



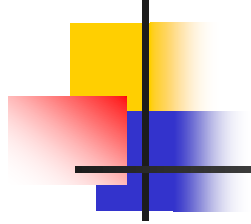
Differential Diagnosis of TMD, Head, & Facial Pain

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Diseases that mimic Temporomandibular Disorders – Differential Diagnosis

1. Comprehensive Medical History
2. Thorough Physical Examination

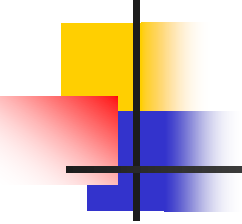


Clinicians must develop a planned systematic approach to patients with complaints of TMJ pain, or risk overlooking more serious conditions, which carry increased morbidity, and in some instances, mortality.

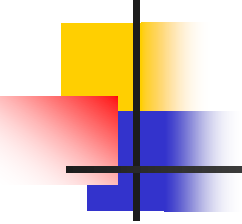


Referred Pain

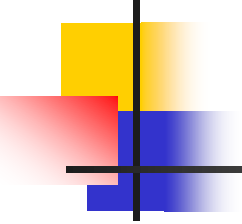
Pain is considered referred if the origin of the irritative lesion is some distance from the site at which the pain is perceived. The anatomic basis for this phenomenon is that pain is referred from one region to another by sensory nerves that share a common segment within the gray matter of the spinal cord.



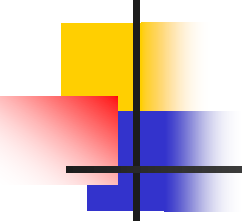
The sensory innervation of the region surrounding the TMJ is supplied by four cranial nerves (V, VII, IX, X), and two cervical nerves (C1, C2). Trigeminal pain is referred to the region anterior to the tragus by way of the auriculotemporal branch of the third division.



Lesions involving the floor of the mouth, teeth, mandible, anterior 2/3 of the tongue, palate, paranasal sinuses and infratemporal fossa can result in pain directed to the same region by the trigeminal nerve.



Pain felt in the external auditory canal and postauricular region can be transmitted by the sensory branch of the facial nerve by way of the nervus intermedius.

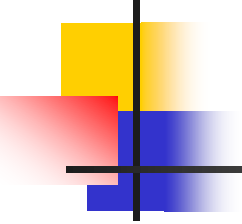


Patients with lesions involving the geniculate ganglion (Ramsay Hunt Syndrome), as well as tumors of the 7th nerve have reported pain in the TMJ region.

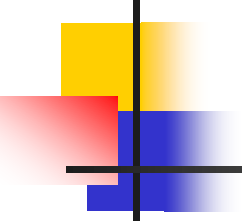


Glossopharyngeal

Referred pain travels from the tonsils, eustacian tube, posterior base of the tongue and nasopharynx to the petrosal ganglion and down the nerve of Jacobson to the middle ear.



Pain can also be referred in regions of the head and neck, which are innervated by branches of the Vagus nerve (to the external auditory canal).



Pain involving the cervical region is referred to the Posterior aspect of the Mastoid region through the greater auricular nerve and lesser occipital nerve, both of which are branches of C2, C3. Myalgic and Arthritic, as well as Neoplastic diseases involving the cervical region must be considered in the evaluation of the patient with TMJ pain.



Differential Diagnosis

TMJ Pain may be due to Pathology in a contiguous site or may be referred from a remote site. The patient can only identify the site where the pain is felt – not the location of its source. Therefore, a comprehensive and careful search of the head and neck is necessary to ascertain the correct diagnosis.



Vascular Syndromes

1. Carotidynia

- a) a variant of migraine
- b) long-lasting throbbing neck and facial pain
- c) Pain is reproduced by palpation of the carotid
- d) Usually, self-limiting, and responds to steroids and salycilates



Temporal Arteritis

(Also Called Giant Cell and Cranial Arteritis)

1. Vascular inflammatory disease of unknown origin
2. Predilection for Whites over 55 years of age
3. Female over male predominance 2:1
4. Headache is most common complaint *
5. Painful Mastication *



Temporal Arteritis

(Also Called Giant Cell and Cranial Arteritis)

6. Often, an elevated SED Rate (ESR)
7. Biopsy of the Temporal artery is confirmatory
8. Prominent, Tender Temporal Artery
9. Prednisone 40-60 mg daily alleviates symptoms and avoids ocular complications (blindness)



Eagle's Syndrome

Caused by inflammation of an elongated styloid process. Pain can be elicited by palpation of the tonsillar fossa.

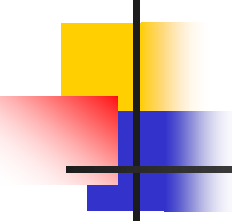
Treatment is by excision of the styloid process. Symptomatic improvement has been reported with Steroid and Lidocaine injections in the Tonsillar Fossa.



