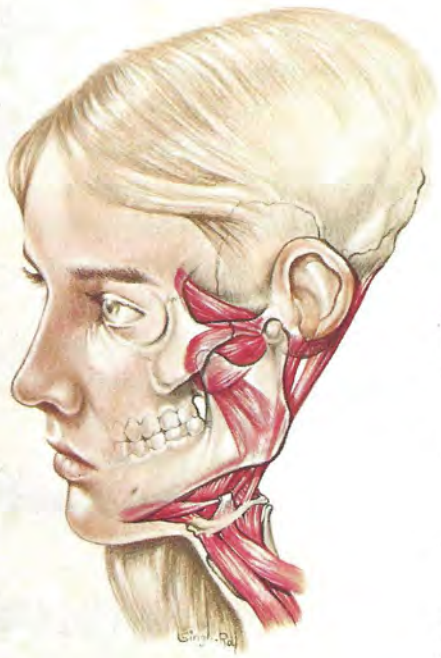
December 15, 1983
VOLUME 17 NUMBER 21

THE PRACTICAL JOURNAL FOR PRIMARY CARE PHYSICIANS

patient care®



Temporomandibular disorders

"Doctor, my jaw hurts."

BASED ON INDIVIDUAL INTERVIEWS WITH DONALD C. CHASE, DDS; M. FRANKLIN DOLWICK, DMD, PHD; BARRY H. HENDLER, MD, DDS; STEVEN L. KRAUS, RPT

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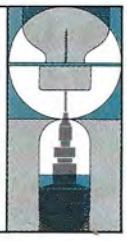

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Prepared by Associate Staff Editor James M. Kent

TEMPOROMANDIBULAR DISORDERS

"Doctor, my jaw hurts."

BASED ON INDIVIDUAL INTERVIEWS WITH DONALD C. CHASE, DDS; M. FRANKLIN DOLWICK, DMD, PHD; BARRY H. HENDLER, MD, DDS; STEVEN L. KRAUS, RPT (SEE PAGE 119)

EXPRESS STOP

Focusing the history: When you suspect a temporomandibular disorder, get a detailed description of the pain, including its character, location, onset, severity, and duration. Pain commonly consists of achy jaw muscles, usually the masseter or temporalis. It can begin over several days or progress over weeks or months; it is often associated with emotional stress or, less frequently, with physical trauma to the jaw. Pain is common with motion of the jaw, and sometimes with movement of the head.

A few key questions can help you determine the likelihood of a temporomandibular disorder and the need for a more searching evaluation (see "Temporomandibular disorders: Paring the differential in the history," page 127).

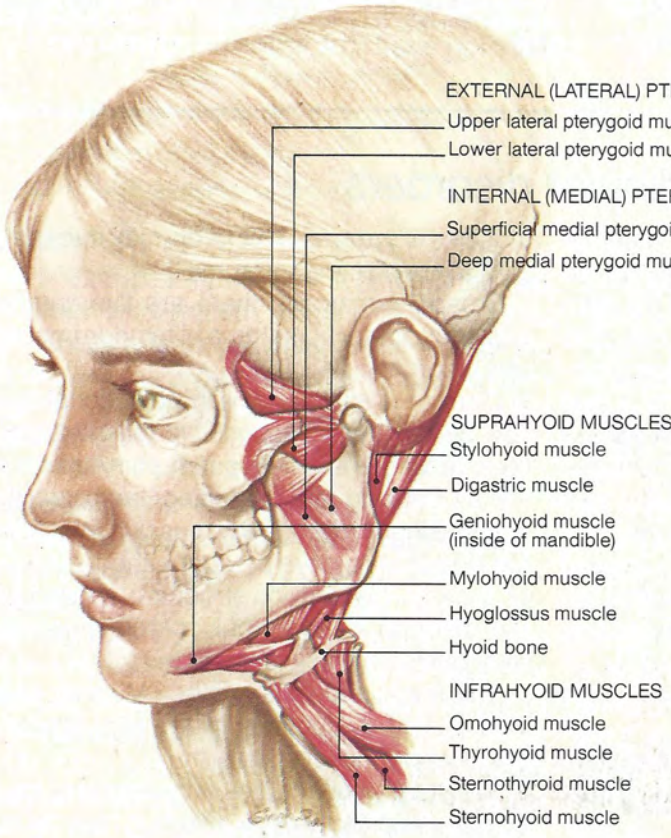
≫ *What kind of pain do you have?* Most patients will have a dull, muscular ache that worsens with use of the jaw; jaw muscles can be exquisitely sensitive to palpation. Referred pain is usually a dull ache or burning sensation that does not change on palpation of the painful area or of the origin.

