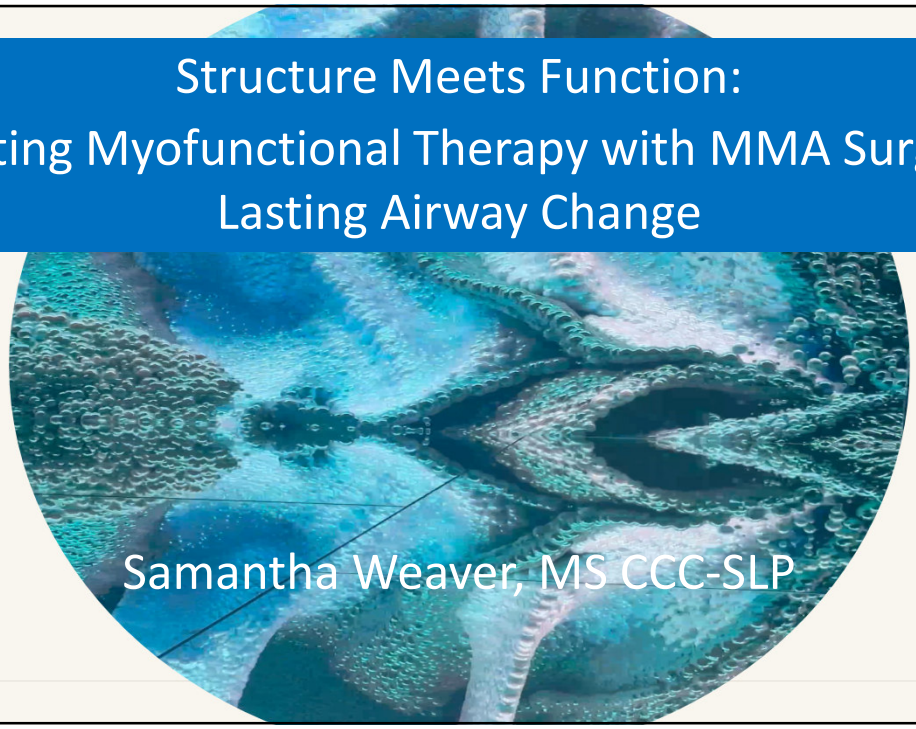
Structure Meets Function:
Integrating Myofunctional Therapy with MMA Surgery for Lasting Airway Change



Samantha Weaver, MS CCC-SLP

1

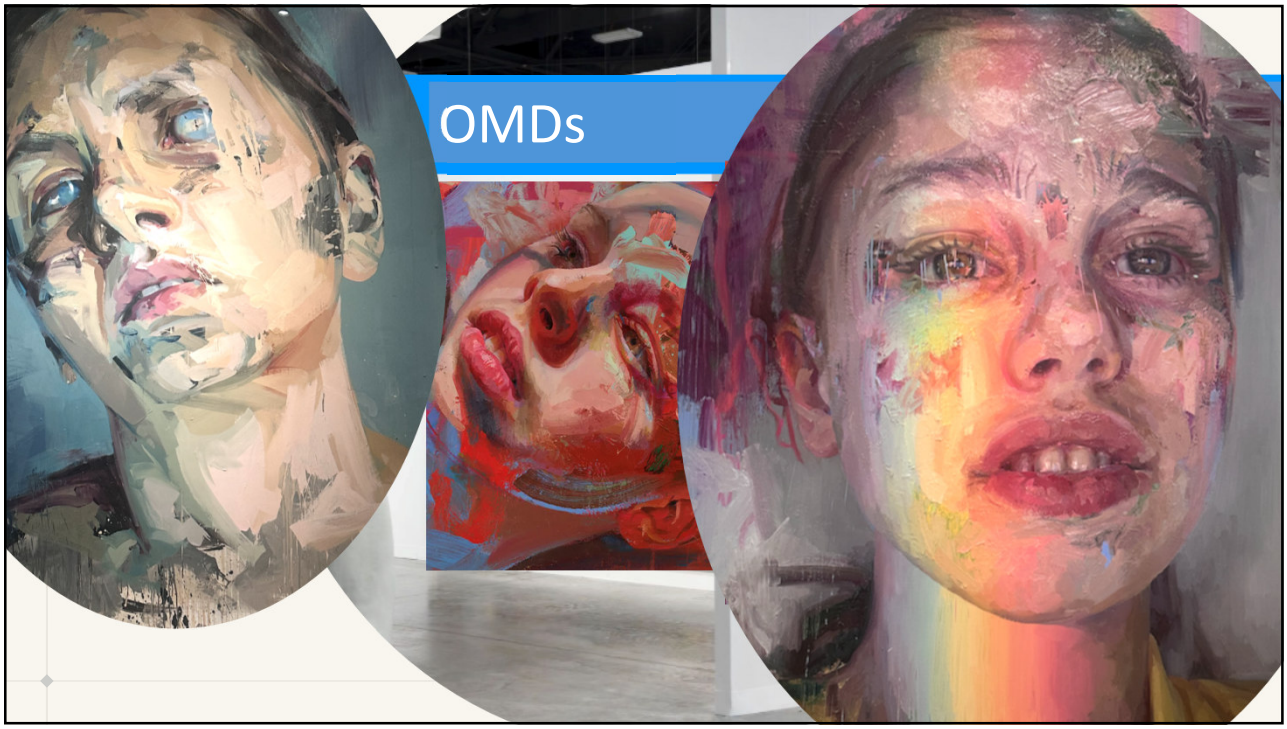
COMPLEXITY

be syst mponents interact in multiple ways
dir neari ss, collective dynamics, hierarchy,
nergence.

Samantha Weaver, MS CCC-SLP
Director, Speech Pathologist
Academy of Orofacial Myofunctional Therapy (AOMT)

LICIA PASKAY JOY MOELLER DR JERRALD SIMMONDS

2

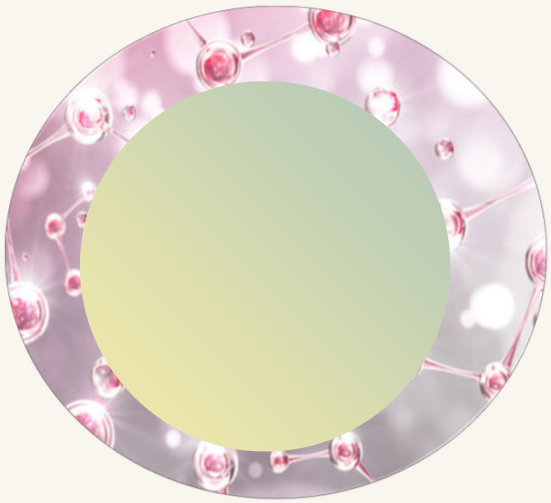


3

Complexity & Universality

Every case is complex, MMA cases share universal oral dysfunction

These patients arrive with long-standing myofunctional disorders



4

Orofacial Myofunctional Disorders (OMDs)

Characterized by abnormal muscle patterns of the mouth and face

Dysfunctional patterns affect growth, airway, sleep, and overall well-being.

Early recognition and retraining can prevent long-term consequences.

5

Orofacial Myofunctional Disorders (OMDs)