Neuralgic Pain

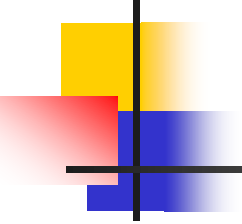
Most neuralgias share the following common features:

1. A “trigger area” or region where light stimulation produces severe pain in the sensory distribution of that nerve
2. Pain is paroxysmal in nature
3. Pain does not awaken the patient at night from sleep
4. The pain is unilateral



Trigeminal Neuralgia (Tic Douloureux)

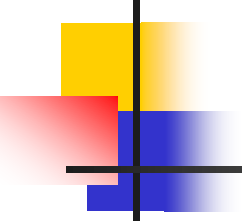
One of the most painful conditions known to man. A misdiagnosis of dental disease is commonly made and is responsible for many unnecessary extractions. Periods of spontaneous remission occur which may span months or even years. Clinical diagnosis of Trigeminal Neuralgia can be based on:

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1. Clinically negative neurologic finding
 2. Alleviation of pain and abolishment of the trigger point by administration of a local anesthetic to block the involved trigeminal nerve division
 3. The “Half Inch Test” in which the patient, when asked to demonstrate where the pain begins will avoid touching the trigger zone by 1/2 inch in fear of precipitating an attack



Glossopharyngeal Neuralgias

- An uncommon condition compared to trigeminal neuralgia.
- Characterized by paroxysms of pain that radiate from the pharynx and tonsillar fauces to the TM region, ear, and tympanum.

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- Pain occurs with swallowing, chewing, talking, or yawning.
 - Tonsillar and pharyngeal regions are trigger zones.



Sphenopalatine Neuralgia

Pain radiates to the mandible, zygoma, and ear. Attacks are associated with edema of the nasal mucosa. The diagnosis rests on the immediate cessation of pain after cocaineization of the sphenopalatine ganglia during an attack (or 4% Lidocaine).



Herpes Zoster Oticus (Ramsay Hunt Syndrome)

- An uncommon acute infectious disease that affects the sensory and motor branches of the facial nerve.
 - Starts with pain and burning.
 - Within 2-3 days, the pain is followed by the onset of ipsilateral facial nerve paralysis.
 - Within 10-14 days, vesicular eruptions appear on the skin of the external auditory canal.



Sinusitis

Acute and chronic infections of the maxillary sinus can refer pain to the TMJ as well as the cheeks and teeth.
Misdiagnosed as TMJ pain in 20% of the cases.



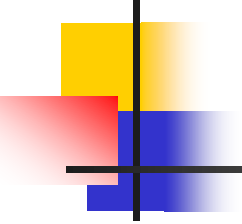
Headaches

- Migraine (Vascular Headache)
- Cluster (Vascular Headache)
- Muscle Contraction Headache

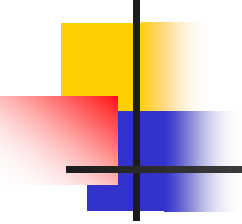


Acoustic Neuroma

Uncommon, benign, slow-growing tumor of Schwann-Cell origin that arises from the vestibular portion of the eighth cranial nerve. The symptom duration until diagnosis ranges from 3 to 10 years. Unilateral hearing loss is the most common initial symptom. Hearing loss with tinnitus is the initial symptom in over 75% of patients and is present at diagnosis in over 90% of patients. Dizziness and unsteadiness eventually develop in 80% of cases.



The trigeminal nerve is commonly involved in acoustic neuromas. Facial hyperesthesia and occasionally, periauricular pain are the most common symptoms secondary to trigeminal involvement.



Confirmation of the presence of an acoustic neuroma is by contrast enhanced CT Scanning or Magnetic Resonance Imaging (MRI). Treatment is by surgical excision of the tumor.



Ear Disease

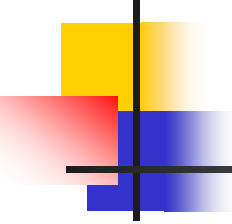
Pathologic conditions of the ear may masquerade as TM Disorders. Patients with TMJ pain often have symptoms similar to those of true ear pathology. Therefore, disease within the ear must be considered and excluded as a source of TMJ pain.



1. Medical History

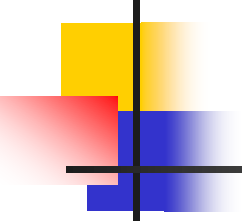
2. Examination of the ear

- a) Inspection of the auricle and external auditory canal, looking for erythema, ear protrusion, tenderness, ecchymosis, or vesicular eruptions.
- b) Otoscopy with insufflation.
 1. Perforation of the tympanic membrane
 2. Otorrhea
- c) Hearing status using a 512Hz tuning fork.



The following conditions represent the most common ear disorders that may mimic a TM Disorder.

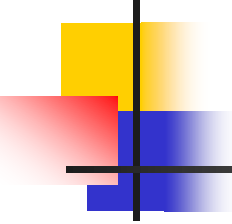
1. Diffuse External Otitis usually seen during the summer with constant high humidity – bacterial and/or fungal. Treatment involves mechanical cleansing of the ear canal, maintenance of a dry environment, applications of topical antibiotic drops.

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2. Malignant External Otitis. Malignant or necrotizing otitis is destructive bacterial infection of the external auditory canal that is most often observed in diabetic and immunocompromised patients. Treatment involves extensive debridement of the ear canal with removal of all granulation tissue and prolonged (6-10 weeks) intravenous antibiotic therapy directed against pseudomonas aeruginosa, the primary causative pathogen. These include Ticarcillin, third generation Cephalosporins (e.g. Ceftazedrine, Cefoperazone), and Cefprofoxacin.



