

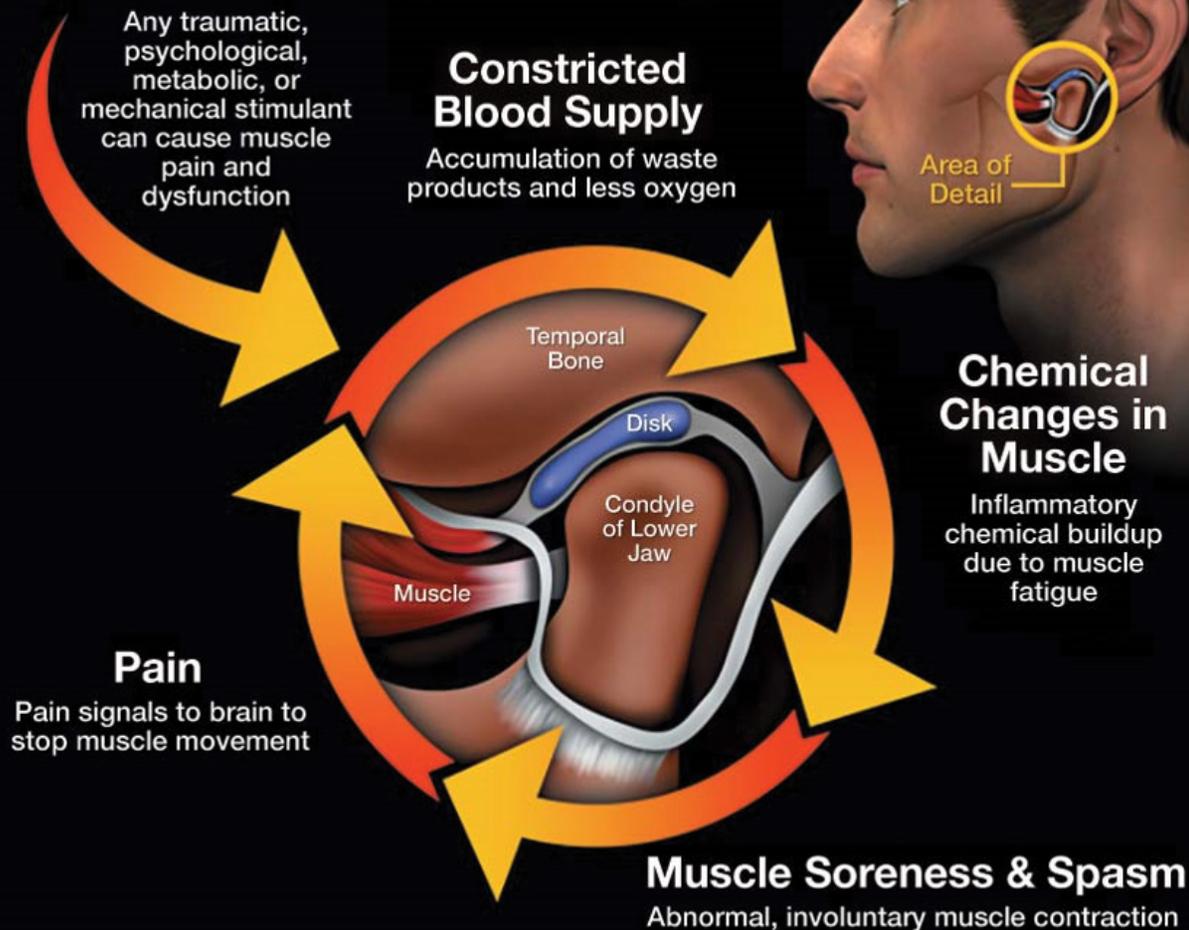


Tee-MD



Total relief from the symptoms of TMD

TMD Muscle Pain Cycle



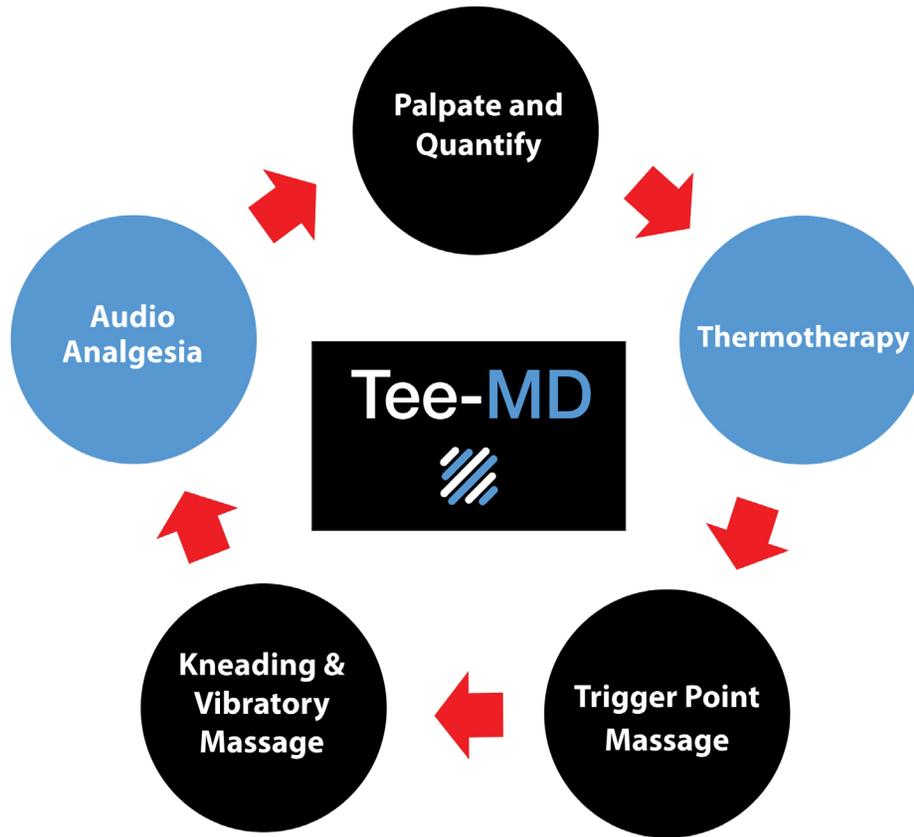
Temporomandibular disorder (TMD) is defined as a musculo-skeletal disorder that affects the temporomandibular joint and/or masticatory muscles and related structures. These conditions may present with pain in the TMJ and associated anatomical structures.

TMD is the most common painful chronic condition of non-dental origin pain in the head and neck region. This condition often results in persistent pain, mandibular functional movement limitations and joint noises.

The prevalence of TMD varies between 31% in adults and 11% in adolescents. TMD affects more women (15–26%) than men (8–15%), occurs most often between the ages of 20 and 50 and commonly peaks in the fourth decade.

According to the diagnostic criteria of the Research Diagnostic Criteria for Temporomandibular Disorders, TMD is categorized into the three groups:

- arthrogenous TMD (including disc dysfunction and joint)
- myogenous TMD (masticatory muscle disorders)
- headache attributed to TMD



Self-management programs are now commonly used for treatment and control of the symptoms of temporomandibular disorders (TMD).

In 2016, the principal components of an effective self-management program for TMD were identified and agreed upon by eleven international experts in TMD therapy.

These protocols and initiatives include:

- education about TMD
- dietary advice and nutrition
- jaw exercises
- parafunctional behavior identification
- massage
- monitoring and avoidance
- thermal therapy

Tee-MD is a system that combines a series of specifically engineered devices with a treatment protocol that allows patients to self-manage the symptoms of TMD and bruxism.

The system has been developed in accordance with the recommendations of oral medicine and TMD experts, working together with the Postgraduate School of Dentistry in Sydney, Australia.

