Temporomandibular Joint Dysfunction

Description

Temporomandibular joint (TMJ) disorder refers to a group of disorders and syndromes characterized by pain in the TMJ and surrounding tissues. Initial conservative therapy is generally recommended; there are also a variety of non-surgical and surgical treatment possibilities for patients whose symptoms persist.

Background

Temporomandibular joint (TMJ) dysfunction (also known as TMJ disorders) refers to a cluster of problems associated with the temporomandibular joint and musculoskeletal structures. The etiology of TMJ disorders remains unclear and is believed to be multifactorial. TMJ disorders are often divided into two main categories: articular disorders (e.g., ankylosis, congenital or developmental disorders, disc derangement disorders, fractures, inflammatory disorders, osteoarthritis and joint dislocation) and masticatory muscle disorders (e.g., myofacial pain, myofibrotic contracture, myospasm, and neoplasia).

There are no generally accepted criteria for diagnosing TMJ disorders. It is often a diagnosis of exclusion and involves physical examination, patient interview, and dental records review. Diagnostic testing and radiologic imaging are generally only recommended for patients with severe and chronic symptoms.

Symptoms attributed to TMJ dysfunction are varied and include but are not limited to clicking sounds in the jaw; headaches; closing or locking of the jaw due to muscle spasms (trismus) or displaced disc; pain in the ears, neck, arms, and spine; tinnitus; and bruxism (clenching or grinding of the teeth).

For many patients, symptoms of TMJ dysfunction are short-term and self-limiting. Conservative treatments, such as eating soft foods, rest, heat, ice, and avoiding extreme jaw movements, and anti-inflammatory medication, are recommended prior to consideration of more invasive and/or permanent therapies, such as surgery.

Note: Low-level laser therapy for TMJ is addressed in policy 2.01.56 Low-Level Laser Therapy and botulinum toxin is addressed in policies 5.12.01, 5.75.01, 5.75.02 and 5.75.03.
Regulatory Status

Several muscle monitoring devices have received clearance from the U.S. Food and Drug Administration (FDA) through the 510(k) process since 1981. Some examples of these devices are: the K6-I Diagnostic System (Myotronics), the BioEMG III™ (Bio-Research Associates), and the GrindCare Measure (Medotech A/S). These devices aid clinicians in the analysis of joint sound, vibrations, and muscle contractions when diagnosing and evaluating TMJ dysfunction. FDA Product Code: KZM.

Related Policies

1.01.09 Transcutaneous Electrical Nerve Stimulation (TENS)
2.01.56 Low-level Laser Therapy
7.01.29 Percutaneous Electrical Nerve Stimulation (PENS) and Percutaneous Neuromodulation Therapy (PNT)

Policy

*This policy statement applies to clinical review performed for pre-service (Prior Approval, Precertification, Advanced Benefit Determination, etc.) and/or post-service claims.

The following diagnostic procedures may be considered medically necessary in the diagnosis of TMJ dysfunction:

- Diagnostic x-ray such as tomograms and arthrograms;
- Computed tomography (CT) scan or magnetic resonance imaging (MRI) (in general, CT scans and MRIs are reserved for pre-surgical evaluations);
- Cephalograms (x-rays of jaws and skull); and
- Pantograms (x-rays of maxilla and mandible).
(Cephalograms and pantograms should be reviewed on an individual basis.)

The following diagnostic procedures are considered investigational in the diagnosis of TMJ dysfunction:

- Electromyography (EMG), including surface EMG;
- Kinesiology;
- Thermography;
- Neuromuscular junction testing;
- Somatosensory testing;
- Transcranial or lateral skull x-rays; Intra-oral tracing or gothic arch tracing (intended to demonstrate deviations in the positioning of the jaws that are associated with TMJ dysfunction);
- Muscle testing;
- Standard dental radiographic procedures;
- Range of motion measurements;
- Computerized mandibular scan (this measures and records muscle activity related to movement and positioning of the mandible and is intended to detect deviations in occlusion and muscle spasms related to TMJ dysfunction);
- Ultrasound imaging/sonogram; and
• Arthroscopy of the TMJ for purely diagnostic purposes.