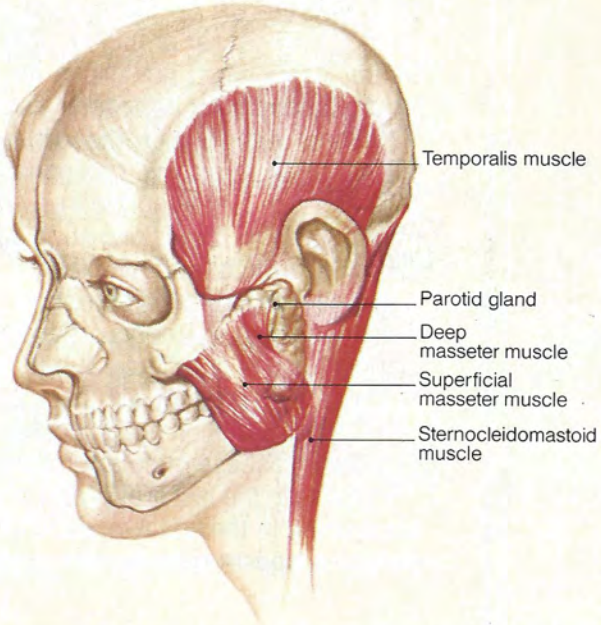
≫ *Where is your pain?* Have the patient outline the area of pain, using one finger. Often, a patient indicates the masseter, the temporalis, the base of the skull, or the temporomandibular joint (TMJ). Referred pain is often dispersed and affects the ear canal, outer ear, neck, supraorbital area, temporal areas, occiput, sinuses, or teeth.

≫ *How did the pain begin?* Pain associated with a temporomandibular disorder can begin over several days, or progress over weeks or months. Typically, the patient will gradually have become aware first of discomfort in the jaw, then of pain, and will not recall exactly when it began. Its occurrence is usually associated with insidious onset of emotional stress or trauma, and, less frequently, with direct physical trauma from a variety of sources: a lengthy dental procedure, a wide yawn, or an activity such as playing a wind instrument or snorkeling. Automobile accidents resulting in whiplash or a direct blow to the mandible are a common cause of injury to the TMJ, the cervical spine, and the muscles of mastication. Sports injuries often involve direct trauma to the mandible.

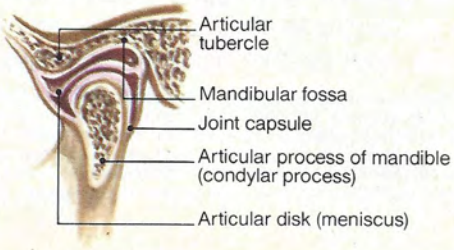
When the signs and symptoms suggest muscular pain, also consider the patient's occupation. Some musicians (for example, clarinetists and violinists) and people who regularly cradle a phone against their shoulder can traumatize the TMJ and the muscles of mastication and of the cervical spine. Also consider, as a precipitating factor, a change in work habits that demands a change in posture—for example, from sitting all day to moving about.

Anatomy of the temporomandibular joint and associated structures





LEFT TEMPOROMANDIBULAR JOINT (lateral view, section)



≫ *When is your pain most severe?* Most patients will complain of pain or difficulty when chewing, yawning, or opening the mouth wide (wide enough to insert two knuckles); some will have pain when turning the head from side to side or nodding up and down. The pain is also often associated with a sound or sensation of clicking, popping, or grinding in the TMJ during opening or closing of the mouth.

Ask the patient if she* has discomfort in the jaw or TMJ, headaches, or a sensation

*Since temporomandibular disorders are reported 3-4 times as often in women as in men, patients in this article are presumed to be female unless otherwise noted.

CAPSULE REVIEW

Defining temporomandibular disorders

Until recently, clinicians tended to lump together disorders that cause pain in and around the temporomandibular joint (TMJ) under the term *temporomandibular joint syndrome* or one of its variants. The more global term *temporomandibular disorders* has recently been introduced to acknowledge that dysfunction is not always limited to the joint proper (see "The chicken, the egg, and the TMJ," page 115). This term was preferred by the American Dental Association's 1982 conference on diagnosing and treating temporomandibular problems (see "American Dental Association guidelines for diagnosing temporomandibular disorders," page 131).

Patients with temporomandibular disorders fall into three diagnostic categories:

≫ Those with joint abnormalities resulting from trauma or from conditions such as ankylosis, synovitis, arthritis, and neoplasm

≫ Those with structural defects of the articular disk (meniscus), ligaments of the disk, condyles, glenoid fossae, or articular tubercles

≫ Those who present with pain, joint noise, or restricted jaw motion but do not have evidence of organic disease or structural defects

Patients in the last group, and presumably at least some in the first two, experience pain as part of a spasm-pain-spasm cycle* affecting muscles in the area. This cycle may subject the TMJ to chronic microtrauma.

Broadly construed, there are five common explanations for symptoms of temporomandibular disorders:

≫ One prevalent opinion is that emotional stress can be ultimately responsible for masticatory muscle fatigue and the spasm-pain-spasm cycle by causing jaw clenching, teeth grinding, and tensing of masticatory muscles. When dysfunction and pain are present without evidence of organic disease or structural abnormality, the disorder is commonly called *myofascial pain-dysfunction syndrome.*

≫ Trauma to or disease of the TMJ may cause pain in and dysfunction of the joint proper or masticatory muscles or both.

≫ Structural abnormalities of the joint may cause symptoms directly or by affecting muscle tone and initiating the spasm-pain-spasm cycle.

≫ Some clinicians maintain that malocclusion can give rise to the spasm-pain-spasm cycle.