These programs are designed to be used in conjunction with a complete set of clinical and radiographic evaluations that are standard in the diagnosis and treatment of TMD.

Relative Tenderness Assessment



Trigger Point Assessment



TMD Palpate and Quantify Techniques

Palpate and Quantify

It is imperative that you educate your patient about TMD in general including locating where the devices should be aimed and their function. Palpation of the muscles to pinpoint the target areas is crucial, as is measuring the amount of mouth opening. Mouth opening measurement is established by using the Tee-MD Range of Motion Gauge, which allows us to assess how much limitation of opening has occurred due to the muscle length and decreasing flexibility . With regards to palpation, there are two principal methods to educate your patients.

1. Relative Tenderness Assessment

The “relative tenderness” assessment, which is done using a standard anatomic location and what your patient perceives to be a reproducible pressure level. The locations are described below for each muscle. The pressure to be used is about 2 kg of pressure with two fingers for 2 seconds. Whilst palpating, ask the patient to rate their “tenderness” as none, mild, moderate or severe.

2. Trigger Point Assessment

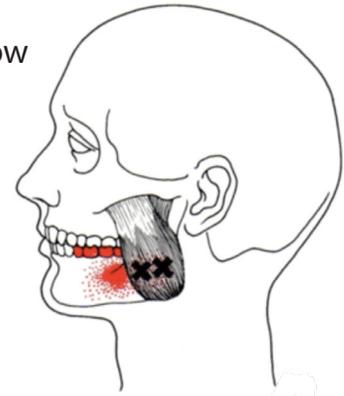
To identify any trigger points, slide the overlying skin back and forth across the muscle. If these taut bands are present, move your fingers up and down the band, applying firm pressure whilst asking the patient to report the most tender point in the band. Demonstrate this to your patient using your own fingers and then get them to copy the technique themselves. Once found, this point needs to be compressed for 5 seconds (with 2 kg pressure) to see if the pain radiates or refers.

Palpate and Quantify

Try and palpate each of these muscle areas and teach your patient how to identify their own trigger points.

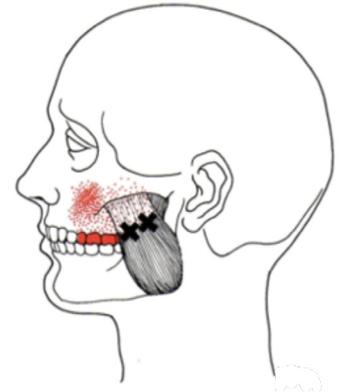
1. Deep Masseter Muscle Palpation

This site is anterior and inferior to the lateral condyle pole, posterior to the posterior edge of the superficial masseter, and beneath the zygomatic arch. Palpate the deep masseter for tenderness using a none, mild, moderate or severe scale.



2. Superficial Masseter Muscle Palpation

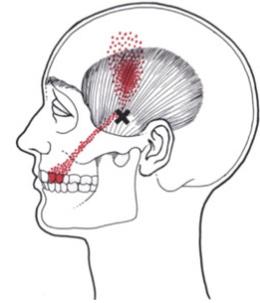
This site is beneath the zygomatic arch and the muscle is angled back towards the angle of the mandible. Palpate the superficial masseter for tenderness using a none, mild, moderate or severe scale.



Palpate and Quantify

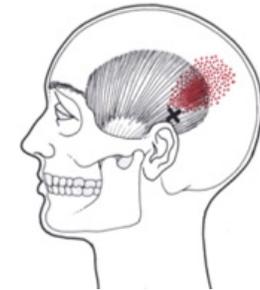
3. Anterior Temporalis Muscle Palpation

The anterior temporalis muscle is palpated at the hair line and opposite the eyebrow. Palpate the anterior temporalis for tenderness using a none, mild, moderate or severe scale.



