2010), doi:10.1016/j.ijosm.2010.05.001
- 92. Threlkeld, J. (1992). The effects of manual therapy on connective tissue. Physical Therapy, 72(12); 893-901. http://ptjournal.apta.org/content/ptjournal/72/12/893.full.pdf
- 93. Tomlinson C, Coon K, MacKenzie A, Archer K. (2013) Improving outcomes in patients with

muscle tension dysphonia: A myofascial release and exercise program. Journal of Orthopaedic & Sports Physical Therapy, 43 (1), A1–A15 DOI:10.2519/jospt.2013.43.1.A1

"Conclusion: Results demonstrate a 10-session MFR+Ex (myofascial release plus exercise) program is feasible in patients with MTD. Furthermore, preliminary findings suggest that the MFR+Ex intervention improves patient outcomes related to pain, functional status, voice-specific QOL, and ROM."

"Clinical Relevance: Preliminary evidence suggests that physical therapists can implement the MFR skills necessary to effect improvements in outcomes for patients with MTD.

Recommendation for expanding physical therapy practice includes patient referral from an outpatient voice center. Physical therapists interested in improving outcomes in patients with MTD should consider incorporating MFR techniques into standard practice."

- 94. Tomlinson, C., Archer, K (2015). Manual Therapy and Exercise to Improve Outcomes in Patients With Muscle Tension Dysphonia: A Case Series. Physical Therapy 95 (1) 117-128; DOI: 10.2522/ptj.20130547
- 95. Van Lierke, K. M., De Ley, S., Clement, G., De Boldt, M., & Van Cauwenberge, P. (2004). Outcome of laryngeal manual therapy in four Dutch adults with persistent moderate-to-severe vocal hyper function: A pilot study. Journal of Voice, 18(4), 467-474, DOI: 10.1016/j.jvoice.2004.02.003

  The use of LMT (note: laryngeal manual therapy) in professional voice users with persistent moderate-to-severe muscle tension dysphonia, especially in some subjects who have not responded to traditional voice therapy, is supported by this pilot study.
- 96. Vigotsky, A., and Bruhns, R. 2015. "The Role of Descending Modulation in Manual Therapy and Its Analgesic Implications: A Narrative Review," Pain Research and Treatment, vol. 2015, Article ID 292805, 11 pages, 2015. https://doi.org/10.1155/2015/292805.
  - "Manual therapy has long been a component of physical rehabilitation programs, especially to treat those in pain. The mechanisms of manual therapy, however, are not fully understood, and it has been suggested that its pain modulatory effects are of neurophysiological origin and may be mediated by the descending modulatory circuit. Therefore, the purpose of this review is to examine the neurophysiological response to different types of manual therapy, in order to better understand the neurophysiological mechanisms behind each therapy's analgesic effects. It is concluded that different forms of manual therapy elicit analgesic effects via different mechanisms, and nearly all therapies appear to be at least partially mediated by descending modulation. Additionally, future avenues of mechanistic research pertaining to manual therapy are discussed."
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"Conclusion: This preliminary survey study indicated that the SLPs who employ MT for dysphagia in HNC patients most often recommend 1 to 2 clinical treatment sessions per week with a self-administered home program 6 to 7 times per week. The timing of MT administration was variable and may be recommended either during or after RT. The type, severity, and number of reported adverse events experienced by HNC patients versus non-HNC patients were similar. A phase 2/3 clinical trial that formally tests safety and preliminary efficacy should be conducted so that objective evidence can guide the use of this therapy before it becomes overly popular with a high-risk patient population."

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