≫ According to some orthopedic physiotherapists, poor posture can influence mobility and

*"Spasm" is used here to mean a sudden, involuntary contraction of a muscle or group of muscles attended by pain and interference with function. Contraction is sustained even when the muscle is at rest (in contrast to muscle splinting), and is induced by efferent impulses from the central nervous system. Bell WE: *Orofacial Pains: Differential Diagnosis*, ed 2. Chicago, Year Book Medical Publishers Inc, 1979, p 66.

of loose or painful teeth in the morning. This generally indicates nocturnal teeth grinding or clenching or poor sleeping posture. More rarely, painful mastication on arising can indicate rheumatoid arthritis (see "Joint inflammation," page 128).

Frequently, patients will have pain after meals and at the end of the day without showing signs of joint inflammation. For these patients, suspect involvement primarily of the masticatory muscles.

≫ *How long have you had this pain?* Most patients will seek help after having pain for more than a month. Some will have ex-

positioning of the mandible, which can result in the spasm-pain-spasm cycle (see "Is the cervical spine implicated?" page 123). Proponents of this view—which is controversial—prefer the term *craniomandibular-cervical dysfunction syndrome*, since they include derangement of the cervical spine in the etiology.

Symptoms

Typical symptoms include, in order of decreasing prevalence, pain in and around the TMJ or masticatory muscles, followed by joint noise—clicking, popping, or crepitus—and limited range of jaw motion. Referred pain may be felt in the occiput, ears, eyes, sinuses, and the angle of the mandible. Clinical evidence suggests that pain in the neck, shoulders, arms, and fingers may be related to disorders in the cervical spine which may be associated with temporomandibular disorders. Muscular pain often affects the temporalis, the masseter, and muscles of the occipital area and the neck.

Epidemiology

≫ Temporomandibular disorders are reported in women about 3-4 times as often as in men. Recent data suggest that women are more apt to seek treatment than men, and that the disorders occur equally in both sexes.

≫ While older studies reported that most patients were women in their 40s and 50s, newer studies report an increasing proportion of men and women under age 20. Some 10-46 million Americans may have symptoms.

≫ Some 70-90 percent of the patients present with pain on jaw movement as the primary symptom. Forty to 60 percent also have unilateral joint noise, and 15-25 percent will have a limited range of jaw motion. Pain on palpation of the masseter is present in about half the patients. Pain is almost always unilateral.

≫ Nearly 60 percent of the patients habitually grind or clench their teeth, most without knowing it. About 20 percent have other suspect oral habits such as excessive gum chewing, biting on hard objects, or biting their fingernails, cheeks, lips, or tongue.

≫ Of patients with temporomandibular disorders, some 70-80 percent suffer from masticatory muscle spasm.* The spasm is usually attributed to overuse from clenching or grinding of the teeth or tensing of masticatory muscles, either as a long-standing habit or as a habit induced by acute emotional stress.

*Laskin DM: Etiology of the pain-dysfunction syndrome. *J Am Dent Assoc* 1969;79:147-53.

perienced pain for a year or more.

Occasionally, you will find little in the history to guide your diagnosis. If the patient's pain is obscure in character and location, check for signs and symptoms of atypical facial neuralgia, keeping in mind that:

≫ Pain from atypical facial neuralgia is constant; it does not change with jaw function, time of day, or palpation.

≫ Atypical facial neuralgia is usually diffuse and follows neuroanatomy; pain from temporomandibular disorders generally involves specific muscles.

≫ Like temporomandibular disorders, atypical facial neuralgia commonly affects emotionally depressed women under age 40.

≫ Atypical facial neuralgia does not present with trigger points, as does a true tic douloureux.

Also inquire about any family history of cardiovascular disease. Angina and cardiac infarction can refer dull, aching, or throbbing pain to the angle and base of the

The chicken, the egg, and the TMJ

Since the 1950s, when the "TMJ syndrome" became generally recognized, general dentists, oral and maxillofacial surgeons, orthodontists, anatomists, physiatrists, physical therapists, and orthopedists have debated which comes first: masticatory muscle spasm or joint derangement? Or does malocclusion play a role in causing either or both of these problems? And what role do posture and derangement of the cervical spine play?

Laszlo Schwartz, DDS, and his co-workers at Columbia University first proposed in 1959 that psychological stress and anxiety resulted in masticatory muscle spasm.* Since then, several other workers have modified Schwartz's ideas. Among them, Daniel Laskin, DDS, has become a leading spokesman and has taken Schwartz a step further. He proposes that occlusal abnormalities in most patients are *not* the cause of muscle spasm.

Meanwhile, the idea that occlusal disharmony is the primary cause of temporomandibular disorders has fallen into disfavor; much of the evidence in support of the theory has been interpreted as anecdotal. Many maintain that the relief that occlusal therapy frequently affords is evidence for an occlusal component in the disorder, but a causal role for such a component has not been confirmed.

Another theory of the etiology of temporomandibular disorders—based on clinical data—proposes that children who have so-called dual bites may be more susceptible to temporomandibular disorders than adults. These children can chew with their jaws in protruded, middle, or retruded positions.

