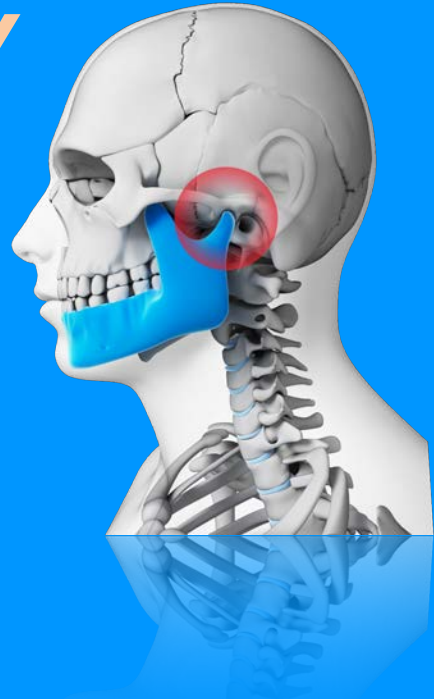
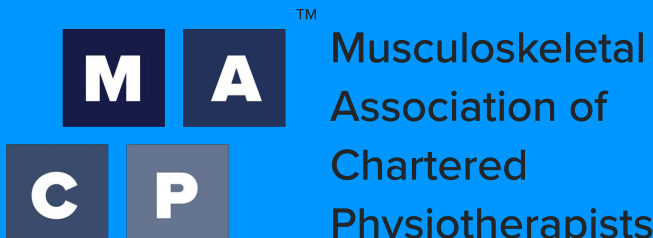


DRY NEEDLING OF MASTICATORY MUSCLES FOR TREATING SOMATOSENSORY TINNITUS: A CASE STUDY

Evangelos Almpandis
PT, MSc, MMACP, MAACP
MRes cand - University of Birmingham



@CprSpine



Temporomandibular Disorders (TMDs)

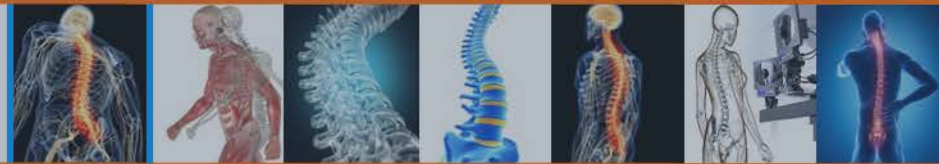
- pain and mechanical dysfunction derived from
 - masticatory muscles
 - temporomandibular joint(s)
- 2nd most common form of orofacial pain
- 2nd most occurring musculoskeletal condition in the US

(American Academy of Orofacial Pain, 2018)



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Temporomandibular Disorders

Local pain & tenderness

Limited Mouth Opening

Otological symptoms

TMD Symptoms

Jaw Crepitus

Headache

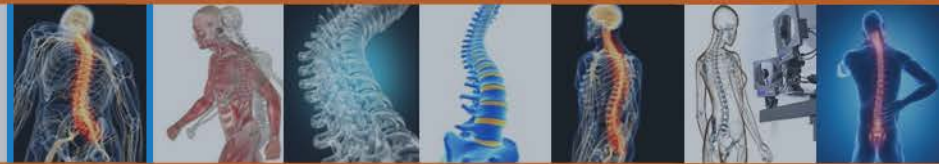
Jaw locking

(American Academy of Orofacial Pain, 2018)



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Common Otological Symptoms

Prevalence of otologic signs and symptoms in adult patients with temporomandibular disorders: a systematic review and meta-analysis

Isabela Porto De Toledo¹ · Fabiane Miron Stefani¹ ·
André Luis Porporatti² · Luis André Mezzomo³ · Marco A. Peres⁴ ·
Carlos Flores-Mir⁵ · Graziela De Luca Canto^{2,5}

- Aural Fullness (74%)
- Otagia (55%)
- Tinnitus (52%)

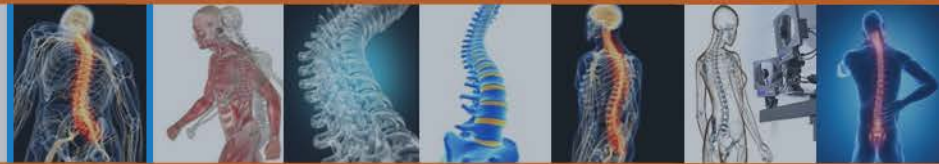
May dominate TMD cases!