6

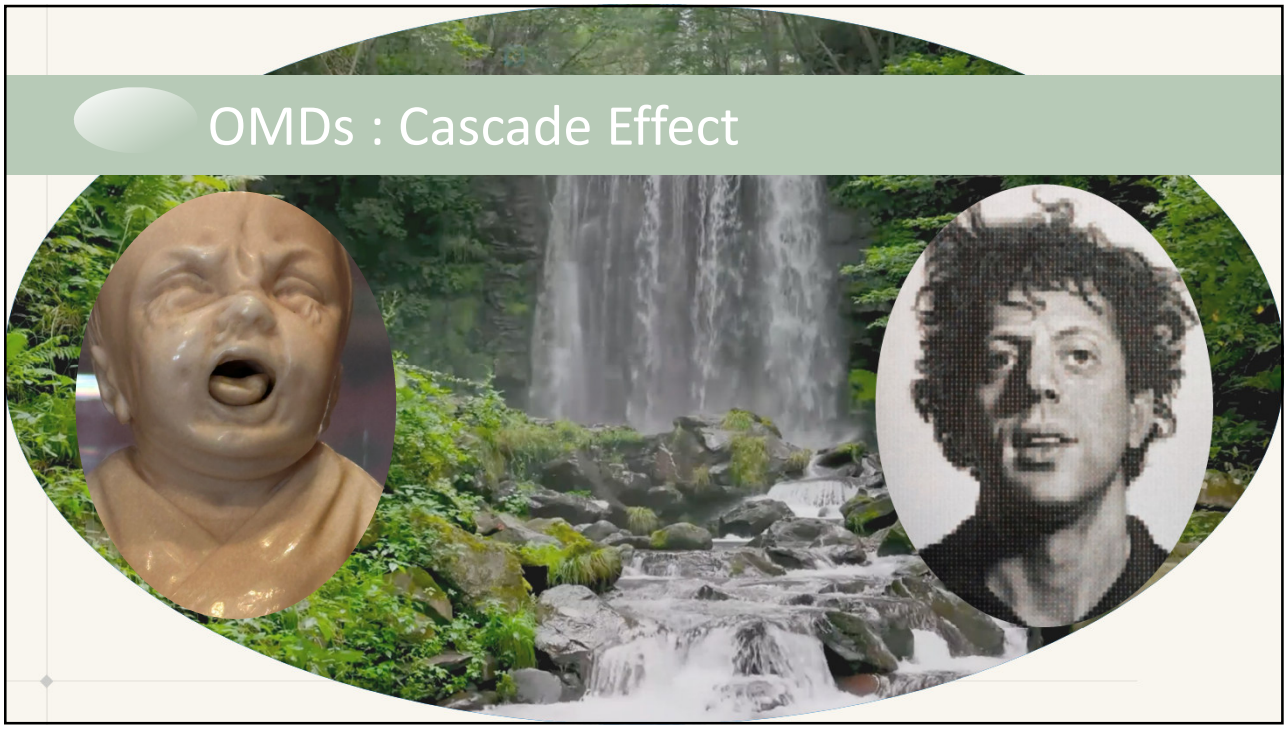
CLINICAL MARKERS, PHENOTYPES, & SYNDROMES

1 Mouth breathing vs nasal breathing
2 Open mouth posture
3 Tongue thrust – anterior
4 Bi-Lateral Tongue Thrust
5 Tongue tie
6 Lip tie
7 Atypical swallowing
8 Habits
9 Chewing disorders
10 Facial muscle dysfunction
11 Hypotonic masseters
12 Speech misarticulations (lisps)
13 Tonsils/adenoids
14 TMJD
15 Sleep disorders/sleep apnea
16 Bruxism/clenching
17 Low tongue rest posture
18 Snoring
19 Malocclusions
20 Cavities and gum disease
21 Changes in saliva quantity & quality
22 Restricted maxilla/High palate
23 Tongue scalloping
24 Craniofacial dysfunctions
25 Allergic shiners. venous pooling
26 Eustachian tubes dysfunctions
27 Esthetic changes
28 Macroglossia
29 Abnormal breathing
30 Tinnitus
31 Infant feeding problems
32 Forward head posture/Posture

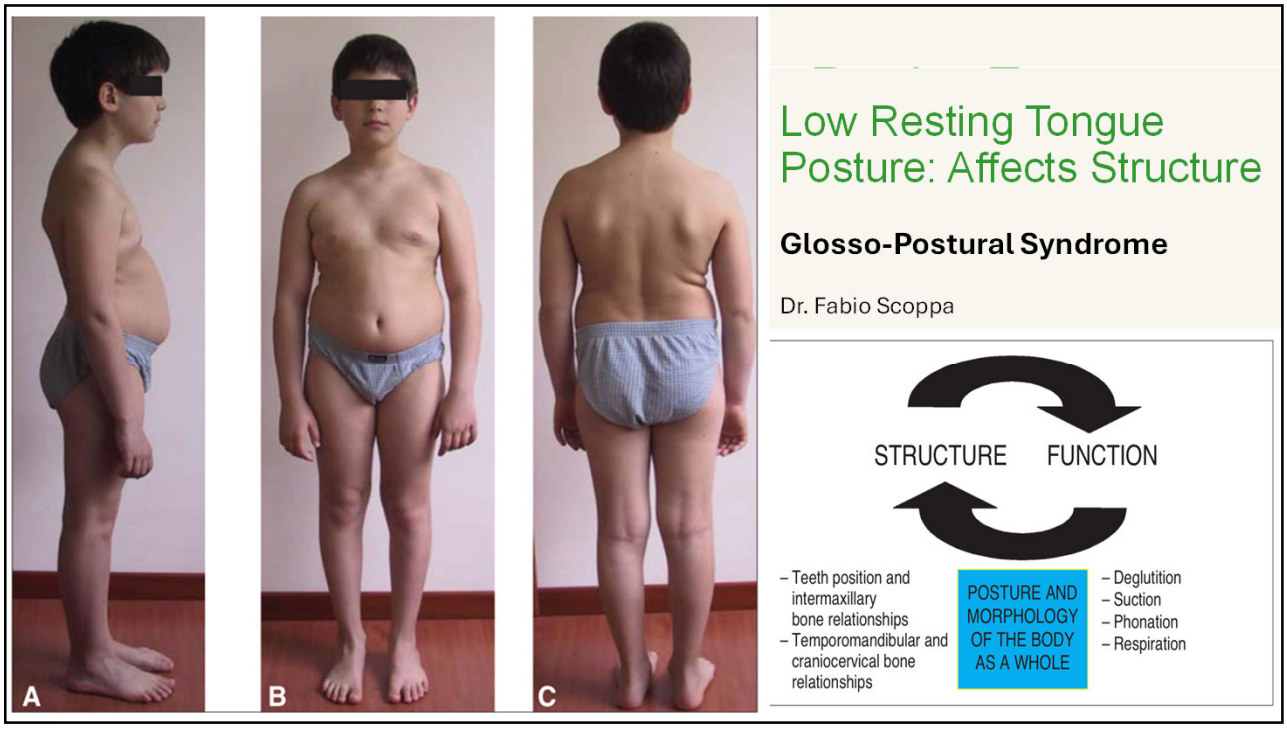
7

Victoria & Albert Museum

8


OMDs : Cascade Effect

9


A
B
C
Low Resting Tongue Posture: Affects Structure
Glosso-Postural Syndrome
Dr. Fabio Scoppa
STRUCTURE
FUNCTION
– Teeth position and intermaxillary bone relationships
– Temporomandibular and craniocervical bone relationships
POSTURE AND MORPHOLOGY OF THE BODY AS A WHOLE
– Deglutition
– Suction
– Phonation
– Respiration