Continuing work by John Rugh, PhD, a psychologist, suggests that about 10 percent of patients with masticatory muscle disorders suffer from a sleep disorder that appears unrelated to anxiety. His work indicates that some people sleep well and grind their teeth; they remember neither dreaming nor bruxism. If they are sedated, they sleep more deeply and grind their teeth more. In contrast, people whose teeth grinding is stress related usually recall dreaming, and they grind their teeth less when sedated.

*Schwartz L: *Disorders of the Temporomandibular Joint: Diagnosis, Management, Relation to Occlusion of Teeth.* Philadelphia, WB Saunders Co, 1959, p 39.

mandible. Temporal arteritis, most common in men over age 50, results in tenderness to palpation over blood vessels in the neck and face; patients describe the pain as throbbing or aching.

EXPRESS STOP

Pacing the physical exam: Begin your examination of the patient with temporomandibular complaints by palpating the masticatory muscles. Vapocoolants can aid diagnosis of muscular involvement. Investigate the condition of the temporomandibular joint proper by palpating both over the joint and through the auditory canal. Listen to the joint with a stethoscope as the patient's jaw moves. Also note any asymmetry in jaw motion and in the face.

Physical examination for temporomandibular disorders begins with palpation of masticatory muscles over their bony origins. Tenderness, which is quite common, signals muscular involvement but does not reveal information about etiology.

You can reach the masseter, the deep masseter, the temporalis, the internal (or medial) pterygoid, and the infrahyoid and suprahyoid muscles. Palpating the internal pterygoids can elicit exquisite pain. The external (or lateral) pterygoids are more difficult to reach; some studies, furthermore, have found them tender in asymptomatic patients.

Refrigerant sprays, or vapocoolants, such as Fluori-Methane, can also help diagnose muscular involvement: When a patient with a limited range of jaw motion can suddenly open her mouth wider following a treatment with a vapocoolant, you can usually safely suspect muscle tension as a major component of her disorder.

To evaluate the temporomandibular joint (TMJ) itself, begin by palpating over the outside of the joint. You are likely to elicit pain if there is synovitis, arthritis, or a structural defect, such as damaged ligament of the articular disk (meniscus).

Next, with the patient's mouth open, stand behind her and, with your palms turned forward, gently insert your little fingers into both ear canals. Ask her to close and open her mouth slowly. With your fingertips pressed gently forward you can feel the condyles translate on opening and pivot in the fossae. Tenderness at the head of the condyle suggests an organic disorder, displacement of the disk, inflammation of the disk ligaments associated with joint laxity, or inflammation of the joint capsule.

With a stethoscope, listen to the joint as the patient opens and closes her mouth. Joint noise, when present with pain, can indicate derangement of the disk, condyle, or both. Crepitus commonly indicates an organic disorder, such as osteoarthritis or rheumatoid arthritis. Keep in mind, however, that about 40 percent of patients who are asymptomatic will have some TMJ noise.

Stand in front of the patient and ask her to open and close her mouth slowly, and note any gross asymmetry in jaw motion. Deviation can be of an S-curve or C-curve shape; if you find either, increase your suspicion of involvement of the TMJ proper, including the possibility of congenital anomalies. Also check for facial asymmetry. Pronounced asymmetry can indicate bony tumors, fractures, abscessed or impacted teeth, and disease of the parotid gland.

Hypertrophy of the masseter or temporalis may result from teeth grinding or jaw clenching, but it may also be congenital.

Given the large proportion of patients whose temporomandibular disorders are caused entirely by muscle spasm and fatigue, it's reasonable to assume provisionally that the patient with evident TMJ dysfunction and no signs or symptoms of organic or structural problems has a disorder of the masticatory muscles. If the patient does not respond to treatment* of

*A forthcoming *Patient Care* article will discuss the treatment of temporomandibular disorders.

Meet the consultants on temporomandibular disorders

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M. Franklin Dolwick, DMD, PhD
associate professor, department of oral and maxillofacial surgery, University of Texas Health Science Center at San Antonio Dental School; chairman, American Association of Oral and Maxillofacial Surgeons ad hoc study group on TMJ disk surgery

Barry H. Hendler, MD, DDS
acting chairman, department of oral and maxillofacial surgery; clinical associate professor of oral surgery and anesthesiology, University of Pennsylvania School of Dental Medicine; director, department of oral and maxillofacial surgery, and associate director, division of dental medicine, Medical College of Pennsylvania, Philadelphia

Steven L. Kraus, RPT
consultant, Emory University School of Dentistry; clinical faculty, department of community health, division of physical therapy, Emory University School of Medicine, Atlanta

In addition to his teaching, clinical, and administrative duties, Dr. Chase recently completed a radiographic study defining temporomandibular joint (TMJ) relationships in normal subjects. Dr. Dolwick, a pioneer in the development of TMJ arthrography and surgical management of TMJ disk derangement, participated in the American Dental Association's 1982 conference on temporomandibular disorders. As a physician and a dentist, Dr. Hendler has long been interested in temporomandibular joint disorders "because it is an area that truly crosses interdisciplinary lines." Mr. Kraus spends about half his time treating patients suffering from temporomandibular disorders.

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muscle spasm and fatigue, you can go on to explore the possibilities of joint disease and structural problems—diagnoses that are more difficult to establish.