(Porto de Toledo et al, 2017)



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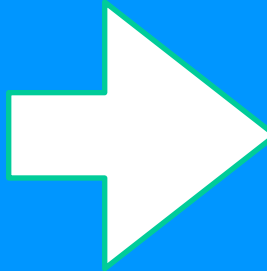
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Tinnitus

- Pathophysiology mechanisms poorly understood
- Heterogenous condition, not a single entity

Auditory



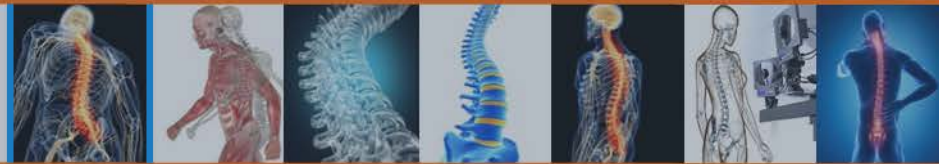
Somatosensory



Otological (internal) basis



modulated by
somatic manoeuvres



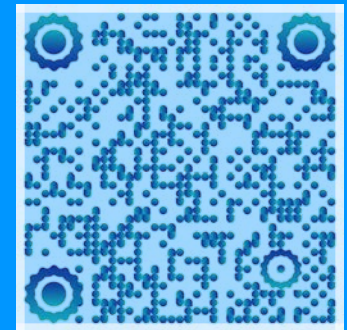
Somatosensory Tinnitus (ST)

- Accounts for 65% of tinnitus population (Sanchez & Rocha, 2011)

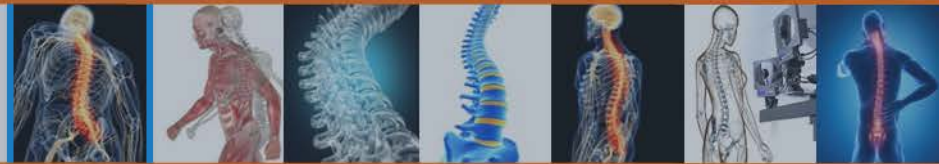
- Consensus on Diagnostic Criteria

(Michiels et al, 2018)

- tinnitus modulated by movement of head, neck, jaw & eyes
- tinnitus modulated by palpation of myofascial trigger points

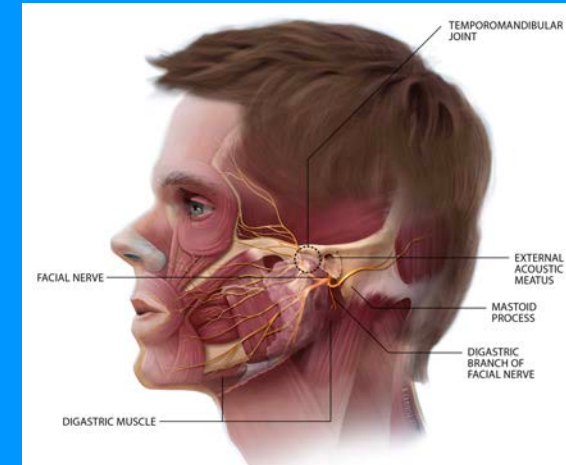
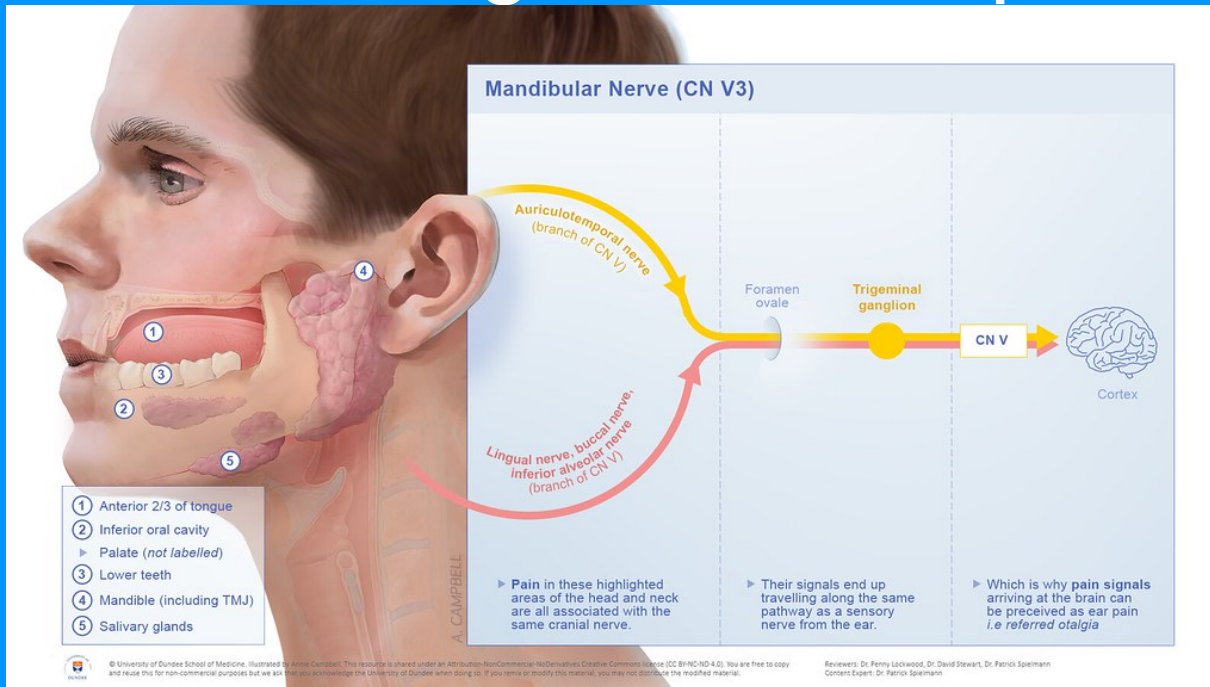


