

Medical Policy



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Title: Temporomandibular Joint (TMJ) Disorder

Professional

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Populations	Interventions	Comparators	Outcomes
Individuals with: <ul style="list-style-type: none"> • Suspected temporomandibular joint disorder 	Interventions of interest are: <ul style="list-style-type: none"> • Ultrasound • Surface electromyography • Joint vibration analysis 	Comparators of interest are: <ul style="list-style-type: none"> • Comprehensive history and physical exam • Alternative diagnostic test 	Relevant outcomes include: <ul style="list-style-type: none"> • Test accuracy • Test validity • Other test performance measures
Individuals with: <ul style="list-style-type: none"> • Confirmed diagnosis of temporomandibular joint disorder 	Interventions of interest are: <ul style="list-style-type: none"> • Intraoral devices or appliances • Pharmacologic treatment 	Comparators of interest are: <ul style="list-style-type: none"> • Alternative nonsurgical intervention 	Relevant outcomes include: <ul style="list-style-type: none"> • Symptoms • Functional outcomes • Quality of life • Treatment-related morbidity

Populations	Interventions	Comparators	Outcomes
Individuals with: <ul style="list-style-type: none"> Confirmed diagnosis of temporomandibular joint disorder 	Interventions of interest are: <ul style="list-style-type: none"> Acupuncture Biofeedback Transcutaneous electrical nerve stimulation Orthodontic services Hyaluronic acid 	Comparators of interest are: <ul style="list-style-type: none"> Alternative nonsurgical intervention 	Relevant outcomes include: <ul style="list-style-type: none"> Symptoms Functional outcomes Quality of life Treatment-related morbidity
Individuals with: <ul style="list-style-type: none"> Confirmed diagnosis of temporomandibular joint disorder 	Interventions of interest are: <ul style="list-style-type: none"> Arthrocentesis Arthroscopy 	Comparators of interest are: <ul style="list-style-type: none"> Nonsurgical intervention 	Relevant outcomes include: <ul style="list-style-type: none"> Symptoms Functional outcomes Quality of life Treatment-related morbidity

DESCRIPTION

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

OBJECTIVE

The objective of this policy is to evaluate diagnostic testing and therapeutic interventions for temporomandibular joint disorder and the effect on net health outcomes.

BACKGROUND

Temporomandibular Joint Disorder

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

Diagnosis

In the clinical setting, TMJD is often a diagnosis of exclusion and involves physical examination, patient interview, and review of dental records. Diagnostic testing and radiologic imaging is generally only recommended for patients with severe and chronic symptoms. Diagnostic criteria for TMJD have been developed and validated for use in both clinical and research settings.¹⁻³

Symptoms attributed to TMJD 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).

Treatment

For many patients, symptoms of TMJD 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.

REGULATORY STATUS

Since 1981, several muscle monitoring devices have received clearance from the U.S. Food and Drug Administration (FDA) through the 510(k) process. Some examples are the K6-I Diagnostic System (Myotronics), the BioEMG III™ (Bio-Research Associates), M-Scan™ (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 TMJD. FDA Product Code: KZM.

Table 1. Muscle-Monitoring Devices Cleared by the U.S. Food and Drug Administration

Devices	Manufacturer	Date Cleared	510(k) No.	Indication
K6-I Diagnostic System	Myotronics, Inc	Jun 1994	K922456	Electromyography
BioEMG III™	Bio-Research Associates, Inc	Feb 2009	K082927	Electromyography, Joint Vibration Recording
M-Scan™	Bio-Research Associates	Jul 2013	K130158	Electromyography
GrindCare Measure	Medotech A/S	Apr 2012	K113677	Electromyography, Nocturnal Bruxism

Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

POLICY

- A. The following *diagnostic procedures* may be considered **medically necessary** in the diagnosis of temporomandibular joint (TMJ) disorder:
1. Diagnostic x-ray, tomograms, and arthrograms;
 2. Computed tomography (CT) scan or magnetic resonance imaging (MRI) (in general, CT scans and MRIs are reserved for presurgical evaluations);
 3. Cephalograms (x-rays of jaws and skull);
 4. Pantograms (x-rays of maxilla and mandible).

(Cephalograms and pantograms should be reviewed on an individual basis.)

- B. The *diagnostic procedures* considered **experimental / investigational** in the diagnosis of TMJ include the following, but are not limited to:
1. Electromyography (EMG), including surface EMG;
 2. Kinesiography;
 3. Thermography;
 4. Neuromuscular junction testing;

5. Somatosensory testing;
 6. Transcranial or lateral skull x-rays (intended to demonstrate deviations in the positioning of the jaws that are associated with TMJ disorder);
 7. Intraoral tracing or gnathic arch tracing;
 8. Muscle testing;
 9. Standard intraoral dental radiographic procedures;
 10. 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 disorder);
 11. Ultrasound imaging/sonogram;
 12. Arthroscopy of the TMJ for purely diagnostic purposes;
 13. Joint vibration analysis.
- C. The following *nonsurgical treatments* may be considered **medically necessary** in the treatment of TMJ disorder:
1. Intraoral removable prosthetic devices/appliances, encompassing fabrication, insertion, and adjustment (such as soft and hard stabilization appliances, anterior positioning appliances, anterior bite appliances, and soft resilient appliances)
 2. Pharmacologic treatment (such as anti-inflammatory, muscle relaxing, and analgesic medications)
- D. The *nonsurgical treatments* considered **experimental / investigational** in the treatment of TMJ disorder include the following, but are not limited to:
1. Electrogalvanic stimulation;
 2. Iontophoresis;
 3. Biofeedback;
 4. Ultrasound;
 5. Devices promoted to maintain joint range of motion and to develop muscles involved in jaw function;
 6. Orthodontic services;
 7. Dental restorations/prostheses, including, but not limited to, fillings, crowns, and implants;
 8. Transcutaneous electrical nerve stimulation (TENS);
 9. Percutaneous electrical nerve stimulation (PENS);
 10. Physical therapy, including diathermy, infrared and heat and cold treatment, and manipulation;
 11. Acupuncture;
 12. Hyaluronic acid.
- E. The following *surgical treatments* may be considered **medically necessary** in the treatment of TMJ disorder:
1. Arthrocentesis;

2. 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;
3. Open surgical procedures (when TMJ disorder 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 placcation, and disc removal.