EXPRESS STOP

Referred pain: Your diagnosis can be complicated by referred pain, which can make other disorders present like temporomandibular disorders, and vice versa. Check for tooth decay, pulpitis, cementitis, periapical abscess, impaction, and occlusal trauma by percussing teeth, applying heat and cold, or both. Sinusitis, masticatory muscle spasm, an ear disorder, migraine, temporal arteritis, or glaucoma (rarely) may be responsible for pain in the jaw or cheek.

You'll want to rule out disorders that can mimic temporomandibular pain—and detect temporomandibular pain that presents like other disorders—before either narrowing your diagnosis by means of a more thorough examination or consulting with a general dentist. Examine teeth, paranasal sinuses, eyes, ears, and head and neck muscles and vasculature. Keep in mind that sites of referred pain are typically marked by hyperesthesia and diffuse tenderness. Referred pain from a tooth usually occurs first in tissue innervated by the same division of the trigeminal (fifth cranial) nerve that connects to the tooth—the maxillary or mandibular division—but pain can spread to tissue innervated by other divisions. For example, referred pain from a disorder in a lower molar is likely to be felt first along the mandibular division and second along the maxillary or ophthalmic divisions.

In determining whether the source of referred pain is from a nontemporoman-

dibular disorder, start by examining the teeth for abnormalities. If you find or suspect any of the following, refer the patient to a dentist:

≫ *Tooth decay* Direct and referred pain from dental caries is detectable by probing and percussing all surfaces of teeth you suspect are afflicted. The decaying tooth may be sensitive to pressure, heat, cold, or sweetened foods and drinks.

≫ *Pulpitis* In early stages of pulpitis, heat and cold applied to an afflicted tooth will elicit pain. When you can produce pain by applying heat and relieve it by applying cold, the pulp is usually moribund. Rarely, these stimuli will cause discomfort at the referred pain site.

≫ *Cementitis* When an infection of the dental pulp spreads through the apical foramen, it may infect the cementum. The tooth will cease being sensitive to thermal change but will be tender to percussion. Often, however, you will find both types of tenderness present.

≫ *Periapical abscess* Cementitis can develop into periapical abscess. The patient may present with a constant aching or throbbing pain, gingival swelling, and, some-

Is the cervical spine implicated?

A relatively new branch of physiotherapy—orthopedic physiotherapy—has advanced the controversial view that the position of the head on the spine and the curvature of the cervical spine can affect mandibular mobility and positioning, indirectly influencing the temporomandibular joint (TMJ), and occlusal contacts. This view, currently supported by clinical experience but not by objective evidence, maintains that when a patient's posture is out of balance, as in the head-forward posture, masticatory muscle spasm, trauma to the TMJ, and malocclusion can result.

To illustrate the effects of posture on jaw position, try this test:

1. Sit upright with your head level and shoulders square. Relax your neck and jaw muscles and lightly tap your teeth together. Notice where they meet.
2. Keep tapping and tilt your head back. Notice that your jaw retrudes and your lower teeth make contact farther back on the upper teeth.
3. Now tip your head forward. Your jaw will protrude and the contact of your teeth will move forward.
4. Keep your head level and thrust it forward. Your jaw will retrude and your teeth will meet as in step 2.

Patients with postures like that of the fourth position—head forward, shoulders rounded—are primary candidates for fatigue of the muscles of mastication as well as of the cervical spine.

When a patient's stance suggests this kind of imbalance, you can assess involvement of the cervical spine by palpation. If the spine is involved, according to proponents of the theory, you will elicit moderate tenderness by palpating the anterior chest along the inferior border of the clavicle and the costosternal joints. You will also find tenderness in the neck (the suprahyoid and infrahyoid muscles), and in the cervical and upper thoracic spine area (the trapezius, rhomboids, splenius, and suboccipital muscles), and where the middle and anterior scalene muscles attach to the first rib.

times, with fever. The tooth and its gingiva may be exquisitely sensitive to pressure.

≫ *Impaction of a tooth* Like abscess, infection of an unerupted or impacted tooth can produce a constant pain and a sensation of pressure in a well-defined area. Look for osseous and soft tissue swelling on the afflicted side; in the mandible, swelling produces restricted or painful jaw motion. If you suspect impaction with infection—or abscess—refer to a dentist for X-ray, the best technique for differentiating the two conditions. Most often pain and tenderness in and around the molars signal impaction; abscess can affect any tooth. A tooth that is impacted and not infected will produce a more diffuse, radiating pain, usually with less swelling.

≫ *Occlusal trauma* A tooth that is continually traumatized at one point on its occlusal surface will traumatize the socket at a single, corresponding point. To find the traumatized tooth and the point of occlusion on the tooth, look for obvious signs of load bearing: wear facets and areas flattened by overload; gingival recession and inflammation; jagged or fractured cusps; and molar cusps without wear, which indicate that other teeth are bearing the load. To elicit pain, percuss the traumatized tooth at the point of occlusion and at precisely the angle at which the tooth is normally stressed.

