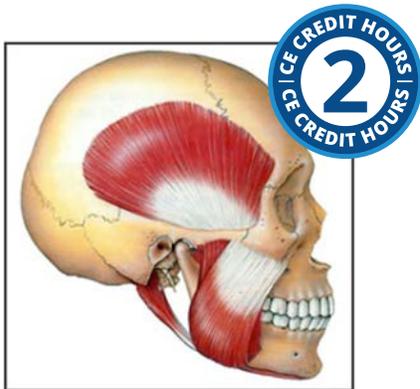


# The Detection and Management of Temporomandibular Disorders in Primary Dental Care



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**Disclaimer:** Participants must always be aware of the hazards of using limited knowledge in integrating new techniques or procedures into their practice. Only sound evidence-based dentistry should be used in patient therapy.

## Conflict of Interest Disclosure Statement

- Ms. Huggins had no conflicts of interest associated with this course.
- Dr. Wright has received royalties for authoring Manual of Temporomandibular Disorders, 3rd Edition. Ames, IA. Wiley Blackwell Publishing Co. 2014.

## Introduction - Temporomandibular Disorders

Most temporomandibular disorders (TMD) responds well to the general dentist's therapy, and self-management is one of the initial therapies they commonly provide. TMD self-management instructions encompasses very cost-effective procedures patients can perform for themselves to manage their symptoms. They are convenient and inexpensive, compared with patients going to practitioners' offices to receive therapy. Patients generally select and use the portions that they personally find most convenient and effective. Occlusal appliance therapy, behavioral therapy, and/or medications can provide additional benefit and can be provided in combination with the self-management or added later if the patient does not obtain satisfactory improvement from the self-instructions.

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## Overview

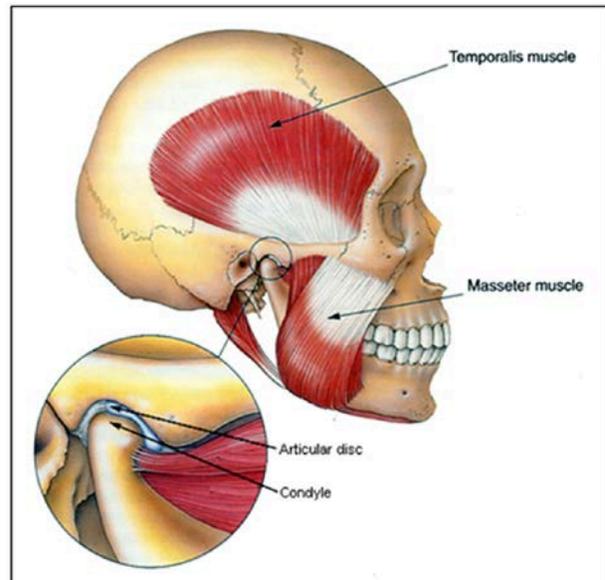
Temporomandibular Disorders (TMD) are a set of common musculoskeletal conditions of the masticatory system for which 3.6 to 7.0% of the general population desire treatment.<sup>1</sup> Females in their childbearing years are more likely to seek treatment for TMD symptoms.<sup>2</sup> Some patients with TMD may only have a single episode, while others may experience TMD with recurring episodes. For a significant minority of individuals, TMD is chronic and persistent.

Over the years this condition has been known by many names, including temporomandibular joint (TMJ), TMJ syndrome, craniofacial pain and others. The most commonly accepted name is TMD.<sup>1</sup> This course provides dentists, dental assistants, and dental hygienists with information about TMD, suggested patient history questions, clinical examination criteria, methods of treatment, and methods for helping patients self-manage their TMD pain and symptoms under the guidance of the dental professional.

## Learning Objectives

**Upon completion of this course, the dental professional should be able to:**

- Assess patients for potential TMD risk factors.
- Conduct a brief clinical examination for TMD.
- Apply clinical examination findings to determine patient's TMD diagnoses.
- List the most commonly used physical, medication, and behavioral treatment modalities for TMD.



**Figure 1.** Temporomandibular Joint.

- Implement a TMD treatment protocol, including TMD self-management strategies.

## Anatomy

### Muscles

The temporalis and the masseter muscles are the primary muscles used when eating or clenching the teeth and are the strongest among the muscles of mastication. TMD pain is primarily associated with pain in these muscles. The medial pterygoid muscles is also used to close the mandible, while the lateral pterygoid muscle pulls the mandible forward.

As is true of other muscles, the characteristics of jaw muscles can change in response to how they are used or overused. Exercise or lack of exercise and changes in patterns of use will affect the structure of these muscles as well as influence whether they perform their functions smoothly and whether these functions are accompanied by pain and discomfort. Jaw muscles that are overused (for example, through excessive muscle tension, clenching and bruxism) may feel tender, achy or “tight.” On the other hand, stretching and strengthening the muscles through controlled exercise can lead to increased flexibility and decreased discomfort.

## TMJ and Associated Structures

The TMJ is like a sliding “ball and socket” joint that allows smooth movement of the mandible during function. As the jaw opens, the condyle (the “ball”) rotates and glides along the glenoid fossa (the joint “socket”), and then slides back to its original position when the mouth closes.