Myofascial Trigger Points (MTPs) of the masticatory muscles are dominant in ST patients (Manfredini et al, 2015)



Pathophysiology

- Afferent input from temporomandibular area changes tinnitus perception

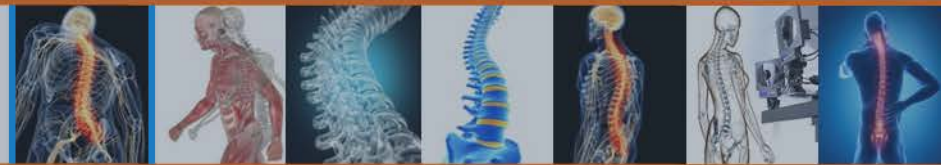


(Images adapted from University of Dundee, School of Medicine)



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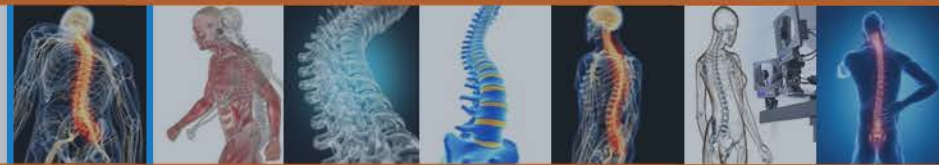
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Clinical Implication

- When assessing tinnitus sufferers without any otological basis (prior ENT screening)

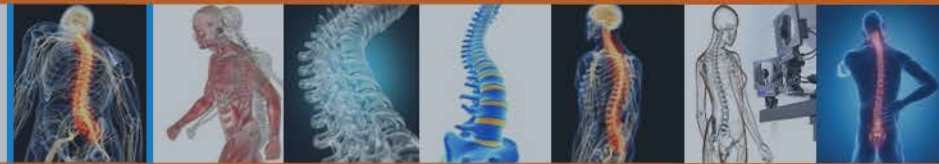
A detailed examination of the TMJ and masticatory musculature is warranted



Research Background

What is known?

- Limited evidence on proposed treatments for ST (Langguth et al., 2019)
- Dry Needling (DN) of MTPs of mastication has short term benefit in PPT (Tesch et al, 2021)
- Tinnitus heterogeneity increases need to identify sub-types that respond to certain treatments (Cederroth et al, 2019)



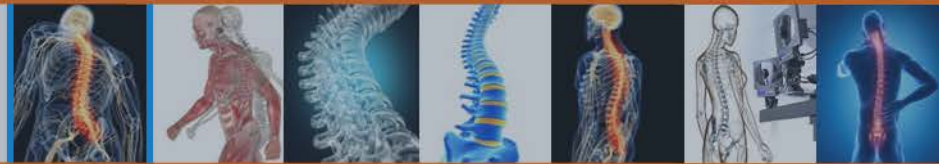
Research Purpose

To investigate the effectiveness of MTP DN of the masticatory muscles in reducing tinnitus severity and improving functional limitation in TMD patient presenting with ST



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Research Methods

Eligibility (Michaels et al, 2018)

1) Prior ENT screening, 2) no otological impairments, 3) tinnitus modulated by palpation of at least 1 MTP of masticatory muscles, 4) no previous exposure to dry needling