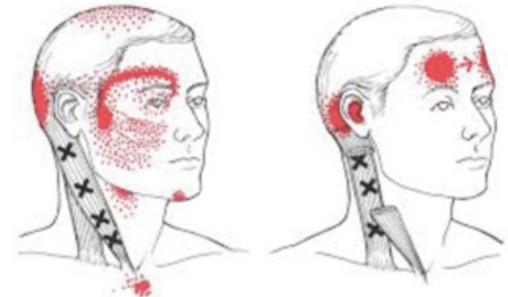
4. Posterior Temporalis Muscle Palpation

This site is just above the pinna of the ear and its direction is posterior from the coronoid process. Palpate the posterior temporalis for tenderness using a none, mild, moderate or severe scale.



5. SCM (Sternocleidomastoid) Muscle Palpation

This site is from the manubrium of the sternum and the clavicle and has an insertion at the mastoid process of the temporal bone of the skull. Palpate the sternocleidomastoid muscle for tenderness using a none, mild, moderate or severe scale.



Thermotherapy

Thermotherapy involves the application or removal of heat to the body for therapeutic purposes.

Application of heat to the body, thermotherapy by addition, is used in dental clinical practice for the treatment of TMD, especially in cases of increased muscle tension and pain crises.

The effects include vasodilation, increased blood flow and consequently oxygenation, elimination of metabolic waste, reduction of nerve pain conduction, reduction of joint stiffness and muscle relaxation.

The Tee-MD devices (Tee-MD Pro+ and Tee-MDi) apply superficial heat to the muscles at 42 degrees Celsius. The heat application techniques offered by these devices present the great advantage of being suitable for patient self-application.



Duration of superficial heat application

Superficial heat application of at least 5 minutes and at most, 30 minutes is recommended. Tee-MD Pro+ has a heating pad which is programmed for short term application, specifically to alleviate pain and prior to trigger point massage.

The Tee-MDi heating element is designed for longer exposure times and to a broader surface area. The cycle lasts for 15 minutes and is ideal for pain relief and as a precursor to all types of massage.

Intensity and frequency of heat stimulus

Patients with TMD are more sensitive to thermal pain, which results in lower values of heat pain limitation compared to normal individuals. Heat pain limits in the face for patients with myogenic TMD is around 46 degrees Celsius; in individuals with arthrogenic TMD, 42 degrees Celsius. Application, twice to three times a day for 15-20 minutes, yields the best outcomes for alleviation of discomfort.



Thermotherapy relieves pain by causing vasodilation and consequently increasing local blood circulation, therefore causing oxygenation and removing metabolic residues.



Benefits of thermotherapy

The main benefit of thermotherapy is pain relief. A study was conducted with 27 patients with TMD symptoms and muscle impairment, where they were divided into two groups. The study group, composed of 19 patients, were submitted to treatment with occlusal splints and thermotherapy; whilst a control group used an occlusal splint only. Symptoms of pain were reduced in 34.7% of patients of the study group and only in 3.75% of patients in control group.