RATIONALE

The most recent literature update was performed through December 6, 2018.

Evidence reviews assess the clinical evidence to determine whether the use of technology improves the net health outcome. Broadly defined, health outcomes are the length of life, quality of life (QOL), and ability to function - including benefits and harms. Every clinical condition has specific outcomes that are important to patients and managing the course of that condition. Validated outcome measures are necessary to ascertain whether a condition improves or worsens; and whether the magnitude of that change is clinically significant. The net health outcome is a balance of benefits and harms.

To assess whether the evidence is sufficient to draw conclusions about the net health outcome of technology, two domains are examined: the relevance, and quality and credibility. To be relevant, studies must represent one or more intended clinical use of the technology in the intended population and compare an effective and appropriate alternative at a comparable intensity. For some conditions, the alternative will be supportive care or surveillance. The quality and credibility of the evidence depend on study design and conduct, minimizing bias and confounding that can generate incorrect findings. The randomized controlled trial (RCT) is preferred to assess efficacy; however, in some circumstances, nonrandomized studies may be adequate. RCTs are rarely large enough or long enough to capture less common adverse events and long-term effects. Other types of studies can be used for these purposes and to assess generalizability to broader clinical populations and settings of clinical practice.

For treatment of temporomandibular joint disorders (TMJD), literature searches have focused on studies comparing novel treatments with conservative interventions and/or placebo controls (rather than no-treatment control groups) and reporting pain reduction and/or functional outcome improvements (eg, jaw movement).

Diagnosis of TMJD

Clinical Context and Test Purpose

The purpose of specific diagnostic tests in patients with suspected TMJD is to provide a treatment option that is an alternative to or an improvement on existing diagnostic approaches, such as a comprehensive history and physical exam and alternative diagnostic tests.

The question addressed in this evidence review is: do specific diagnostic tests improve the net health outcome for individuals with suspected TMJD?

The following PICOTS were used to select literature to inform this review.

Patients

The relevant population of interest are individuals with suspected TMJD.

Interventions

The diagnostic tests being considered are ultrasound, surface electromyography, and joint vibration analysis.

Comparators

Comparators of interest include a comprehensive history and physical exam and alternative diagnostic tests. Alternative diagnostic tests can include routine dental x-rays, panoramic radiographs, computed tomography, magnetic resonance imaging, and scintigraphy.

Outcomes

The general outcomes of interest are test validity, and other test performance measures.

Timing

The existing literature evaluating ultrasound, surface electromyography, and joint vibration analysis as diagnostic tests for suspected TMJD has varying lengths of follow-up. While studies described below all reported at least one outcome of interest, longer follow-up was necessary to fully observe outcomes. Therefore, at least one year of follow-up is considered necessary to demonstrate efficacy.

Setting

Patients with suspected TMJD are managed by primary care providers, dentists, and otolaryngologists in an outpatient clinical setting.

Study Selection Criteria

Below are selection criteria for studies to assess whether a test is clinically valid.

- a. The study population represents the population of interest. Eligibility and selection are described.
- b. The test is compared with a credible reference standard.
- c. If the test is intended to replace or be an adjunct to an existing test; it should also be compared with that test.
- d. Studies should report sensitivity, specificity, and predictive values. Studies that completely report true- and false-positive results are ideal. Studies reporting other measures (eg, Receiver Operating Characteristic, Area Under the Receiver Operating Curve, c-statistic, likelihood ratios) may be included but are less informative.
- e. Studies should also report reclassification of diagnostic or risk category.

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

Ultrasound

A 2009 literature review identified 20 studies evaluating ultrasound for diagnosing TMJDs; all studies evaluated disc displacement and several also considered osteoarthritis and/or joint effusion.⁴ The reported sensitivity of ultrasound to detect disc displacement, compared with the reference standard (magnetic resonance imaging in most studies), ranged from 31% to 100%, and the specificity ranged from 30% to 100%. Reviewers stated that even when changes in ultrasound technology over time were taken into account, study findings were contradictory.

They noted unexplained differences between studies conducted by the same group of researchers. Reviewers concluded that additional advances are needed to standardize the ultrasound assessment of TMJD before it can be considered an accurate diagnostic tool.

Surface Electromyography

A 2006 systematic review of surface electromyography found a lack of literature on the accuracy of this method of diagnosis, compared with a criterion standard (ie, comprehensive clinical examination and history-taking).⁵ Reviewers concluded there was insufficient evidence that electromyography can accurately identify people with facial pain from those without pain, but that the technique may be useful in a research setting.

Joint Vibration Analysis

Sharma et al (2013) published a systematic review on joint vibration analysis for diagnosis of TMJDs.⁶ Reviewers identified 15 studies that evaluated the reliability and/or diagnostic accuracy of joint vibration analysis compared with a reference standard. Methodologic limitations were identified in all studies and included the absence of well-defined diagnostic criteria, use of a nonvalidated system for classifying disease progression, variability within studies in the reference standard used, 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% to 100% and specificity ranging from 59% to 100%.

Section Summary: Diagnosis of TMJD

Current evidence is insufficient or imprecise to support the use of ultrasound, surface electromyography or joint vibration analysis to diagnose TMJD.

Treatment of TMJD

Clinical Context and Therapy Purpose

The purpose of orthotics and pharmacologic treatment in patients with a confirmed diagnosis of TMJD is to provide a treatment option that is an alternative to or an improvement on existing therapies, such as alternative nonsurgical intervention.