To keep the jaw opening and closing motions smooth, a soft articular disc composed of cartilage lies between the condyle and the fossa. The articular disc acts as a pad or cushion for the TMJ during chewing and other movements. The joint contains synovial fluid, that keeps the TMJ well lubricated and nourished. The bony surfaces of the TMJ are covered by fibrocartilage that can be repaired or regenerated even after it has been damaged by disease or jaw injury. Sensory innervation comes from the mandibular branch of the trigeminal nerve.

## Prevalence, Epidemiology and Etiology

### Prevalence

TMD is the 2nd most common musculoskeletal pain, with low back pain being the first. About 33% of the population has at least one TMD symptom and 3.6 to 7.0% of the population has TMD with sufficient severity that they desire treatment.<sup>1,3</sup>

As seen in Figure 2, TMD varies with age and there are significant gender differences. In a large study of adults (1,016) conducted in Seattle, WA,<sup>2</sup> females had higher rates of TMD pain at all ages, including a peak prevalence of 18% in the 25-44 year old group, compared with 10% of males for the same ages. Since there is a decrease in prevalence after this age, this suggests TMD tends not to be a

painful life-long disorder. For example, in the aforementioned study, only 2% of females and no males reported TMD pain at 65 years of age and greater.

TMD, like many other chronic pain conditions such as headache and back pain, typically has cycles in which the pain and discomfort are present and then diminish or go away completely. For the vast majority of people, a recurrence of TMD does not indicate a more serious problem. Only a small percentage of people with TMD pain develop significant, long-term problems.

### Etiology

It is not always clear the reason a patient develops TMD symptoms, or what has caused an exacerbation of existing symptoms. As is true for all common chronic pain problems (e.g., common tension headache, low back pain) the scientific evidence overwhelmingly views these problems from a biopsychosocial perspective. The biopsychosocial model regards TMD as an integrated combination of biological, psychological, and social factors that interact together; TMD is not only a physical or biological condition. A thorough history, examination and patient observations that address these domains provide the information required to render a diagnosis and most appropriate treatments.

### Physical

Direct and indirect trauma to the face can cause TMD pain and symptoms. A direct blow to the face can cause pain and in some cases fracture of underlying bones. A motor vehicle accident, whether with direct or indirect trauma, can cause pain in the face. TMD symptoms can even be due to dental treatment, such as from a

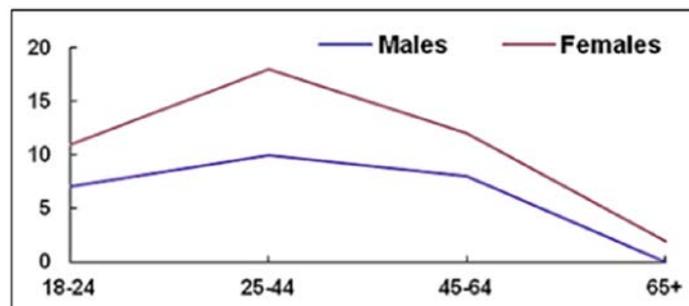


Figure 2. Six Month Prevalence Rate (%) of TMD Pain.

patient staying open for an extended period of time or from an inferior alveolar injection that caused trismus of the medial pterygoid muscle.

There are a number of local and systemic conditions that can cause resorption of the condyle, which can result in TMD related problems. Local pathologies include: osteoarthritis, reactive arthritis, infection, and traumatic injuries. There are many systemic conditions that can also cause condylar resorption, the more common of these connective tissue and autoimmune diseases include rheumatoid and psoriatic arthritis, lupus erythematosus, and Sjögren's syndrome. Additionally, scleroderma and ankylosing spondylitis can cause condylar resorption, as can infections as Lyme's disease. Another condition that affects the TMJ is idiopathic condylar resorption (ICR). ICR is also called idiopathic condylolysis, condylar atrophy and progressive condylar resorption.

Another cause for an abnormal condyle is congenital malformations of the condyle. Both hyperplasia (an overgrowth of the condyle) and hypoplasia (a shortened mandibular ramus and/or an underdeveloped condyle) can occur, but these generally do not predispose the patient to TMD.

Another potential contributing factor for TMD may occur from placing a restoration that is not in harmony with the rest of the patient's occlusion.<sup>3,4</sup> While a patient's natural occlusion is generally only a minor contributor to the etiology of TMD, changing a patient's natural occlusion (e.g., through orthodontics) does not provide the long-term TMD symptom benefit that would justify this.<sup>1</sup>

### **Behavioral**

Stress may cause or aggravate TMD. Most of us think of "stress" as an external situation (the "stressor") that causes us to have negative physical and emotional reactions, which may overwhelm a person's ability to cope effectively. If a stressful situation persists, or if a person has had a number of stressors over time, the body may develop a higher level of muscle tension, predisposing the person to TMD.