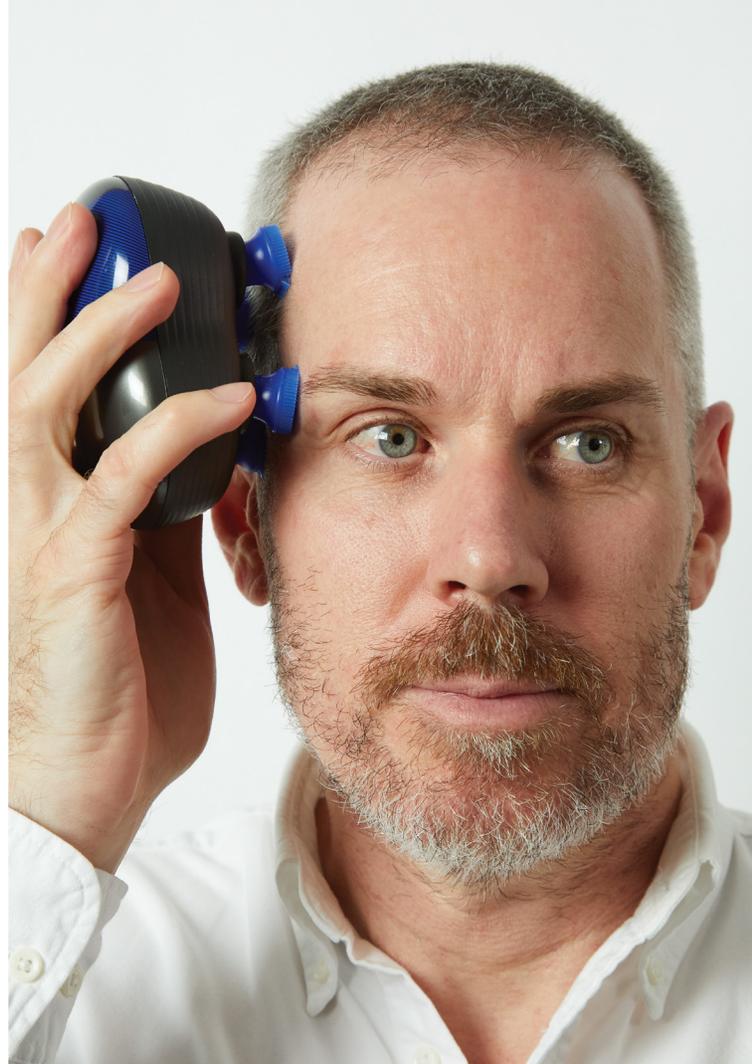
The muscle pain mechanism has been described as resulting from the accumulation of metabolic waste. When blood irrigation is insufficient in certain muscles, it induces them into an anaerobic metabolic state. The increase of metabolic residues within the muscle stimulates and perpetuates pain and spasm, even after elimination of the factor causing them.

Thermotherapy, therefore, relieves the pain by causing vasodilation and consequently increasing local blood circulation, causing oxygenation and removing metabolic residues. Other benefits brought by heat are reduction in tension and muscle stretching due to increase in extensibility in the collagen of the muscle, with consequent improvement in mouth opening and jaw functions.

Thermotherapy by addition is contraindicated in cases of inflammation, trauma or hemorrhage. In such cases, thermotherapy by subtraction (ice or cryotherapy) is recommended.



14.



Kneading Massage

Kneading is a TMD massage technique in which pressure is applied to both the superficial and deep tissues of the facial muscles and muscles of mastication. Kneading is used to treat tight muscles, increase flexibility and decrease pain and can also be used to produce a therapeutic response to help reduce the emotions of stress and anxiety.

Kneading in the head and neck involves compressing soft tissues via a circular technique, whereby tissues are lifted, rolled and squeezed in a compressive action. The key is to grab the tissue and invoke an application of force to break down and realign the collagen fibers. This relaxes constricted tissue, decreases pain and increases movement.

The technique also reduces muscle tightness by increasing the temperature of soft tissues, increasing blood circulation, breaking down adhesions and decreasing hypertonic tone.

Critically, kneading helps to increase flexibility of the TMJ and facial muscles. As the massage is applied and resulting pressure to the muscle fibers, stretching and elongation occurs.

Increased flexibility influences the ability of the patient to open their mouth and function which can also help prevent injuries from occurring and maximizing chewing efficacy.



Vibratory Massage

Vibrational massage is a technique in which the facial tissues are pressed and released in an up and down movement. This creates a vibrating and shaking force system into the muscles that can be performed in a soothing or stimulating manner. Lighter vibration techniques help stimulate the parasympathetic system and help the muscles relax, whilst increasing the speed of vibration can be used to stimulate the circulatory system and loosen soft tissues.

Vibration can loosen the muscles rapidly in preparation for activity and function and can be used for tighter muscles by increasing the temperature of soft tissues (by friction) and increasing blood circulation.