The question addressed in this evidence review is: do orthotics and pharmacologic treatment improve the net health outcome for individuals with a confirmed diagnosis of TMJD?

The following PICOTS were used to select literature to inform this review.

Patients

The relevant population of interest are individuals with confirmed TMJD.

Interventions

The therapies being considered are intraoral devices or appliances and pharmacological treatment. Intraoral devices and appliances are described in the Regulatory Status section above and can include stabilization splints. Pharmacological treatment can include nonsteroidal anti-inflammatory drugs, opioids, corticosteroids, muscle relaxants, antidepressants, anticonvulsants, and benzodiazepines.

Comparators

The main comparators of interest are alternative nonsurgical intervention, such as medications, physical therapy, and injections. Alternative medicine techniques can also be used, such as acupuncture, relation techniques, TENS, and biofeedback.

Outcomes

The general outcomes of interest are symptoms, functional outcomes, QOL, and treatment-related morbidity. Symptoms of TMJD may include, pain, tenderness, or aching in the jaw or one or both of the temporomandibular joints, difficulty or pain while chewing, and locking of the temporomandibular joint.

Timing

The existing literature evaluating intraoral devices or appliances and pharmacologic treatment as a treatment for confirmed TMJD has varying lengths of follow-up, ranging from six weeks to one year of follow-up. While the systematic reviews described below all reported at least one outcome of interest, longer follow-up was necessary to fully observe outcomes. Therefore, at least one year of follow-up is considered necessary to demonstrate efficacy.

Setting

Patients with confirmed TMJD are actively managed by primary care providers, dentists, and otolaryngologists in an outpatient clinical setting.

Study Selection Criteria

Methodologically credible studies were selected using the following principles:

- a. To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;
- b. In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies.
- c. To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought.
- d. Studies with duplicative or overlapping populations were excluded.

Systematic Reviews

List and Axelsson (2010) published a review of systematic reviews on treatments for TMJD published through August 2009.⁷ They identified 30 reviews; there were 23 qualitative systematic reviews and 7 meta-analyses. Eighteen of the systematic reviews included only RCTs, three only included case-control studies, and nine included a mix of RCTs and case series. TMJDs were defined inconsistently in the primary studies and systematic reviews, and several reviews addressed the related diagnoses of bruxism, disc replacements, 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. Reviewers divided the treatments into five categories (some studies were included in >1 category). These categories and the main findings are listed in Table 2.

Table 2. Categories of Treatment

Categories	No. of Articles	Findings
Occlusal appliances, occlusal adjustment, and orthodontic treatment	10	Six systematic reviews did not find significant benefit vs other treatments, 4 found no benefit vs a placebo device, and 3 found occlusal therapy was better than no treatment.
Physical treatments including acupuncture, TENS, exercise, and mobilization	8	Four reviews found no significant benefit of acupuncture over other treatments, 1 found no difference between acupuncture and placebo treatment, and 3 found acupuncture was better than no treatment. One review found active exercise and postural training were effective for treating TMJD-related pain.
Pharmacologic treatment	7	Treatments found to be superior to placebo were analgesics (2 reviews), clonazepam or diazepam (3 reviews), antidepressants (4 reviews), and hyaluronate (1 review). One review found effects of hyaluronate and corticosteroids to be similar.
Maxillofacial surgery	4	Three reviews evaluated surgery for patients with disc displacements and 1 addressed orthognathic surgery in patients with TMJD. Reviews of surgical treatments generally included lower level evidence (eg, 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 discectomy, 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 could not be drawn about intervention equivalence.
Behavioral therapy and multimodal treatments	6	Two reviews found biofeedback to be better than active control or no treatment, 1 review found a combination of biofeedback and CBT to be better than no treatment, and 2 found a combination of biofeedback and relaxation to be better than no treatment. One review found the effects of biofeedback and relaxation to be similar.

Adapted from List and Axelsson (2010).⁷

CBT: cognitive-behavioral therapy; TENS: transcutaneous electrical nerve stimulation; TMJD: temporomandibular joint disorders.

Overall, reviewers concluded there was insufficient evidence that electrophysical modalities and surgery would be effective for treating TMJD. They found some evidence that occlusal appliances, acupuncture, behavioral therapy, jaw exercises, postural training, and some medications could be effective at reducing pain for patients with TMJDs. However, reviewers noted that most of the systematic reviews examined included primary studies with considerable variation in methodologic quality and, thus, it was not possible to draw definitive conclusions about the effectiveness of any of the treatments.

Randhawa et al (2016) published a systematic review of noninvasive interventions for TMJDs, which included RCTs with at least 30 individuals per treatment arm, cohort studies with at least 100 patients per exposed group, and case-control interventions.⁸ Reviewers identified 31 studies for appraisal, of which 7 RCTs described in 8 publications had a low-risk of bias and were assessed further. Most RCTs evaluated interventions outside the scope of our review, including cognitive-behavioral therapy and self-care management. Three RCTs evaluated occlusal devices for TMJDs of variable duration and generally reported no significant improvements with occlusal devices regarding pain, mouth opening, or other outcomes.

