



# Louisiana

## Temporomandibular Joint Dysfunction

**Policy #** 00583

Original Effective Date: 01/01/2018

Current Effective Date: 01/01/2018

*Applies to all products administered or underwritten by Blue Cross and Blue Shield of Louisiana and its subsidiary, HMO Louisiana, Inc. (collectively referred to as the "Company"), unless otherwise provided in the applicable contract. Medical technology is constantly evolving, and we reserve the right to review and update Medical Policy periodically.*

*Note: Electrical Nerve Stimulation is addressed separately in medical policy 00142.*

*Note: Intra-Articular Hyaluronan Injections for Osteoarthritis of the Knee is addressed separately in medical policy 00075.*

*Note: Low-Level Laser Therapy is addressed separately in medical policy 00194.*

*Note: Botulinum Toxins is addressed separately in medical policy 00012.*

*Note: Percutaneous Electrical Nerve Stimulation (PENS) and Percutaneous Neuromodulation Therapy (PNT) is addressed separately in medical policy 00144.*

### Diagnostic Procedures

#### When Services Are Eligible for Coverage

Coverage for eligible medical treatments or procedures, drugs, devices or biological products may be provided only if:

- Benefits are available in the member's contract/certificate, and
- Medical necessity criteria and guidelines are met.

Based on review of available data, the Company may consider the following *diagnostic procedures* in the diagnosis of temporomandibular joint dysfunction (TMJD) to be **eligible for coverage**:

- Diagnostic x-ray, tomograms, and arthrograms;
- Computed tomography (CT) scan or magnetic resonance imaging (MRI) (in general, computed tomography [CT] scans and magnetic resonance imagings [MRIs] are reserved for presurgical evaluations);
- Cephalograms (x-rays of jaws and skull);
- Pantograms (x-rays of maxilla and mandible).

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

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### **When Services Are Considered Investigational**

*Coverage is not available for investigational medical treatments or procedures, drugs, devices or biological products.*

Based on review of available data, the Company considers *diagnostic procedures* in the diagnosis of temporomandibular joint dysfunction (TMJD), including but not limited to the following procedures, to be **investigational\***:

- Electromyography (EMG), including surface electromyography (EMG);
- Kinesiography;
- Thermography;
- Neuromuscular junction testing;
- Somatosensory testing;
- 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 temporomandibular joint dysfunction [TMJD]);
- Muscle testing;
- Standard dental radiographic procedures;
- Range-of-motion measurements;
- Computerized mandibular scan (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 temporomandibular joint dysfunction [TMJD]);
- Ultrasound imaging/sonogram;
- Arthroscopy of the temporomandibular joint (TMJ) for purely diagnostic purposes;
- Joint vibration analysis.

## **Nonsurgical Treatments**

### **When Services Are Eligible for Coverage**

*Coverage for eligible medical treatments or procedures, drugs, devices or biological products may be provided only if:*

- *Benefits are available in the member's contract/certificate, and*
- *Medical necessity criteria and guidelines are met.*

Based on review of available data, the Company may consider the following *nonsurgical treatments* in the treatment of temporomandibular joint dysfunction (TMJD) to be **eligible for coverage**:

- Intraoral removable prosthetic devices/appliances (encompassing fabrication, insertion, adjustment);
- Pharmacologic treatment (e.g., anti-inflammatory, muscle relaxing, analgesic medications).

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### **When Services Are Considered Investigational**

*Coverage is not available for investigational medical treatments or procedures, drugs, devices or biological products.*

Based on review of available data, the Company considers *nonsurgical treatments* in the treatment of temporomandibular joint dysfunction (TMJD), including but not limited to the following treatments, to be **investigational\***:

- Electrogalvanic stimulation;
- Iontophoresis;
- Biofeedback;
- 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;
- Percutaneous electrical nerve stimulation;
- Acupuncture;
- Hyaluronic acid.