10

Philip

3 rounds of braces
Rhinoplasty
Chin Implant
UPPP
MMA

TMD
QOL

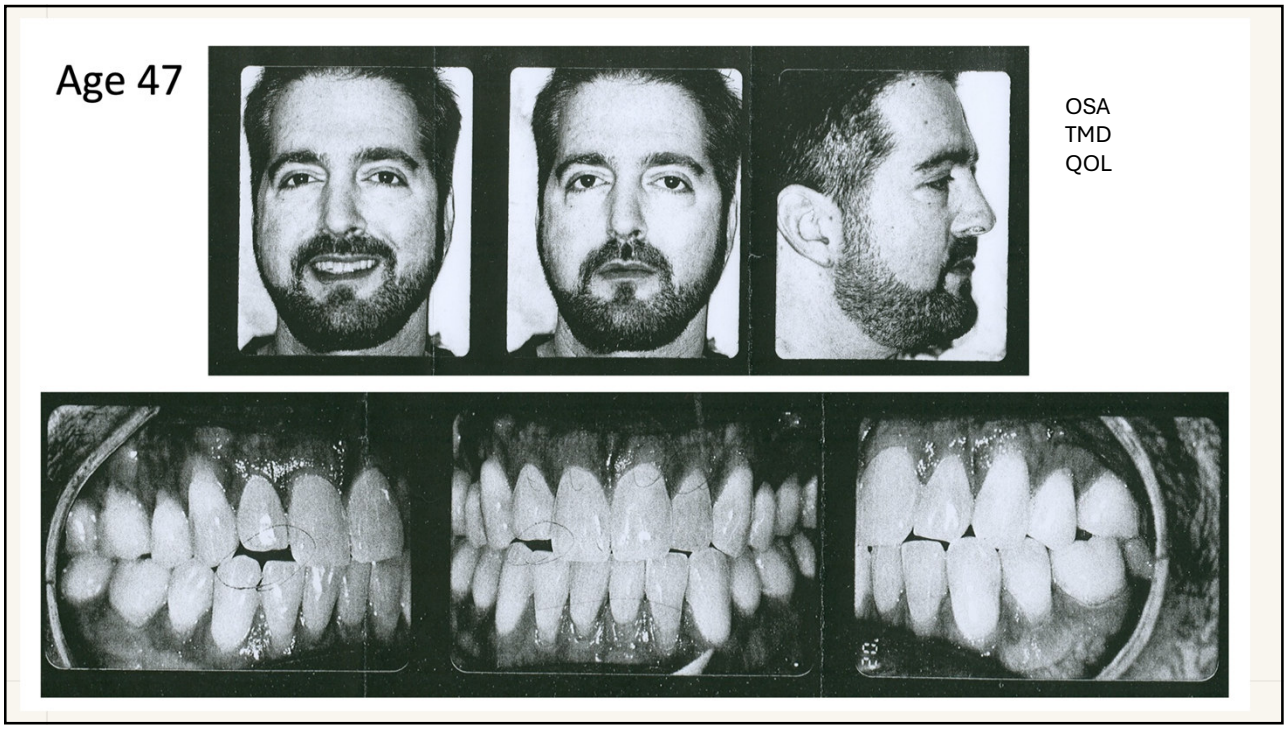
11

12

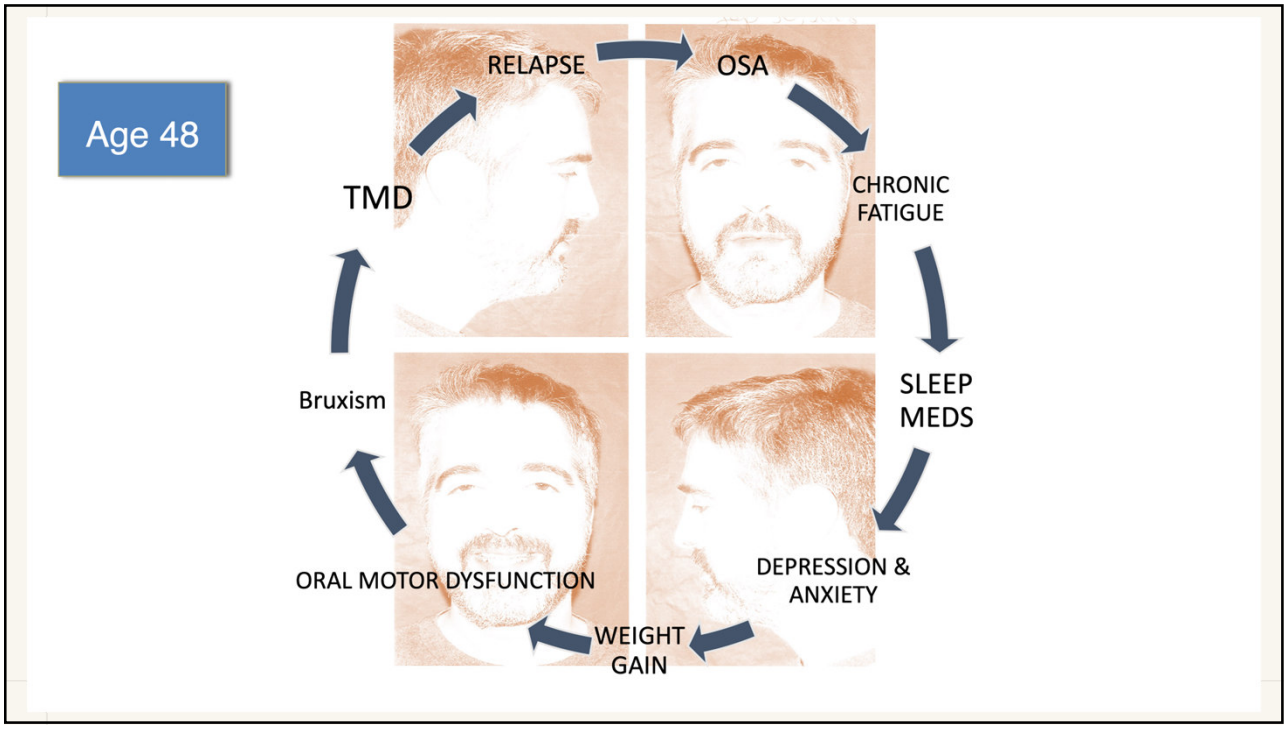
Age 24

13

14


Age 47
OSA
TMD
QOL

15


Age 48
RELAPSE
OSA
TMD
CHRONIC FATIGUE
SLEEP MEDS
Bruxism
ORAL MOTOR DYSFUNCTION
DEPRESSION & ANXIETY
WEIGHT GAIN

16

17

Universal Presentation

- Oral dysfunction, tongue posture issues, inefficient chewing
- Breathing dysfunction, muscle tension, pain patterns, skeletal postural issues

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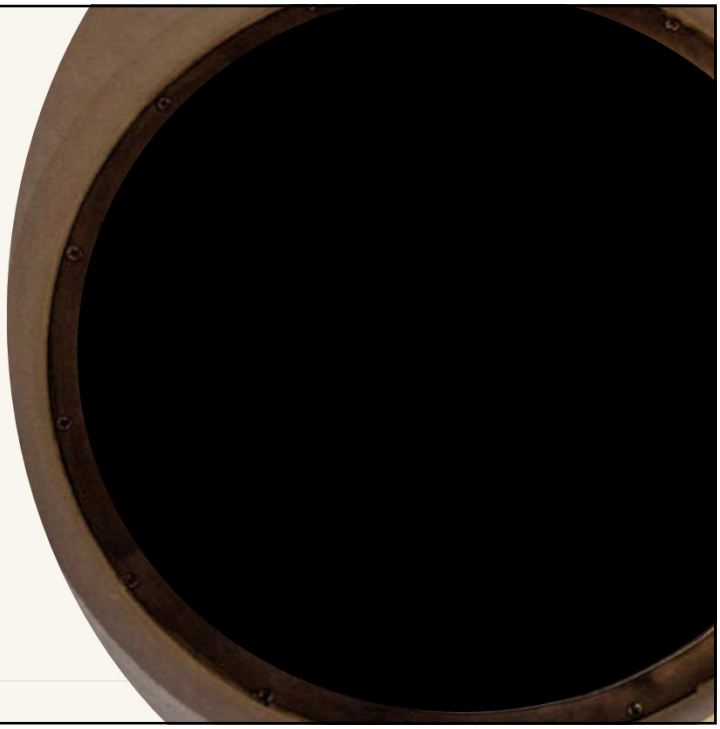
Strategic Planning

- Turning takes planning, time, and awareness of currents

Biomechanical adaptations act as currents that resist change

- Ignoring them does not remove them



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Objectives

- **Identify common myofunctional dysfunctions** that impact functional recovery and surgical outcomes.
- **Understand the role of myofunctional therapy before and intervention:** in neuromuscular preparation, pain management, and possible post-surgical adaptation.
- **Recognize the value of interdisciplinary collaboration** in improving rehabilitation efficiency and long-term stability following intervention.

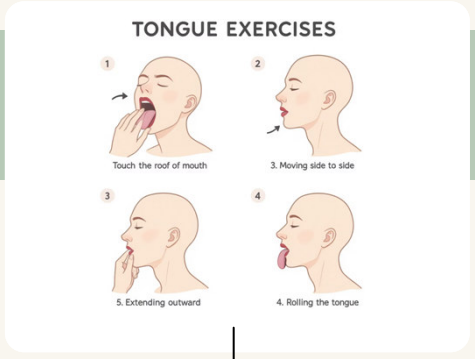
20

Question: Can Simple Exercises Transform Health?

Orofacial myofunctional therapy (OMT) uses targeted techniques to retrain muscles.

Benefits for **systemic improvements** that improve **sleep** scales, **cognition**, **orthodontic** stability.

- Non-invasive treatment options
- Complementary to existing protocols
- Evidence-based outcomes



Biases:

What is the Research Bias **(Study Design)**

What is **my** bias? (Clue: it's **STRONG!)**

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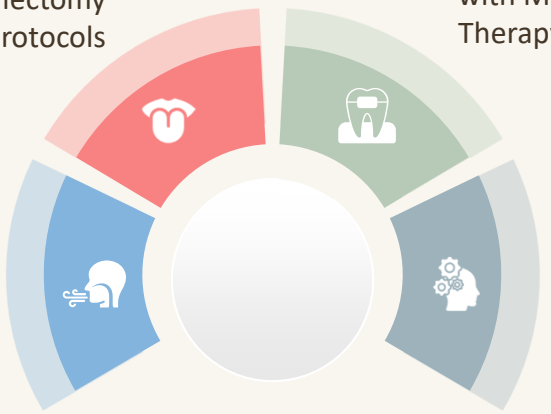
Myofunctional Therapy (OMT)

Tongue Tie Research
Post-frenectomy outcomes and protocols

Orthodontic Stability:
Long-term outcomes with Myofunctional Therapy

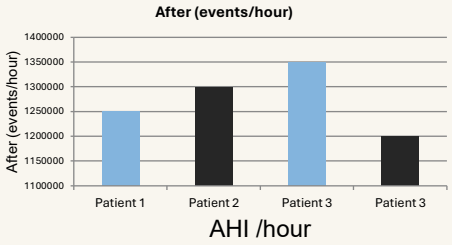


Sleep Apnea & Myofunctional Therapy:
Recent meta-analyses and clinical studies

Cognitive Health:
Long-term outcomes with Myofunctional Therapy

22

nd Sleep-Disordered Breathing



Orofacial Myofunctional Therapy for Obstructive Sleep Apnea: A Systematic Review and Meta-Analysis (2024)

Adult OMT patients had a statistically significant improvement in AHI saturation when compared with sham OMT or no therapy.