3. Bullows Myringitis

4. Acute Otitis Media. Bacterial infection of the middle ear that often accompanies an upper respiratory infection. Deep-seated, throbbing pain often associated with hearing loss. The conductive hearing loss is secondary to the accumulation of purulent fluid in the middle ear space. Otoscopy reveals a dull and erythematous tympanic membrane that has lost its normal landmarks and has limited mobility. Treatment includes analgesics and oral antibiotics. The antibiotics of choice are Ceclor, Septra, and Augmentin.

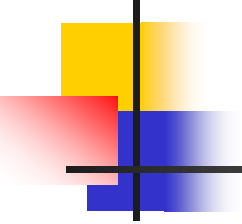


*Note: The diagnosis of nasopharyngeal carcinoma must always be considered in any adult who develops otitis media not precipitated by a URI and is refractory to medical treatment. Such cases of recurrent or refractory serious otitis media require nasopharyngoscopy and CT scanning of the nasopharynx to rule out a mass lesion.

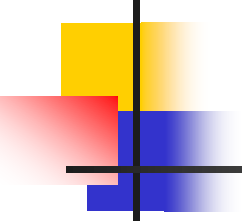


Malignancies

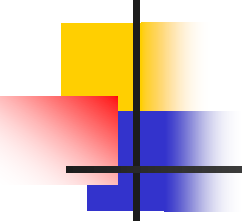
Malignancies, both regional and metastatic, can manifest themselves as TMJ pain and must always be considered in every differential diagnosis of TMJ pain.



Although most malignant tumors that involve the TMJ are usually secondary to contiguous spread from the skin, parotid gland, ear, and nasopharynx, some metastasis from the breast, lung, prostate, and colon have been reported.



Pre-auricular mass in a patient with symptoms of TMJ pain should alert the clinician to consider the parotid gland as the primary focus.



The majority of parotid tumors (80%) are benign. The most common presentation of a benign tumor is that of a firm, mobile, and non-tender mass.



Clinical features of a malignant parotid tumor:

1. Pain is often associated with a higher incidence of malignancy. Additionally, pain is often an indicator of poor prognosis.
2. Facial nerve paralysis.
3. Hardness and fixation of the mass are associated with 30% to 50% incidence of malignancy.



Examination and Diagnosis

Medical History:

1. Baseline information
2. Alert practitioner to pertinent medical history or to complications that may be encountered.
3. Help establish etiology of problem.
4. Establish and maintain a legal record.
5. Help establish a database for research.



Organization of Medical History

1. Personal data.
2. Chief complaint.
3. History of present illness.
4. Past medical history.
5. Past dental history.



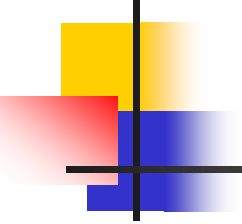
Examination

Examination for T.M. disorders differs from the examination for general dentistry. The teeth and periodontium receive less attention than the state of the muscles and joints and the mandibular movement.



The examination is made up of:

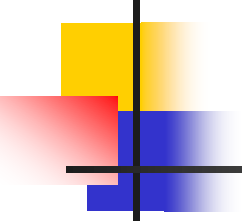
1. Observation.
2. Masticatory muscle examination (palpation and resistance testing).
3. T.M. joint examination. (Palpation, range of motion, selective joint loading, assessment of joint sounds).
4. Head and neck examination.

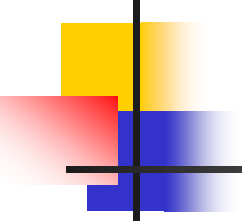
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5. Occlusal analysis.
 6. Diagnostic anesthetic blocks.
 7. Cervical spine examination.
 8. T.M. joint imaging.
 9. Specialist consultation.



Masticatory Muscle Examination:

- This is the most important part of the examination.
- The recommended technique is simultaneous palpation of the left and right sides using approximately 3 pounds of pressure.

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1. Temporalis Muscles.
 2. Zygomatic arch.
 3. Masseter muscles.
 4. Anterior Digastric Muscles.
 5. Cervical Spine.

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6. Trapezius Muscles.
 7. Sternocleidomastoid Muscles.
 8. Medial Pterygoid Muscles.
 9. Lateral Pterygoid Muscle Area.
 10. Coronoid Process.



Temporomandibular Joint Examination

1. Palpation of the lateral aspect of each joint (anterior to the external Auditory meatus).
2. Palpation of the condyle through the external Auditory Meatus.



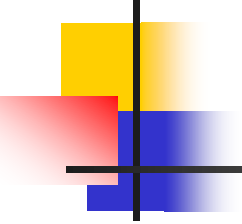
3. Range of motion:

- a) Maximal Interincisal opening/active range of motion.
- b) Lateral movement.
- c) Protrusive movement.
- d) Patterns of mandibular opening.
- e) Selective Temporomandibular joint loading.
 - 1) If clenching elicits joint tenderness capsulitis or Retrodiscitis is suspected.