Some patients may clench or grind their teeth when they experience stress and this can result in sore jaw muscles and/or TMJs, and can also cause headaches. Some patients will feel physically or emotionally fatigued or "stressed" as a result of their pain, and this can reduce their ability to cope with the pain. This may lead to even more pain, which for some patients, becomes a cycle of pain, stress, tension, and fatigue. Thus, while it is difficult to know whether stress has caused a patient's TMD, stress generally makes TMD worse.

Nocturnal (nighttime) and diurnal (daytime) clenching and grinding can cause TMD pain and other symptoms. A patient may report clenching or grinding, or a dental examination may provide this indication through tooth attrition. For patients with significant tooth attrition, it is important to determine whether this attrition is associated with a current grinding habit, or if the attrition occurred in the past. Studies have not found significantly greater tooth attrition in patients with TMD and some patients exhibit very severe tooth attrition with no history of TMD pain or dysfunction.

Patients with cerebral palsy, dystonia, or Parkinson's disease may grind their teeth due to an associated movement disorder. These sustained muscle contractions can cause jaw muscle fatigue and pain. Additionally, patients with a severe dystonia may grind excessively resulting in severe tooth attrition.

There are many other types of "parafunctional habits" (using the jaw in ways other than its intended purpose) people engage in that can cause or exacerbate TMD. These habits may be repetitive movements (e.g., gum chewing, biting lips or cheek) or other habits (e.g., chewing on pencils, pens, and fingernails; shifting the jaw and holding it to one side; and continually popping the TMJ). Some patients with a Class II malocclusion will posture the jaw forward in order to have more of a Class I appearance, which can also lead to muscle fatigue. Frequently patients are unaware of the contribution a parafunctional habit has on their jaw muscle tension and fatigue.

## Common Signs and Symptoms of TMD

### TMD Pain

Pain is the most common complaint of TMD patients and more commonly occurs in the masticatory muscles, but can also occur in the TMJs or both.<sup>3</sup> Pain can be present at any time, even in the absence of any jaw activity. The pain intensity can be mild to severe and its duration can also vary considerably from momentary to constant. For some individuals there can be multiple episodes over weeks or months. For many patients the TMD pain eventually resolves, but for some patients the pain can persist for years.

### TMJ Sounds

Some patients have clicking, popping, and/or crepitus (a crunching sound similar to what is heard when one walks on wet sand at the beach) sounds when moving their condyle. These findings alone are not an indication that TMD treatment is necessary, in spite that most clicking or popping sounds are caused by the articular disc being displaced. Joint sounds generally occur from normal variations in the physical characteristics of the joint. There are many individuals with TMJ noises who do not have any TMD related pain. For example, in a large epidemiological survey of individuals with and without any current TMD pain, 25% of those without any pain had clicking during a

clinical examination.<sup>5</sup> In the same study, among the individuals with TMD pain, 40% had clicking on clinical examination. Crepitus was much less common and only occurred in fewer than 10% of the individuals, whether or not they had TMD pain. Crepitus is usually the result of either current or past arthritic activity within the TMJ.

### Limitation in Opening

The inability to open wide without pain is a common TMD patient complaint and clinical finding. Such limitation when opening may be the result of muscle hyperactivity or strain that prevents a patient from opening a normal distance. When measuring the opening distance, the incisal vertical overlap is added to the incisal edge-to-incisal edge measurement; 40 mm is considered minimum of normal for an adult of normal stature. In less frequent cases, limitation in opening can be caused by the articular disc being displaced and blocking the person from fully opening. In such cases, patients generally exhibit a deviation to one side upon opening and pain from the TMJ is generally present.

### Deviation in Opening

A deviation in opening is generally due to muscle tension or a displaced disc. There are various degrees of deviations and patterns that can occur.

**Table 1. TMD Symptoms and Features.**

Symptom	Feature
Pain	Most common complaint among patients with TMD. Present in muscles of mastication and/or TMJ.
TMJ sounds	Clicking or popping are discrete sounds. Crepitus (grating or grinding) is a more continuous sound.
Limitation in range of motion	Less than 40 mm opening. Less than 7 mm lateral movement.
TMJ catching or locking	Catching is typically brief and transient, multiple episodes can occur. Locking can last from a few seconds to weeks, may be continuous, and may occur as multiple episodes.

## TMJ Catching or Locking

Catching or locking within the TMJ may occur upon opening or closing and there are several potential causes for these. This interference to smooth condylar movement may vary from a momentary catching to a continuous lock. About 15% of individuals with TMD pain report that they have had at least one locking episode.<sup>5</sup>

## Patient History

A very brief screening questionnaire, such as the one below (Table 2) can help the clinician determine if a patient has a potential TMD problem.<sup>6</sup> This questionnaire can help identify dental patients who are at risk of aggravating their pre-existing pain from dental treatment.<sup>7</sup>

This brief screening questionnaire includes an assessment of pain, morning stiffness/pain, and whether specific jaw activities change the pain. Positive responses may warrant additional questions. There are numerous questions and questionnaires that have been recommended to elicit the TMD symptom history; they vary from brief to lengthy and many are available via the internet.