- **Guimares et al (2009)**
  Effects of oropharyngeal exercises on patients with moderate obstructive sleep apnea syndrome
- **Camacho et al. (2015)**
  Meta-analysis found 50% AHI reduction in adults, 62% in children. Daily exercises (10-30 min) reduced snoring by 31%.
- **Carrasco-Llatas et al. (2021)**
  23 studies showed increased genioglossus activity. 70% of cases saw 30-50% AHI reduction.
- **Zhou et al. (2022)**
  12 studies demonstrated 40% AHI reduction and 25% better oxygen levels with simple exercises.

23

nd Sleep-Disordered Breathing


medicina

MDPI

Review

Orofacial Myofunctional Therapy in Obstructive Sleep Apnea Syndrome: A Pathophysiological Perspective

Venkata Koka [1,*], Andrea De Vito [2,*], Gabriel Roisman [1], Michel Petitjean [1], Giulio Romano Filograna Pignatelli [1], Davide Padovani [2] and Winfried Randerath [3]

OSA's complex pathophysiology necessitates targeted treatment approaches. OMT presents a promising non-invasive option that can enhance muscle function and improve treatment adherence, particularly when integrated with conventional therapies

- **Airway Collapsibility**: Increased in obesity due to fat deposition around the airway.
- **Muscle Responsiveness**: The pharyngeal muscles, particularly the genioglossus, may not respond adequately during sleep, leading to airway obstruction.
- **Arousal Threshold**: A reduced threshold may disrupt breathing by limiting the time available for muscles to activate and reopen the airway.
- **Loop Gain**: High loop gain indicates a hypersensitive ventilatory control feedback loop, complicating OSA management.

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OMT and Cognitive Function

Working Memory

Yang et al. (2020): 20% improvement in digit span tests after OSA treatment.

Attention

15% better Stroop test performance with improved sleep breathing.

Verbal Memory

18% enhancement in verbal recall with better sleep quality

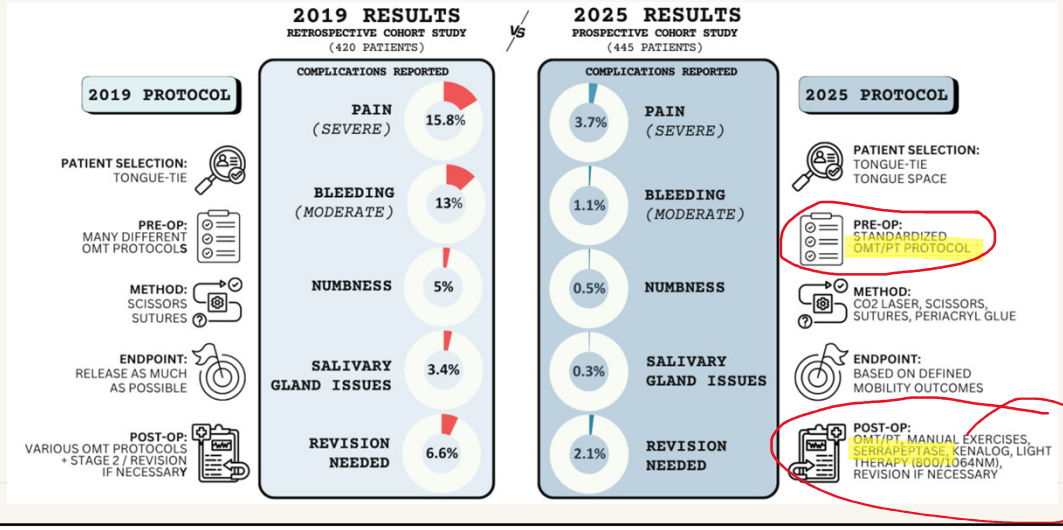
Executive Function

Li et al. (2023): 25% improvement in Trail Making Test after sleep treatment.

25

Lingual Frenuloplasty with Myofunctional Therapy: Improving Outcomes for the Treatment of Ankyloglossia (Tongue-Tie) with Refined Techniques and Endpoints

AUTHORS: SOROUSH ZAGHI MD, AMANDA RAMIREZ, SABRINA ESPADAS, GLORIA NGUYEN, LESLEY MCGOVERN KUPIEC, RDH, MS, NORA GHODOUSI-ZAGHI DDS, MARYAM NOURI-NOROUZ, RDH, SANDRALUZ GONZALEZ, RDH, SANDA VALCU-PINKERTON, RDHAP, JENNIFER RODRIGUEZ, CHAD KNUTSEN, LEYLI NOROUZ-KNUTSEN



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nd MMA

European Journal of Orthodontics, 2025, **47**, cjaf024
https://doi.org/10.1093/ejo/cjaf024
Systematic Review

Impact of myofunctional therapy on orthodontic management and orthognathic surgery outcomes: a scoping review

Cristine M. Stefani[1], Adriano de Almeida de Lima[1], Fabiane M. Stefani[2], Janice Y. Kung[3], Sharon Compton[4], Carlos Flores-Mir[4,5,*]

[1]Universidad Federal de Brasilia, Department of Dentistry, University of Brasilia, Campus Universitário Darcy Ribeiro, Brasilia, Federal District, Brasilia 70910-900, Brazil
[2]Universidad Federal de Santa Catarina, Department of Speech, Language and Hearing, Federal University of Santa Catarina, R. Eng. Agronômico Andrei Cristian Ferreira, s/n - Trindade, Florianópolis, Santa Catarina, Florianopolis 88040-900, Brazil
[3]Geoffrey and Robyn Sperber Health Sciences Library, Edmonton Clinic Health Academy, 11405 87 Ave NW, University of Alberta, Edmonton AB T6G 1C9, Canada
[4]Mike Petrik School of Dentistry, University of Alberta, 5-528 ECHA, 11405 87 Ave NW, Edmonton, Alberta T6G 1C9, Canada
[5]Departamento de Odontologia Social, Universidad Peruana Cayetano Heredia, Av. Honorio Delgado 430, San Martin de Porres, Lima 15102, Peru
*Correspondant author. University of Alberta, 5-528 ECHA, 11405 87 Ave NW, Edmonton, Alberta T6G 1C9, Canada. E-mail: cf1@ualberta.ca.

- Seven studies examined residual OMDs following orthognathic surgery, **with all reporting positive outcomes from OMT**
- Non-RCTs focusing on **mastication training showed improvements in masticatory efficiency and muscle activity**
- Two small RCTs indicated that traditional **OMT significantly improved orofacial functions** compared to no treatment, with evidence rated as plausible.
- The findings suggest that OMT may be beneficial for patients post-orthognathic surgery, although further research is needed.

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nd MMA

Original Article
http://dx.doi.org/10.1590/1678-7757-2017-0164
JAOS JOURNAL OF APPLIED ORAL SCIENCE

Effects of orofacial myofunctional therapy on masticatory function in individuals submitted to orthognathic surgery: a randomized trial

Daniela Galvão de Almeida PRADO[1]
Giédre BERRETIN-FELIX[2]
Renata Resina MIGLIORUCCI[3]
Mariana da Rocha Salles BUENO[3]
Raquel Rodrigues ROSA[2]
Marcela POLIZEL[4]
Isadora Ferraz TEIXEIRA[5]

Abstract

Objectives: The esthetic and functional results of orthognathic surgery of severe dentofacial deformities are predictable, however there are differences regarding the effects on stomatognathic system. The aim was to investigate the effects of orofacial myofunctional therapy (OMT) on the masticatory function in individuals with dentofacial deformity submitted to orthognathic surgery (OGS). Material and Methods: Forty-eight individuals (18-40 years) were evaluated, 14 undergoing OMT (treated group-TG), 10 without this treatment (untreated group-UTG) and 24 in a control group with normal occlusion; for

The study concludes that OMT has a positive impact on clinical and electromyographic aspects of masticatory function in individuals with DFD undergoing OGS.