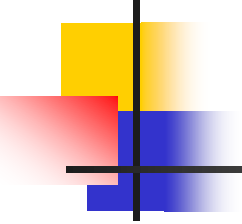
Head and Neck Exam:

1. Thorough exam for palpable nodes, Salivary gland pathology, and Neoplastic disease.
2. Evidence of habitual cheek biting or tongue thrusting.
3. Joint sounds – clicking or crepitus.



Clicking has been shown through Cadaver Studies, arthrography, and open joint surgery to be indicative of disc displacement.

The later the click occurs during the opening movement, the more severe the disc displacement.



Crepitus is evidence of a change in osseous contour. It commonly indicates osteoarthritis, but other Arthritides must be considered as well.



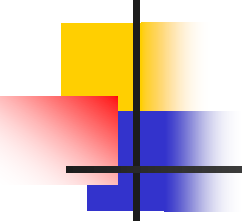
Occlusal Analysis:

Take notes of the patient's maxillo-mandibular relationship, both skeletal and dental.



Cervical Spine Examination:

Many patients presenting for TMJ evaluations have cervical symptoms. It is clinically evident that these problems can act synergistically with the TM disorders and can refer pain to the temporal region. Motor vehicle accident victims, in particular, often present with both cervical sprain and TMJ injury.

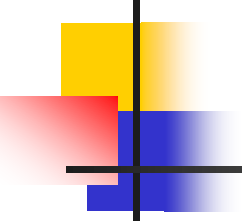


Dental practitioners are not normally trained to do in-depth analysis of the upper quarter, but should evaluate the structures generally. When indicated, (almost always), a referral should be made to a physical therapist, physiatrist, osteopathic physician, or a neurologist.



The Practitioner should note:

1. Any shoulder asymmetry or deviation of the neck.
2. Check for forward head or neck posture.
3. Check head rotation (about 80 degrees in each direction).

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4. Extension and Flexion (about 60 degrees in each direction).
 5. Side-bending (about 45 degrees in each direction).

During this exam, all pain and limitation of movement is noted.

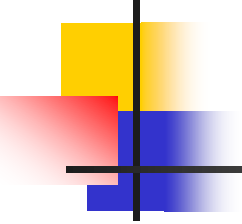


Temporomandibular Joint Imaging

General Screening:

- Panoramic x-ray.
- Lateral Transcranial Imaging.

Tomograms produce clear radiographic “slices” of the condyle, which can clearly show subtle osseous changes.

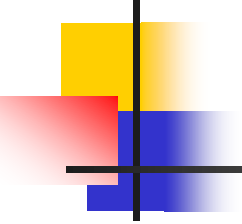


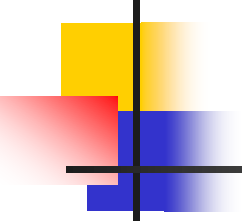
Arthrography requires injection of radiopaque dye into both joint spaces. It can visualize the meniscus during movement (Fluoroscopic record recorded on videocassette). This invasive procedure causes tenderness and some patients are allergic to the dye.



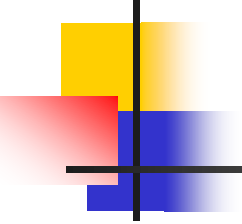
CT and MRI

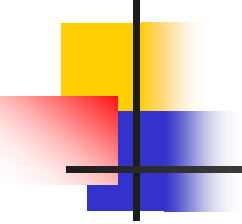
CT is superior for visualizing osseous structures while MRI can visualize disc position.

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- Comprehensive treatment of Temporomandibular Joint disorders (Cranio-mandibular) can be broken down into three areas:
 - Modalities.
 - Mobilization.
 - Patient Education.



Physical Modalities and Manual Techniques Used in the Treatment of Maxillofacial Pain

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1. Physical modalities are only an adjunct to therapeutic techniques.
 2. Physical modalities can be used to:
 - A. Decrease pain.
 - B. Increase or decrease circulation.
 - C. Alter nerve conduction velocity.
 - D. Facilitate soft tissue stretching by altering the elastic properties of the connective tissue.

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- E. Decrease swelling.
 - F. Decrease muscular spasm and trigger points.
 - G. Prepare the superficial tissue for electrical modalities, mobilization, posture re-education, or exercise.
 - H. Speed the repair of connective tissue.



Application of cold:

- Cryotherapy:
 - Although cold traditionally has been used therapeutically for acute injury, the same effect can be beneficial in the sub-acute and chronic phase of dysfunction.

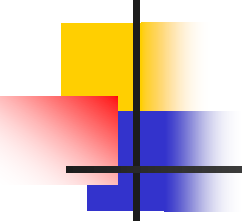


Physiologically, cold will:

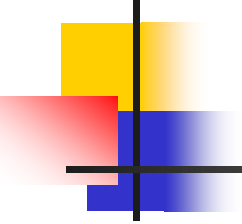
1. Cause vasoconstriction.
2. Decrease metabolism.
3. Reduce swelling.
4. Reduce muscle spasm.
5. Reduce pain by producing a local anesthetic effect.



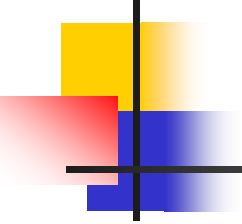
The cold impedes synaptic transmission and slows nerve conduction velocity, thus elevating the pain threshold.