Normal therapeutic applications of vibration have been shown to significantly increase blood flow. In one trial, vibrations, both 30 and 50 Hz, were shown to substantially increase peripheral blood flow, with 50 Hz giving the superior results, having a more rapid and longer lasting effect. 30 Hz vibration slowly increased blood flow, which lasted for about 7 minutes. 50 Hz increased blood flow more rapidly and was still increased 15 minutes later.

Stretching exercises are ideal to lengthen the muscles of mastication to their optimal operational length. This allows full movement and efficient function.



18.



Trigger Point Massage

Trigger points are painful areas in the head and neck soft tissue that are very common, often alarmingly intense and are a major factor in TMD pain. The masseter muscle often harbors many of the most uncomfortable trigger points in the human body. The other major muscles directly associated with TMJ trigger points are the temporalis and the SCM.

Massaging in a circular motion around the area and compressing directly on the trigger points can provide significant relief for TMD sufferers. Each patient has a different threshold of pain and discomfort in their trigger points. Some patients only obtain a release after heavy pressure whilst others need the lightest touch imaginable.

There are many physiological benefits of trigger pointing which include increased blood circulation, the removal of waste products and the breakdown of fibrous tissue. Trigger pointing also helps the removal of waste products in the muscles by deliberately causing a blockage of blood by applying pressure onto the soft tissues.

When the pressure is released, oxygenated blood is delivered into the muscles. Fresh blood supplies the necessary oxygen and helps affected tissues to heal. Trigger pointing is best delivered by Tee-MD Rover and Tee-MD Pro+.

Audio Analgesia

Research in 2020 has supported that listening to relaxing music or favorite music can improve TMD pain. However, the opposite is true for stressful music or no music at all.

In the journal **Headache**, researchers conducted a study about music and TMD. The study looked at how music helps to modulate awake bruxism in people with chronic painful TMD.

Awake bruxism is a stress behavior characterized by teeth clenching, which is a strong contributor to chronic TMD and can cause pain to worsen.

Researchers recorded the electromyographic (EMG) activity in the right masseter of 14 women with chronic TMD and 15 pain-free women during a guided music listening session, which is a music intervention based on models of mood meditation and attention modulation.



Audio Analgesia

Additionally, the objective was to see if guided music listening would modulate masticatory muscle activity and awake bruxism in subjects with chronic painful muscular TMD.

During a listening session, researchers used three types of music: stressful, relaxing and the participants' favorite music. The other session included no music control blocks that lasted 15 minutes.

In each session, participants' motor effort of the right masseter was measured relative to their maximum voluntary contraction, which is the muscular effort to maintain mandibular posture. They also produced spontaneous awake bruxism episodes and measured how long they lasted. What they found is that the EMG posture increased during the stressful music block. However, it decreased during the relaxing and favorite music blocks.

This shows that patients with chronic TMD found relief when listening to relaxing music and their own favorite music but decreased the muscular effort during spontaneous awake bruxism episodes by 26% (relaxing music) and 44% (favorite music). In contrast, stressful music increased pain by about 43%. Tee-MDi offers the option of streaming music through Bluetooth.



Tee-MD Rover



Tee-MD Pro +



Tee-MD i

The Tee-MD range of devices have been developed to minimize the discomfort of pain associated with TMD. In accordance with key protocols for self management, as outlined by oral medicine specialists. The Tee-MD system and devices provides four essential elements.

education | thermotherapy | massage therapy | relaxation



Conservative management involving non-pharmacological protocols is effective in the majority of cases. This involves identifying and managing predisposing and contributing factors. Where possible, it is important to distinguish between myofascial causes of TMD and intra-articular disorders of the joint itself.

Myofascial disorders are the result of tension, fatigue or spasm of the masticatory muscles, whereas intra-articular disorder stems from mechanical or inflammatory disruption of the joint itself. Musculoskeletal dysfunction is the most common cause of TMD.

