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PRIMARY CARE
PHYSICIANS

patient care



Special problems

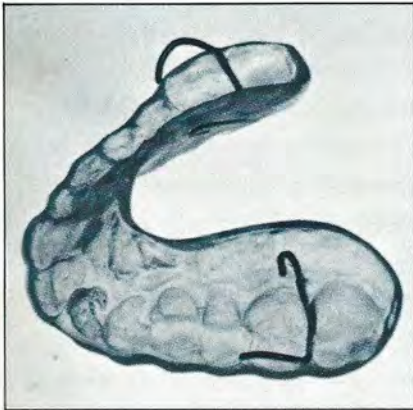
Zeroing in on schizophrenia How you can help the schizophrenic

BASED ON INDIVIDUAL INTERVIEWS WITH ROBERT CANCRO, MD; IAN R. H. FALLOON, MD; SAMUEL B. GUZE, MD; JOHN S. STRAUSS, MD

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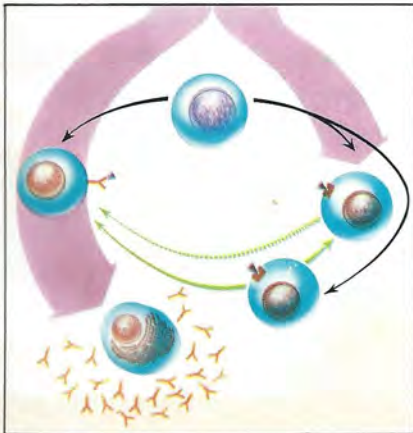
A PATIENT CARE ROUNDTABLE WITH JONATHAN ABRAMS, MD; BERNADINE HEALY BULKLEY, MD; MICHAEL V. HERMAN, MD; FLOYD D. LOOP, MD; NANETTE KASS WENGER, MD; T. REGINALD HARRIS, MD, MODERATOR; TENNYSON WILLIAMS, MD, READERS' REPRESENTATIVE



Temporomandibular disorders

Management for TMJ troubles

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



Acquired immune deficiency syndrome

Making sure you don't miss AIDS

BASED ON INDIVIDUAL INTERVIEWS WITH ANTHONY S. FAUCI, MD; HARRY W. HAVERKOS, MD; DONNA T. MILDVAN, MD; WILLIAM F. OWEN, JR, MD

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TEMPOROMANDIBULAR DISORDERS

Commonsense management for TMJ troubles

Pain resolves for the overwhelming majority of patients when you treat noninvasively for the most common cause of temporomandibular disorders—masticatory muscle fatigue and spasm.

EXPRESS STOP

Initial therapy: When the primary symptoms of a temporomandibular disorder are muscle fatigue and muscle pain, initiate two weeks of therapy that includes a diet of soft foods, application of moist heat or ice, or both, alteration of oral and sleep habits, and isotonic exercises of muscle groups opposing those that are fatigued. If your patient does not respond after 2-3 weeks or has distracting pain, prescribe an anti-inflammatory drug, with or without a muscle relaxant.

When you establish that your patient suffers from masticatory muscle fatigue and pain—the hallmark of the most common temporomandibular affliction, myofascial pain-dysfunction syndrome—begin treatment with two weeks of basic therapy: a diet of soft foods, application of moist heat or ice, or both, to the temporomandibular joint (TMJ) and associated muscles, alteration of oral and sleep habits, and isotonic exercises of the jaw to ease masticatory muscle fatigue and tension.

A diet of soft foods needn't be all porridge and applesauce, but it should exclude foods that are difficult to chew (steak, hard rolls), that are hard or crunchy (apples, carrots, nuts), or that require wide jaw opening (club sandwiches, large rolls,



pickles). The object of the diet is for the patient to rest the masticatory muscles and avoid stressing the TMJ.

Moist heat applied over the afflicted joint and over the masticatory muscles—most importantly, the temporalis and masseter—can be helpful in stimulating blood flow and decreasing muscle viscosity. A towel heated with steam or a hot pack is best, applied for 15 minutes 3-4 times a day. For patients who do not respond to heat alone,

For a related article, see "Doctor, my jaw hurts." *Patient Care*, December 15, 1983, page 108.

have them alternate 5-8 minutes each of heat, then ice, then heat. Note, however, that heat is contraindicated for patients who have sustained a direct blow to the jaw or TMJ; have them apply ice 3-4 times a day for 10-15 minutes for the first 1-3 days and thereafter heat alone on the same schedule for about a week.

Getting patients to change their harmful oral habits can also ease their discomfort, but can be difficult to do. Advise patients not to bite their fingernails, chew gum or tobacco, or clench a pipe or cigar between their teeth. When you find evidence of other oral habits such as clenching or grinding the teeth or biting the lips, cheeks, or tongue, ask the patient if she* is aware of the habit. Most patients will be unaware of chronic habits; by pointing them out and explaining how they relate to the pain and stiffness, you can help the patient break these habits. Have patients repeat to themselves, "Lips together, teeth apart," as a reminder of the normal resting position of the jaw—with the tongue on the anterior palate, teeth apart, and masticatory muscles relaxed.

Also advise patients to sleep with a single, flat pillow or a specially designed pillow that will place the cervical spine in a normal lordotic curve. Use of this kind of pillow will put less stress on the muscles of the spine and of mastication. These pillows are available from pharmacies or hospital supply houses for \$8-\$50. Also advise patients against resting on the stomach or side, which can stress the jaw and traumatize the TMJ.