Orthotics

Intraoral Devices or Appliances

Fricton et al (2010) reported on a systematic review of RCTs on the intraoral treatment of TMJDs and identified 47 publications on 44 trials.⁹ Intraoral appliances included soft and hard stabilization appliances, anterior positioning appliances, anterior bite appliances, and soft resilient appliances. Studies compared two types of devices or compared one device with different treatment (eg, acupuncture or biofeedback). None of the studies evaluated the use of one device during the day and a different device during the night. The primary outcome of the meta-analysis was pain reduction. The pain was measured differently in the studies, and reviewers defined a successful outcome as at least a 50% reduction in pain on a self-report scale or at least an "improved" status when the pain was measured by the subjective report of status. Ten RCTs were included in two meta-analyses; the others were excluded because they did not measure pain, there were not at least two studies using similar devices or control groups, or data were not usable for pooled analysis. A pooled analysis of 7 RCTs (n=385 patients) that evaluated hard stabilization appliances and use of palatal nonoccluding appliances as a control found a significantly greater reduction in pain with hard appliances (odds ratio, 2.45; 95% confidence interval [CI], 1.56 to 3.86; p<0.001). A pooled analysis of 3 studies (n=216 patients) did not find a statistically significant effect of hard appliances compared with a no-treatment control group (odds ratio, 2.14; 95% CI, 0.80 to 5.75; p=0.12).

Ivorra-Carbonell et al (2016) reported on a systematic review of functional advancement devices for TMJD, which included systematic reviews, meta-analyses, RCTs, case-control studies, and cohort studies, assessed using PRISMA methodology.¹⁰ Reviewers included 21 articles evaluating some advancement device, considered of medium- or high-quality by CONSORT criteria. Results were summarized descriptively; reviewers concluded that, after treatment with mandibular advancement, the condyle was in "more advanced position."

Stabilization Splints

Ebrahim et al (2012) identified 11 RCTs comparing splint therapy for TMJDs with minimal or no therapy.¹¹ Nine of the 11 studies used stabilization splints, 1 used soft splints, and 1 used an anterior repositioning appliance. Reviewers used the GRADE system to rate study quality. Nine studies did not report whether allocation was concealed, and six studies did not report masking 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 with minimal or no intervention (standardized mean difference, -0.93; 95% CI, -1.33 to -0.53). Using a 100-millimeter visual analog scale (VAS) to measure pain, splint therapy was associated with an 11.5 mm lower mean VAS score (95% CI, -16.5 to -6.6 mm). There were no statistically significant differences between groups in QOL or depression scores.

Zhang et al (2016) identified 13 publications from 11 studies (n=538 patients) evaluating splint therapy for TMJDs.¹² Risk of bias was high for two or more domains for all studies. Splint therapy group patients had greater improvements in pain control than control patients (mean difference, 2.02; 95% CI, 1.55 to 2.49; $I^2=0.558$).

An earlier Cochrane review by Al-Ani et al (2004) identified 12 RCTs that compared stabilization splint therapy for TMJD with a control intervention.¹³ (The control group was not limited to minimal or no intervention as in the Ebrahim review.) There was wide variability in the comparison interventions and no standardization of outcomes; thus, study results could not be pooled. This Cochrane review was withdrawn in 2016 for being out of date and not meeting current Cochrane methodologic standards.¹⁴

Pharmacologic Treatment

Häggman-Henrikson et al (2017) published a systematic review that included 41 RCTs assessing various pharmacologic regimens for pain from TMJDs or burning mouth syndrome; of these, 13 were selected for a network meta-analysis.¹⁵ Nine studies evaluated temporomandibular muscular pain, which appeared to decrease more with cyclobenzaprine than with placebo, although no specific statistics were reported. Pain reduction was also favorable for botulinum toxin and Ping-On ointment in the meta-analysis; other descriptive analyses showed a reduction of pain with nonsteroidal anti-inflammatory drugs and melatonin tablets when compared with placebo.

Section Summary: Orthotics and Pharmacologic Treatment

Evidence evaluating the use of orthotics in the treatment of TMJD, while sometimes conflicting and inconclusive, suggests that use of orthotics reduces TMJD pain. A systematic review found that different pharmacologic agents reduced pain in patients with TMJD. A systematic review of intraoral appliances (44 studies) and meta-analyses of subsets of these studies found a significant benefit of intraoral appliances compared with control interventions. Other systematic reviews have found a significant benefit of several pharmacologic treatments (eg, analgesics, muscle relaxants, and anti-inflammatory medications [vs placebo]). The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

Other Nonsurgical Therapies

Clinical Context and Therapy Purpose

The purpose of nonsurgical therapies in patients with a confirmed diagnosis of TMJD is to provide a treatment option that is an alternative to or an improvement on existing therapies, such as alternative nonsurgical intervention.

The question addressed in this evidence review is: do nonsurgical therapies improve the net health outcome for individuals with a confirmed diagnosis of TMJD?

The following PICOTS were used to select literature to inform this review.

Patients

The relevant population of interest are individuals with confirmed TMJD.

Interventions

The nonsurgical therapies being considered are acupuncture, biofeedback, TENS, orthodontic services, and hyaluronic acid.

Comparators

The main comparator of interest is alternative nonsurgical intervention, such as medications.

Outcomes

The general outcomes of interest are symptoms, functional outcomes, QOL, and treatment-related morbidity. Symptoms of TMJD are described in the second PICOTS above.

Timing

The existing literature evaluating nonsurgical therapies as a treatment for confirmed TMJD has varying lengths of follow-up, ranging from one week to six months of follow-up. While the systematic reviews and RCTs described below all reported at least one outcome of interest,

longer follow-up was necessary to fully observe outcomes. Therefore, at least one year of follow-up is considered necessary to demonstrate efficacy.

Setting

Patients with confirmed TMJD are actively managed by primary care providers, dentists, and otolaryngologists in an outpatient clinical setting.

Study Selection Criteria

Methodologically credible studies were selected using the following principles:

- a. To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;
- b. In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies.
- c. To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought.
- d. Studies with duplicative or overlapping populations were excluded.

