



MASSACHUSETTS

Blue Cross Blue Shield of Massachusetts is an Independent Licensee of the Blue Cross and Blue Shield Association

Medical Policy

Temporomandibular Joint Disorder

Table of Contents

- [Policy: Commercial](#)
- [Policy: Medicare](#)
- [Authorization Information](#)
- [Coding Information](#)
- [Description](#)
- [Policy History](#)
- [Information Pertaining to All Policies](#)
- [References](#)
- [Endnotes](#)

Policy Number: 035

New Policy Number: 2.01.21

NCD/LCD: N/A

Related Policies

- Transcutaneous Electrical Nerve Stimulation (TENS), #[003](#)
- Low-Level Laser Therapy, #[522](#)
- Percutaneous Electrical Nerve Stimulation (PENS) and Percutaneous Neuromodulation Therapy (PNT), #[172](#)
- Biofeedback for Chronic Pain, #[210](#)
- Injections for Osteoarthritis, #[427](#)

Policy

Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity Medicare HMO BlueSM and Medicare PPO BlueSM Members

DIAGNOSTIC PROCEDURES

The following **diagnostic procedures** may be considered **MEDICALLY NECESSARY** in the diagnosis of temporomandibular joint disorder (TMJD):

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

*Cephalograms and pantograms should be reviewed on an individual basis.

The following **diagnostic procedures** are considered **INVESTIGATIONAL** in the diagnosis of TMJD:

- Electromyography (EMG), including surface EMG;
- Kinesiography;
- Thermography;
- Neuromuscular junction testing;
- Somatosensory testing;

- Transcranial or lateral skull x-rays;
- Intra-oral tracing or gnathic arch tracing (intended to demonstrate deviations in the positioning of the jaws that are associated with TMJ disorder);
- Muscle testing;
- Standard dental radiographic procedures;
- Range of motion measurements;
- Computerized mandibular scan (this measures and records muscle activity related to movement and positioning of the mandible and is intended to detect deviations in occlusion and muscle spasms related to TMJD);
- Ultrasound imaging/sonogram;
- Arthroscopy of the temporomandibular joint (TMJ) for purely diagnostic purposes;
- Joint vibration analysis.

NONSURGICAL TREATMENTS

The following **nonsurgical treatments** may be considered **MEDICALLY NECESSARY** in the treatment of TMJD:

- Intra-oral removable prosthetic devices/appliances (encompassing fabrication, insertion, and adjustment);
- Pharmacologic treatment (such as anti-inflammatory, muscle relaxing, and analgesic medications);
- Physical therapy.¹

The following **nonsurgical treatments** are considered **INVESTIGATIONAL** in the treatment of TMJD:

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;
8. Transcutaneous electrical nerve stimulation (TENS);
9. Percutaneous electrical nerve stimulation (PENS);
10. Acupuncture;
11. Hyaluronic acid.

SURGICAL TREATMENTS

The following **surgical treatments** may be considered **MEDICALLY NECESSARY** in the treatment of TMJD:

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

Prior Authorization Information

Inpatient

- For services described in this policy, precertification/preauthorization **IS REQUIRED** for all products if the procedure is performed **inpatient**.

Outpatient

- For services described in this policy, see below for products where prior authorization **might be required** if the procedure is performed **outpatient**.

	Outpatient
--	-------------------

Commercial Managed Care (HMO and POS)	Prior authorization is required .
Commercial PPO and Indemnity	Prior authorization is not required .
Medicare HMO BlueSM	Prior authorization is required .
Medicare PPO BlueSM	Prior authorization is not required .

Note: Prior authorization is **not** required on CPT codes: 70328, 70330, 70332, 70336, 70350, and 70355.

CPT Codes / HCPCS Codes / ICD Codes

Inclusion or exclusion of a code 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 as it applies to an individual member.

Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.

The following codes are included below for informational purposes only; this is not an all-inclusive list.