## TMD Clinical Examination

Patients who have positive responses to a brief screening questionnaire will potentially benefit from a clinical examination (Table 3). A brief clinical examination,<sup>8</sup> with the aid of an assistant, should only take a few minutes to complete. The examination and specifications below have been adapted from reliability and validity studies of TMD examinations and diagnostic criteria<sup>7</sup> and provide the key information to identify the patient's clinical diagnoses. This examination collects information about the patient's pain history, opening and excursive ranges of motion, joint sounds and pain on palpation of the masticatory muscles and TMJs.

## Brief Specifications for Conducting the Clinical Examination

1. Mandibular openings: use a millimeter (endodontic) ruler to measure from the incisal edge of the maxillary to mandibular central incisors, and adjust (add for incisal vertical overlap).

- a. Unassisted opening without pain: ask the patient to open as wide as possible without any (additional) pain.
  - b. Unassisted opening with pain: ask the patient to open as wide as possible in spite of causing pain.
  - c. Maximum assisted opening: ask the patient to open as wide as possible and apply a moderate amount of pressure to assist the patient to open wider.
2. Muscle Palpations: palpate the central portion of the temporalis and masseter muscles. Ask the patient to let you know when tenderness is felt; start with light pressure and increase up to 2-3 pounds. Stop as soon as tenderness is felt or 2-3 pounds is reached. If unable to reproduce the patient's pain, then palpate the entire muscle.
  3. TMJ Palpations: ask the patient to open about 1-1.5 inches and palpate the lateral pole up to 1 pound, in a similar manner as the muscles were palpated. Then palpate in a circle around the lateral pole with up to 2-3 pounds in a similar manner as the muscle palpations.
  4. TMJ sounds: place a finger over the TMJ as the patient opens, closes, and moves laterally. It can take up to three movements in each direction before a joint sound may be detected. To best detect joint sounds the patient should open fully, completely close and move in each direction as far as possible, even if pain is present.

The TMD evaluation is primarily based upon history and clinical evaluation, TMJ imaging is only performed if there is a reasonable expectation that the obtained additional information will influence the patient's treatment.<sup>3</sup> In some cases definitive imaging is needed. To determine the actual position of the articular disc, an MRI provides the best diagnostic information. The status of osseous structures such as the condyle, are best viewed with Cone Beam Computed Tomography (CBCT) imaging. A review and report by a radiologist, such as an oral and maxillofacial radiologist, is recommended.

There are other potential assessments that can be used, however, the choice of adjunctive

Table 2. TMD Screening Questionnaire.

<b>TMD Screening Questionnaire</b>	
1.	<b>In the last 30 days, on average, how long did any pain in your jaw or temple on either side last?</b> <ul style="list-style-type: none"><li>a. No pain</li><li>b. From very brief to more than a week, but it does stop</li><li>c. Continuous</li></ul>
2.	<b>In the last 30 days, have you had pain or stiffness in your jaw on awakening?</b> <ul style="list-style-type: none"><li>a. No</li><li>b. Yes</li></ul>
3.	<b>In the last 30 days, did the following activities change any pain (that is, make it better or make it worse) in your jaw or temple area on either side?</b> <ul style="list-style-type: none"><li>A. <b><i>Chewing hard or tough food:</i></b><ul style="list-style-type: none"><li>a. No</li><li>b. Yes</li></ul></li><li>B. <b><i>Opening your mouth or moving your jaw forward or to the side:</i></b><ul style="list-style-type: none"><li>a. No</li><li>b. Yes</li></ul></li><li>C. <b><i>Jaw habits such as holding teeth together, clenching, grinding or chewing gum:</i></b><ul style="list-style-type: none"><li>a. No</li><li>b. Yes</li></ul></li><li>D. <b><i>Other jaw activities such as talking, kissing or yawning:</i></b><ul style="list-style-type: none"><li>a. No</li><li>b. Yes</li></ul></li></ul>

**Table 3. TMD Clinical Examination Form.**

TMD Clinical Examination	
<b>Question</b>	<b>Yes or No</b>
A. Have you had pain in the face, jaw, temple, in front of the ear or in the ear in the past month?	
B. Have you ever had your jaw lock or catch so that it won't open all the way, and was this limitation in jaw opening severe enough to interfere with your ability to eat?	

Anytime during the exam the patient reports pain, ask if the pain is familiar, like the pain the patient has been experiencing.

**1. Mandibular movements (measured in millimeters).**

	mm Opening	Pain: Yes or No	Familiar: Yes or No
Unassisted Opening without pain		N/A	N/A
Unassisted Opening with pain			
Maximum Assisted Opening (passive stretch)			
Right Lateral Excursion	N/A		
Left Lateral Excursion	N/A		

**2. Pain on muscle palpations, conducted at 2-3 pounds of pressure.**  
 Temporalis includes: posterior, middle and inferior aspects  
 Masseter includes: origin, body and insertion

Muscle site	Pain: Yes or No	Familiar: Yes or No
Right Temporalis		
Left Temporalis		
Right Masseter		
Left Masseter		

**3. Pain on joint palpations, 1 lb. of pressure on the lateral pole and 2-3 pounds "around" the lateral pole.**

Joint site	Pain: Yes or No	Familiar: Yes or No
Right Lateral Pole		
Left Lateral Pole		
Right "around" the Lateral Pole		
Left "around" the Lateral Pole		

**4. Joint Sounds.**  
 Sounds are assessed by palpation. Coarse crepitus should also be audible 6 inches from the joint.