Subject

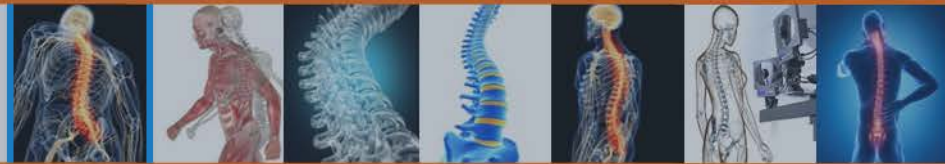
47 yr old female - 6/12 history of unilateral R intermittent tinnitus - screened by ENT & referred for physio assessment

(Ethics Committee, UoBirmingham)



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Key Clinical Findings

Detailed TMD Examination
(RDC /TMD)

Palpable
masticatory
MTPs
increasing
tinnitus
perception

Limited MMO
(28mm)

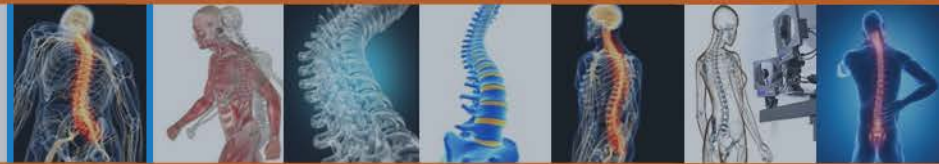


(Schiffman et al, 2014)



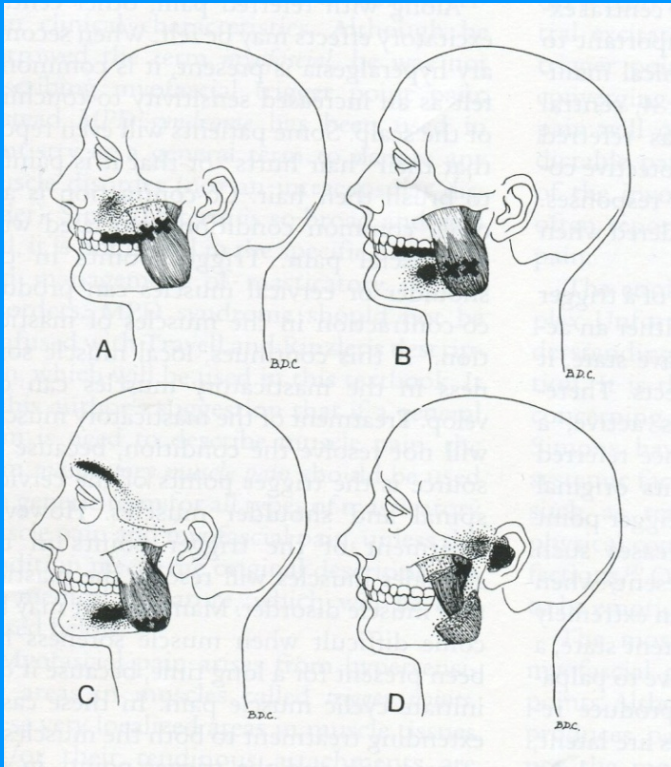
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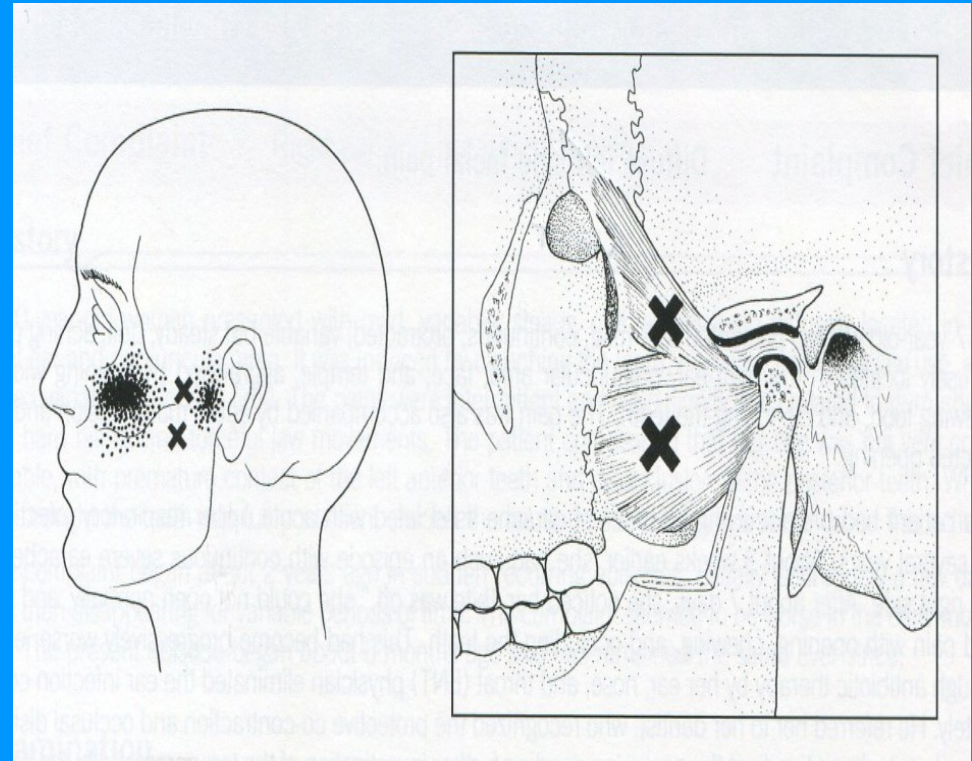