Acupuncture

A 2011 systematic review and meta-analysis identified 7 sham-controlled randomized trials evaluating acupuncture for treating TMJD.¹⁶ The studies included a total of 141 patients. Sample sizes of individual studies ranged from 7 to 28 patients. Four studies used a single acupuncture session, and the other 3 used 6 to 12 sessions. All seven studies reported a change in pain intensity as assessed by VAS. In 6 of the studies, pain intensity was measured immediately after treatment; the seventh measured pain after 16 weeks. A pooled analysis of findings from 5 studies (n=107 patients) found a statistically significant reduction in pain intensity, as measured by VAS. The pooled weighted mean difference (WMD) in pain intensity was -13.63 (95% CI, -21.16 to -6.10; p<0.001). A pooled subgroup analysis of 4 studies (n=89 patients) found acupuncture to be superior to a nonpenetrating sham acupuncture (WMD = -13.73; 95% CI, -21.78 to -5.67; p<0.001). A pooled analysis of 2 studies (n=18 patients) 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 might have been underpowered. Reviewers noted that previous studies had 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 selected studies had a change of 24.2 mm or more.

Orthodontic Services

A Cochrane review by Luther et al (2010) did not identify any RCTs evaluating orthodontic treatment for TMJDs and thus concluded there was insufficient evidence on the efficacy of orthodontics.¹⁷ Reviewers defined orthodontic treatment as appliances that would induce stable tooth movement for a sufficient period to bring about permanent change in tooth position. The 2010 Cochrane review was withdrawn in 2016 for being out of date and not meeting current Cochrane methodologic standards¹⁸; a new Cochrane review on occlusal interventions for managing TMJDs is planned.

Hyaluronic Acid Injection

Systematic Reviews

Several systematic reviews of studies have assessed the use of hyaluronic acid for treating TMJDs.^{19,20,21,22} Only one systematic review limited its inclusion criteria to RCTs and pooled study findings³⁴the Cochrane review by Shi et al (2013).²¹ The Shi et al (2013) review included RCTs

comparing the effect of at least 1 hyaluronic acid injection alone or in combination with other active treatments to placebo or glucocorticoid injections alone or in combination with the same active treatment group. Seven studies met inclusion criteria: three studies compared hyaluronic acid with placebo, three studies compared hyaluronic acid with glucocorticoids, and two studies compared hyaluronic acid plus arthroscopy or arthrocentesis with arthroscopy or arthrocentesis alone. (One study included three arms and was included in the first two comparisons.) Five of the 7 studies included fewer than 50 participants.

Outcomes were categorized as symptoms, which reflected the subjective feeling and the judgment of the patients, and clinical signs, which reflected the objective judgment of the observer. A meta-analysis of 2 trials did not find a statistically significant difference between hyaluronic acid and placebo for short-term (<3 months) improvement in symptoms (relative risk [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 for 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 (≥ 3 months) on clinical signs (RR=1.71; 95% CI, 1.05 to 2.77). For the comparison between hyaluronic acid and glucocorticoids, only short-term data were available for pooling. There were no significant differences between groups for 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 of combination treatments (hyaluronic acid plus arthroscopy or arthrocentesis). Reviewers found there was insufficient, consistent evidence to draw conclusions on the use of hyaluronate for treating patients with TMJDs. This Cochrane review was withdrawn in 2013 for being out of date and not meeting contemporary Cochrane methodologic standards.²³

Liu et al (2017) conducted a systematic review and meta-analysis of RCTs or cohort studies that compared temporomandibular osteoarthritis outcomes in patients treated with intra-articular corticosteroid, hyaluronate, or placebo injection.²⁴ All eight selected studies were RCTs; of these, three contained data on hyaluronate injection. Compared with placebo, corticosteroid injections prompted a significant decrease in long-term (ie, ≥ 6 months postprocedure) pain (3 studies; mean difference, -0.74; 95% CI, -1.34 to -0.13; $p=0.02$; $I^2=0\%$). However, in a pooled analysis of 2 studies (both of which included pretreatment arthrocentesis), long-term maximal mouth opening was increased for placebo more than for corticosteroid injection (mean difference, -2.06; 95% CI, -2.76 to -1.36; $p<0.001$; $I^2=28\%$). Only two studies were available for comparing corticosteroid with hyaluronate injections, which precluded strong analysis. Short-term pain and mouth opening measures did not significantly differ between any of the injection groups, nor did the incidence of adverse events. The meta-analysis was limited by the small sample sizes of included trials, as well as by the variety of corticosteroid types used. Reviewers concluded that corticosteroid injection following arthrocentesis may be effective for relief of long-term joint pain but may be less effective for improving mouth opening.

Randomized Controlled Trials

Most published RCTs evaluating hyaluronic acid for treating TMJDs have had small sample sizes, short follow-up times, and/or lacked blinding. Representative RCTs with larger sample sizes and stronger methodology are described next.

Gorrela et al (2017) reported on the efficacy of injecting sodium hyaluronate in patients with TMJDs.²⁵ The trial comprised 62 individuals with the disorder; some members ($n=31$) of the trial were treated with arthrocentesis, and some members ($n=31$) were treated by a combination

of arthrocentesis and an injection of sodium hyaluronate. Follow-up was observed at one week, two weeks, one month, three months, and at six months. Using a VAS, patients were asked to measure pain from one to ten. Pain decreased significantly for patients in both treatment groups ($p < 0.001$) at the one week and the six-month follow-up; however, patients who were injected with sodium hyaluronate reported a significantly stronger decrease in pain at the six-month follow-up ($p < 0.001$). Preoperative mean VAS pain scores for patients who received injection started at 6.0; by the 6-month follow-up, the mean VAS pain score was 0.23. Preoperative mean pain scores for patients who received arthrocentesis alone started at 6.77; by the 6-month follow-up, the mean pain score was 1.71. While not an overwhelmingly significant difference, the trialists concluded that adding an injection of sodium hyaluronate to arthrocentesis treatment can significantly decrease the pain felt by patients who suffer from TMJD.