The use of joint vibration analysis for the purpose of diagnosis of TMJ dysfunction is considered not medically necessary.

The following nonsurgical treatments may be considered medically necessary in the treatment of TMJ dysfunction:
• Intra-oral removable prosthetic devices/appliances (encompassing fabrication, insertion, and adjustment).
• Pharmacologic treatment (such as anti-inflammatory, muscle relaxing, and analgesic medications).

The following nonsurgical treatments are considered investigational in the treatment of TMJ dysfunction:
• Electrogalvanic stimulation;
• Iontophoresis;
• Ultrasound;
• Devices promoted to maintain joint range of motion and to develop muscles involved in jaw function;
• Orthodontic services;
• Dental restorations/prostheses;
• Transcutaneous electrical nerve stimulation (TENS);
• Percutaneous electrical nerve stimulation (PENS);
• Acupuncture;
• Hyaluronic acid

The following surgical treatments may be considered medically necessary in the treatment of TMJ dysfunction:
• Arthrocentesis;
• Manipulation for reduction of fracture or dislocation of the TMJ;
• Arthroscopic surgery in patients with objectively demonstrated (by physical examination or imaging) internal derangements (displaced discs) or degenerative joint disease who have failed conservative treatment;
• Open surgical procedures (when TMJ dysfunction is the result of congenital anomalies, trauma, or disease in patients who have failed conservative treatment) including, but not limited to arthroplasties; condylectomies; meniscus or disc plication and disc removal.

Benefit Application

The BCBS FEP contract excludes coverage for biofeedback. Consequently, the policy statements do not address biofeedback.

The BCBS FEP contract stipulates that FDA-approved biologics, drugs and certain devices may not be considered investigational when used for their intended purpose and thus these products may only be assessed based on medical necessity.
Rationale

Literature Review

Literature searches have concentrated on identifying systematic reviews and meta-analyses. The focus for treatment of temporomandibular (TMJ) disorders has been on studies that compared novel treatments to conservative interventions and/or placebo controls (rather than no-treatment control groups) and that reported pain reduction and/or functional outcomes, e.g., jaw movement.

Diagnosis of temporomandibular dysfunction

Several systematic reviews of the literature on specific techniques for diagnosing TMJ were identified and are described below.

Ultrasound

A 2009 systematic review identified 20 studies evaluating ultrasound for diagnosing TMJ disorders; all studies evaluated disc displacement and several additionally considered osteoarthrosis and/or joint effusion. (1) The reported sensitivity of ultrasound to detect disc displacement, compared to the reference standard (MRI in the majority of studies), ranged from 31-100%, and the specificity ranged from 30-100%. The investigators stated that, even when changes in ultrasound technology over time were taken into consideration, study findings were contradictory. They noted unexplained differences between studies conducted by the same group of researchers. The authors concluded that additional progress needs to be made in standardizing ultrasound assessment of the TMJ joint before this can be considered an accurate tool for diagnosing TMJ disorders.

Surface Electromyography

The authors of a 2006 systematic review on surface electromyography found a lack of literature on the accuracy of this method of diagnosis, compared to a gold standard (i.e., comprehensive clinical examination and history-taking). (2) They concluded that there is insufficient evidence that electromyography can accurately separate individuals with facial pain from those without pain but that the technique may be useful in a research setting.