Myofascial Trigger Points

Masseter



Lat. Pterygoid

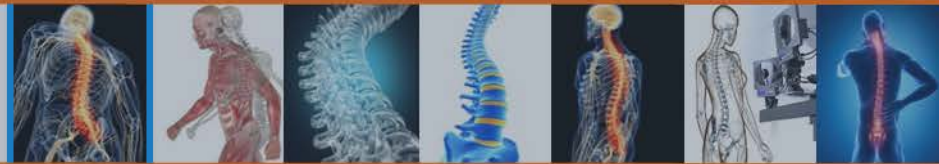


Images adapted from Travel & Simmons (1996)



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Intervention

MTP De-activation



4 Dry Needling Treatment Sessions



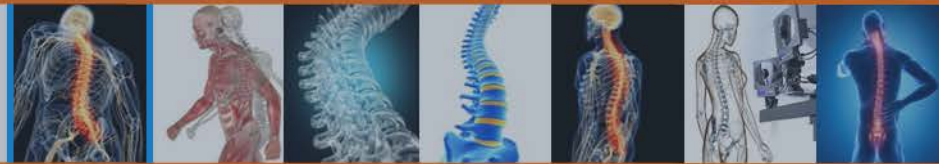
7 days interval in-between sessions (no washout effect)

(AACCP Guidelines, 2017)



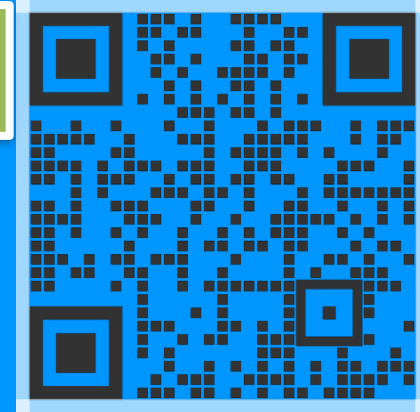
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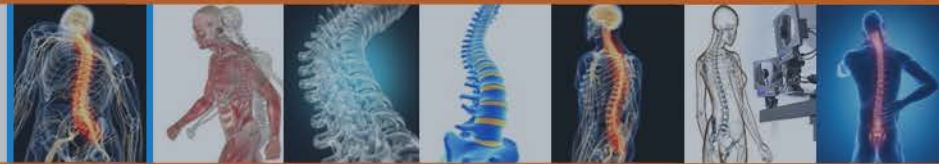
Outcome measures

Tinnitus Handicap Inventory (THI)



- 25 item questionnaire
- 5 grade severity scale (0-100 score)
- Valid and reliable across various populations and languages (Zeman et al, 2012)
- 2 measures: baseline, 4/12

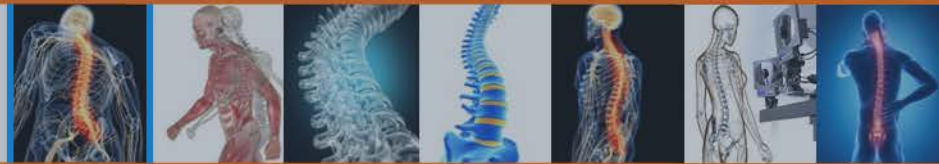
Cut off >58 associated with co-existing TMDs
(Edvall et al, 2019)



Outcome measures

Tinnitus Functional Index (TFI)