The above medical necessity criteria MUST be met for the following codes to be covered for Commercial Members: Managed Care (HMO and POS), PPO, Indemnity, Medicare HMO Blue and Medicare PPO Blue:

CPT Codes

CPT codes:	Code Description
20605	Arthrocentesis, aspiration and/or injection; intermediate joint or bursa (e.g., temporomandibular, acromioclavicular, wrist, elbow or ankle, olecranon bursa)
21010	Arthrotomy, temporomandibular joint
21050	Condylectomy, temporomandibular joint (separate procedure)
21060	Meniscectomy, partial or complete, temporomandibular joint
21073	Manipulation of temporomandibular joint(s) (TMJ), therapeutic, requiring an anesthesia service (i.e., 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 (e.g., proton) imaging, temporomandibular joint(s)
70350	Cephalogram, orthodontic
70355	Orthopantomogram

ICD-10 Procedure Codes

ICD-10-PCS procedure codes:	Code Description
0NJW0ZZ	Inspection of Facial Bone, Open Approach
0NRR0JZ	Replacement of Right Maxilla with Synthetic Substitute, Open Approach
0NRS0JZ	Replacement of Left Maxilla with Synthetic Substitute, Open Approach
0NUR0JZ	Supplement Right Maxilla with Synthetic Substitute, Open Approach

0NUS0JZ	Supplement Left Maxilla with Synthetic Substitute, Open Approach
0R9C3ZZ	Drainage of Right Temporomandibular Joint, Percutaneous Approach
0R9D3ZZ	Drainage of Left Temporomandibular Joint, Percutaneous Approach
0RBC0ZZ	Excision of Right Temporomandibular Joint, Open Approach
0RBC4ZZ	Excision of Right Temporomandibular Joint, Percutaneous Endoscopic Approach
0RBD0ZZ	Excision of Left Temporomandibular Joint, Open Approach
0RBD4ZZ	Excision of Left Temporomandibular Joint, Percutaneous Endoscopic Approach
0RJC0ZZ	Inspection of Right Temporomandibular Joint, Open Approach
0RJC4ZZ	Inspection of Right Temporomandibular Joint, Percutaneous Endoscopic Approach
0RJD0ZZ	Inspection of Left Temporomandibular Joint, Open Approach
0RJD4ZZ	Inspection of Left Temporomandibular Joint, Percutaneous Endoscopic Approach
0RQC0ZZ	Repair Right Temporomandibular Joint, Open Approach
0RQC4ZZ	Repair Right Temporomandibular Joint, Percutaneous Endoscopic Approach
0RQCXZZ	Repair Right Temporomandibular Joint, External Approach
0RQD0ZZ	Repair Left Temporomandibular Joint, Open Approach
0RQD4ZZ	Repair Left Temporomandibular Joint, Percutaneous Endoscopic Approach
0RQDXZZ	Repair Left Temporomandibular Joint, External Approach
0RRC0JZ	Replacement of Right Temporomandibular Joint with Synthetic Substitute, Open Approach
0RRD0JZ	Replacement of Left Temporomandibular Joint with Synthetic Substitute, Open Approach
0RSC0ZZ	Reposition Right Temporomandibular Joint, Open Approach
0RSCXZZ	Reposition Right Temporomandibular Joint, External Approach
0RSD0ZZ	Reposition Left Temporomandibular Joint, Open Approach
0RSDXZZ	Reposition Left Temporomandibular Joint, External Approach
0RUC0JZ	Supplement Right Temporomandibular Joint with Synthetic Substitute, Open Approach
0RUD0JZ	Supplement Left Temporomandibular Joint with Synthetic Substitute, Open Approach
3E0U33Z	Introduction of Anti-inflammatory into Joints, Percutaneous Approach
3E0U3GC	Introduction of Other Therapeutic Substance into Joints, Percutaneous Approach
BN05ZZZ	Plain Radiography of Facial Bones
BN06ZZZ	Plain Radiography of Mandible
BN070ZZ	Plain Radiography of Right Temporomandibular Joint using High Osmolar Contrast
BN071ZZ	Plain Radiography of Right Temporomandibular Joint using Low Osmolar Contrast
BN07YZZ	Plain Radiography of Right Temporomandibular Joint using Other Contrast
BN07ZZZ	Plain Radiography of Right Temporomandibular Joint
BN080ZZ	Plain Radiography of Left Temporomandibular Joint using High Osmolar Contrast
BN081ZZ	Plain Radiography of Left Temporomandibular Joint using Low Osmolar Contrast
BN08YZZ	Plain Radiography of Left Temporomandibular Joint using Other Contrast
BN08ZZZ	Plain Radiography of Left Temporomandibular Joint
BN090ZZ	Plain Radiography of Bilateral Temporomandibular Joints using High Osmolar Contrast
BN091ZZ	Plain Radiography of Bilateral Temporomandibular Joints using Low Osmolar Contrast
BN09YZZ	Plain Radiography of Bilateral Temporomandibular Joints using Other Contrast
BN09ZZZ	Plain Radiography of Bilateral Temporomandibular Joints
BN0GZZZ	Plain Radiography of Single Tooth
BN0HZZZ	Plain Radiography of Multiple Teeth
BN0JZZZ	Plain Radiography of All Teeth
BN170ZZ	Fluoroscopy of Right Temporomandibular Joint using High Osmolar Contrast
BN171ZZ	Fluoroscopy of Right Temporomandibular Joint using Low Osmolar Contrast