Joint Vibration Analysis

In 2013, Sharma and colleagues published a systematic review of literature on joint vibration analysis for diagnosis of TMJ disorders. (3) The authors identified 15 studies that evaluated the reliability and/or diagnostic accuracy of joint vibration analysis compared to a reference standard. Methodological limitations were identified in all the studies. These limitations included the absence of well-defined diagnostic criteria, use of a non-validated system for classifying disease progression, variability within studies in the reference standard, and lack of blinding. In the 14 studies reporting on diagnostic accuracy, there was a wide range of reported values, with sensitivity ranging from 50-100% and specificity ranging from 59-100%.
A 2010 article by List and Axelsson was a review of systematic reviews on treatments for TMJ dysfunction published through August 2009 (4). The authors identified 30 reviews; there were 23 qualitative systematic reviews and 7 meta-analyses. Eighteen of the systematic reviews included only randomized controlled trials (RCTs), 3 included case-control studies, and 9 included a mixture of RCTs and case series. There was inconsistency in how TMJ disorders were defined in the primary studies and systematic reviews, and several of the reviews addressed the related diagnoses of bruxism, disc displacements, and myofascial pain. Twenty-nine of the systematic reviews had pain intensity or pain reduction as the primary outcome measure, and 25 reported clinical outcome measures such as jaw movement or jaw tenderness on palpation. The authors divided the treatments into 5 categories (some studies were included in more than 1 category). These categories and the main findings are as follows:

1. Occlusal appliances, occlusal adjustment, and orthodontic treatment (10 articles): Six systematic reviews did not find significant benefit compared to other treatments, 4 found no benefit compared to a placebo device, and 3 found that occlusal therapy was better than no treatment.

2. Physical treatments including acupuncture, transcutaneous electrical nerve stimulation (TENS), exercise, and mobilization (8 articles): Four reviews found no significant benefit of acupuncture over other treatments, 1 found no difference between acupuncture and placebo treatment, and 3 found that acupuncture was better than no treatment. One review found that active exercise and postural training were effective for treating TMJ-related pain.

3. Pharmacologic treatment (7 articles): Treatments found to be superior to placebo were analgesics (2 reviews), clonazepam or diazepam (3 reviews), antidepressants (4 reviews) and hyaluronate (1 review). The last review also found hyaluronate and corticosteroids to have a similar effect.

4. Maxillofacial surgery (4 articles): Three reviews evaluated surgery for patients with disc displacements and the fourth addressed orthognathic surgery in patients with TMJ disorder. Reviews of surgical treatments generally included lower level evidence (e.g., case series), and did not always compare surgery with a control condition. One review of patients with disc displacements with reduction reported similar treatment effects for arthrocentesis, arthroscopy, and disectomy, and another review in patients in disc displacement without reduction found similar effects of arthrocentesis, arthroscopy, and physical therapy (used as a control intervention). Due to the lack of high-quality controlled studies, conclusions cannot be drawn about intervention equivalence.

5. Behavioral therapy and multimodal treatments (6 articles): Two reviews found biofeedback to be better than active control or no treatment, 1 review found a combination of biofeedback and cognitive-behavioral therapy to be better than no treatment, and 2 found a combination of biofeedback and relaxation to be better than no treatment. One review found that the effects of biofeedback and relaxation were similar.

Overall, the authors concluded that there is insufficient evidence that electrophysical modalities and certain types of surgery are effective for treating TMJ dysfunction. They found some evidence that occlusal appliances, acupuncture, behavioral therapy, jaw exercise, postural training, and some medications can be effective in reducing pain for patients with TMJ disorders. However, the authors note that most of the systematic reviews they examined included primary studies with considerable variability in methodology and outcome measures.
variation in methodologic quality, and thus, it is not possible to make definitive conclusions about the effectiveness of any of the treatments.

Representative systematic reviews and meta-analyses on specific treatments for TMJ disorders are summarized below:

**Intra-oral appliances/devices**

A 2010 systematic review searched for RCTs on intraoral treatment of TMJ disorders and identified 47 publications on 44 trials. (5) Intraoral appliances included soft and hard stabilization appliances, anterior positioning appliances, anterior bite appliances, and soft resilient appliances. Studies compared 2 types of devices or compared one device to a different treatment, e.g., acupuncture or biofeedback. None of the studies evaluated use of one device during the day and a different device during the night. The primary outcome of the meta-analysis was pain. Pain was measured differently in the studies, and the authors defined a successful outcome as at least a 50% reduction in pain on a self-report scale or at least an “improved” status when pain was measured by subjective report of status. Ten RCTs were included in a meta-analysis; the others were excluded because they did not measure pain, there were not at least 2 studies using similar devices or control groups or data were not usable in a pooled analysis. A pooled analysis of 7 RCTs with 385 patients evaluating hard stabilization appliances and using palatal non-occluding appliances as a control found a significantly greater reduction in pain with hard appliances (odds ratio [OR]: 2.45, 95% CI: 1.56 to 3.86, p=0.0001). A pooled analysis of 3 studies with 216 patients did not find a significant effect of hard appliances compared to a no-treatment control group, OR: 2.14 (95% CI: 0.80 to 5.75, p=0.12), p=0.86.