Cold can be applied easily and inexpensively as ice chips or cubes, commercial ice packs, or vasocoolant spray. Ice massage can be performed by the patient to reduce muscle spasm. The ice cube is stroked over the muscle in spasm, parallel to the direction of the muscle fibers. Application should continue until the area becomes numb.



Flouro-methane spray and stretch was developed by Dr. Janet Travell in 1985. A thin spray of vapocoolant is directed over a trigger point zone while the practitioner passively stretches the involved muscles. The streams of spray should overlap and be performed in one direction from trigger point toward the referral zone of pain.

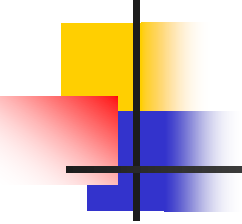


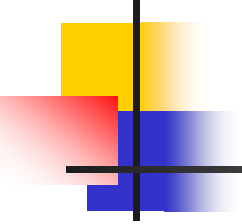
Spray and stretch techniques should only be applied to myogenous craniomandibular disorders, because the effect of over-opening of the mouth can progress the displaced disc relationship in intracapsular disorders.

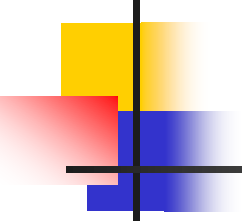


Application of Heat:

Heat should not be used directly over the T.M. joint. Heat can be used over the muscles of the upper back and neck.

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- Heat promotes relaxation:
 1. Reduces pain.
 2. Increases metabolism.
 3. Increases connective tissue flexibility.
 4. Prepares muscles for the modalities and exercise.

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- Ultrasound is known to increase heat in the deep soft tissue. In addition, heat:
 1. Increases circulation.
 2. Alters nerve conduction velocity.
 3. Increases pain threshold, and
 4. Modifies skeletal muscle contractile properties.

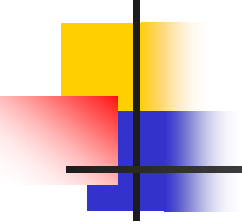


Therefore, ultrasound is used to treat joint contractures, scar tissue, muscle spasm, and pain. Ultrasound can also be used for phonophoresis, which propels a hydrocortisone, or dexamethasone impregnated coupling agent into the soft tissue or the T.M. joint.

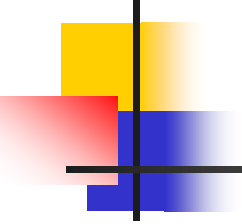


Phonophoresis can:

1. Reduce local irritation.
2. Reduce pain.
3. Reduce post-treatment irritation from mobilization and/or exercise.



Electric High Voltage Stimulation (HVS or EGS) is a form of electric stimulation applied to reduce pain, alter nerve conduction, increase circulation, and decrease swelling.



Transcutaneous Electrical Neural Stimulation, (TENS), is an effective adjunct to physical therapy in the reduction of pain. If appropriately used, the TENS unit can bridge the gap therapeutically between office treatment sessions.



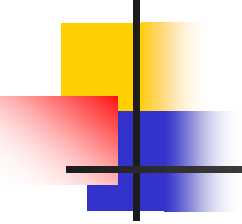
Mobilization Techniques – Joint Liberation

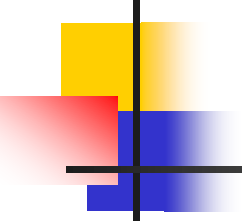
After the soft tissue of the maxillofacial region is prepared by the application of physical modalities, the Osteopathic Physician may elect to use mobilization techniques.



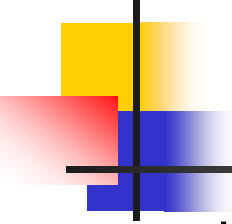
Mobilization may be applied to:

1. Stretch the soft tissue of the maxillofacial region.
2. Increase the range of motion of the temporomandibular joint.
3. Relax the muscle spasm.

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4. Restore the TM joint disc to a more normal position on the condylar head.
 5. Stabilize the joint.
 6. Prepare the joint for treatment.
 7. Restore joint play.



*The American Academy of Orofacial Pain (AAOP) cited physical therapy as an important adjunctive treatment in the management of TMD.



*The American Academy of Craniomandibular Disorders (AACD) guidelines note that “Physical therapy helps relieve musculoskeletal pain and restore normal function by altering sensory input, reducing inflammation, decreasing, coordinating, and strengthening muscle activity, and promoting the repair and regeneration of tissues.”



Manual Therapy

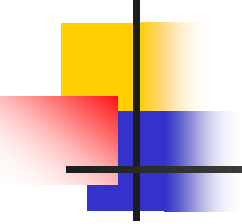
Manual therapy is the application of gentle, passive, sustained and oscillating forces to joints or soft tissues to assist in their readaptation. Readaptation may restore joint mobility through lengthening of the muscle, capsule, or fascial structure. Once the tissue is sufficiently flexible and strengthened, the patient can regain a more ideal head-on-neck orthostatic relationship.