- The study involved 48 individuals aged 18-40, divided into treated (TG), untreated (UTG), and control groups.
- TG received 10 sessions of OMT post-surgery, showing significant improvement in masticatory function scores from pre-surgery
- The proportion of individuals with **adequate lower lip tone and tongue mobility** increased significantly in TG
- OMT led to **improvements in masticatory type, lower lip tone, and tongue mobility.**

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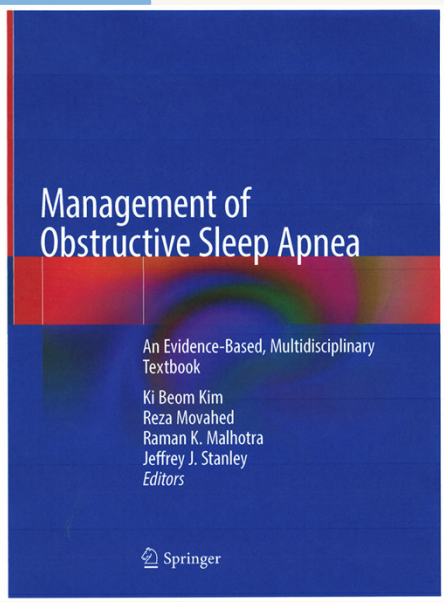
nd MMA



Post-surgical Myofunctional Therapy and Physical Therapy

Joy L. Moeller, Cynthia Peterson, Licia Coceani Paskay, Samantha D. Weaver, and Soroush Zaghi

Contents

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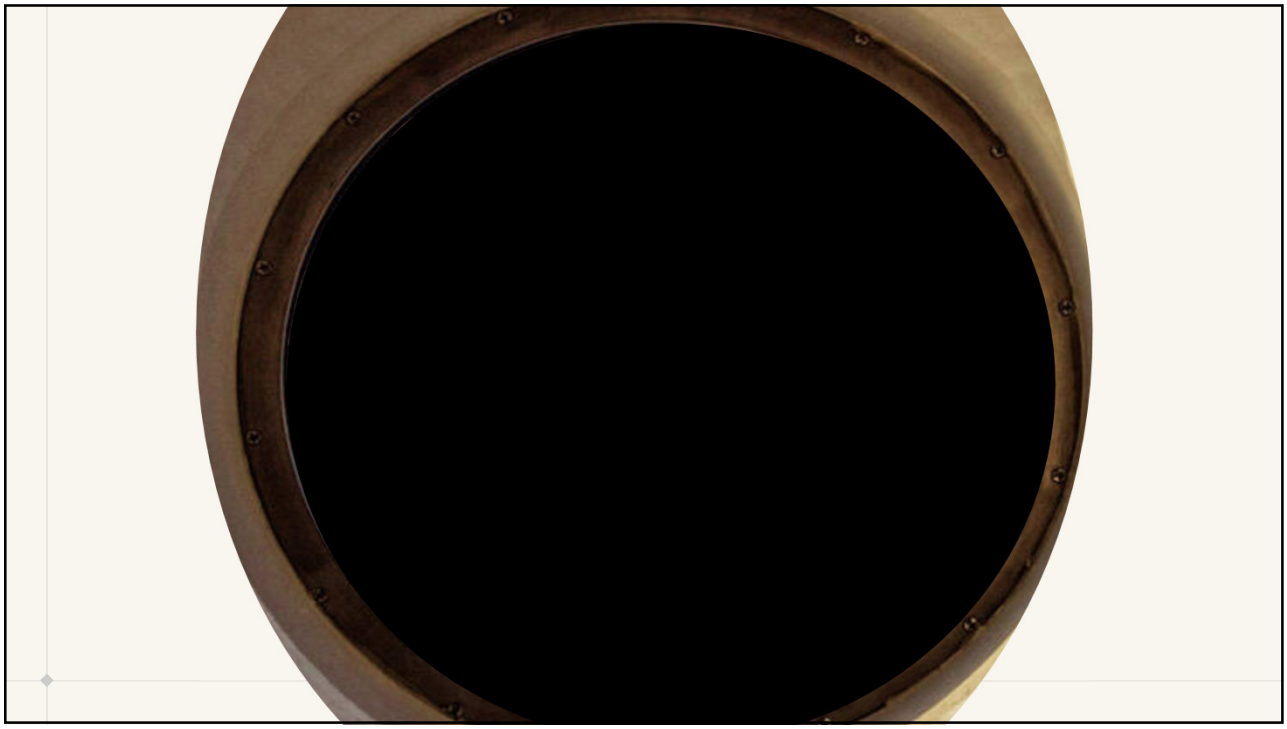

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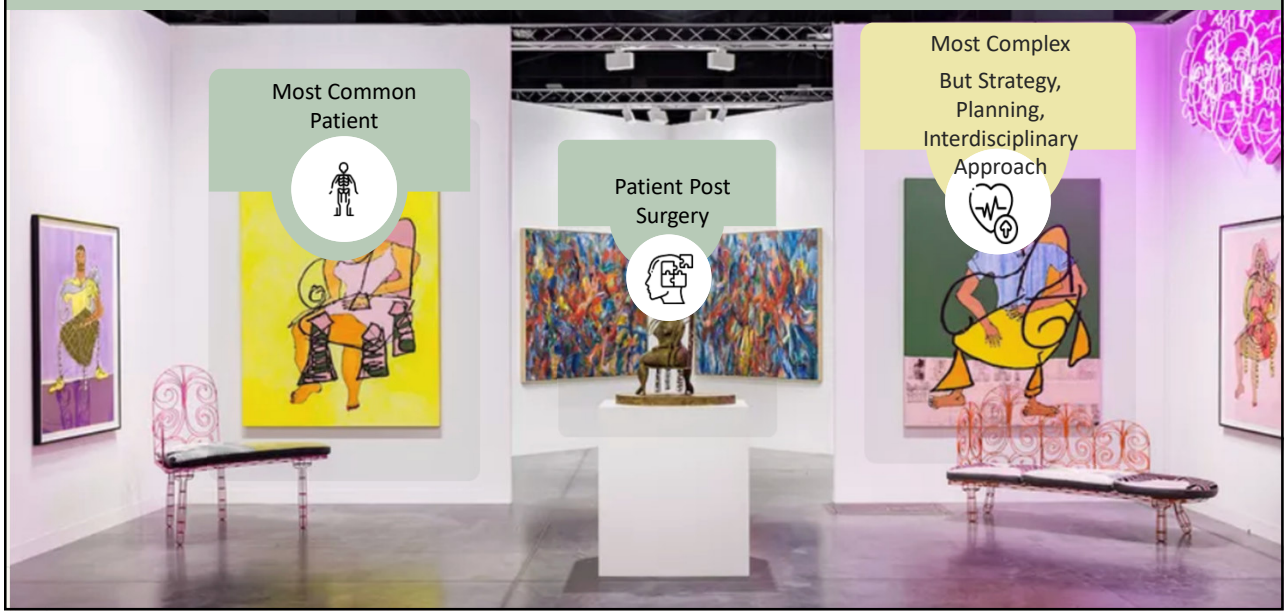
Gallery Tour



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MMA Success Criteria: Numbers

- ≥50% reduction in AHI or RDI with post-operative values <20 events/hour
- Improvements in **sleepiness, quality of life, and oxygen saturation.**

MMA Success Criteria

Stats

- S. Zaghi et al., 2016 (518 patients across 45 studies) reported an **85.5% success rate**, indicating a **14.5% failure rate**,
- J. Holty et al., 2010 Holty et al., 2010 (627 adults across 53 studies) found an **86.0% success rate (14.0% failure).**
- I. Makovey et al., 2017, reported a lower **55% success rate (45% failure)** in 20 patients at the University of Michigan.
- S. Liu et al., 2017 (379 patients at Stanford) reported **76.3% success (23.7% failure)**,

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Rachel: Myofunctional Therapy post MMA

- Female 20s; Psychologist
- Happy with Esthetic Results
- Chief Complaint: Jaw Muscle tension (PT)
- Food Regime Challenging (Foods, Substance, Mastication)
- Intermittent Anxiety; Sleep Hygiene Adherence

OMDs:

- **Low Resting Tongue Posture**
- **Open Mouth Posture**
- **Tongue Thrust**
- **Chewing Dysfunction**
- **Atypical Swallow**
- **Tongue Tie**
- **Sleep Disordered Breathing**

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Myofunctional Evaluation

TONE	SENSATION	FUNCTION	HABITS
Neuromuscular Tone & Muscle Tension • Orofacial and cervical muscle tone • Guarding, asymmetry, recruitment patterns • Jaw–tongue–floor-of-mouth relationships	**Sensory Integration, Proprioception & Pain** • Oral proprioceptive accuracy • Sensory mapping after surgery • Pain mechanisms (nociceptive, neuropathic, nociplastic)	**Functional Performance** • Oral rest posture • Breathing pattern • Mastication • Swallow coordination • Speech endurance	**Habits, Load & Daily Integration** • Clenching, bracing, mouth breathing • Chewing load tolerance • Sleep posture and recovery • Energy and fatigue patterns