**Stabilization Splints**

In 2012, Ebrahim and colleagues identified 11 RCTs comparing splint therapy for TMJ to minimal or no therapy. (6) Nine of the 11 studies used stabilization splints, 1 used soft splints and 1 used an anterior repositioning appliance. The authors used the GRADE system to rate study quality. Nine studies did not report whether allocation was concealed and 6 studies did not report masking of outcome assessors. Length of follow-up in the studies ranged from 6 to 52 weeks. A pooled analysis of study findings found that splint therapy was significantly associated with a reduction in reported pain compared to minimal or no intervention (SMD: -0.93, 95% CI: -1.33 to -0.53). Using a visual analogue scale to measure pain, splint therapy was associated with an 11.5mm lower mean VAS score (95% CI: -16.5 to -6.6mm). There were not statistically significant differences between groups in quality of life or depression scores. An earlier meta-analysis by Al-Ani and colleagues, published in 2004, identified 12 RCTs that compared stabilization splint therapy for TMJ dysfunction to a control intervention. (7) (The control group was not limited to minimal or no intervention as in the Ebrahim review, described above). There was wide variability in the comparison interventions and no standardization of outcomes; thus, results of the studies were not pooled.

**Acupuncture**

A 2011 meta-analysis identified 7 sham-controlled RCTs on acupuncture for treating TMJ disorders. (8) The studies included a total of 141 patients. Sample sizes of individual studies ranged from 7 to 28. Four studies used a single acupuncture session, and the other 3 used 6-12 sessions. All 7 studies reported change in pain intensity as assessed by a visual analogue scale (VAS). In 6 of the studies,
pain intensity was measured immediately after treatment, the 7th measured pain after 16 weeks. A pooled analysis of findings from 5 studies (n=107) found a statistically significant improvement in pain intensity, as measured by a VAS. The pooled weighted mean difference (WMD) in pain intensity was -13.63 (95% confidence interval [CI]: -21.16 to -6.10, p=0.0004). In a sub-group analysis, a pooled analysis of 4 studies (n=89) found acupuncture to be superior to a non-penetrating sham acupuncture, WMD: -13.73, 95% CI:-21.78 to -5.67, p=0.0008. A pooled analysis of 2 studies (n=18) did not find a significant difference in efficacy between acupuncture and a penetrating sham acupuncture, WMD: -12.95, 95% CI:-34.05 to 8.15, p=0.23. The latter analysis may have been underpowered. The authors noted that previous studies have found that a 24.2 mm change in pain assessed by a 100 mm VAS represents a clinically significant difference and that only 2 of the included studies had a change of 24.2 mm or more. The evidence on acupuncture is limited by the small number of studies, small sample sizes, and, in most studies, assessment of effectiveness only immediately post-treatment.

Orthodontic Services

A 2010 Cochrane review by Luther and colleagues did not identify any RCTs evaluating orthodontic treatment for treating TMJ disorders and thus concluded that there is insufficient evidence on the efficacy of orthodontics. They defined orthodontic treatment as appliances that would induce stable tooth movement for a sufficient period of time to bring about permanent change in tooth position.