Joint site	Right Click: Yes or No	Left Click: Yes or No	Right Crepitus: Yes or No	Left Crepitus: Yes or No
Opening				
Closing				
Right Excursion				
Left Excursion				
Protrusion				

diagnostic procedures should be based upon published, peer-reviewed data showing diagnostic efficacy and safety.<sup>9</sup> Additionally, they should only be performed if there is a reasonable expectation that the obtained additional information will influence the patient's treatment.

Occasionally, but rarely, aggressive local pathology can present with signs and symptoms similar to TMD and all patients who are being evaluated for TMD should receive a careful and comprehensive head and neck assessment.

### Diagnostic Classifications

Results from the TMD clinical examination can be used to determine the patient's clinical diagnoses. The suggested diagnostic classification below (Table 4) provides a step-by-step approach that uses specific algorithms to determine a patient's diagnoses.<sup>7</sup> Only the most common diagnostic categories are provided.

#### Instructions:

1. Diagnoses are not mutually exclusive, so TMD patients generally have multiple diagnoses.
2. The term "altered" refers to either an aggravation or improvement, and "familiar pain" is the pain the patient is familiar with having.
3. The parentheses ( ) around a number refers to a Clinical Examination item in Table 3.

Most TMD patients will have a myalgia diagnosis because pain is the most common reason patients seek care and pain from the muscles is more common than from the TMJ. Disc displacement with reduction is fairly common, so many patients will also have co-occurring disc displacement with reduction. Many patients will also have a portion of their pain from the TMJ, so many will also have an arthralgia diagnoses, in which the TMD is from both the myalgia and the arthralgia. Hence, most TMD patients will have multiple TMD diagnoses.

### Common Treatments

For some people, TMD pain and limitations in jaw movement often diminish or go away with little or no treatment. Many patients can experience relief from their TMD symptoms

by observing for and changing oral behaviors and habits that can cause jaw muscle tension and fatigue. Other patients will benefit from physical medicine treatments and/or medications. The patient, under the direction of a dental professional, can in most cases self-manage their TMD. The American Association for Dental Research (AADR) Policy Statement on TMD therapy strongly recommends that, unless there are specific and justifiable indications to the contrary, treatment of TMD patients initially should be based on the use of conservative, reversible and evidence-based therapeutic modalities; they provide much less risk of producing harm.<sup>9</sup> These are therapies that cause no permanent changes to the TMJ or associated structures. The following are the most commonly used TMD treatment strategies.

### Managing Oral Behaviors

Patients should avoid opening their mouth wide and moving excessively from one side to another, instead use passive range of motion exercises to gently stretch tight jaw muscles. Intentionally popping or clicking the TMJ should also be avoided. The usual jaw position should be where the jaw muscles are relaxed so the teeth are slightly apart and the tongue is lightly resting just behind the maxillary or mandibular anterior teeth. Frequent self-monitoring and correcting the jaw position and ensuring no clenching or grinding activity is occurring, will help to decrease jaw muscle tension. Some simple diet modifications (e.g., smaller bites, soft diet, avoid opening wide, and avoid hard/crunchy/chewy foods) can also help to decrease jaw muscle tension and fatigue. Because caffeine is a stimulant, it is recommended patients limit their daily caffeine consumption to 8 ounces of normal brewed coffee, 2 cups of tea, or 12 ounces of soda.<sup>10</sup>

### Physical Treatments

Occlusal appliance therapy can help relax the muscles, decrease muscle tension and aid in habit control. Occlusal appliances (splints) are often used to treat TMD, and typically are hard acrylic or soft vinyl. The flat plane splint should cover all of the teeth in the arch and be adjusted to provide an ideal occlusion, otherwise there is a tendency for teeth to