A study by Manfredini et al (2012) in Italy randomized 72 patients with TMJD 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.²⁶ Sixty (83%) of 72 participants completed the study, with 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 three-month follow-up. For example, the percentage change in pain at rest ranged from -29.1% in the group receiving 5 weekly single-needle arthrocentesis plus low-molecular-weight hyaluronic acid injections to, -38.4% in the group receiving a single-session of arthrocentesis alone. Trial limitations included the small number of patients in each treatment group and the substantial number of dropouts in the absence of an intention-to-treat analysis.

A study by Bjornland et al (2007) in Norway evaluated 40 patients with osteoarthritis of the TMJD in a double-blind RCT.²⁷ Patients received 2 injections, 14 days apart, of sodium hyaluronate or corticosteroids. The pain was assessed using a VAS ranging 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 VAS score) was 14 in the hyaluronic acid group and 31 in the corticosteroid group; the between-group 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).

Bertolami et al (1993) published a double-blind placebo-controlled trial that evaluating 121 patients with TMJD.²⁸ Patients had to have a confirmed diagnosis of degenerative joint disease, reducing displaced disc 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 six months. Eighty patients were randomized to the hyaluronate group and 41 to the placebo group. This included 57 patients in the degenerative joint disease group, 50 patients in the reducing displaced disc group, and 14 patients in the DDN group. Fourteen (12%) of 121 patients were excluded from the analysis because they did not meet eligibility criteria. Seven outcomes were assessed, including three measures of dysfunction, two measures of patient perception of improvement, and two measures of change in noise. No significant differences in outcomes were seen for the degenerative joint disease group. In the DDN group, there were significant between-group differences through one month, favoring the hyaluronic acid group. The number of patients in the DDN group who completed follow-up after

one month was insufficient to draw meaningful conclusions about efficacy. The most consistent between-group differences in the reducing displaced disc group were for the two measures of patient perception of improvement and one of the noise variables. There were fewer between-group differences in dysfunction measures.

Section Summary: Nonsurgical Therapies

A systematic review evaluating the use of orthodontic services to treat TMJD did not find sufficient literature to draw conclusions about efficacy. The evidence on acupuncture is limited by the small number of studies, small sample sizes, and in most studies, efficacy assessment only immediately posttreatment. The evidence on the use of hyaluronic acid to treat TMJD is inconclusive, given the methodologic issues with the systematic review and RCTs conducted (eg, small sample sizes) and better surgical options. Overall, the evidence is insufficient to determine that the technologies result in a meaningful improvement in the net health outcome.

Surgical Techniques

Clinical Context and Therapy Purpose

The purpose of surgical techniques in patients with a confirmed diagnosis of TMJD is to provide a treatment option that is an alternative to or an improvement on existing therapies, such as nonsurgical intervention.

The question addressed in this evidence review is: do surgical therapies improve the net health outcome for individuals with a confirmed diagnosis of TMJD?

The following PICOTS were used to select literature to inform this review.

Patients

The relevant population of interest are individuals with confirmed TMJD.

Interventions

The surgical therapies being considered are arthrocentesis and arthroscopy.

Comparators

The main comparators of interest are alternative nonsurgical intervention, such as intraoral devices and appliances, pharmacologic treatment, acupuncture, biofeedback, TENS, orthodontic services, and hyaluronic acid.

Outcomes

The general outcomes of interest are symptoms, functional outcomes, QOL, and treatment-related morbidity. Symptoms of TMJD are described in the second PICOTS above.

Timing

The existing literature evaluating surgical techniques as a treatment for confirmed TMJD has varying lengths of follow-up up to six months. While the systematic reviews described below all reported at least one outcome of interest, longer follow-up was necessary to fully observe outcomes. Therefore, at least six months of follow-up is considered necessary to demonstrate efficacy.

Setting

Patients with confirmed TMJD are actively managed by primary care providers, dentists, and otolaryngologists in an outpatient clinical setting.

Study Selection Criteria

Methodologically credible studies were selected using the following principles:

- a. To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;
- b. In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies.
- c. To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought.
- d. Studies with duplicative or overlapping populations were excluded.

A Cochrane review by Guo et al (2009) identified 2 RCTs (total n=81 patients) that compared the effectiveness of arthrocentesis plus lavage with arthroscopy for the treatment of TMJD.²⁹ Data were pooled only for the outcome of maximum incisal opening. A meta-analysis of the 2 trials found a statistically significant difference between the interventions for this outcome, with a WMD of -5.28 (95% CI, -7.10 to -3.46), favoring arthroscopy. The Cochrane review was withdrawn in 2015 for being out of date and not meeting current Cochrane methodologic standards.³⁰ Another Cochrane review (2015) reporting on arthroscopy for TMJD was also withdrawn from Cochrane from 2015 for being out of date and not meeting current Cochrane methodologic standards.³¹

In a systematic review, Vos et al (2013) identified 3 RCTs (total n=222 patients) that compared the efficacy of lavage of the temporomandibular joint (ie, arthrocentesis or arthroscopy) with nonsurgical temporomandibular joint treatment.³² Although reviewers assessed the quality of the studies to be adequate, only one stated that allocation to treatment group was concealed; two did not explicitly state use of an intention-to-treat analysis. The two primary outcomes considered were change in pain and maximal mouth opening at six months compared with baseline. The pain was measured by VAS. Pooled analysis of data from the 3 trials found a statistically significant reduction in pain at 6 months with surgery plus lavage vs nonsurgical therapy (standardized mean difference = -1.07; 95% CI, -1.38 to -0.76). There was no statistically significant difference in the efficacy between the 2 treatments for the other outcome variable, maximal mouth opening (standardized mean difference=0.05; 95% CI, -0.33 to 0.23).