Several types of head pain can also cloud the diagnosis. Keep in mind that patients with sinus pain, headache, ear discomfort, or pain in the jaw or cheek may have (more or less in decreasing order of frequency):

≫ *Sinusitis* Check for acute frontal sinus-

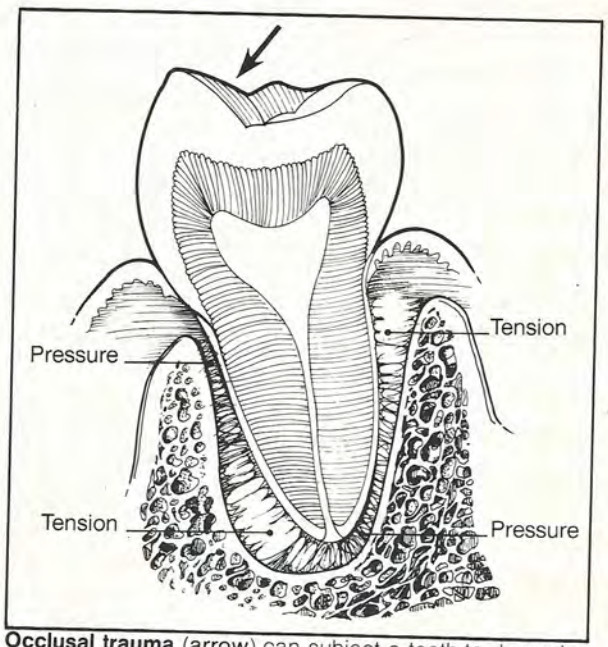
itis when you find a history of postnasal drip or respiratory allergies. Pain from sinusitis can be referred to the jaw, cheek, or frontal areas. Unlike pain from temporomandibular disorders, the pain of sinusitis usually increases when the barometric pressure falls, when the patient bends over, or when you press on the interior and lateral walls of the sinuses.

≫ *Muscle spasm* Just as pain may be referred to the temporomandibular area, the reverse may be true: Recent evidence sug-

Temporomandibular disorders: Paring the differential in the history

If the patient reports . . .	Increase your suspicion of . . .
jaw pain that is: • limited to the masseter, the temporalis, the base of the skull, or the temporomandibular joint (TMJ) *or* • associated with insidious onset of emotional stress or trauma or with direct physical trauma *or* • brought on by nodding the head or turning it from side to side *or* • worse after meals and at the end of the day jaw pain or difficulty in chewing, yawning, or opening the mouth wide occupational activities that may stress the TMJ, the muscles of mastication, or the cervical spine	masticatory muscle fatigue.*
any of the following symptoms, when the patient experiences them in association with arising: discomfort in the jaw or TMJ, headaches, or a sensation of loose or painful teeth	nocturnal teeth grinding or clenching or poor sleeping posture.
a dull, aching, or throbbing pain in the angle and base of the mandible, with a family history of cardiovascular disease	referred pain from angina or cardiac infarction.
facial pain that is obscure in character or location	atypical facial neuralgia.
morning jaw stiffness that subsides with less than half an hour of jaw use, with evidence of rheumatoid arthritis in joints other than the TMJ	rheumatoid arthritis of the TMJ.

*If more benign causes have been ruled out, consider osteoarthritis as an explanation for pain or stiffness that increases with jaw use.



Occlusal trauma (arrow) can subject a tooth to damaging tension and pressure, with consequent tenderness in the periodontium.

gests that masticatory muscle spasm can refer pain to specific sites.* Statistically significant relationships have been found between headaches and external pterygoid muscle tenderness; between aching, stuffiness, or tingling in the ear and internal pterygoid muscle tenderness; and between sinus pain and tenderness in temporal and internal pterygoid muscles.

≫ *An ear disorder* Pain in the jaw, the back of the neck, or the temples may stem from an ear disorder. Check the ear canals and tympanic membranes for inflammation or infection.

≫ *Migraine* Classic migraine and cluster headaches can cause pain in the jaw and cheek, although it is usually felt in the orbital, parietal, and temporal regions. Expect a description of either throbbing pain or steady ache that lasts from a few hours to a day or two.

≫ *Temporal arteritis* This disorder affects men over age 50 almost exclusively; it is marked by a distinct onset of lateral head pain and by tenderness or a burning sensation over the lateral neck muscles and blood vessels. The pain is constant and becomes progressively more severe. It occasionally refers pain to the jaw and posterior neck.

≫ *Glaucoma* More rarely, glaucoma and other eye disorders may produce pain in the jaw, cheek, or teeth.

*Campbell CD, Loft GH, Davis H, et al: TMJ symptoms and referred pain patterns. *J Prosthet Dent* 1982;47:430-3.

EXPRESS STOP

Joint inflammation: Synovitis, rheumatoid arthritis (RA), and osteoarthritis (OA) are the most common inflammatory disorders affecting the temporomandibular joint (TMJ). Synovitis is associated with tenderness over the joint, and—when accompanying RA—joint stiffness that abates with jaw movement. It responds to corticosteroid injections. Discomfort from OA will not lessen with movement. Imaging procedures will usually reveal erosion of the TMJ structures with arthritis.

Of the common inflammatory disorders of the temporomandibular joint (TMJ), synovitis tends to produce the mildest symptoms; it is often associated with chronic trauma to the joint and with certain systemic diseases. Most commonly, you'll find it as a complication of osteoarthritis (OA) or of adult rheumatoid arthritis (RA). Occasionally it accompanies juvenile RA. Mumps, measles, and infectious mononucleosis can also result in TMJ synovitis.

