



# Prescriptive exercise for TMJ disorders.

Comparing oromyofunctional therapy with traditional  
exercise for TMJ pain.

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Does TMD treatment need to be unnecessarily complex? Due to the fact that TMD's are located around the orofacial complex TMD treatment has been adopted by many dental professionals. Courses in 'Neuromuscular dentistry' train dentists to address muscular imbalances, utilise graded occlusal splint devices and even practice modification of tooth surfaces to alter occlusion to address TMD. These expensive and complex interventions have been shown to be effective, yet they rest heavily on a biomechanical rationale for chronic pain. Our conviction is that popular neuromuscular dentistry techniques that are highly technical and complex may have an unintended nocebo effect for patients and also discourage physical therapists in the use of conservative techniques due to the impression that TMD diagnosis and treatment is highly complex and beyond their grasp.

Temporomandibular disorders are a group of musculoskeletal and neuromuscular conditions that involve the TM joints and are a major cause of non-dental pain in the orofacial region causing symptoms in up to 33% of the population (Leeuw, 2018).

“...popular neuromuscular dentistry techniques that are highly technical and complex may have an unintended nocebo effect...”



This literature review was conducted using all databases available to Torrens university Australia, manual search as well as the database of research inside the professional only oromyofunctional study group. Search focused on RCTs and systematic reviews pertaining to the effects of exercise therapy on Temporomandibular Disorders (TMD) and the effects of oromyofunctional therapy on TMD's.

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

## Exercise Prescription for TMD.

Assisted stretch and resisted strength exercises are the style of exercises traditionally employed by physical therapists. These utilise passive and active stretching as well as resisted concentric and eccentric opening for the masticatory muscles.

Oromyofunctional therapy utilises active functional movements to retrain the muscles of the tongue, lips, jaw and face in order to aid in the stomatognathic functions mastication, swallowing, respiration and speech. In contrast to traditional physical therapy exercise prescriptions, OM exercises are focused on the tone and posture of the tongue, are active (unassisted), do not encourage painful movements and have a high emphasis on control and proprioception. An example of OM exercises as utilised in the most well conducted RCT for OMT to date, by De Felicio et al. (2010) can be seen in the left column, page 3. This study compared an OMT regime to splint therapy.

## What does the research say?

Nagata et al. (2015) conducted an RCT comparing traditional assisted jaw exercises plus conservative multimodal prescriptions to splint therapy. Multimodal prescriptions (MMPs) typically include education, breathing exercises and thermal therapy. In like manner De Felicio et al. (2010) compared an OMT protocol (including MMPs) and splint treatments. In both studies exercises combined with MMPs were equal, or superior in outcomes compared to splint therapy. The problem with these studies and most others is that jaw exercises are combined with a spectrum of multimodal interventions. Armijo-Olivio et al. (2015), Dickerson et al. (2016) and Shimada et al. (2018) all conducted systematic reviews exploring exercise prescription for TMD.

“...the physiological linkages among jaw, tongue and lip functions have historically not been considered in most proposals for TMD treatment...”.

**Goldfish** - Hold the tip of the tongue on the 'spot' behind the upper incisors. Open and close the mouth seeking to control deviation of the mandible and retaining contact of the tongue to palate.

**Sweeps** - Draw a line with the tip of the tongue antero-posteriorly over the roof of the mouth repeatedly.

**Tongue isometrics (Tongue push ups, Tic Toc Pops)** - Suction the entire tongue to the entire roof of the mouth for an isometric hold. Open and close the mouth without losing suction. Tic Tocs are the same action but 'pop' the tongue off the roof of the mouth (Smile for a 'Tic' and purse lips for a 'Toc').

**Isometrics for the tongue and lips** - Hold the tongue in the cheek pouch, upper lip pouch or lower lip pouch for a count of 5 without breaking the lip seal.

They all found positive results when using MMP's combined with jaw exercises, but each systematic review cited the same problem: the jaw exercises were only one component of the programs and furthermore, most studies did not provide clear information regarding exercise dosage, frequency or compliance. As such, the isolated effect of specific exercises could not be measured. Shimada et al. (2018) concluded that 'it is difficult to propose concrete TMD management plans if all kinds of exercise therapies are lumped together.' The same is true for OM exercises. Melis et al. (2019) in their systematic review of OMT for TMD stated, 'OMT is a collective term that includes many different treatment strategies'. As such it is difficult to determine whether it is the OM exercises or the other MMP interventions that are providing the positive outcomes.

Michelotti et al. (2004) employed traditional 'assisted' physical therapy style exercises and education. The study measured outcomes from education only and education combined with home exercise prescription. They found that the success rate

after 3 months was 57% for the group that received education only and 77% for the group that received both education and home exercises. This is a positive outcome, however the exercise prescription still included MMP interventions that confounds the outcome.

“...In addition to alleviating TMD pain, OMT may improve chewing, swallowing, speaking and breathing and is therefore more likely to give longer lasting improvement, improve self-care strategies and reduce the likelihood of acute presentations becoming chronic...”

Machado et al. (2015) compared low level laser therapy (LLLT) with OMT for TMD. This study actually recorded outcomes for the OMT full protocol (including MMPs) compared to OM exercises alone (without MMPs). Although these protocols were performed with LLLT and LLLT placebo, Machado et al. gives some insight into the effectiveness of the OM exercises in isolation. They found that OM exercises alone (with placebo LLLT) are effective but neither LLLT nor OM exercises alone were as effective as the full OM protocol (including MMPs). They also found that LLLT alone was effective but not sufficient for TMD rehabilitation.

## Conclusion.

The literature makes it clear that outcomes equal to, or better than, splint therapy or LLLT are achieved with jaw exercises combined with various conservative multimodal prescriptions. However, the scientific evidence that validates specific exercises and exercise dosage is weak because of the limited number, and low quality, of RCTs which fail to isolate the exercise prescriptions.

So in essence the research favours the outcomes of the full OMT protocol including exercises, but is insufficient to validate which exercises in particular, or indeed which aspect of the breathing retraining and oral posture retraining is having the most effect.

We favour the OMT protocols over traditional assisted physical therapy exercises because in addition to improved jaw range of movement and function, as is seen with assisted physical therapy exercises, OMT includes strategies for lips, tongue and cheeks aiding in stomatognathic functions. These physiologic linkages among jaw, tongue, and lip functions have historically not been considered in most proposals for TMD treatment. In addition to alleviating TMD pain, OMT may improve chewing, swallowing, speaking and breathing and is therefore more likely to give longer lasting improvement, improve self-care strategies and reduce the likelihood of acute presentations becoming chronic.

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