## **Surgical Treatments**

### **When Services Are Eligible for Coverage**

*Coverage for eligible medical treatments or procedures, drugs, devices or biological products may be provided only if:*

- *Benefits are available in the member's contract/certificate, and*
- *Medical necessity criteria and guidelines are met.*

Based on review of available data, the Company may consider the following *surgical treatments* in the treatment of temporomandibular joint dysfunction (TMJD) to be **eligible for coverage**:

- Arthrocentesis;
- Manipulation for reduction of fracture or dislocation of the temporomandibular joint (TMJ);
- Arthroscopic surgery in patients with objectively demonstrated (by MRI or CT imaging) internal derangements (displaced discs) or degenerative joint disease (DJD) who have failed conservative treatment, e.g., the individual tried and failed non-surgical therapies for at least 3 months with documented compliance. Therapies should include behavioral changes, pharmacological therapy, and/or reversible intraoral appliances;
- Open surgical procedures (when temporomandibular joint dysfunction [TMJD] is the result of congenital anomalies, trauma, or disease) including, but not limited to, arthroplasties; condylectomies; meniscus or disc plication, and disc removal in patients who have objectively documented abnormalities and who have failed conservative treatment, e.g., the individual tried and

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failed non-surgical therapies for at least 3 months with documented compliance. Therapies should include behavioral changes, pharmacological therapy, and/or reversible intraoral appliances.

### **When Services Are Considered Investigational**

*Coverage is not available for investigational medical treatments or procedures, drugs, devices or biological products.*

Based on review of available data, the Company considers all other *surgical treatments* in the treatment of temporomandibular joint dysfunction (TMJD) to be **investigational**.\*

### **Background/Overview**

TMJD (also known as TMJ dysfunction) 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 are often divided into 2 main categories: articular disorders (e.g., ankylosis, congenital or developmental disorders, disc derangement disorders, fractures, inflammatory disorders, osteoarthritis, joint dislocation) and masticatory muscle disorders (e.g., myofascial pain, myofibrotic contracture, myospasm, neoplasia).

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.

Symptoms attributed to TMJD vary 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 TMJD are short-term and self-limiting. Conservative treatments (e.g., eating soft foods, rest, heat, ice, avoiding extreme jaw movements) and anti-inflammatory medication are recommended before considering more invasive and/or permanent therapies (e.g., surgery).

Note that low-level laser therapy for TMJD is addressed in medical policy 00194, and botulinum toxin for TMJD is addressed in medical policy 00012.

### **FDA or Other Governmental Regulatory Approval**

U.S. Food and Drug Administration (FDA)

Since 1981, several muscle-monitoring devices have been cleared for marketing by the U.S. FDA through the 510(k) process. Some examples are: the K6-I Diagnostic System (Myotronics), the BioEMG III™<sup>‡</sup> (Bio-Research Associates), M-Scan™<sup>‡</sup> (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.

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Centers for Medicare and Medicaid Services (CMS)

There is no national coverage determination (NCD). In the absence of an NCD, coverage decisions are left to the discretion of local Medicare carriers.

### **Rationale/Source**

Recent literature searches have concentrated on identifying systematic reviews and meta-analyses. For treatment of TMJD, the focus has been on studies that compared novel treatments with 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 TMJD**

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. The reported sensitivity of ultrasound to detect disc displacement, compared with the reference standard (MRI 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 need to be made in standardizing ultrasound assessment of the TMJD before it can be considered an accurate diagnostic tool.

#### **Surface Electromyography**

A 2006 systematic review on surface EMG found a lack of literature on the accuracy of this method of diagnosis, compared with a criterion standard (i.e., comprehensive clinical examination and history-taking). Reviewers concluded that there was insufficient evidence that EMG 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**

In 2013, Sharma et al published a systematic review on joint vibration analysis for diagnosis of TMJDs. 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%.

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### TREATMENT OF TMJD

#### Overview

List and Axelsson (2010) published a review of systematic reviews on treatments for TMJD published through August 2009. They 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 only included case-control studies, and 9 included a mix of RCTs and case series. TMJDs were defined inconsistently in the primary studies and systematic reviews, and several of the 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 5 categories (some studies were included in >1 category). These categories and the main findings are listed in Table 1.