BN17YZZ	Fluoroscopy of Right Temporomandibular Joint using Other Contrast
BN17ZZZ	Fluoroscopy of Right Temporomandibular Joint
BN180ZZ	Fluoroscopy of Left Temporomandibular Joint using High Osmolar Contrast
BN181ZZ	Fluoroscopy of Left Temporomandibular Joint using Low Osmolar Contrast
BN18YZZ	Fluoroscopy of Left Temporomandibular Joint using Other Contrast
BN18ZZZ	Fluoroscopy of Left Temporomandibular Joint
BN190ZZ	Fluoroscopy of Bilateral Temporomandibular Joints using High Osmolar Contrast
BN191ZZ	Fluoroscopy of Bilateral Temporomandibular Joints using Low Osmolar Contrast
BN19YZZ	Fluoroscopy of Bilateral Temporomandibular Joints using Other Contrast
BN19ZZZ	Fluoroscopy of Bilateral Temporomandibular Joints
BN250ZZ	Computerized Tomography (CT Scan) of Facial Bones using High Osmolar Contrast
BN251ZZ	Computerized Tomography (CT Scan) of Facial Bones using Low Osmolar Contrast
BN25YZZ	Computerized Tomography (CT Scan) of Facial Bones using Other Contrast
BN25ZZZ	Computerized Tomography (CT Scan) of Facial Bones
BN260ZZ	Computerized Tomography (CT Scan) of Mandible using High Osmolar Contrast
BN261ZZ	Computerized Tomography (CT Scan) of Mandible using Low Osmolar Contrast
BN26YZZ	Computerized Tomography (CT Scan) of Mandible using Other Contrast
BN26ZZZ	Computerized Tomography (CT Scan) of Mandible
BN290ZZ	Computerized Tomography (CT Scan) of Bilateral Temporomandibular Joints using High Osmolar Contrast
BN291ZZ	Computerized Tomography (CT Scan) of Bilateral Temporomandibular Joints using Low Osmolar Contrast
BN29YZZ	Computerized Tomography (CT Scan) of Bilateral Temporomandibular Joints using Other Contrast
BN29ZZZ	Computerized Tomography (CT Scan) of Bilateral Temporomandibular Joints
BN2F0ZZ	Computerized Tomography (CT Scan) of Temporal Bones using High Osmolar Contrast
BN2F1ZZ	Computerized Tomography (CT Scan) of Temporal Bones using Low Osmolar Contrast
BN2FYZZ	Computerized Tomography (CT Scan) of Temporal Bones using Other Contrast
BN2FZZZ	Computerized Tomography (CT Scan) of Temporal Bones
BN39YZZ	Magnetic Resonance Imaging (MRI) of Bilateral Temporomandibular Joints using Other Contrast
BN39ZZZ	Magnetic Resonance Imaging (MRI) of Bilateral Temporomandibular Joints

Description

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, myofibroticcontracture, myospasm, neoplasia).