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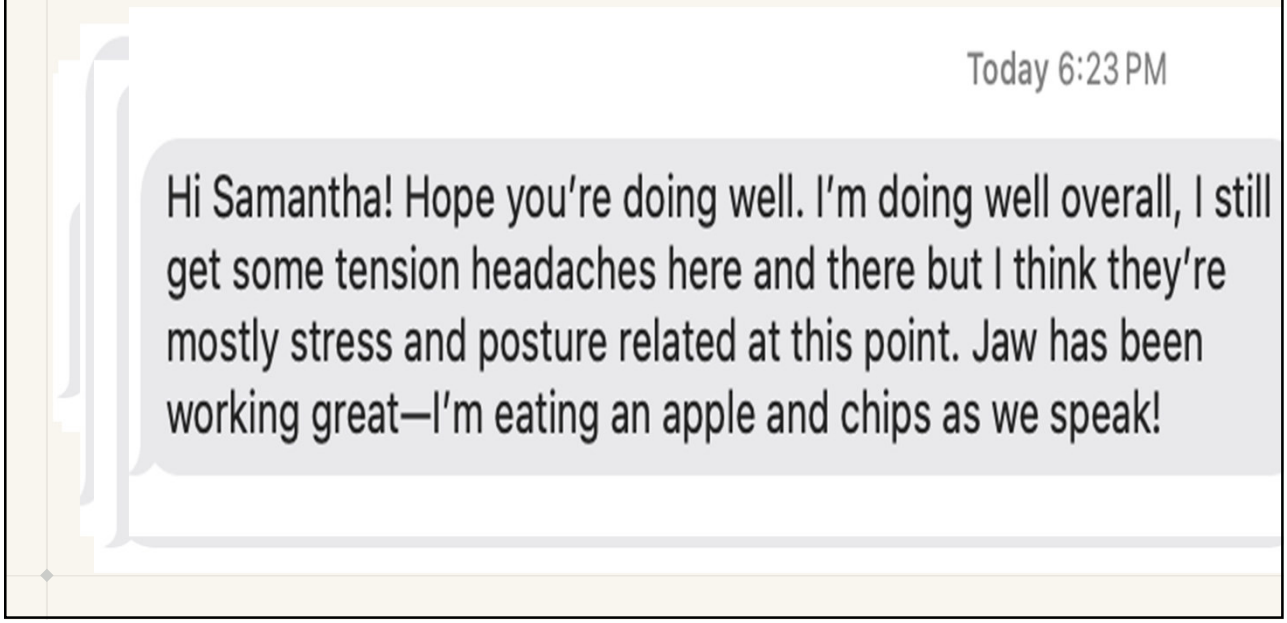
Pain & Sensitivity



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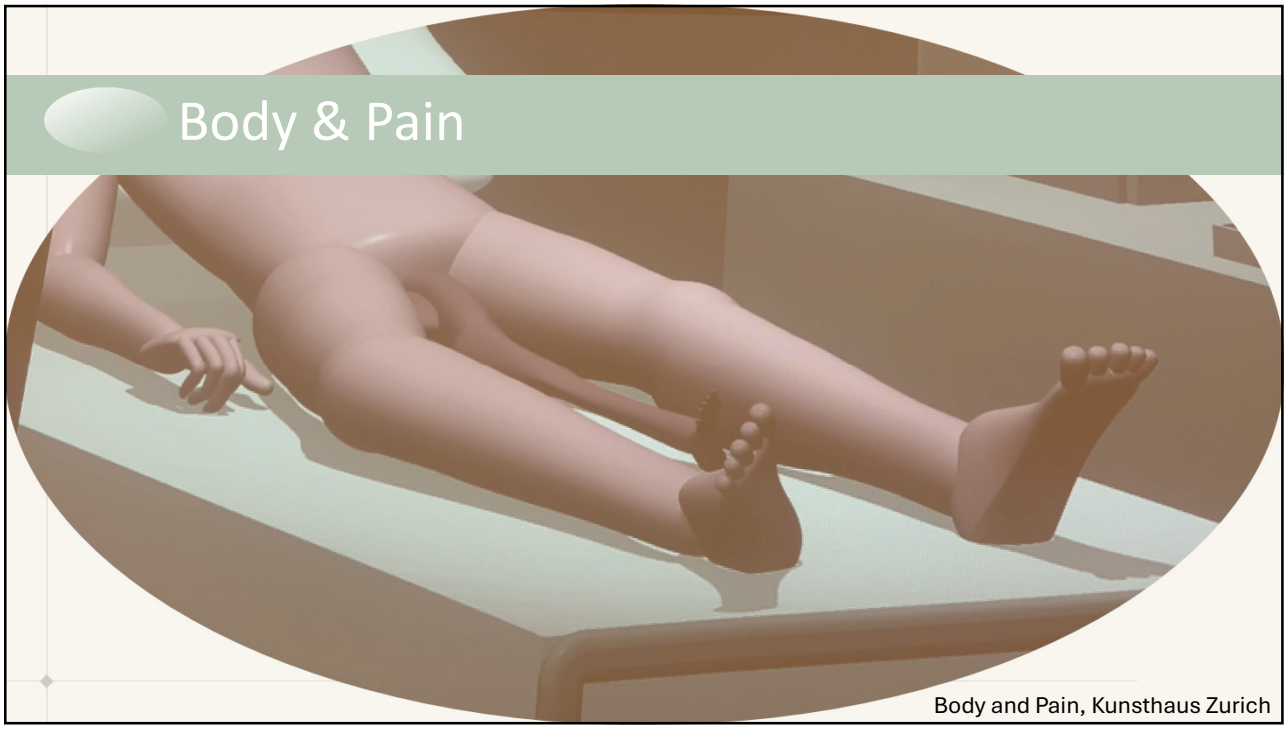
Body & Pain
Body and Pain, Kunsthaus Zurich

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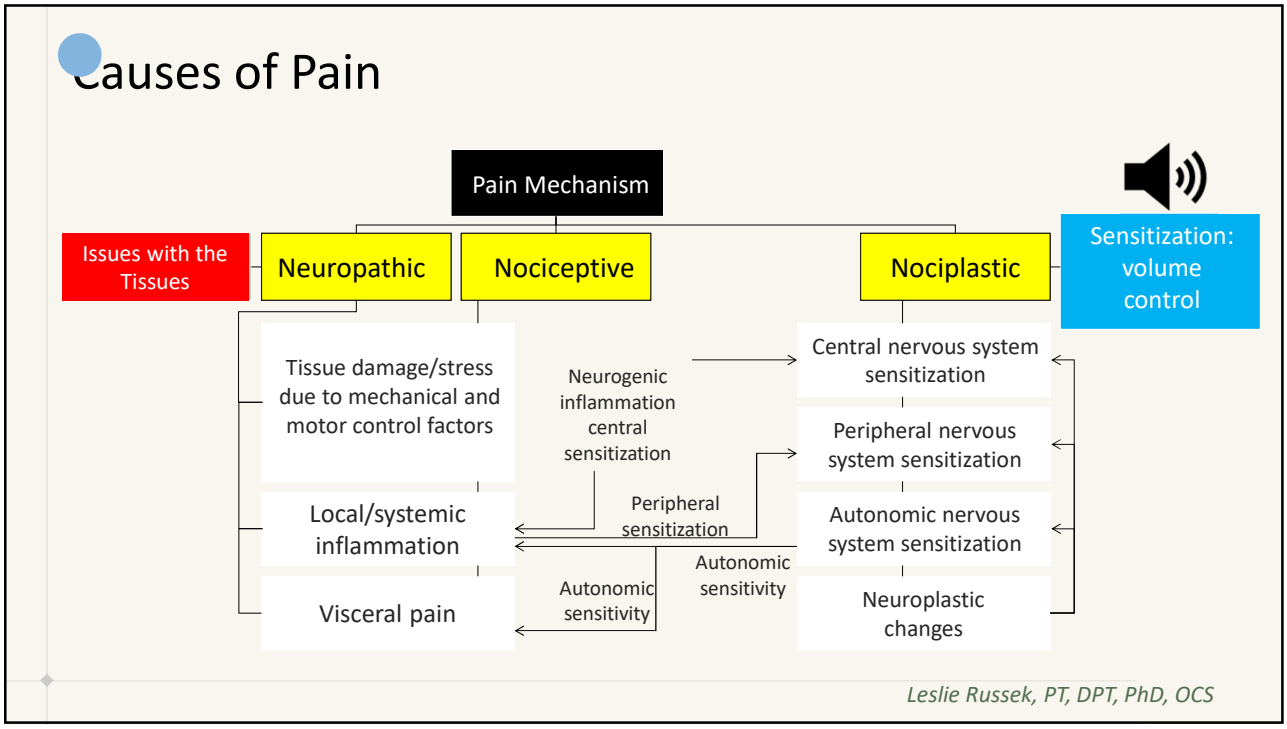
Causes of Pain
Pain Mechanism
Issues with the Tissues
Neuropathic
Nociceptive
Nociplastic
Sensitization: volume control
Tissue damage/stress due to mechanical and motor control factors
Local/systemic inflammation
Visceral pain
Neurogenic inflammation central sensitization
Peripheral sensitization
Autonomic sensitivity
Autonomic sensitivity
Central nervous system sensitization
Peripheral nervous system sensitization
Autonomic nervous system sensitization
Neuroplastic changes
Leslie Russek, PT, DPT, PhD, OCS