Table 4. Diagnostic Classifications.<sup>7</sup>

Pain-related TMD Diagnoses
<p><b>Myalgia:</b> Pain in temporalis or masseter muscle altered by jaw movement, function, or parafunction <i>PLUS</i> Familiar pain when palpating either muscle (2) <i>OR</i> <b>Familiar pain during maximum unassisted or assisted opening (1).</b></p>
<p><b>Myofascial pain with referral, e.g., tooth pain from a masticatory muscle:</b> Referred pain altered by jaw movement, function, or parafunction <i>PLUS</i> Familiar pain brought on when palpating the temporalis or masseter muscle (2).</p>
<p><b>Arthralgia:</b> Pain in preauricular region altered by jaw movement, function, or parafunction <i>PLUS</i> Familiar pain when palpating the TMJ (2) <i>OR</i> Familiar pain during maximum unassisted opening, assisted opening, or excursive movements (1).</p>
TMJ Diagnoses
<p><b>Disc displacement with reduction:</b> History of TMJ noise <i>PLUS</i> Clicking or popping during opening and closing (4) <i>OR</i> Clicking or popping during opening or closing and during excursive movements (4).</p>
<p><b>Disc displacement with reduction with intermittent locking:</b> History of TMJ noise and the TMJ locks causing a limited opening and then unlocks <i>PLUS</i> Clicking or popping during opening and closing (4) <i>OR</i> Clicking or popping during opening or closing and during excursive movements (4).</p>
<p><b>Disc displacement without reduction with limited opening:</b> The TMJ is locked causing a limited opening, in which the opening limitation is severe enough to interfere with eating <i>PLUS</i> Maximum assisted opening is less than 40 mm (1).</p>
<p><b>Disc displacement without reduction without limited opening:</b> Previous history of the TMJ being locked with limited opening, in which the opening limitation was severe enough to interfere with eating <i>PLUS</i> Maximum assisted opening is 40 mm or greater (1).</p>
<p><b>Degenerative joint disease:</b> History of TMJ noise <i>PLUS</i> Crepitus present during maximum active opening, passive opening, or excursive movements (4).</p>

supraerupt. When the flat occlusal splint is made properly, no permanent changes in the bite usually result. Many patients with myalgia do very well using self-care strategies only, without a splint.<sup>10</sup> In a large study of patients with myalgia, there were no significant differences in self-reported pain, joint sounds or clinically detected pain whether a patient received a hard acrylic splint, a custom fit soft athletic mouthguard, or usual conservative self-care only without the use of any oral appliance.<sup>11</sup>

**Thermal Treatments**

Thermal treatments include applications of heat, cold, and alternating the two. Most patients find heat the most beneficial, but patients should try these and use whichever they find works the best. Patients should apply thermal packs 2 to 4 times a day. Heat pack (e.g., a dry or moist heating pad) should be applied for 15 to 20 minutes, while cold packs (e.g., bag of frozen peas wrapped in a towel) should be applied only until numbness is first felt (usually about 10 minutes). With the alternating technique, use heat for 5 minutes and cold until numbness is first felt.

**Passive Range of Motion Exercises**

This exercise helps to stretch the muscles without any additional pain or strain. Instructions to the patient are:

1. Open as wide as possible, without any additional pain, and hold open for about 10-15 seconds, then
2. Close about halfway and hold for 5 seconds, without touching the teeth, to rest; and then
3. Steps 1 and 2 are repeated. The patient can repeat the exercise 10-15 times, and perform this series 2-4 times per day.

**Medications**

The most commonly recommended medications for relief of TMD muscle and joint pain are over-the-counter non-steroidal anti-inflammatory drugs (NSAIDs). Dosage regimens vary depending on the NSAID, the pain’s intensity and type of pain the patient is experiencing. A physician consultation may be warranted if the dental professional is considering prescribing a NSAID on a long-term basis.

Non-narcotic analgesics such as acetaminophen may be recommended for TMD pain. Muscle relaxants may be prescribed for patients to take at bedtime, for those who awake with muscle pain. Low doses of tricyclic antidepressants are prescribed for TMD, at doses lower than what will treat depression, but at levels that are beneficial for musculoskeletal pain.<sup>3</sup>

**Behavioral Treatments**

Helping patients to identify, monitor and change parafunctional habits, such as the

**Table 5. Commonly Prescribed Medications.**

Symptom	Feature
Pain	Most common complaint among patients with TMD. Present in muscles of mastication and/or TMJ.
TMJ sounds	Clicking or popping are discrete sounds. Crepitus (grating or grinding) is a more continuous sound.
Limitation in range of motion	Less than 40 mm opening. Less than 7 mm lateral movement.
TMJ catching or locking	Catching is typically brief and transient, multiple episodes can occur. Locking can last from a few seconds to weeks, may be continuous, and may occur as multiple episodes.

ones mentioned above, can be very effective in decreasing muscle tension and pain. For patients who indicate they are stressed, it is helpful for them to identify the stressors and make a plan to reduce and manage them. It is not necessary for the dental professional to know about specific personal stressors, but to guide the patient to identify and manage the stress themselves. For patients who would like assistance with this, clinicians can recommend patients talk with their physicians about a referral to a psychologist who can assist.

Abdominal or “Tension Release” breathing and Progressive Muscle Relaxation (PMR) can be useful tools to help decrease generalized tension and stress, which in turn can help decrease facial muscle tension. Relaxation strategies are commonly used self-management techniques for the control of many pain conditions such as headache and back pain. A state of relaxation is thought to interrupt the body’s physical responses to stress, thus decreasing stress-induced tension and fatigue. With practice, people typically become more aware of when their muscles are tense and the patient can immediately relax their muscles. The patient can explore different techniques to determine which works best.

### **Infrequently Recommended Non-reversible Treatment**

Non-reversible and surgical interventions for TMD are rarely needed and can include repositioning splints, occlusal adjustments, and surgeries such as arthrocentesis, disc repositioning and joint replacement. It must be recognized that for some TMD patients, the self-management strategies provided above may not be sufficient, especially when there is a high pain intensity. In such cases, the dentist may consider a referral to a hospital or university-based TMD pain clinic—most dental schools have such a clinic and are well-suited to manage resistant cases of TMD, whether the resistance to treatment is associated with biologic and structural factors or behavioral and emotional factors.