Diagnosis

In the clinical setting, TMJD is often a diagnosis of exclusion and involves physical examination, patient interview, and a review of dental records. Diagnostic testing and radiologic imaging are 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.^{1,2,3}

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).

Treatment

For many patients, symptoms of TMJD are short-term and self-limiting. Conservative treatments (eg, eating soft foods, rest, heat, ice, avoiding extreme jaw movements) and anti-inflammatory medication are recommended before considering more invasive and/or permanent therapies (eg, surgery).

Note that low-level laser therapy for TMJD is addressed in policy [#522](#).

Summary

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.

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 randomized controlled trials (RCTs) and systematic reviews of the RCTs. The 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 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, quality of life, 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, quality of life, 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.

Policy History

Date	Action
4/2019	BCBSA National medical policy review. Description, summary and references updated. Policy statements unchanged.
11/2018	BCBSA National policy review. Summary section clarified. Policy statements unchanged. 11/2018
4/2018	BCBSA National policy review.

	Dysfunction changed to "Disorder" in the policy statement and title. Policy statements otherwise unchanged. 4/2018
1/2018	Clarified coding information.
3/2017	New references added from BCBSA National medical policy.
6/2016	BCBSA National policy review. Gothic in second policy statement corrected to "gnathic." 6/1/2016
5/2016	Clarified coding information.
9/2014	New references added from BCBSA National medical policy. Prior authorization information clarified.
9/2014	Physical therapy coverage clarified as specified in the subscriber certificate. Effective 9/1/2014.
6/2014	Updated Coding section with ICD10 procedure and diagnosis codes, effective 10/2015.
1/2014	BCBSA National medical policy review. New investigational indications described. Effective 1/1/2014.
2/2013	BCBSA National medical policy review. Changes to policy statements. Effective 2/4/2013.
11/2011-4/2012	Medical policy ICD 10 remediation: Formatting, editing and coding updates. No changes to policy statements.
3/1/2012	BCBSA National medical policy review. Changes to policy statements.
6/2011	Reviewed - Medical Policy Group - Orthopedics, Rehabilitation Medicine and Rheumatology. No changes to policy statements.
3/1/2011	BCBSA National medical policy review. Changes to policy statements.
7/2009	Reviewed - Medical Policy Group - Orthopedics, Rehabilitation Medicine and Rheumatology. No changes to policy statements.
7/2008	Reviewed - Medical Policy Group - Orthopedics, Rehabilitation Medicine and Rheumatology. No changes to policy statements.
7/2007	Reviewed - Medical Policy Group - Orthopedics, Rehabilitation Medicine and Rheumatology. No changes to policy statements.

Information Pertaining to All Blue Cross Blue Shield Medical Policies

Click on any of the following terms to access the relevant information:

[Medical Policy Terms of Use](#)

[Managed Care Guidelines](#)

[Indemnity/PPO Guidelines](#)

[Clinical Exception Process](#)

[Medical Technology Assessment Guidelines](#)

References

1. Schiffman E, Ohrbach R, Truelove E, et al. Diagnostic criteria for temporomandibular disorders (DC/TMD) for clinical and research applications: recommendations of the International RDC/TMD Consortium Network* and Orofacial Pain Special Interest Groupdagger. J Oral Facial Pain Headache. Winter 2014;28(1):6-27. PMID 24482784
2. Ohrbach R, Turner JA, Sherman JJ, et al. The research diagnostic criteria for temporomandibular disorders. IV: evaluation of psychometric properties of the Axis II measures. J Orofac Pain. Winter 2010;24(1):48-62. PMID 20213031