Parafunctional behaviors, such as bruxism, teeth grinding, clenching and abnormal posture, stress and anxiety, all contribute to masticatory muscle pain and spasm. Cognitive and psychiatric disturbance, such as depression and anxiety, and autoimmune disorders, fibromyalgia and other chronic pain conditions are also frequently associated with TMD.

Tee-MD devices deliver a broad range of massage techniques which have a calming and balancing effect on the nervous system. When applied, the nerves and sensory receptors are stimulated and messages are sent to the brain. The parasympathetic system then slows down body activity, such as reducing the heart rate and lowering blood pressure.





The Tee-MD Pro+ is ideal to apply thermotherapy (heat) and to massage painful trigger points in the muscles of mastication and surrounding facial muscles.

The device is unique in that it features 3 anatomically shaped silicone massage heads that are specific to the masseter, temporalis and sternocleidomastoid muscles.

A thermotherapy warm up of these muscles at 42 degrees Celsius is an ideal complementary protocol with trigger point massage.

Massaging in a circular motion around the painful areas and compressing directly on the trigger points can provide significant relief for TMD sufferers. Each patient has a different threshold of pain and discomfort in their trigger points. Some patients only obtain a release after heavy pressure whilst others need the lightest touch imaginable.

A deeper trigger point massage is achieved by increasing the vibratory speed and application of more pressure. The device comes with 2 differing hardness of massage heads.



Tee-MD Rover

Tee-MD Rover

The Tee-MD Rover device is a unique massager that targets all facial muscles and muscles of mastication, to relieve the discomfort from trigger points associated with sufferers of TMD.

The unique massage heads engage with trigger points in the muscles by lifting the soft tissue upwards and in a circular motion, both clockwise and anti-clockwise, simultaneously. This device creates compression and friction which acts upon the collagen fibres. These fibres in the muscles are then realigned, which increases flexibility and movement, encouraging further blood supply and relieving tension.

Modes of action

- Kneading massage
- Trigger point massage





Masseter



Temporalis



Occipital

Tee-MDi



Tee-MDi is a proven therapeutic device that delivers:

1. targeted compressional massage of a variety of facial and head and neck muscles
2. trigger point massage
3. specific thermotherapy to enliven blood circulation
4. soothing vibratory massage to treat areas of tension around the whole head and neck including the eyes, temporalis muscles, muscles of mastication and muscles of facial expression
5. relaxation using a variety of music and audio files
6. induces onset of sleep

Compressional and vibratory massage fires the stretch reflex, which enables the spasmed and hypertonic jaw and facial muscles to relax. The pressure applied by Tee-MDi stretches special cells in the muscles and triggers a reflexive contraction. This contraction relieves the muscle from spasm and is generally accompanied by a general relaxation of any of the facial or head and neck muscles. Compression from Tee-MDi initially constricts the facial and neck muscle fibers and capillaries: metabolites, by-products of muscles doing work, are then eliminated.

This momentary reflexive tightening of the muscle compresses blood flow and the lymph channels. This tightening forces metabolites out of muscle tissue and prevents tissue irritation caused by the lack of drainage of lactic, hyaluronic and carbonic acids.