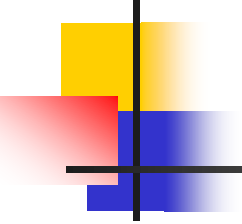


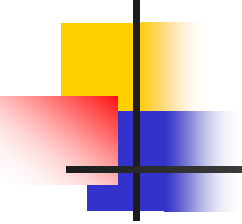
Soft Tissue and Joint Mobilization

Soft tissue mobilization techniques include deep pressure point massage, stretching, myofascial release, strain-counterstrain, and craniosacral therapy.

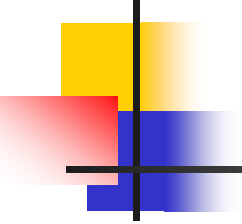
The masticatory and cervical musculature is prone to the development of trigger points when shortening, lengthening, or loosening of muscles occurs.

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1. Myofascial Release is a combination of direct, indirect, and reflex neural release procedures. Abnormalities and mechanical asymmetries found by palpation of tissue are signals of altered structure. The basis of this technique is sensing palpable changes of various levels of tissue and manually directing gentle force to assist in releasing tissues. This alteration of tissue is thought to be mechanical and neuroreflexive. This technique can be used for the muscles of mastication as well as the upper cervical spine.

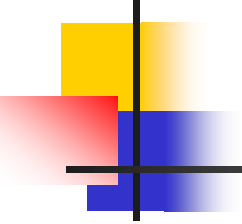
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2. Joint Mobilization techniques are divided into four grades:
 - Grade I - Small amplitude movement at the beginning of joint range is used for extremely irritable joints (neuromodulation).
 - Grade II - A larger amplitude oscillation that is partway into available joint range.

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- Grade III – Large-amplitude movements that move the joint through full available range.
 - Grade IV – Small-amplitude movements that are performed at the end of joint range.

The presenting state of the joint dictates the grade of mobilization to be performed.



Causing pain must always be avoided, and a decision to increase mobilization is based upon re-evaluation as therapy progresses.

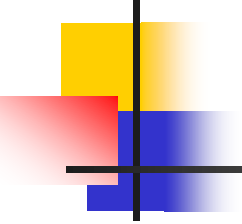


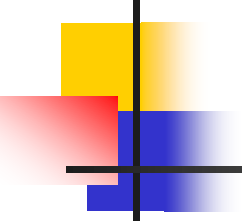
Manipulation, or grade IV mobilization employs a high-velocity, low amplitude thrust that moves a joint beyond its restricted range. This should only be used by a therapist who has extensive training and experience in manual therapy. Grades I through IV are most often used with the TMJ. Grades I through IV are used for treatment of the cervical spine.

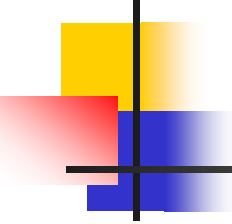


Specific Joint Mobilization: TMJ

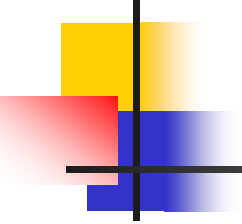
- When mandibular movements are severely limited, severe pain and spasm due to recent trauma are present, extraoral techniques are useful. They can help decrease spasm and pain when done in grades I and II oscillations in:
 1. Lateral glide.
 2. Depression.
 3. Protrusion.

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- After the soft tissue of the maxillofacial region is prepared by the application of physical modalities (such as TENS), mobilization may be applied to:
 1. Stretch the soft tissue of the maxillofacial region.
 2. Increase the range of motion of TM joints.

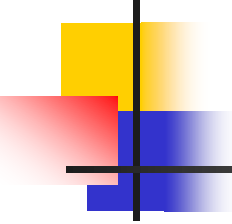
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3. Restore the TM joint disc to a more normal position on the mandibular head.
 4. Stabilize the joint.
 5. Restore joint play.



Initially, the practitioner may simply gently depress the mandible to take up “the slack” in the joint capsule. According to Rocabado, this action will restore play in the joint. Joint play is the passive, nonvoluntary movement in the joint, which is actually the normal joint laxity. Although this movement is minimal, it is required for normal joint function and is present in all synovial joints.



Once the joint play is restored, the practitioner should concentrate on restoring any motions that the patient is lacking. As muscle guarding decreases and the range of motion increases, restricted soft-tissue structures are more easily assessed and allow the appropriate use of direct intraoral techniques.

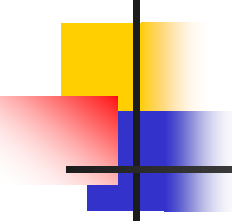


The desired effect of mobilization techniques is the deformation of collagen within its elastic range. Clinicians must develop an acute tissue-sensing ability through practice. Active mandibular opening is helpful in increasing the effectiveness of these treatment techniques. If these techniques are used with too much force, increased pain and swelling and decreased mobility may result.