3. Schiffman E, Ohrbach R. Executive summary of the Diagnostic Criteria for Temporomandibular Disorders for clinical and research applications. *J Am Dent Assoc.* Jun 2016;147(6):438-445. PMID 26922248
4. Manfredini D, Guarda-Nardini L. Ultrasonography of the temporomandibular joint: a literature review. *Int J Oral Maxillofac Surg.* Dec 2009;38(12):1229-1236. PMID 19700262
5. Klasser GD, Okeson JP. The clinical usefulness of surface electromyography in the diagnosis and treatment of temporomandibular disorders. *J Am Dent Assoc.* Jun 2006;137(6):763-771. PMID 16803805
6. Sharma S, Crow HC, McCall WD, Jr., et al. Systematic review of reliability and diagnostic validity of joint vibration analysis for diagnosis of temporomandibular disorders. *J Orofac Pain.* Winter 2013;27(1):51-60. PMID 23424720
7. List T, Axelsson S. Management of TMD: evidence from systematic reviews and meta-analyses. *J Oral Rehabil.* May 2010;37(6):430-451. PMID 20438615
8. Randhawa K, Bohay R, Cote P, et al. The effectiveness of noninvasive interventions for temporomandibular disorders: a systematic review by the Ontario Protocol for Traffic Injury Management (OPTIMA) Collaboration. *Clin J Pain.* Mar 2016;32(3):260-278. PMID 25924094
9. Friction J, Look JO, Wright E, et al. Systematic review and meta-analysis of randomized controlled trials evaluating intraoral orthopedic appliances for temporomandibular disorders. *J Orofac Pain.* Summer 2010;24(3):237-254. PMID 20664825
10. Ivorra-Carbonell L, Montiel-Company JM, Almerich-Silla JM, et al. Impact of functional mandibular advancement appliances on the temporomandibular joint - a systematic review. *Med Oral Patol Oral Cir Bucal.* Sep 1 2016;21(5):e565-572. PMID 27475694
11. Ebrahim S, Montoya L, Busse JW, et al. The effectiveness of splint therapy in patients with temporomandibular disorders: a systematic review and meta-analysis. *J Am Dent Assoc.* Aug 2012;143(8):847-857. PMID 22855899
12. Zhang C, Wu JY, Deng DL, et al. Efficacy of splint therapy for the management of temporomandibular disorders: a meta-analysis. *Oncotarget.* Dec 20 2016;7(51):84043-84053. PMID 27823980
13. Al-Ani MZ, Davies SJ, Gray RJ, et al. Stabilisation splint therapy for temporomandibular pain dysfunction syndrome. *Cochrane Database Syst Rev.* Feb 2004(1):CD002778. PMID 14973990
14. Al-Ani MZ, Davies SJ, Gray RJ, et al. WITHDRAWN: Stabilisation splint therapy for temporomandibular pain dysfunction syndrome. *Cochrane Database Syst Rev.* Jan 04 2016(1):CD002778. PMID 26727210
15. Häggman-Henrikson B, Alstergren P, Davidson T, et al. Pharmacological treatment of oro-facial pain - health technology assessment including a systematic review with network meta-analysis. *J Oral Rehabil.* Oct 2017;44(10):800-826. PMID 28884860
16. Jung A, Shin BC, Lee MS, et al. Acupuncture for treating temporomandibular joint disorders: a systematic review and meta-analysis of randomized, sham-controlled trials. *J Dent.* May 2011;39(5):341-350. PMID 21354460
17. Luther F, Layton S, McDonald F. Orthodontics for treating temporomandibular joint (TMJ) disorders. *Cochrane Database Syst Rev.* Jul 7 2010(7):CD006541. PMID 20614447
18. Luther F, Layton S, McDonald F. WITHDRAWN: Orthodontics for treating temporomandibular joint (TMJ) disorders. *Cochrane Database Syst Rev.* Jan 07 2016(1):CD006541. PMID 26741357
19. Manfredini D, Piccotti F, Guarda-Nardini L. Hyaluronic acid in the treatment of TMJ disorders: a systematic review of the literature. *Cranio.* Jul 2010;28(3):166-176. PMID 20806734
20. Machado E, Bonotto D, Cunali PA. Intra-articular injections with corticosteroids and sodium hyaluronate for treating temporomandibular joint disorders: a systematic review. *Dental Press J Orthod.* Sep-Oct 2013;18(5):128-133. PMID 24352399
21. Shi Z, Guo C, Awad M. Hyaluronate for temporomandibular joint disorders. *Cochrane Database Syst Rev.* Jan 2003(1):CD002970. PMID 12535445
22. Goiato MC, da Silva EV, de Medeiros RA, et al. Are intra-articular injections of hyaluronic acid effective for the treatment of temporomandibular disorders? A systematic review. *Int J Oral Maxillofac Surg.* Dec 2016;45(12):1531-1537. PMID 27374020
23. Shi Z, Guo C, Awad M. WITHDRAWN: Hyaluronate for temporomandibular joint disorders. *Cochrane Database Syst Rev.* Oct 8 2013(10):CD002970. PMID 24105378