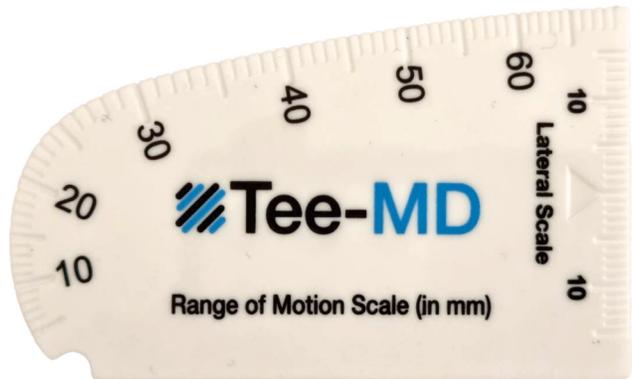
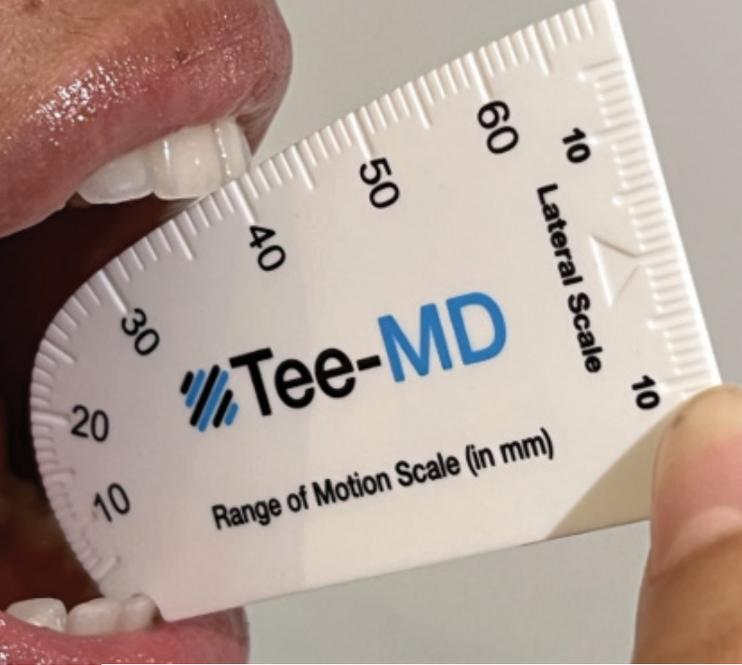


d. Stress-Head

TMD and headache are closely related pathologies; the prevalence of headache in the population who suffer with TMD varies between 48% and 77%, whilst in the general population, the prevalence of headache is around 45%. Primary headaches are more common in patients with TMD symptoms compared to individuals without headache.

There is a strong correlation between headache and other dysfunctional symptoms, such as pain during mandibular movement, pain in the temporomandibular area, depression, anxiety and poor sleep quality. Patients with headache and TMDs reported significantly higher levels of pain and disability compared to patients with only TMDs.

The d.Stress-Head Multiple Target Device is the most comprehensive and adaptable solution to relieve the symptoms of headaches and TMD. The twin device combination allows patients to deliver a total cranial treatment modality in a variety of anatomical locations and with a multiplicity of iterations. Increased blood flow in all cranial blood vessels provides superior drainage of waste materials and changes to muscle lengths. Primary targets are the masseter muscles, temporal and peri-orbital regions and the frontalis area.





Tee-MD Range of Motion (ROM) gauge

A restricted degree of mouth opening is often a sign that muscle length changes from TMD have, or are occurring.

The normal range of motion for opening is 40 to 60 mm. Limited or restricted range of motion (less than 40 mm) is a reduction in an individual's ability for normal range of movement. Along with opening movement, an individual should be able to slide their jaw to the left and to the right at least 25 percent of their total mouth opening, in a symmetrical fashion.

When restricted movement exists, an imbalance in the TMJ and associated musculature is present and a breakdown of that system is likely to occur. In the case of the mouth range of opening, when an individual cannot open their mouth very far, the muscles supporting the TMJ are restricted due to pain, strain, inflammation, swelling, injury, disease or another cause.

To use the Tee-MD ROM gauge, place the notch on the bottom of the scale between the lower incisor teeth. The top part of the device measures where the upper incisor teeth touch when the mouth is fully open.

Further Reading

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Tee-MD

	Tee-MD Pro +	Tee-MD Rover	Tee-MDi
Thermotherapy	✓		✓
Trigger Point Massage	✓	✓	
Kneading Massage		✓	
Compressional Massage			✓
Vibratory Massage	✓		✓
Audio Analgesia			✓



Tee-MD Rover



Tee-MD Pro +

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Tee-MDi



d.Stress-Head