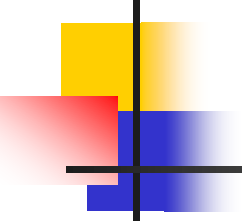


Specific Joint Mobilization: Upper Cervical Spine

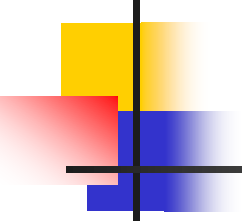
Headache and facial pain can originate from C1-3. Mobilization of the subcranial joints should always be preceded by a vertebral artery test. The test is designed to detect the presence of vascular insufficiency, which may be exacerbated by backward bending, side-bending, and/or, rotation of the head. Symptoms include pupillary changes, nystagmus, dizziness, visual changes, and giddiness.



The first cervical mobilization is transverse vertebral pressure. A gentle force is applied with the thumbs on the lateral tip of the lateral mass of C1. This technique is applied toward and away from the symptomatic side of the upper cervical spine. When done appropriately, a decrease in pain, spasm, and joint restriction between the occiput and C1 will occur.



Posteroanterior unilateral vertebral pressure is used when symptoms are bilateral or unilateral. This should never be done in a way that produces radicular symptoms. At the occiput-atlantal joint (0-C1), the primary motions are flexion and extension. When Posteroanterior unilateral pressures are used, motion will be increased when the force is directed to the posterior aspect of the lateral mass of the Atlas.

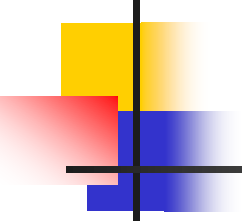


If it is used at the C1-2 segment, the primary motion will be approximately 40 degrees of rotation. The force is applied to the C2 articular pillar. This movement is further enhanced by rotating the patient's head 30 degrees before applying this technique, thus taking up the slack at C1-2.

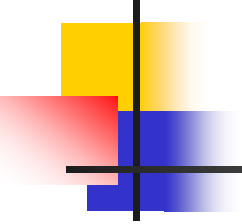


Patient Education

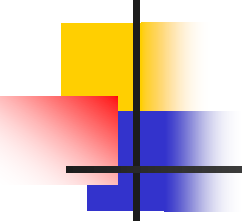
Education of patients is a key factor during all phases of physical therapy. A discussion of the nature of the pathology and its relationship to posture, pain, and mechanics is necessary. Patients must understand that they are responsible for the problem and its treatment.

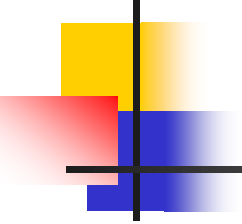


Forward head posture with resultant rounding of the shoulders can produce dysfunction of the Craniocervical and Temporomandibular systems.



Postural re-education starts with instruction in relaxed sitting position. Patients who sit in FHP over long periods of time are placing the head in a posteriorly rotated position, leading to pathologic changes in the soft tissue of the TMJ, hyoid, and cervical spine.

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- Adaptive FHP strongly influences muscle tone and elasticity of the masticatory system.
 1. The resting position of the mandible is altered.
 2. Suboccipital impingement forces are increased.
 3. Freeway space is influence.

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4. FHP alters breathing and swallowing as a result of decreased airway potency and tongue position.
 5. May lead to clenching, Bruxism, and TMJ loading.
 6. FHP may lead to increased compressive forces and intervertebral disc degeneration.



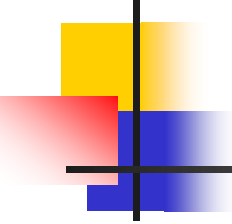
Sitting Posture

1. Chairs with appropriate lumbar support to maintain lumbar lordosis.
2. Knees and hips should be in a 90-90 degree position with free lateral movement to turn left and right.
3. When hips are in the 90 degree position, proper anterior pelvic tilt is maintained, promoting a decrease in lumbar disc pressure and inducing proper cranio cervical posture.



Sleeping Posture

1. Least easily controlled.
2. Patients should be instructed to avoid lying in a prone position, which stresses the cervical spine by rotating and extending it, and places tension on the cervical joints, muscles, and ligaments. The TMJ also receives compressive forces in this position.



Patients with waking pain or increased stiffness should have their sleeping posture evaluated.

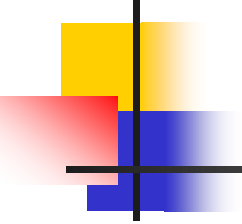
Appropriate sleeping posture is lying on the side or back. The head and neck must be supported by a pillow meeting the patient's Biomechanical need.



Nasal-Diaphragmatic Breathing

Mouth breathing (caused by allergies or nasal obstruction) increases activity on the Scalenes and Sternocleidomastoid muscles.

Enlargement of the adenoids may lead to forward and downward position of the tongue.



Shortening of the Scalenes and Sternocleidomastoids leads to increased posterior cranial rotation.

As the cranium is pulled into FHP, activity of the Temporales and Masseter muscles increase causing the mandible to elevate and retrude.

These events may ultimately lead to change in occlusion, facial morphology and lead to cervical spine pathology.



Self-Mobilization Exercises

- A self-mobilization program will help maintain joint mobility as well as muscle strength and length, thus preventing recurrence of pain.
- A stretching program is as important as a musculoskeletal strengthening program.



Passive Stretching: Cervical Spine

Flexibility is a key factor in preventing repeated injury.



Passive Stretching: TM Joint

Passive mobilization of the TMJ is done at home after application of ice or heat.