Although it is difficult to diagnose, sus-

pect synovitis when you find tenderness on palpation of the TMJ posteriorly, from the ear canal (see "Pacing the physical exam," page 118), but there is no evidence of arthritis. You will also find tenderness on palpation of the lateral joint, just anterior to the tragus, where you feel a slight depression.

When you suspect an arthritic inflammation, keep in mind that the time of day when jaw dysfunction is worst can help you narrow the diagnosis. If, in the morning on arising, the patient's jaw stiffness abates in less than a half hour of jaw use, and you find evidence elsewhere for RA, suspect RA, usually accompanied by synovitis. Keep in mind that RA usually affects the TMJ *after* involvement of the fingers, wrists, and weight-bearing joints. Expect this involvement in about half your patients with RA.*

If the patient has no TMJ stiffness on arising, but increasing stiffness with use, suspect OA in the absence of evidence for more benign sources of pain. In the early stages of OA, stiffness disappears with rest but reappears with fatigue, and often at the end of the day. When present, joint noise will usually be a grinding rather than a clicking.

If, in the absence of arthritis, you consider that the patient has synovitis, first try conservative therapies for several weeks—application of moist heat to the TMJ, a soft diet, use of a bite plate or

*Ericson S, Lundberg M: Alterations in the temporomandibular joint at various stages of rheumatoid arthritis. *Acta Rheum Scand* 1967;13:257-74.

American Dental Association guidelines for diagnosing temporomandibular disorders

At a June, 1982, conference on temporomandibular disorders, the American Dental Association, the country's largest dental group, assembled the following diagnostic guidelines:*

≫ The use of radiographs to assess joint spaces has not been shown to be a reliable diagnostic procedure. Radiographs should be reserved for patients with suspected pathologic conditions.

≫ Arthrography of the temporomandibular joint is not recommended as a routine diagnostic procedure to assess internal joint derangement. Reserve it for patients who have not profited from nonsurgical therapy of an adequate duration and who contemplate surgery.

≫ Although psychological factors are suspected to be involved in some temporomandibular disorders, there is no evidence to support the use of psychological testing (Minnesota Multiphasic Personality Inventory, anxiety scales, and life event scales) in diagnosing temporomandibular disorders.

≫ The scientific literature has not shown that malocclusion causes temporomandibular disorders. Clinical data show that the two conditions often coexist, although the nature of the relationship is unclear.

≫ Scientific studies have not supported applied kinesiology as a reliable indicator of jaw dysfunction, for establishing proper jaw position, or for providing useful information on the patient's systemic health.

*Report of the President's Conference on the Examination, Diagnosis, and Management of Temporomandibular Disorders, Association reports. *J Am Dent Assoc* 1983;106:75-9.

night guard, and, when masticatory muscle spasm is present, isotonic exercise to break the spasm. These therapies should bring relief if the trouble is synovitis. If these therapies are unsuccessful, consider injecting the joint with corticosteroids.*

In making the diagnosis, several imaging procedures may be helpful, including panoramic X-rays, transcranial X-rays, and CT scans. Reserve the last for patients who are most difficult to treat or who are in poor health.

In severe synovitis or arthritis, X-rays and scans will reveal some erosion of the temporal bone, the articular tubercle, and the condyle. In milder cases of synovitis, imaging procedures are not always diagnostic. A CT scan will show a narrowing of the joint space, increased radio-opacity, osteophytes, and condensation of the subchondral bone.

X-rays show the same kind of structural erosion in OA as in RA, but only after about 30 percent of the bone has been destroyed. In more advanced RA cases, look for an open anterior bite and overbite as evidence of condylar and temporal bone recession.

EXPRESS STOP

Structural joint disorders: If you've ruled out an organic temporomandibular joint (TMJ) disorder, suspect a displacement of the articular disk (meniscus), the most common structural disorder; it's nearly always associated with an opening and closing click and tenderness over the TMJ. Coordinate the radiographic workup with a dentist. The use of arthrography remains controversial, but it can be helpful in determining the need for surgery.

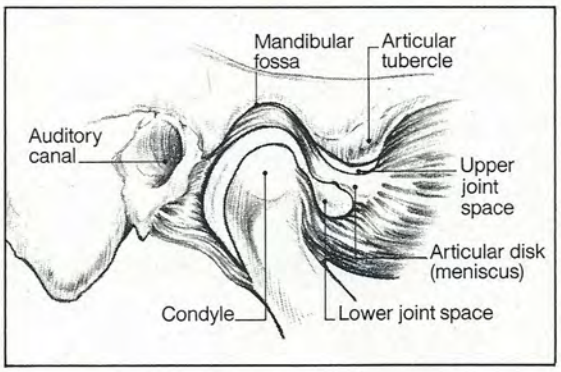
If failure of noninvasive therapy for arthritis or synovitis has ruled out organic disorders of the temporomandibular joint (TMJ) but the patient still has pain, joint noise, limited range of jaw motion or a locking jaw, suspect a derangement of the articular disk (meniscus).