### **Dental Professional Directed Patient Self-management Approach**

Once it has been determined that a patient needs TMD treatment, the dental professional

can work with the patient to primarily implement self-management, because few treatment strategies require in office hands-on procedures. Self-management of TMD can be very successful in decreasing TMD related pain and symptoms.<sup>10</sup> The dental professional establishes a self-management plan of care that focuses on areas of treatment that is specific to each patient. Many patients benefit from a written plan of care, such as the sample Patient Self-management Checklist, shown in Table 6. In addition to providing a checklist for self-management strategies, it is helpful to check with the patient after a few weeks to determine if they are using the checklist, any concerns, and ensure symptoms are improving. Patients can be seen in the dental office for follow-up and in some cases telephone check-in will be sufficient.

It must be recognized that for some TMD patients, the self-management strategies provided above may not be sufficient, especially when there is a high pain intensity. In such cases, the dentist may consider a referral to a hospital or university-based TMD pain clinic—most dental schools have such a clinic and are well-suited to manage resistant cases of TMD, whether the resistance to treatment is associated with biologic and structural factors or behavioral and emotional factors.

### **Conclusion**

TMD are common, more prevalent in women, and are conditions that dentists and dental hygienists are likely to encounter in everyday clinical practice. TMD can be caused or exacerbated by physical changes, stress and parafunctional jaw habits. TMD includes a constellation of symptoms, of which pain is the most common. Other symptoms include joint sounds, TMJ catching, limited jaw opening and deviation on opening. A brief screening history regarding pain and activities that make the pain worse can help determine if a patient has a potential TMD problem. A clinical examination that incorporates an assessment of pain and joint sounds on opening and excursive movements is recommended. The examination should also include palpations of the muscles of mastication and the TMJ, and findings from the clinical examination are used to determine the diagnoses. Dental professional recommended

conservative and reversible self-management treatment strategies are beneficial for most

patients, with very few patients requiring non-reversible treatment.

**Table 6. Sample Patient Self-management Checklist.**

**Monitor Habits and Behaviors:** Check Frequently/at Least 4 times/day

Clenching and grinding

Jaw posture

Other habits (chewing on pencils, pens, other)

**Diet Modification:**

Small bites/cut food up

Soft diet

Avoid crunchy, chewy and hard foods

**Stretching:**

Open as wide as possible without pain hold \_\_\_ sec, close halfway, rest 5 sec  
( \_\_\_ repetitions, \_\_\_ times/day)

**Thermal Pack:**

Apply [ ] cold pack or [ ] heat pack to areas of pain ( \_\_\_ minutes 2/day)

**NSAIDS:** \_\_\_ mg \_\_\_ times/day

**Splint Use:** [ ] nightly [ ] \_\_\_ hours/daytime

**Identify** and Reduce Stressors

**Breathing/Relaxation Exercises:** [ ] Abdominal Breathing [ ] PMR

## Course Test Preview

To receive Continuing Education credit for this course, you must complete the online test. Please go to: [www.dentalcare.com/en-us/professional-education/ce-courses/ce395/test](http://www.dentalcare.com/en-us/professional-education/ce-courses/ce395/test)

- 1. What percent of the population desires treatment for their TMD?**
  - A. 1 to 5
  - B. 3.6 to 7
  - C. 15.6 to 22
  - D. 35 to 43
- 2. TMD is most common among \_\_\_\_\_.**
  - A. children 2 to 5 years old
  - B. boys 8 to 12 years old
  - C. men 22 to 26 years old
  - D. women 25 to 44 years old (in their childbearing years)
- 3. The primary muscles involved in jaw function, and also the strongest of the muscles of mastication are the \_\_\_\_\_ and \_\_\_\_\_ muscles.**
  - A. Masseter/Frontalis
  - B. Frontalis/Temporalis
  - C. Temporalis/Masseter
  - D. Sternocleidomastoid/Masseter
- 4. There are many potential treatments for TMD, which treatment is not warranted?**
  - A. Providing TMD self-management instructions
  - B. Providing coping strategies to decrease the impact of stress
  - C. Providing orthodontics
  - D. Helping the patient to decrease oral parafunctional habits
- 5. Which conditions can cause condylar resorption?**
  - A. Rheumatoid arthritis
  - B. Psoriatic arthritis
  - C. Lupus Erythematosus
  - D. All of the above.
- 6. In a normal healthy TMJ, \_\_\_\_\_.**
  - A. the condyle rotates
  - B. the condyle translates
  - C. there is a disc between the condyle and fossa
  - D. All of the above.
- 7. The most common complaint among TMD patients is \_\_\_\_\_.**
  - A. joint sounds
  - B. limited jaw opening
  - C. pain
  - D. tooth wear
- 8. What treatment must be provided for all clicking TMJs that are not painful or causing catching?**
  - A. TMJ surgery
  - B. Orthodontics
  - C. Orthognathic surgery
  - D. No treatment is indicated.