**Table 1. List and Axelsson’s (2010) 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 that 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 that acupuncture was better than no treatment. One review found that 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 (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 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.   |

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

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Overall, reviewers concluded that 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 they examined included primary studies with considerable variation in methodologic quality and, thus, it was not possible to make definitive conclusions about the effectiveness of any of the treatments.

In 2016, Randhawa et al 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. 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 in terms of pain, mouth opening, or other outcomes.

### **Intraoral Devices or Appliances**

In 2010, Friction et al reported on a systematic review of RCTs on intraoral treatment of TMJDs and identified 47 publications on 44 trials. 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 1 device with a different treatment (e.g., acupuncture or biofeedback). None of the studies evaluated use of 1 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 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 pain was measured by subjective report of status. Ten RCTs were included in 2 meta-analyses; 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 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 [OR], 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 (OR=2.14; 95% CI, 0.80 to 5.75; p=0.12).

In 2016, Ivorra-Carbonell et al reported on a systematic review of functional advancement devices for TMJD, which included systematic reviews, meta-analyses, RCTs, case-control studies, and cohort studies. Reviewers included 21 articles evaluating some kind of 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**

In 2012, Ebrahim et al identified 11 RCTs comparing splint therapy for TMJDs with minimal or no therapy. Nine of the 11 studies used stabilization splints, 1 used soft splints, and 1 used an anterior repositioning

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appliance. Reviewers used the GRADE system to rate study quality. Nine studies did not report whether allocation was concealed, and 6 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 [SMD], -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 quality of life or depression scores.

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

An earlier Cochrane review by Al-Ani et al (2014) identified 12 RCTs that compared stabilization splint therapy for TMJD with a control intervention. (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; a new Cochrane review on occlusal interventions for managing TMJDs is planned.

### Acupuncture

A 2011 systematic review and meta-analysis identified 7 sham-controlled RCTs on acupuncture for treating TMJD. 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 7 studies reported 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) found a statistically significant improvement 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 may 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 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, efficacy assessment only immediately posttreatment.

### Orthodontic Services

A 2010 Cochrane review by Luther et al did not identify any RCTs evaluating orthodontic treatment for TMJDs and thus concluded that there is insufficient evidence on the efficacy of orthodontics. Reviewers defined orthodontic treatment as appliances that would induce stable tooth movement for a sufficient period

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of time 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 standards; a new Cochrane review on occlusal interventions for managing TMJDs is planned.

### **Hyaluronic Acid**

#### ***Systematic Reviews***

There are several systematic reviews of studies on hyaluronic acid for treating TMJDs. Only 1 of the systematic reviews limited its inclusion criteria to RCTs and pooled study findings—the 2013 Cochrane review by Shi et al. The Shi 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: 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 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 ( $\geq 3$  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 that there was insufficient consistent evidence to draw conclusions on 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.

#### ***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 published 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 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

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(6) 5 weekly single-needle arthrocenteses plus low-molecular-weight hyaluronic acid. Sixty (83%) of 72 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 in pain at rest ranged from -29.1% in the group receiving 5 weekly single-needle arthrocenteses plus low-molecular-weight hyaluronic acid to -38.4% in the group receiving a single session of arthrocentesis alone. Limitations of the study included the small number of patients in each treatment group and the substantial number of dropouts in absence of an intention-to-treat (ITT) analysis.

A 2007 study by Bjornland et al in Norway published a double-blind RCT that included 40 patients with osteoarthritis of the TMJD. Patients received 2 injections, 14 days apart, of 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 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).

In 1993, Bertolami et al published a double-blind placebo-controlled trial that included 121 patients with TMJD. Patients had to have a confirmed diagnosis of 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. Eighty patients were randomized to the hyaluronate group and 41 to the placebo group. This included 57 patients in the DJD group, 50 patients in the DDR 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. 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 for 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 et al, last updated in 2009, identified 2 RCTs (total N=81 patients) that compared the effectiveness of arthrocentesis and lavage for the treatment of TMJD to arthroscopy. 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) in favor of arthroscopy. The Cochrane review was withdrawn in 2015 for being out of date and

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not meeting current Cochrane methodologic standards; a new Cochrane review on surgical interventions for managing TMJDs is planned. Another Cochrane review reporting on arthroscopy for TMJD, originally published in 2010, was also withdrawn from Cochrane from 2015 for being out of date and not meeting current Cochrane methodologic standards.