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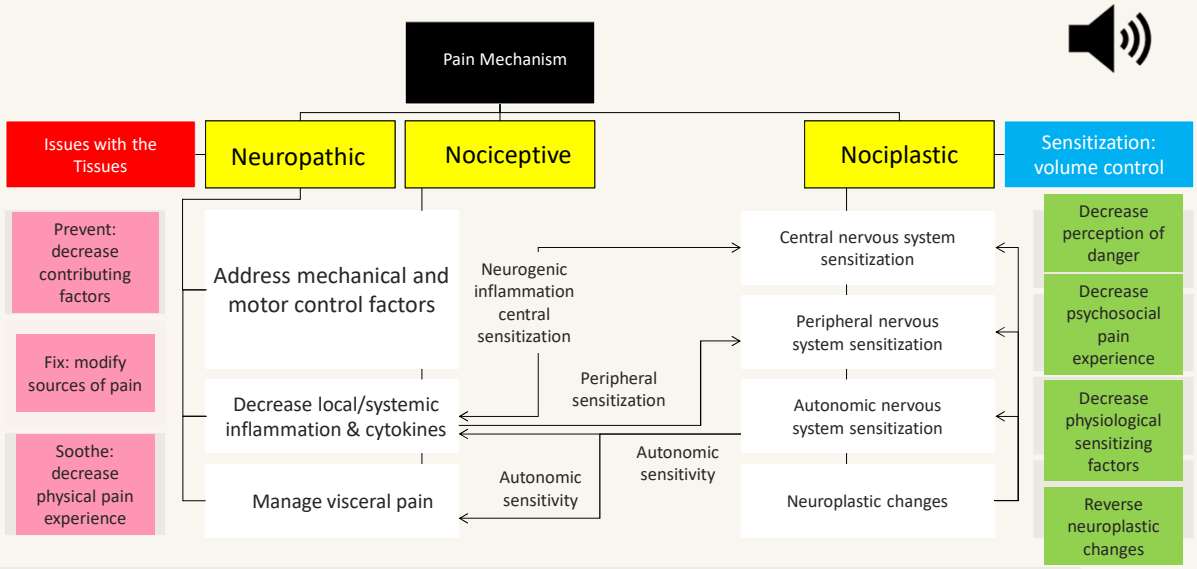
Managing Pain



Leslie Russek, PT, DPT, PhD, OCS

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Sensitization: "Volume Control"

Leslie Russek, PT, DPT, PhD, OCS

Pain due to (or amplified by) malfunction in the central, peripheral or autonomic nervous systems nervous systems.

- 'Nociplastic' changes, where nerve connections actually change, may perpetuate these dysfunctions.

This pain typically does not respond well to purely physical treatments such as medications, surgery or passive treatments.

•People typically either get temporary benefit, no benefit, or might get worse with standard physical treatments.

Yves Netshammer, 1970
Kunsthaus, Zurich

The nervous system needs to be actively reprogrammed to change this .

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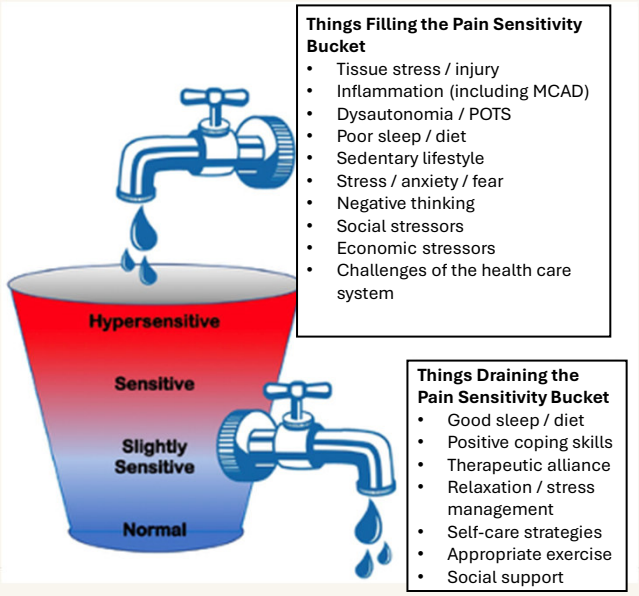
The Pain Sensitivity Bucket



Things Filling the Pain Sensitivity Bucket

- Tissue stress / injury
- Inflammation (including MCAD)
- Dysautonomia / POTS
- Poor sleep / diet
- Sedentary lifestyle
- Stress / anxiety / fear
- Negative thinking
- Social stressors
- Economic stressors
- Challenges of the health care system

Things Draining the Pain Sensitivity Bucket

- Good sleep / diet
- Positive coping skills
- Therapeutic alliance
- Relaxation / stress management
- Self-care strategies
- Appropriate exercise
- Social support

- Many factors contribute to pain sensitivity
- Multiple management approaches can decrease pain sensitivity
- The "bucket" reflects the cumulative effects of all these factors

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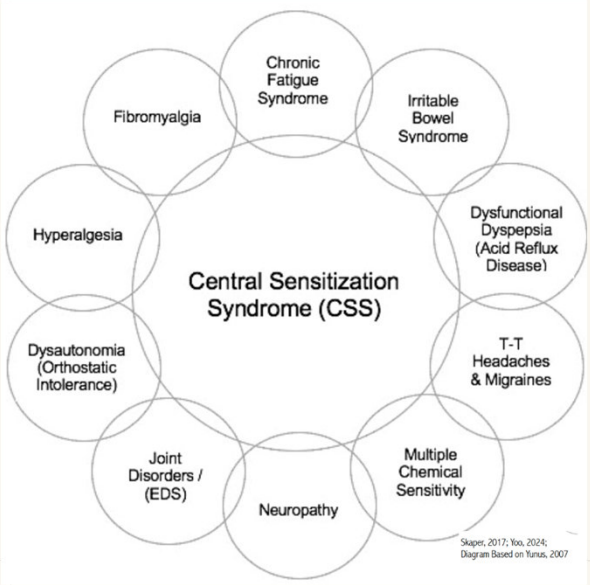
Recognizing Central Sensitization



- Chronic Fatigue Syndrome
- Irritable Bowel Syndrome
- Dysfunctional Dyspepsia (Acid Reflux Disease)
- Tension-Type (T-T) Headaches & Migraines
- Multiple Chemical Sensitivity
- Neuropathy
- Joint Disorders / Ehlers-Danlos Syndrome (EDS)
- Dysautonomia (Orthostatic Intolerance)
- Hyperalgesia
- Fibromyalgia

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Validated Questionnaire

Central Sensitization Inventory - 9

	Never	Rarely	Some-times	Often	Always
1. Unrefreshed in the morning					
2. Muscles stiff/achy					
3. Pain all over the body					
4. Headaches					
5. Do not sleep well					
6. Difficulty concentrating					
7. Stress makes symptoms worse					
8. Tension in neck and shoulders					
9. Poor memory					
	0	1	2	3	4
Total score					

CSI-9 score
Subclinical 0-9
Mild 10-19
Mod/severe 20-36
(Nishigami, 2018)

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Albert: Myofunctional Therapy

- Team Approach: Cardiologist, Dentist, Surgeon, PT
- Got to know baseline symptoms
- Father in 1st tier of communication
- Worked diligently and slowly over time
- Breathing (NSDR)

OMDs:

- Low Resting Tongue Posture
- Open Mouth Posture
- Tongue Thrust
- Atypical Swallow
- Tongue Tie
- CCI

PT/ Prolotherapy/ Medications for Mast Cell Activations

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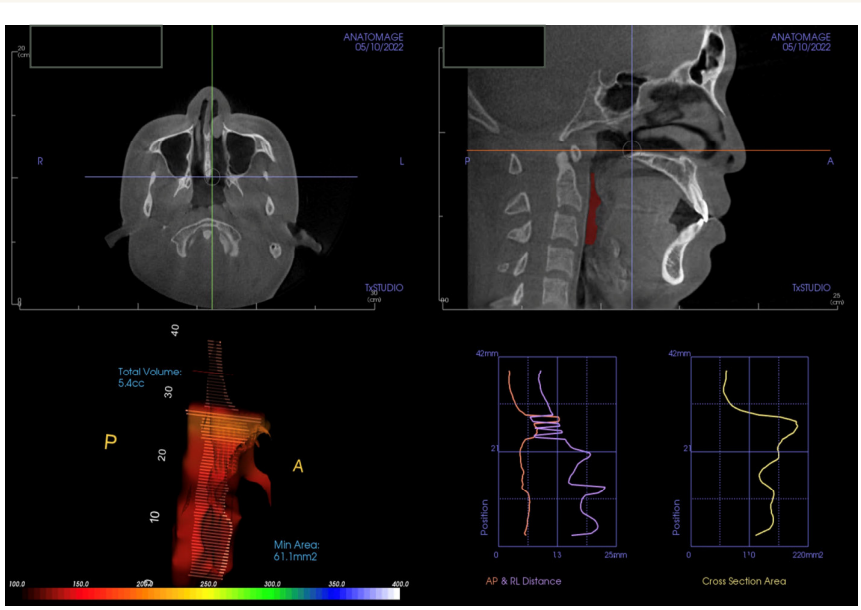
Airway