9. **The most common cause of TMJ clicking is \_\_\_\_\_.**  
A. eating a soft diet  
B. a displacement of the articular disc  
C. an overbite  
D. a perforated articular disc
10. **Crepitus (a grating sound) is present when \_\_\_\_\_.**  
A. the masseter muscles have been overused  
B. the lateral pterygoid muscle is in spasm  
C. there has been arthritic activity within the TMJ  
D. None of the above.
11. **A TMD screening questionnaire may include questions about \_\_\_\_\_.**  
A. assessment of TMD pain  
B. morning pain or stiffness  
C. jaw activities that change the pain  
D. All of the above.
12. **How many millimeters is the minimum of normal opening for an adult of normal stature?**  
A. 20  
B. 30  
C. 40  
D. 50
13. **Which muscles are palpated in a TMD Clinical Examination?**  
A. Masseter  
B. Buccinator  
C. Temporalis  
D. A and C
14. **Most TMD patient have \_\_\_\_\_.**  
A. only a single TMD diagnosis  
B. multiple TMD diagnoses  
C. a psychiatric diagnosis  
D. None of the above.
15. **What is the most common TMD diagnosis?**  
A. ankylosis  
B. myalgia  
C. arthritis  
D. arthralgia
16. **The American Association for Dental Research recommends that patients be first treated with \_\_\_\_\_.**  
A. conservative reversible therapies  
B. irreversible therapies  
C. full mouth reconstruction  
D. orthodontics

- 17. For how long should heat packs be applied?**
- A. 1 to 2 minutes
  - B. 15 to 20 minutes
  - C. 2 to 3 hours
  - D. 24 hours a day
- 18. The most commonly recommended medication for TMD symptoms is \_\_\_\_\_.**
- A. Percocet
  - B. Benzodiazepine
  - C. Over-the-counter NSAIDs
  - D. Tricyclic antidepressants (TCAs)
- 19. The Passive Range of Motion Exercise includes \_\_\_\_\_.**
- A. opening without pain
  - B. holding open 10-15 seconds
  - C. resting halfway open for 5 seconds
  - D. All of the above.
- 20. The Dental Professional Directed Patient Self-management includes \_\_\_\_\_.**
- A. self-management strategies tailored to the patient
  - B. a checklist of self-management strategies for the patient to implement
  - C. follow up with the patient would be helpful
  - D. All of the above.

## References

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## Additional Resources

- Wright EF. Manual of Temporomandibular Disorders. 3rd ed. Wiley Blackwell Publishing Co, Ames, IA, 2014.
- American Academy of Orofacial Pain. de Leeuw R, Klasser GD. (eds) Orofacial Pain: Guidelines for Assessment, Diagnosis and Management. 6th ed. Chicago: Quintessence Publishing Co, 2018.

## About the Authors

### Kimberly Hanson Huggins, RDH, BS



*The staff at P&G Professional Oral Health expresses our condolences regarding the loss of Kimberly Hanson Huggins, RDH on January 20, 2014. She was instrumental in several research projects in temporomandibular disorders and oral facial pain, pediatric dentistry, and delivering oral health care to populations with special needs while at the University of Washington, School of Dentistry. We will miss her.*

Ms. Huggins was a Research Manager and Affiliate Instructor of the Temporomandibular Disorder (TMJ) and Facial Pain research program in the Department of Oral Medicine, School of Dentistry, University of Washington. She participated in the development of clinical research protocols for many different research studies. She was an expert on the implementation of clinical research studies and the development of documents and processes that inform the Human Subjects aspects of this research. She participated in research data acquisition, data analysis, and preparation of research manuscripts. She was also the Principal Investigator of an NIDCR PRECEDENT (Practice Based Research Network) survey of dentists and their attitudes and beliefs related to patients with special needs. She conducted NIDCR funded research related to TMD and other facial pain conditions since 1985.

### Edward F. Wright, DDS, MS



Dr. Wright received his dental degree from Case Western Reserve University in 1977, completed a 1-year Advanced Clinical Dentistry Program in 1988, completed a 2-year TMJ and Craniofacial Pain Program in 1994, and completed a 2-year Dental Research Fellowship in 2003. From 1994 to 2001, he was the head Air Force dentist for TMD and on the staff at Lackland AFB's 2-year general dentistry residency program. He is the author of the book "Manual of Temporomandibular Disorders," which is in its 3rd edition and has been translated into Spanish, Chinese and Korean. Dr. Wright provides the TMD training for UTHSCSA's predoctoral students, and AEGD, Prosthodontics, Periodontics, and Orthodontics residents. He is the UTHSCSA's Module Director for the TMD Module, Orofacial Pain Module, and Dental Anatomy and Occlusion Module, and Course Director for their Occlusion and TMD Course. Dr. Wright is the primary author of over 90 publications, Past-President of the American Academy of Orofacial Pain, and one of the Board of Directors of the American Board of Orofacial Pain.

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