Hyaluronic Acid

There are several systematic reviews of studies on hyaluronic acid for treating TMJ disorders. Only 1 of the systematic reviews limited its inclusion criteria to RCTs and pooled study findings. This was a Cochrane review by Shi et al, published in 2003. The Shi review included RCTs comparing the effect of at least 1 hyaluronic acid injection alone or in combination with other active treatments with placebo or glucocorticoid injections alone or in combination with the same active treatment group. A total of 7 studies met inclusion criteria; 3 studies compared hyaluronic acid with placebo, 3 studies compared hyaluronic acid with glucocorticoids, and 2 studies compared hyaluronic acid plus arthroscopy or arthrocentesis with arthroscopy or arthrocentesis alone. (One study included 3 arms and was included in the first 2 comparisons.) Five of the 7 studies included fewer than 50 participants.

Outcomes were categorized as symptoms, which reflected subjective feeling and the judgment of the patients, and clinical signs, which reflected objective judgment of the observer. A meta-analysis of 2 trials did not find a statistically significant difference between hyaluronic acid and placebo on short-term (<3 months) improvement in symptoms (risk ratio [RR], 1.24; 95% CI, 0.72 to 2.14). Similarly, a pooled analysis of 3 trials did not find a significant difference between hyaluronic acid and placebo on short-term improvement of clinical signs (RR=1.69; 95% CI, 0.80 to 3.57). However, a pooled analysis of 2 studies found a statistically significant between-group difference in long-term effect on clinical signs (RR=1.71; 95% CI, 1.05 to 2.77) (long-term was defined as ≥3 months). For the comparison between hyaluronic acid and glucocorticoids, only short-term data were available for pooling. There were no significant differences between groups on short-term improvement in symptoms (2 studies; RR=0.99; 95% CI, 0.84 to 1.17) or short-term improvement in clinical signs (3 studies; RR=0.91; 95% CI, 0.66 to 1.25). Data were not pooled for studies on combination treatment (hyaluronic acid plus arthroscopy or arthrocentesis). The investigators found that there is insufficient consistent evidence to draw conclusions on use of hyaluronate for treating patients with TMJ disorders.
Most published RCTs evaluating hyaluronic acid for treating TMJ disorders had small sample sizes, short follow-up times, and/or lack of blinding. Representative RCTs published through May 2012 are described next. RCTs with larger sample sizes and stronger methodology were selected for description.

A 2012 study by Manfredini et al in Italy randomized 72 patients with TMJ dysfunction to 1 of 6 treatment groups: (1) single-session arthrocentesis alone; (2) single-session arthrocentesis plus corticosteroid; (3) single-session arthrocentesis plus low-molecular-weight hyaluronic acid; (4) single-session arthrocentesis plus high-molecular-weight hyaluronic acid; (5) 5 weekly arthrocenteses plus low-molecular-weight hyaluronic acid; or (6) 5 weekly single-needle arthrocenteses plus low-molecular-weight hyaluronic acid. (13) A total of 60 of 72 (83%) participants completed the study (between 9 and 12 patients per treatment group). In a per-protocol analysis, there were no significant differences among groups on any of the outcome variables at the 3-month follow-up. For example, the percentage change (SD) in pain at rest ranged from -29.1% (62.9%) in the group receiving 5 weekly single-needle arthrocenteses plus low-molecular-weight hyaluronic acid to -38.4% (56.5%) in the group receiving a single session of arthrocentesis alone. Limitations of the study include the small number of patients in each treatment group and the substantial number of dropouts in absence of an ITT analysis.

A 2007 study by Bjornland et al in Norway published a double-blind RCT that included 40 patients with osteoarthritis of the TMJ. (14) Patients received 2 injections, 14 days apart, of either sodium hyaluronate or corticosteroids. Pain was assessed using VAS from 0 to 100. Patients were followed for 6 months (assessed at 14 days, 1 month, and 6 months). There was a statistically significant reduction in pain within each group at all follow-up points. At the 6-month follow-up, pain intensity (mean [SD] VAS score) was 14 (16) in the hyaluronic acid group and 31 (32) in the corticosteroid group; the difference was statistically significant (p<0.001). The number of patients who were pain-free at 6 months was 7 (35%) of 20 in the hyaluronic acid group and 6 (30%) of 20 in the corticosteroid group (p value not reported).