Anterior displacement of the disk on jaw opening is the most common structural disorder; the second is subluxation of the TMJ, which you can sometimes feel by palpating over the joint on opening of the mouth.

Displacement of the disk is nearly always associated with tenderness over the TMJ and clicking, crepitus, or locking of the joint. It is thought that the disk can become displaced by one or a combination of factors that stretch its medial and lateral collateral ligaments: chronic microtrauma from masticatory muscle spasms, acute

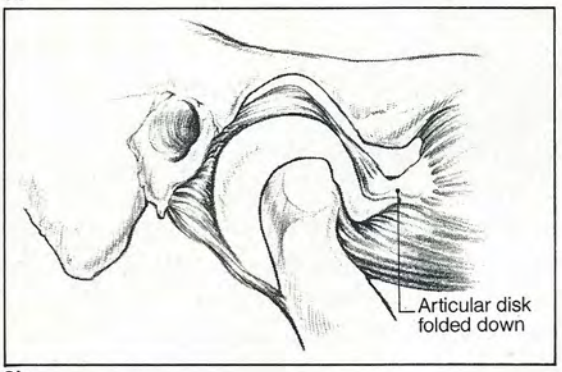
*A forthcoming *Patient Care* article will discuss these and other aspects of the treatment of temporomandibular disorders.

1a



1b

2a



2b

Temporomandibular joint arthrograms can reveal the condition and position of the joint's soft tissue. Here, arthrograms show anterior displacement of the articular disk (meniscus) with the mouth closed (**1a**) and partially open (**2a**). As the artist's renderings make clear (**1b**, **2b**), the action of the condyle on opening folds the articular disk downward and causes it to be displaced even further anteriorly.

trauma (such as a blow to the jaw), malocclusion that stresses the joint, stressful oral habits, or congenital abnormality of joint structures.

To help confirm your suspicion of a structural disorder, look to radiographic studies. While they will not help in identifying disk problems, they can show the condition of the bony surfaces. You can coordinate the radiographic workup with—or delegate it to—a dentist. The American Dental Association guidelines suggest transcranial, transpharyngeal, or panoramic views for the initial studies and CT scans for patients in whom the first procedures indicate TMJ abnormality. CT scanning costs about 40 percent more than a conventional X-ray series, but it exposes the patient to about half the radiation.

Since the mid-1970s, the use of arthrography to diagnose the condition and reveal the position of the disk has grown as much in popularity as in controversy. Conservative oral surgeons believe its use should be restricted to preoperative diagnostics. Others regard it as the best tool for imaging the relationship of the joint's hard and soft tissues, and consider it essential in determining the need for surgery. Still others, invoking the uncertainty principle, claim that injection of an anesthetic and an arthrographic fluid alters the relationship of the fossa, disk, and condyle.

The procedure takes about a half hour and involves an injection of local anesthetic followed by injection of water-soluble, iodinated radiographic contrast material. In all, up to 1.3 ml of fluid is injected into the joint space.

Inform the patient who will undergo the procedure that it may alter her bite for a day or two and cause mild-to-moderate discomfort for a few days and tenderness for up to two weeks.

For some patients, such as the elderly, the frail, or those who have suffered recent myocardial infarctions, oral and maxillofacial surgeons will often choose CT scans rather than TMJ arthrography. Generally, CT scans cost about the same as arthrography. □

REFERENCES FOR Chase DC, Dolwick MF, Hendler BH, et al: "Doctor, my jaw hurts." (JM Kent, ed). *Patient Care* 17:108-136, December 15, 1983.

1. Alderman MM: The management of the patient with myofascial pain dysfunction syndrome (part I). *Compend Contin Dent Educ* 1981;1:253-67.
2. Bell WE: *Orofacial Pains: Differential Diagnosis*, ed 2. Chicago, Year Book Medical Publishers Inc, 1979.
3. Campbell CD, Loft GH, Davis H, et al: TMJ symptoms and referred pain patterns. *J Prosthet Dent* 1982;47:430-3.
4. Ericson S, Lundberg M: Alterations in the temporomandibular joint at various stages of rheumatoid arthritis. *Acta Rheum Scand* 1967;13:257-74.
5. Greene CS, Olson RE, Laskin DM: Psychological factors in the etiology, progression, and treatment of MPD syndrome. *J Am Dent Assoc* 1982;105:443-8.
6. Guralnick W, Kaban LB, Merrill RG: Temporomandibular-joint afflictions. *N Engl J Med* 1978;299:123-9.
7. Laskin DM: Etiology of the pain-dysfunction syndrome. *J Am Dent Assoc* 1969;79:147-53.
8. Marbach JJ, Lipton JA: Treatment of patients with temporomandibular joint and other facial pain by otolaryngologists. *Arch Otolaryngol* 1982;108:104.
9. Report of the President's Conference on the Examination, Diagnosis, and Management of Temporomandibular Disorders, Association reports. *J Am Dent Assoc* 1983;106:75-9.
10. Shapiro BL: Changing views about temporomandibular pain-dysfunction. *Northwest Dent* 1981;60:6.

Coming up in *Patient Care*

Watch for a companion piece to the accompanying article, which will present a plan for treating temporomandibular disorders, covering the spectrum of therapy from hot packs and exercises through articular disk surgery.