24. Liu Y, Wu J, Fei W, et al. There a difference in intra-articular injections of corticosteroids, hyaluronate, or placebo for temporomandibular osteoarthritis? *J Oral Maxillofac Surg.* Nov 8 2017. PMID 29182905
25. Gorrela H, Prameela J, Srinivas G, et al. Efficacy of temporomandibular joint arthrocentesis with sodium hyaluronate in the management of temporomandibular joint disorders: a prospective randomized control trial. *J Maxillofac Oral Surg.* Dec 2017;16(4):479-484. PMID 29038631
26. Manfredini D, Rancitelli D, Ferronato G, et al. Arthrocentesis with or without additional drugs in temporomandibular joint inflammatory-degenerative disease: comparison of six treatment protocols. *J Oral Rehabil.* Apr 2012;39(4):245-251. PMID 21999138
27. Bjornland T, Gjaerum AA, Moystad A. Osteoarthritis of the temporomandibular joint: an evaluation of the effects and complications of corticosteroid injection compared with injection with sodium hyaluronate. *J Oral Rehabil.* Aug 2007;34(8):583-589. PMID 17650168
28. Bertolami CN, Gay T, Clark GT, et al. Use of sodium hyaluronate in treating temporomandibular joint disorders: a randomized, double-blind, placebo-controlled clinical trial. *J Oral Maxillofac Surg.* Mar 1993;51(3):232-242. PMID 8445463
29. Guo C, Shi Z, Revington P. Arthrocentesis and lavage for treating temporomandibular joint disorders. *Cochrane Database Syst Rev.* Oct 7 2009(4):CD004973. PMID 19821335
30. Guo C, Shi Z, Revington P. WITHDRAWN: Arthrocentesis and lavage for treating temporomandibular joint disorders. *Cochrane Database Syst Rev.* Dec 16 2015(12):CD004973. PMID 26677172
31. Rigon M, Pereira LM, Bortoluzzi MC, et al. WITHDRAWN: Arthroscopy for temporomandibular disorders. *Cochrane Database Syst Rev.* Dec 16 2015(12):CD006385. PMID 26677136
32. Vos LM, Huddleston Slater JJ, Stegenga B. Lavage therapy versus nonsurgical therapy for the treatment of arthralgia of the temporomandibular joint: a systematic review of randomized controlled trials. *J Orofac Pain.* Spring 2013;27(2):171-179. PMID 23630689
33. American Association for Dental Research (AADR). Science Policy: Temporomandibular disorders (TMD). 1996 (revised 2010, reaffirmed 2015); <http://www.iadr.org/AADR/About-Us/Policy-Statements/Science-Policy#TMD>. Accessed January 29, 2018.
34. American Society of Temporomandibular Joint Surgeons. Guidelines for diagnosis and management of disorders involving the temporomandibular joint and related musculoskeletal structures. 2001; <http://astmjs.org/final%20guidelines-04-27-2005.pdf>. Accessed January 26, 2018.
35. American Dental Association. Temporomandibular (Craniomandibular) Disorders. 1997; <http://www.ada.org/1958.aspx>. Accessed January 26, 2018.
36. Hossameldin RH, McCain JP. Outcomes of office-based temporomandibular joint arthroscopy: a 5-year retrospective study. *Int J Oral Maxillofac Surg.* Jan 2018;47(1):90-97.

Endnotes

¹ Based on Subscriber Certificate