In a retrospective cohort study, Hossameldin and McCain (2018) assessed the efficacy of an office-based TMJ arthroscopic technique. The researchers assessed the following outcomes of the procedure: improvement in painless range-of-motion in the mandible, reduced pain on loading, and improvement in functional jaw pain. The cohort included an initial 363 patients, excluded 41, and an analysis was performed on the joints of the remaining 322 that were compromised. Within the 322 patients, 452 joints were operated on with a 66.6% (n=301 joints) success rate (p=.001). It is stated within the outcome variable section that the primary outcome variable of success or failure was determined by the reduction of joint pain postoperatively. This could be subjective. When the operation failed (n=151 joints, 33.3%), 141 joints were involved in a subsequent procedure that ranged from more advanced arthroscopy to a total joint replacement.³⁶

Section Summary: Surgical Techniques

Systematic reviews of the literature, which includes RCTs, have shown that the use of arthrocentesis and arthroscopy reduces pain levels in patients with TMJD.

SUMMARY OF EVIDENCE

For individuals who have suspected TMJD who receive ultrasound, surface electromyography, or joint vibration analysis, the evidence includes systematic reviews of diagnostic test studies. The relevant outcomes are test validity, and other performance measures. None of the systematic reviews found that these diagnostic techniques accurately identified patients with TMJD and many of the studies had methodologic limitations. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have a confirmed diagnosis of TMJD who receive intraoral devices or appliances or pharmacologic treatment, the evidence includes RCTs and systematic reviews of the RCTs. The relevant outcomes are symptoms, functional outcomes, QOL, and treatment-related morbidity. A systematic review of intraoral appliances (44 studies) and meta-analyses of subsets of these studies found a significant benefit of intraoral appliances compared with control interventions. Other systematic reviews have found a significant benefit of several pharmacologic treatments (eg, analgesics, muscle relaxants, and anti-inflammatory medications [vs placebo]). The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have a confirmed diagnosis of TMJD who receive acupuncture, biofeedback, transcutaneous electrical nerve stimulation, orthodontic services, or hyaluronic acid, the evidence includes RCTs, systematic reviews of these RCTs, and observational studies. The relevant outcomes are symptoms, functional outcomes, QOL, and treatment-related morbidity. The systematic reviews did not find that these technologies reduced pain or improved functional outcomes significantly more than control treatments. Moreover, many individual studies were small and/or had methodologic limitations. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have a confirmed diagnosis of TMJD, who receive arthrocentesis or arthroscopy, the evidence includes RCTs and systematic reviews of the RCTs. The relevant outcomes are symptoms, functional outcomes, QOL, and treatment-related morbidity. Only one review, which included three RCTs, compared arthrocentesis or arthroscopy with nonsurgical interventions for TMJD. Pooled analyses of the RCTs found that arthrocentesis and arthroscopy resulted in superior pain reduction compared with control interventions. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

PRACTICE GUIDELINES AND POSITION STATEMENTSAmerican Association for Dental Research

A policy statement, revised in 2010 and reaffirmed in 2015, by the American Association for Dental Research recommended the following for the diagnosis and treatment of temporomandibular joint disorders (TMJDs)³³:

“It is recommended that the differential diagnosis of TMDs 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.³⁴ For diagnosis of this type of TMJD, 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 to 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)
- Coronoidotomy/coronoidectomy
- Styloidectomy

American Dental Association

Selected statements from the American Dental Association's practice parameters for TMJDs, last revised in 1997,³⁵ are:

- "Initially the dentist should select the least invasive and most reversible therapy that may ameliorate the patient's pain and/or functional impairment."
- "The dentist should evaluate the effectiveness of initial therapy prior to considering more invasive and/or irreversible therapy."
- "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."

- "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 RECOMMENDATIONS

Not applicable.

ONGOING AND UNPUBLISHED CLINICAL TRIALS

Some currently unpublished trials that might influence this review are listed in Table 3.

Table 3. Summary of Key Trials

NCT No.	Trial Name	Planned Enrollment	Completion Date
Ongoing			
NCT02839967	Influence of Intraoral Phototherapy on Pain, Joint Mobility, Functionality and Quality of Life in Individuals With Temporomandibular Joint Dysfunction	30	Jan 2018
NCT02437383	Effect of COMT (Catecholamine-O-methyltransferase) Genetic Polymorphisms on Response to Propranolol Therapy in Temporomandibular Disorder	200	Apr 2018
NCT03180671	The Effectiveness of Anterior Deprogrammers as a Tool for Reducing Pain and Masticatory Muscles	80	May 2019
NCT03029494	The Role of Oxidative Stress and Opio[r]phin in Temporomandibular Disorders	80	Sep 2019
Unpublished			
NCT02908568	Effect of Stimulation of the Proprioceptive Trigemino-cardiac Reflex through Medical Device for the Pain of Patients with Temporomandibular Disorders	36	Aug 2017
NCT02822469	Thermograph Evaluation of Masticatory Muscles Pre and Post Indirect Physiotherapeutic Treatment in TMD Subjects: A Randomized, Placebo-controlled Study	32	Dec 2016
NCT02880774	Influence of Manual Therapy in Temporomandibular Joint on the Mandibular Movement: Clinical Trial, Randomized, Placebo-controlled and Blind	24	Aug 2016
NCT02637544	Treatment Efficacy of Acupuncture in Non-Chronified Pain Patients with TMDs	40	Aug 2016
NCT02397070	Effectiveness of a Jaw Exercise Program in Temporomandibular Disorder Patients	30	Jul 2015
NCT02602483 ^a	Randomized, Double Blind, Placebo Controlled Exploratory Study To Assess the Efficacy and Safety of a Triple Combination of Ibuprofen+Mg+Ascorbic Acid for Acute Pain Treatment in Temporomandibular Joint Disorder (TMJD) Patients	96	Dec 2016 (completed)

NCT: national clinical trial.

^a Denotes industry-sponsored or cosponsored trial.