In 1993, Bertolami et al published a double-blind placebo-controlled trial that included 121 TMJ patients. (15) Patients needed to have a confirmed diagnosis of degenerative joint disease (DJD), reducing displaced disc (DDR) or nonreducing displaced disc (DDN), failure of other nonsurgical treatments, and severe dysfunction. Patients received a single injection of sodium hyaluronate or saline and were followed for 6 months. A total of 80 patients were randomized to the hyaluronate group and 41 to the placebo group. This included a total of 57 patients in the DJD group, 50 patients in the DDR group, and 14 patients in the DDN group. Fourteen of 121 (12%) patients were excluded from the analysis because they did not meet eligibility criteria. No significant differences in outcomes were seen for the DJD group. In the DDN group, there were significant between-group differences through 1 month, favoring the hyaluronic acid group. The number of patients in the DDN group who completed follow-up after 1 month was insufficient to draw meaningful conclusions about efficacy. In the DDR group, there were no statistically significant differences between groups in any outcome at 1 or 2 months. At 3 and 6 months, 2 of 7 reported outcomes were significantly better in the hyaluronic acid group than in the placebo group. At 5 months, 5 of 7 reported outcomes were significantly better in the hyaluronic acid group. The 7 outcomes included 3 measures of dysfunction, 2 measures of patient perception of improvement, and 2 measures of change in noise. The most consistent between-
group differences in the DDR group were for the 2 measures of patient perception of improvement and one of the noise variables. There were fewer between-group differences on dysfunction measures.

Surgery

A Cochrane review by Guo and colleagues, last updated in 2009, identified two RCTs with a total of 81 patients that evaluated the effectiveness of arthrocentesis and lavage for the treatment of TMJ dysfunction. (16) Data were pooled only for the outcome maximum incisal opening. A meta-analysis of the 2 trials found a WMD of -5.28 (95% CI: -7.10 to -3.46) in favor of arthroscopy compared to arthrocentesis. The authors concluded there was insufficient evidence from high-quality RCTs to draw conclusions about the effectiveness of arthrocentesis.

In a 2013 systematic review, Vos and colleagues identified 3 RCTs with a total of 222 patients comparing the efficacy of lavage of the TMJ (i.e., arthrocentesis or arthroscopy) to non-surgical TMJ treatment. (17) Although they assessed the quality of the studies to be adequate, only 1 study stated that allocation to treatment group was concealed and 2 studies did not explicitly state that an intention-to-treat analysis was used.

The 2 primary outcomes considered were change in pain and maximal mouth opening (MMO) at 6 months compared to baseline. Pain was measured by a visual analogue scale (VAS). Pooled analysis of data from the 3 trials found a statistically significant reduction in pain at 6 months with lavage versus non-surgical therapy (SMD: -1.07, 95% CI: -1.38 to -0.76). There was not a statistically significant difference in the efficacy of the 2 treatments for the other outcome variable, MMO (SMD: -0.05, 95% CI: -0.33 to 0.23).

Ongoing and Unpublished Clinical Trials

Some currently unpublished trials that might influence this review are listed in Table 1.

<table>
<thead>
<tr>
<th>NCT No.</th>
<th>Trial Name</th>
<th>Planned Enrollment</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCT02144233</td>
<td>Restoring Masticatory Function as Treatment for Chronic Pain: a Randomized Placebo-controlled Trial</td>
<td>110</td>
<td>Jul 2016</td>
</tr>
<tr>
<td>Unpublished</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCT02397070</td>
<td>Effectiveness of a Jaw Exercise Program in Temporomandibular Disorder Patients</td>
<td>30</td>
<td>Jul 2015</td>
</tr>
</tbody>
</table>

NCT: national clinical trial.
Practice Guidelines and Position Statements

American Association for Dental Research
A policy statement, revised in 2010 and reaffirmed in 2015, recommends the following for the diagnosis and treatment of TMJ disorders (18):

“It is recommended that the differential diagnosis of TMDs [temporomandibular disorders] or related orofacial pain conditions should be based primarily on information obtained from the patient's history, clinical examination, and when indicated, TMJ radiology or other imaging procedures. The choice of adjunctive diagnostic procedures should be based upon published, peer-reviewed data showing diagnostic efficacy and safety. However, the consensus of recent scientific literature about currently available technological diagnostic devices for TMDs is that except for various imaging modalities, none of them shows the sensitivity and specificity required to separate normal subjects from TMD patients or to distinguish among TMD subgroups...."