In a 2013 systematic review, Vos et al identified 3 RCTs (total N=222 patients) that compared the efficacy of lavage of the TMJ (i.e., arthrocentesis or arthroscopy) with nonsurgical TMJ treatment. Although reviewers assessed the quality of the studies to be adequate, only 1 study stated that allocation to treatment group was concealed; 2 studies did not explicitly state that an ITT analysis was used. The 2 primary outcomes considered were change in pain and maximal mouth opening (MMO) at 6 months compared with baseline. Pain was measured by VAS. Pooled analysis of data from the 3 trials found a statistically significant reduction in pain at 6 months with lavage versus nonsurgical therapy (SMD = -1.07; 95% CI, -1.38 to -0.76). There was no 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).

### SUMMARY OF EVIDENCE

For individuals who have suspected TMJD who receive ultrasound, surface EMG, or joint vibration analysis, the evidence includes systematic reviews of diagnostic test studies. Relevant outcomes are test accuracy, test validity, and other performance measures. None of the systematic reviews found that these diagnostic techniques accurately identify patients with TMJD and many of the included 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 RCTs. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. A systematic review of intraoral appliances (44 studies) and meta-analyses of subsets of these studies have found a significant benefit of intraoral appliances compared with control interventions. Other systematic reviews found a significant benefit of several pharmacologic treatments (e.g., 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. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. The systematic reviews did not find that the above technologies improved pain and 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 RCTs. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. Only 1 review, which included 3 RCTs, compared

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arthrocentesis or arthroscopy with nonsurgical interventions for TMJD. Pooled analyses of the RCTs found that arthrocentesis and arthroscopy resulted in superior pain reduction than control interventions. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

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### **Policy History**

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12/07/2017 Medical Policy Committee review

12/20/2017 Medical Policy Implementation Committee approval. New policy.

08/01/2018 Coding update.

08/16/2018 Coding update

Next Scheduled Review Date: 12/2018

### **Coding**

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|------------------|--|
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| HCPCS            | D0370, D7840, D7850, D7852, D7854, D7856, D7858, D7860, D7865, D7872, D7873, D7874, D7875, D7876, D7877, D7899, E1700, E1701, E1702, S8948 |
| ICD-10 Diagnosis | M26.00-M26.29, M26.4-M26.9   |

\*Investigational – A medical treatment, procedure, drug, device, or biological product is Investigational if the effectiveness has not been clearly tested and it has not been incorporated into standard medical practice. Any determination we make that a medical treatment, procedure, drug, device, or biological product is Investigational will be based on a consideration of the following:

- A. Whether the medical treatment, procedure, drug, device, or biological product can be lawfully marketed without approval of the U.S. Food and Drug Administration (FDA) and whether such approval has been granted at the time the medical treatment, procedure, drug, device, or biological product is sought to be furnished; or
- B. Whether the medical treatment, procedure, drug, device, or biological product requires further studies or clinical trials to determine its maximum tolerated dose, toxicity, safety, effectiveness, or effectiveness as compared with the standard means of treatment or diagnosis, must improve health outcomes, according to the consensus of opinion among experts as shown by reliable evidence, including:
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- B. Clinically appropriate, in terms of type, frequency, extent, level of care, site and duration, and considered effective for the patient's illness, injury or disease; and
- C. Not primarily for the personal comfort or convenience of the patient, physician or other health care provider, and not more costly than an alternative service or sequence of services at least as likely to produce equivalent therapeutic or diagnostic results as to the diagnosis or treatment of that patient's illness, injury or disease.

For these purposes, "nationally accepted standards of medical practice" means standards that are based on credible scientific evidence published in peer-reviewed medical literature generally recognized by the relevant medical community, Physician Specialty Society recommendations and the views of Physicians practicing in relevant clinical areas and any other relevant factors.

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