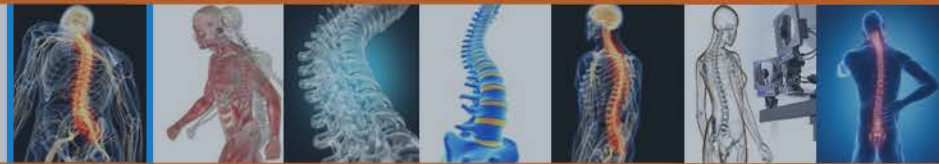
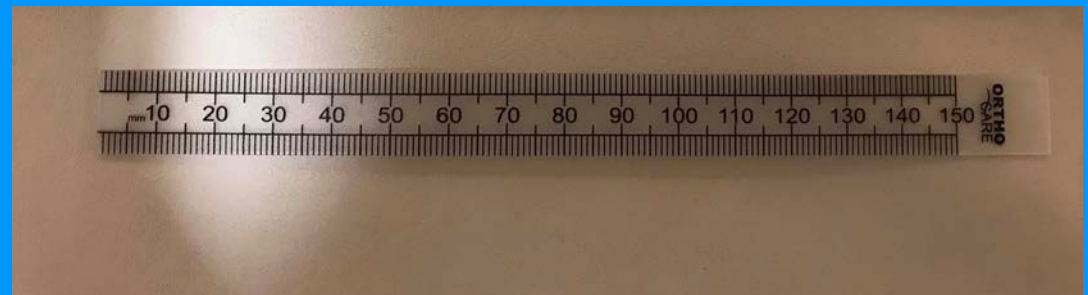
- 25 item questionnaire
- Score 0 -100
- QoL, cognitive interference, emotional distress
- No Qs to assess modulation by movement
- Valid, reliable, responsive to treatment related change (Chadra et al, 2018)
- 2 measures: baseline, 4/12