“It is strongly recommended 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. Studies of the natural history of many TMDs suggest that they tend to improve or resolve over time. While no specific therapies have been proven to be uniformly effective, many of the conservative modalities have proven to be at least as effective in providing symptomatic relief as most forms of invasive treatment...."

American Society of Temporomandibular Joint Surgeons
Consensus clinical guidelines, published in 2001, focus on TMJ associated with internal derangement and osteoarthritis. (19) For diagnosis of this type of TMJ dysfunction, a detailed history and, when indicated, general physical examination are recommended. Imaging of the TMJ and associated structures is also recommended. Options for basic radiography to provide information on temporal bone and condylar morphology include use of plain films, panoramic films, and tomograms. Also recommended is imaging of the disc and associated soft tissue with MRI or arthrography. Other diagnostic procedures that may be indicated include computed tomography, MRI, arthrography (for selected cases) and isotope bone scans.

Nonsurgical treatment should be considered first for all symptomatic patients with this condition. Recommended treatment options include change in diet, nonsteroidal anti-inflammatory drugs, maxillomandibular appliances, physical therapy, injections of corticosteroids or botulinum toxin, and behavior modification. If adequate symptom relief does not occur within 2-3 weeks, surgical consultation is advised. The guideline states that the following surgical procedures are considered to be accepted and effective for patients with TMJ associated with internal derangement/osteoarthritis:

- Arthrocentesis
- Arthroscopy
- Condylotomy
- Arthrotomy (prosthetic joint replacement may be indicated in selected patients who have severe joint degeneration, destruction, or ankylosis)
- Coronidotomy/coronoidectomy
- Styloidectomy
American Dental Association
Selected statements from the American Dental Association’s practice parameters for temporomandibular disorders, reaffirmed in 2015,(20) are:

- “The key element in the design of this set of parameters for temporomandibular (TM) disorders is the professional judgment of the attending dentist, for a specific patient, at a specific time.”
- “Initially the dentist should select the least invasive and most reversible therapy that may ameliorate the patient’s pain and/or functional impairment.”
- “Any treatment performed should be with the concurrence of the patient and the dentist.… 
- “The dentist should evaluate the effectiveness of initial therapy prior to considering more invasive and/or irreversible therapy.”
- “The dentist should counsel the patient that TM disorders are often managed, rather than resolved, and that symptoms of TM disorders may persist, change, or recur intermittently.
- “The patient should be informed that the success of treatment is often dependent upon patient compliance with prescribed treatment and recommendations for behavioral modifications. Lack of compliance should be recorded.”
- “When articular derangement and/or condylar dislocation has been determined to be the etiology of the patient’s pain and/or functional impairment, manual manipulation of the mandible may be performed by the dentist.
- “Oral orthotics (guards/splints) may be used by the dentist to enhance diagnosis, facilitate treatment or reduce symptoms.
- “The dentist should periodically evaluate oral orthotics (guards/splints) for their effectiveness, appropriateness and possible risks associated with continued use.
- “Before restorative and/or occlusal therapy is performed, the dentist should attempt to reduce, through the use of reversible modalities, the neuromuscular, myofascial and temporomandibular joint symptoms.
- “The dentist may replace teeth, alter tooth morphology and/or position by modifying occluding, articulating, adjacent or approximating surfaces, and by placing or replacing restorations (prostheses) to facilitate treatment.
- “Transitional or provisional restorations (prostheses) may be utilized by the dentist to facilitate treatment.
- “Intracapsular and/or intramuscular injection, and/or arthrocentesis may be performed for diagnostic and/or therapeutic purposes.
- “Orthodontic therapy may be utilized to facilitate treatment.
- “Orthognathic surgery may be performed to facilitate treatment.
- “When internal derangement or pathosis has been determined to be the cause of the patient’s pain and/or functional impairment, arthroscopic or open resective or reconstructive surgical procedures may be performed by the dentist.”