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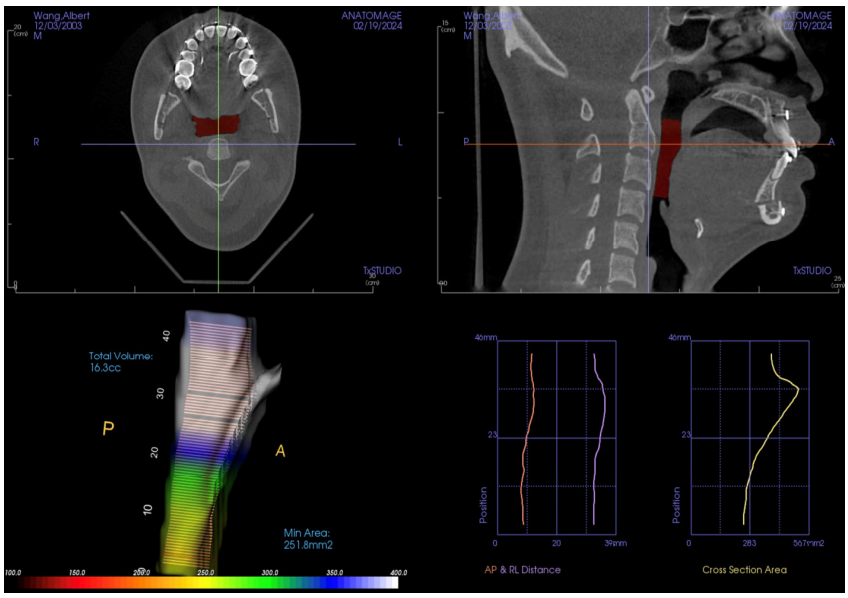
st Airway



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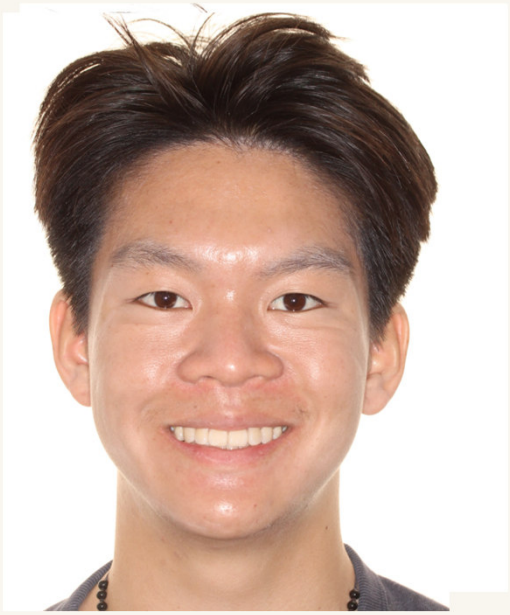
Albert



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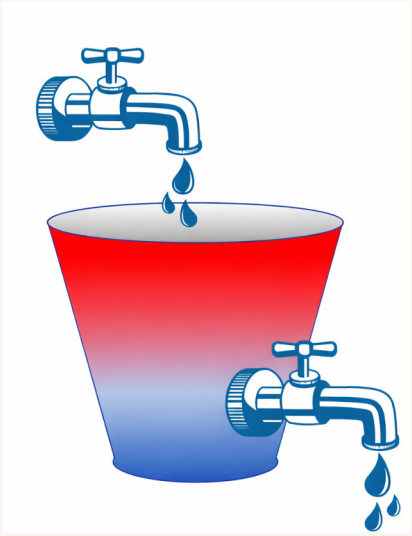
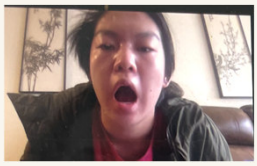
Draining the Sensitivity Bucket

Things Filling the Pain Sensitivity Bucket

- Tissue stress / injury
- Inflammation (including MCAD)
- Dysautonomia / POTS
- Poor sleep / diet
- Sedentary lifestyle
- Stress / anxiety / fear
- Negative thinking
- Social stressors
- Economic stressors
- Challenges of the health care system





Things Draining the Pain Sensitivity Bucket

- Good sleep / diet
- Positive coping skills
- Therapeutic alliance
- Relaxation / stress management
- Self-care strategies
- Appropriate exercise
- Social support

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It's been a long time - and I have been thinking of Albert! Inbox x

Samantha Weaver
Hello This is Samantha Weaver - and I frequently think of Albert and wanted to check in to see how he is doing? If you have a spare moment, I would lov
Fri, Jan 2, 11:16 PM (13 hours ago)

After many years of slow credit accumulation at a local community college, he eventually transferred to UC San Diego last fall and started a new college life there. The first quarter is fine. His overall energy level is about 70–80% of the average person. With his disciplined and organized time management, he is able to handle all his study and social activities. He is happy with his college life there.
Thank you very much for your previous help with Albert, which contributes to his recovery in multiple aspects.

I think MMA and the associated oral and dental interventions have the best contribution, followed by neck strengthening, prolotherapy, and mast cell–stabilizing medications.

Hongxin

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Interdisciplinary Team: Structure + Function

Orthodontist, Surgeon, PT, Myofunctional Therapist

Collaboration prevents drift when headwinds increase.

Specific Conditions will require targeted treatment and advocacy

Reduce Sensitivity Load: Pre & Post Surgery

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In Summary

"I think a lot of people are at the end of their rope physically and mentally by the time they actually have surgery, which makes recovery that much harder. So as much preparation as people can do, the better. This includes Myo, PT, nutrition, strength training and stress management."

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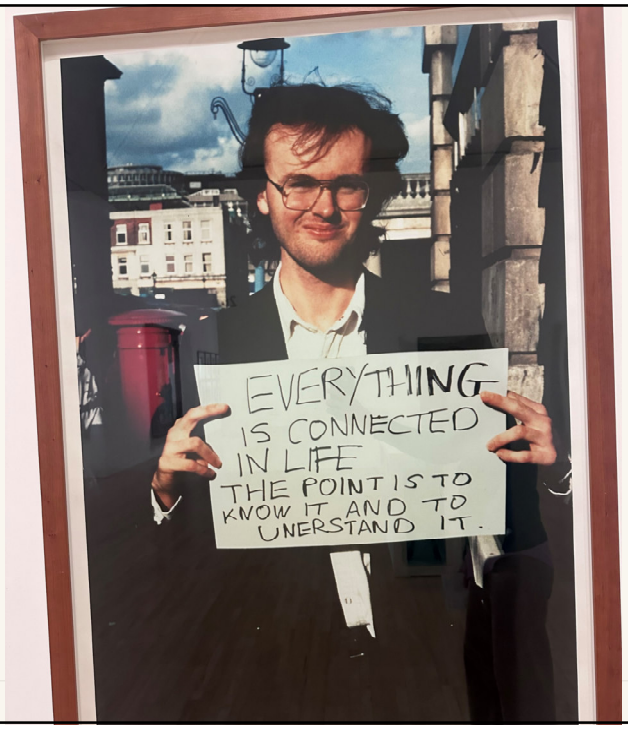

Gillian Wearing

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Thank you for Listening!

Samantha Weaver MS CCC-SLP
Academy of Orofacial
Myofunctional Therapy (AOMT)

SCAN ME!

sam@aomtinfo.org

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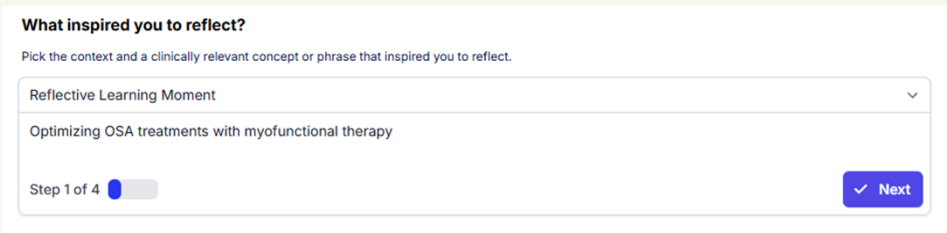
https://champions.learner.plus/sec/

Optimizing outcome of OSA treatments with myofunctional therapy



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