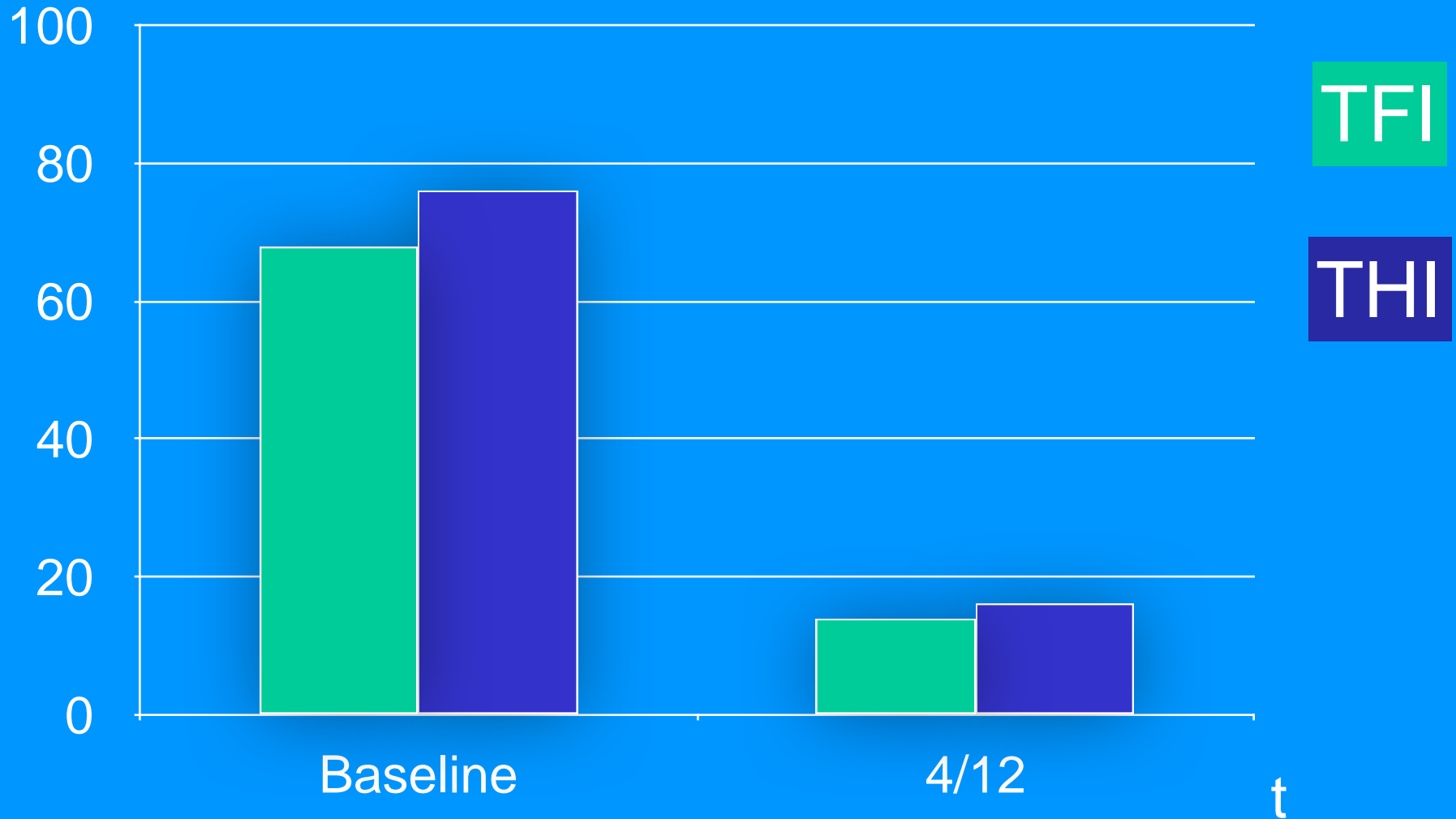
Outcome measures

Maximum Mouth Opening (MMO)

- mm scale ruler
- Baseline, last session (1/12), 4/12
- Clinically meaningful difference $>6.5\text{mm}$ (Kropmans et al, 2000)
- Average: 40mm - 50mm