U.S. Preventive Services Task Force
Not applicable

Summary
The evidence on diagnosis of temporomandibular joint (TMJ) dysfunction supports use of several diagnostic modalities, including diagnostic x-rays, tomograms, arthrograms, and cephalograms, as well as, for presurgical evaluations, computed tomography, or magnetic resonance imaging. The evidence on treatment of TMJ dysfunction includes a large number of randomized controlled trials (RCTs) evaluating different treatment modalities, and systematic reviews of these RCTs. Treatments supported by evidence, and/or by national clinical guidelines, include the intraoral removable devices, pharmacologic treatment, arthrocentesis, manipulation for reduction of fracture or dislocation of the TMJ, arthroscopic surgery (in selected patients), and open surgical procedures (in selected patients).

Medicare National Coverage

No national coverage determination.

References


<table>
<thead>
<tr>
<th>Policy History</th>
<th>Date</th>
<th>Action</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>December 2012</td>
<td>New Policy</td>
<td>Policy updated with literature review. References 4,7,13, and 18 added; others renumbered or removed. Joint vibration analysis added as not medically necessary diagnostic procedure. Low-level laser therapy removed from policy because of overlap with policy 2.01.56, low-level laser policy. In the statement on medically necessary treatments, intra-oral reversible prosthetic devices changed to intraoral removable prosthetic devices for clarification only.</td>
</tr>
<tr>
<td></td>
<td>September 2013</td>
<td>Update Policy</td>
<td>Policy updated with literature review. References 4,7,13, and 18 added; others renumbered or removed. Joint vibration analysis added as not medically necessary diagnostic procedure. Low-level laser therapy removed from policy because of overlap with policy 2.01.56, low-level laser policy. In the statement on medically necessary treatments, intra-oral reversible prosthetic devices changed to intraoral removable prosthetic devices for clarification only.</td>
</tr>
<tr>
<td></td>
<td>September 2014</td>
<td>Update Policy</td>
<td>Policy updated with literature review; references 12 and 15-16 added. Policy statements unchanged.</td>
</tr>
<tr>
<td></td>
<td>September 2015</td>
<td>Update Policy</td>
<td>Policy updated with literature review through June 1, 2015; no references added. Bullet point on biofeedback removed from investigational statement on nonsurgical treatments.</td>
</tr>
<tr>
<td></td>
<td>June 2016</td>
<td>Update Policy</td>
<td>Policy updated with literature review through December 18, 2015; no references added. Policy statements unchanged.</td>
</tr>
</tbody>
</table>
Keywords

Arthrocentesis, TMJ Dysfunction
Arthroscopy, TMJ Dysfunction
Cephalograms, TMJ Dysfunction
Electromyography (EMG), TMJ Dysfunction
EMG (Electromyography), TMJ Dysfunction
Gothic Arch Tracing, TMJ Dysfunction
Intra-Oral Tracing, TMJ Dysfunction
Iontophoresis, TMJ Dysfunction
Kinesiography, TMJ Dysfunction
Mandibular Occlusal Repositioning Appliance
Medical Treatment, TMJ Dysfunction
Neuromuscular Junction Testing, TMJ Dysfunction
Pantograms, TMJ Dysfunction
PENS (Percutaneous Electrical Nerve Stimulation)
Physical Therapy, TMJ Dysfunction
Temporomandibular Disease (TMD)
Temporomandibular Joint (TMJ) Dysfunction/Syndrome
TENS (Transcutaneous Electrical Nerve Stimulation), TMJ Dysfunction
TMJ (Temporomandibular Joint) Dysfunction/Syndrome

This policy was approved by the FEP Pharmacy and Medical Policy Committee on June 24, 2016 and is effective July 15, 2016.

Deborah M. Smith, MD, MPH