CODING

The following codes for treatment and procedures applicable to this policy are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

CPT/HCPCS

- 20605 Arthrocentesis, aspiration and/or injection; intermediate joint or bursa (eg, temporomandibular, acromioclavicular, wrist, elbow or ankle, olecranon bursa); without ultrasound guidance
- 20606 Arthrocentesis, aspiration and/or injection; intermediate joint or bursa (eg, temporomandibular, acromioclavicular, wrist, elbow or ankle, olecranon bursa); with ultrasound guidance, with permanent recording and reporting
- 21010 Arthrotomy, temporomandibular joint
- 21050 Condylectomy, temporomandibular joint (separate procedure)
- 21060 Meniscectomy, partial or complete, temporomandibular joint (separate procedure)
- 21073 Manipulation of temporomandibular joint(s) (TMJ), therapeutic, requiring an anesthesia service (ie, general or monitored anesthesia care)
- 21116 Injection procedure for temporomandibular joint arthrography
- 21240 Arthroplasty, temporomandibular joint, with or without autograft (includes obtaining graft)
- 21242 Arthroplasty, temporomandibular joint, with allograft
- 21243 Arthroplasty, temporomandibular joint with prosthetic joint replacement
- 29800 Arthroscopy, temporomandibular joint, diagnostic, with or without synovial biopsy (separate procedure)
- 29804 Arthroscopy, temporomandibular joint, surgical
- 70328 Radiologic examination, temporomandibular joint, open and closed mouth; unilateral
- 70330 Radiologic examination, temporomandibular joint, open and closed mouth; bilateral
- 70332 Temporomandibular joint arthrography, radiological supervision and interpretation
- 70336 Magnetic resonance (eg, proton) imaging, temporomandibular joint(s)
- 70350 Cephalogram, orthodontic
- 70355 Orthopantomogram (eg, panoramic x-ray)

ICD-10 Diagnoses

- M26.601 Right temporomandibular joint disorder, unspecified
- M26.602 Left temporomandibular joint disorder, unspecified
- M26.603 Bilateral temporomandibular joint disorder, unspecified
- M26.611 Adhesions and ankylosis of right temporomandibular joint
- M26.612 Adhesions and ankylosis of left temporomandibular joint
- M26.613 Adhesions and ankylosis of bilateral temporomandibular joint
- M26.621 Arthralgia of right temporomandibular joint
- M26.622 Arthralgia of left temporomandibular joint
- M26.623 Arthralgia of bilateral temporomandibular joint

M26.631	Articular disc disorder of right temporomandibular joint
M26.632	Articular disc disorder of left temporomandibular joint
M26.633	Articular disc disorder of bilateral temporomandibular joint
M26.69	Other specified disorders of temporomandibular joint
M27.8	Other specified disease of jaws
M27.0	Developmental disorders of jaws
M27.9	Disease of jaws, unspecified

REVISIONS

01-01-2014	Policy added to the bcbsks.com web site.
10-01-2014	Description section updated
	In Policy section: <ul style="list-style-type: none"> Removed Item E 2 "Manipulation for reduction of fracture or dislocation of the TMJ" as it was not felt to be unique to this policy subject.
	Rationale section updated
	In Coding section: <ul style="list-style-type: none"> Corrected CPT Code 90336 to be 70336
	References updated
01-01-2015	In Coding section: <ul style="list-style-type: none"> Added CPT Code: 20606 (Effective January 1, 2015) Revised CPT Code: 20605 (Effective January 1, 2015)
03-18-2015	In Policy section: <ul style="list-style-type: none"> In Item C 1, added "(such as soft and hard stabilization appliances, anterior positioning appliances, anterior bite appliances, and soft resilient appliances)" In Item D 7, added "including, but not limited to, fillings, crowns, and implants"
08-05-2015	Updated Description section.
	In Policy section: <ul style="list-style-type: none"> In Item A 4, removed "Panoramic radiographic image" and added "Pantograms" to read "Pantograms (x-rays of maxilla and mandible)." In Item B 6, removed "gnathic" and added "gothic" to read "Transcranial or lateral skull x-rays; intraoral tracing or gothic arch tracing" Removed Item B 9, "Range of motion measurements"
	Updated Rationale section.
	In Coding section: <ul style="list-style-type: none"> Updated nomenclature to codes 20606, 21050, 21060, and 70355.
	Updated References section.
05-25-2016	Updated Description section.
	In Policy section: <ul style="list-style-type: none"> In Item B 6, removed "gothic" and added "gnathic" to read "Transcranial or lateral skull x-rays; intraoral tracing or gnathic arch tracing (intended to demonstrate deviations in the positioning of the jaws that are associated with TMJ dysfunction);"
	Updated Rationale section.
	Updated References section.
10-01-2016	In Coding section: <ul style="list-style-type: none"> Added ICD-10 codes effective 10-01-2016: M26.601, M26.602, M26.603, M26.611, M26.612, M26.613, M26.621, M26.622, M26.623, M26.631, M26.632, M26.633 Termed ICD-10 codes effective 09-30-2016: M26.60, M26.61, M26.62, M26.63
03-29-2017	Updated Description section.
	Updated Rationale section.
	Updated References section.

03-14-2018	Updated Description section.
	In Policy section: <ul style="list-style-type: none"> ▪ In previous Item B, separated previous Item 6 into two separate items, to read, "6. Transcranial or lateral skull x-rays (intended to demonstrate deviations in the positioning of the jaws that are associated with TMJ dysfunction)" and "7. Intraoral tracing or gnathic arch tracing" ▪ In new Item B 9 (previous Item B 8), added "intraoral" to read, "Standard intraoral dental radiographic procedures"
	Updated Rationale section.
	In Coding section: <ul style="list-style-type: none"> ▪ Removed ICD-9 codes.
	Updated References section.
04-24-2019	Policy title changed from "Temporomandibular Joint (TMJ) Dysfunction".
	Updated Description section.
	In Policy section: <ul style="list-style-type: none"> ▪ Changed "dysfunction" to "disorder" throughout policy language.
	Updated Rationale section.
	Updated References section.

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