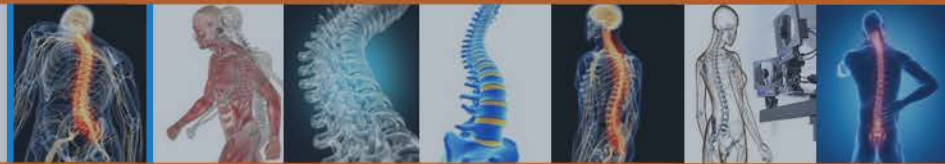


Results

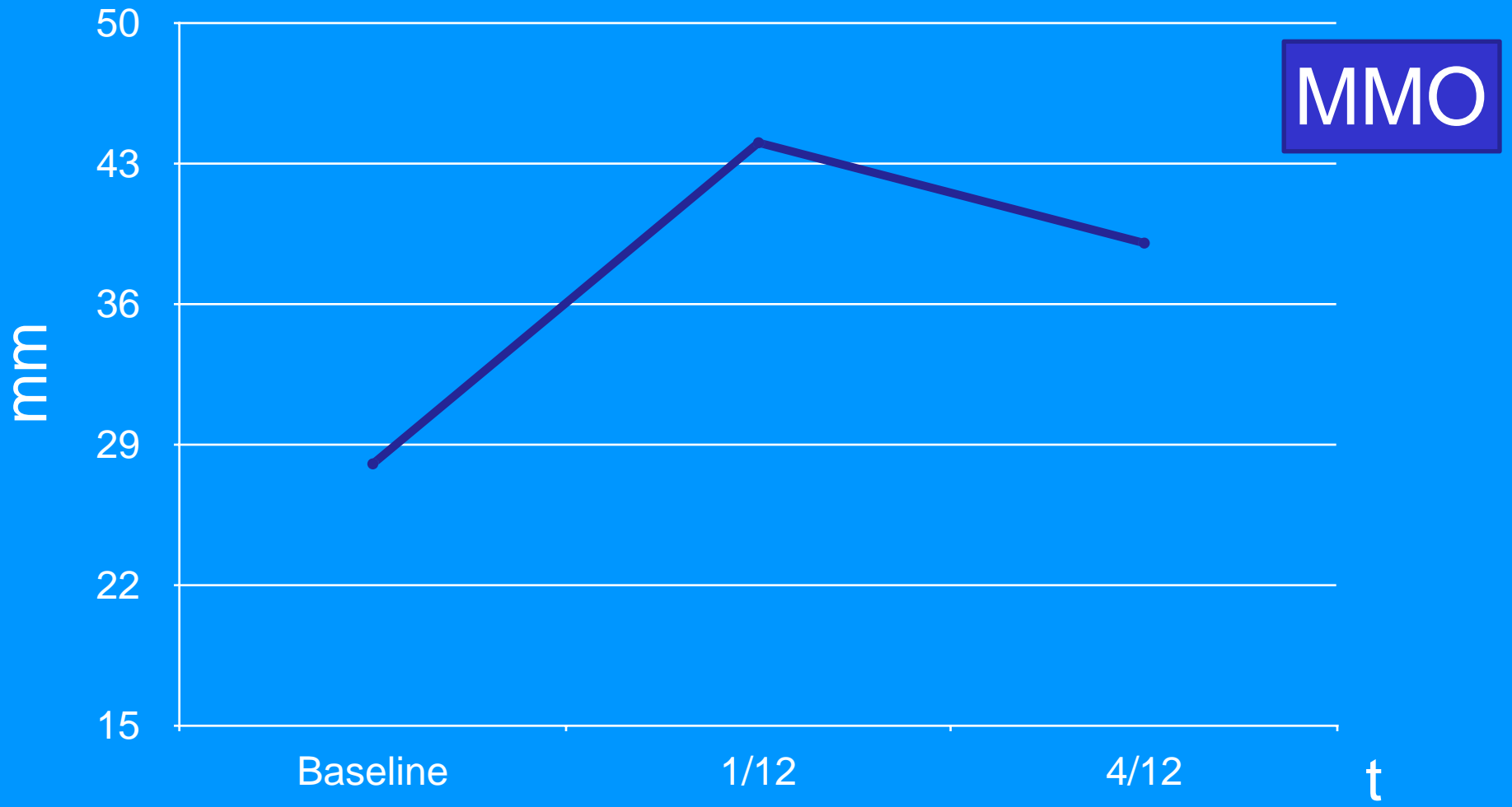


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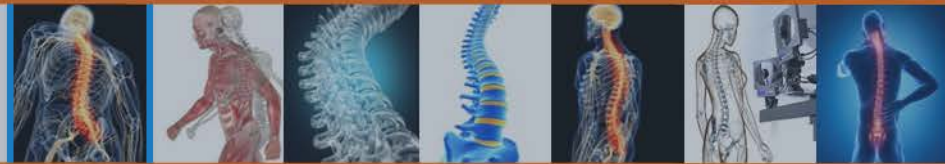


Results



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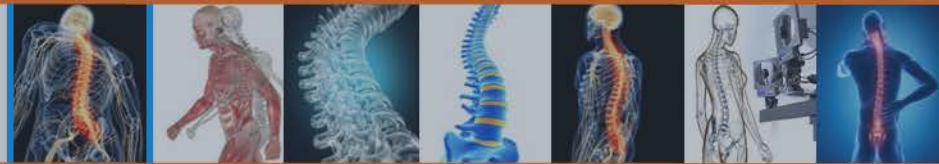


Conclusions

Tinnitus severity strongly linked to TMDs

Orofacial assessment should be part of evaluating ST sufferers

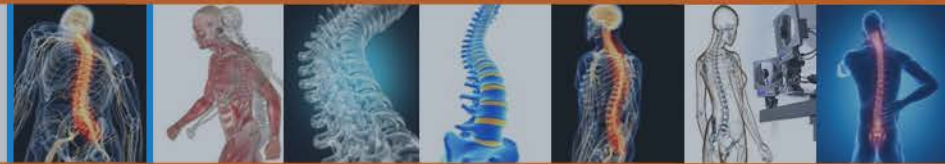
Myofascial DN of MTPs can be beneficial in improving tinnitus suffering and account for clinically meaningful change



Future Research

Aim for identifying subtypes of tinnitus to target specific interventions

RCTs needed to fully explore DN potential in treating effectively TMD modulated ST

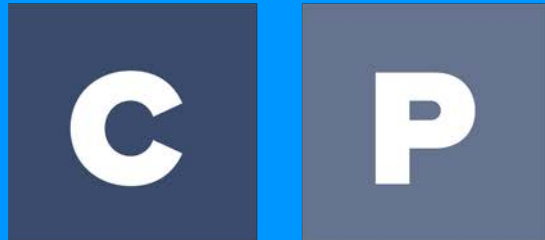


Acknowledgements



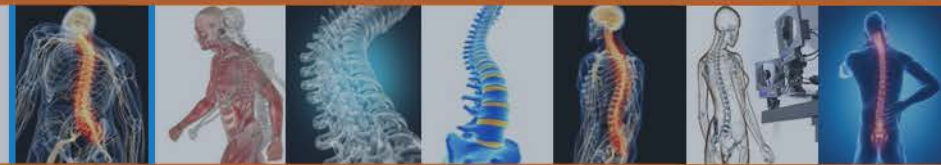
TM

Musculoskeletal
Association of
Chartered
Physiotherapists



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Questions?



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