SPLINT THERAPY



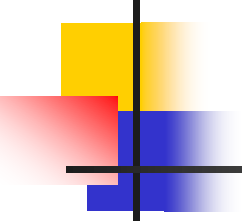
Occlusal Splints

- Removable interocclusal appliances.
- Usually fabricated from hard acrylic.
- Prescribed for the treatment of BRUXISM and CRANIOMANDIBULAR SYMPTOMS for almost a century.



TMD Treatment Objectives of Splints

- Eliminate occlusal interference.
- Stabilize tooth and joint relationships.
- Provide a passive stretching of the musculature to reduce abnormal muscle activity.
- Decrease parafunctional habits.
- Protect against tooth abrasion.
- Decrease joint loading.

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- Theories of Splint Therapy
 - Design of Multiple Appliances
 - Expectations, Limitations, and Complications of Splint Therapy



The Six Major Theories Covering the Mechanism of the Action of Splints

- Occlusal Disengagement Theory
- Vertical Dimension Theory
- Maxillo-mandibular Realignment Theory
- Oral Orthopedics Theory
- TMJ Repositioning Theory
- Cognitive Awareness Theory



Occlusal Disengagement Theory

- Placement of an appliance with proper occlusal relationships replaces previously faulty occlusal relationships.
- Eliminates the stimulus causing muscular hypertrophy.
- Allows for proper joint and mandibular function.



Vertical Dimension Theory

- The craniomandibular system is adaptive and can function in the presence of vertical change.
- When the change becomes excessive, and the adaptive capacity is overcome, pathology and dysfunction may result.
- Therefore, placing an appliance to restore a more normal vertical dimension of occlusion may cause a decrease in dysfunction.



Maxillo-Mandibular Realignment Theory

- Proposes that the mandible is malpositioned relative to the maxilla at the position of maximum intercuspation (centric occlusion).
- If the mandible is repositioned, a more optimum maxillo-mandibular relationship can be evolved, and the symptoms eliminated.



Oral Orthopedics Theory

- Malrelationship of the jaw effects the entire neuromuscular system, involving function of the head, neck, and shoulders.
- Advocates evaluation of head and neck posture as well as jaw relationships.
- Reposition the mandible with its condyles to produce an optimum neuromuscular balance as well as a bilateral condyle/fossae and jaw relationship.



MORA

- Developed by Dr. Harold Gelb.
- Hard acrylic appliance that covers the lower posterior teeth only.



Advantages of the MORA include:

- Ease of construction.
- Hygienic.
- Comfortable.
- Inconspicuous.
- Reversible.
- Phonetically and aesthetically acceptable.



The Muscle-Determined Position

- Treatment involves low frequency TENS to stimulate the 5th and 7th cranial nerves.
- Stimulation causes an automatic involuntary closure.
- Accomplishes a neuromuscularly controlled balanced muscle contraction.
- Determines a functionally correct occlusal position, compatible with a continued state of relaxation.



TEMPOROMANDIBULAR JOINT REPOSITIONING THEORY

Proposes that a change in the condylar position within the involved TMJ will improve joint function and relieve symptoms.



Anterior Repositioning for Treatment of Internal Derangements

(Variation of the Condylar Repositioning Theory)

- An internal derangement is an abnormal relationship of the disc (meniscus) to the condyle when the teeth are in the intercuspal position.
- Disc is placed anteriorly.
- Condyle is placed posteriorly.



ANTERIOR REPOSITIONING SPLINTS

- Move the mandible into an anterior position.
- Bring the condyle forward.
- Re-establish the correct condyle/disc relationship.
- Eliminate clicking.
- Relieve condylar pressure on the retro-discal tissues.



Anterior Repositioning Splints

- Function to keep the disc in place so that:
 - Soft tissue healing can occur.
 - The disc may recontour.
 - Osseous remodeling may occur.



COGNITIVE AWARENESS THEORY

States that the presence of any splint in the patient's mouth is a constant reminder to alter previous behavior patterns.



SPLINT THERAPY

THE CONCEPT

- A treatment that functions within the context of other treatment measures including:
 - Physical therapy.
 - Medication.
 - Psychological counseling.
 - Other branches of dental and medical care.



The Ideal Splint Should Be:

- Comfortable.
- Non-invasive.
- Reversible.
- Aesthetic.
- Retentive.
- Functional.



Proper Selection of Splint Type

- Depends on an individual's needs and requests.
- Depends on an accurate diagnosis.
- Muscular disorders without joint involvement have different requirements from internal derangements.
- Muscular derangements differ in extent of meniscus displacement, chronicity, and degree of pathologic tissue change.



BRUXISM

- Is defined as jaw clenching with or without forcible excursive movement, where the intensity of the clenching dictates the severity of tooth grinding.
- Is generally accepted to be one of the primary contributing factors in TMD.



Traditional Inter-Occlusal Splint Methods

- Specific design addresses lateral movement (grinding).
- Severity of symptoms is dictated by the intensity of vertical movement (clenching).



NTI

(Nociceptive Trigeminal Inhibition)

A new method and device that suppresses clenching intensity by exploiting the nociceptive trigeminal inhibition reflex and prevents canine (cuspid) and posterior tooth contact.