Isotonic exercise of masticatory muscle

*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.

groups that oppose those that are fatigued can ease painful spasm by inhibiting motor nerve stimulation to antagonist muscles.* Suggest exercise before meals and in the morning and evening and have the patient perform about 10 repetitions of each exercise (see the patient education aid "Helpful treatment for a stiff, sore jaw," page 148).

A majority of your patients suffering from temporomandibular disorders will show some improvement with this first level of treatment after 2-3 weeks. For those who do not respond or who have pain that distracts them from their normal routine and makes eating difficult, consider prescribing an anti-inflammatory agent or a muscle relaxant, or both.

Note, however, that the decision—and time—to introduce drug therapy is controversial. Some authorities prefer to withhold drug therapy as long as possible, while others include it in the initial treatment. Generally, however, they prescribe anti-inflammatory, analgesic agents for the first week of therapy, only when there is distracting pain. Therapy includes aspirin, 300-400 mg, 2-3 times a day; ibuprofen (Motrin, Rufen), 400-600 mg tid; or diflunisal (Dolobid), 500 mg bid.

If the symptoms show no sign of abating after a week, some clinicians will add a muscle relaxant such as diazepam (Valium), 5-10 mg tid, or cyclobenzaprine HCl (Flexeril), 10 mg tid, in the second week. Many, however, will prescribe muscle relaxants with the initial therapy when the patient shows signs of acute anxiety (see "The physician-patient

**"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.

relationship in temporomandibular therapy," below). Narcotics are appropriate only for patients with severe pain from acute trauma or for those recovering from surgery; their use is not indicated for musculoskeletal pain.

Increase your suspicion of an organic or structural disorder of the TMJ if your patient does not respond to the initial therapy, with or without drug therapy, after 2-3 weeks. Advise patients to give the therapy time—especially if they have had the disorder for a month or more.

EXPRESS STOP

Dental therapy: Use of oral appliances or conservative occlusal grinding may be appropriate when initial treatment fails and there is no evidence of organic or structural disorders of the temporomandibular joint. Appliances may be therapeutic for displacement of the articular disk (meniscus) or for pain from nocturnal teeth grinding or clenching. Conservative grinding is indicated only in some situations and only after reversible treatment has failed.

If your patient doesn't respond to the initial treatment but doesn't show evidence

The physician-patient relationship in temporomandibular therapy

Studies have shown that success in treating patients with myofascial pain-dysfunction syndrome (MPDS) depends more on your approach to the patient than on the specific treatment.* Of primary importance are:

- Good rapport with the patient and a friendly, supportive attitude
- Clear, forthright explanation of the disorder
- Candid appraisal of how long therapy will take and what it will involve
- Assurance that the condition is neither dangerous nor a sign of emotional illness

Most patients will be relieved to learn that emotional stress may be a factor in the cause of their discomfort. People tend to consider stress-induced dysfunctions, such as peptic ulcer, to be socially acceptable because they perceive them as conditions imposed from without and beyond their responsibility.

When you first explain MPDS to your patient,

be aware that its inscrutability will often fuel her frustration: In some respects, medicine conditions patients to expect a clear-cut diagnosis, a tangible etiology, and a definitive treatment. It also emphasizes that the physician does something to the patient, who is a passive recipient. With MPDS, however, a patient's understanding of the disorder and willingness to participate in therapy at home can mean the difference between success and failure.

If the patient with acute stress or anxiety does not respond to conventional treatment but does not have evidence of organic or structural disorders, you might consider referral to a specialty clinic (see "A partial list of clinics specializing in temporomandibular disorders," page 161). You might also suggest that the patient seek "counseling"—rather than "see a psychiatrist or psychologist." Assure the patient that she is not "crazy" and that counseling—which can include biofeedback or other relaxation techniques—may help her to manage pain, stress, and anxiety better.

*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.

Temporomandibular disorders

of organic or structural disorders of the temporomandibular joint (TMJ), you might consider referral for dental procedures: therapy with an oral appliance or with conservative occlusal grinding (see "A partial list of clinics specializing in temporomandibular disorders," page 161).

The oral appliances used, bite plates and night guards, are devices of acrylic and

wire that the patient can insert and remove. An appliance of either sort separates the occlusal surfaces of the teeth by placing a flat plate between them. The plate frees the mandible from the influences of the tooth cusps; by allowing the mandible to slide, it prevents wear of the teeth, slows recession of the gums and erosion of alveolar bone, and allows masticatory muscles

Meet the consultants on temporomandibular disorders



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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

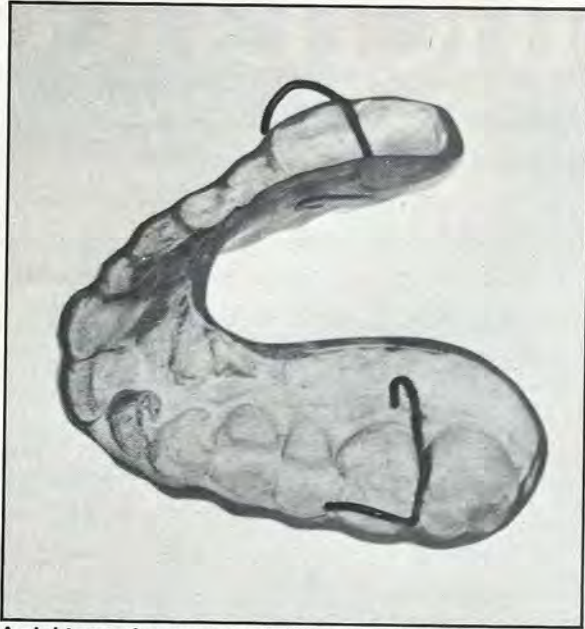


Steven L. Kraus, RPT
consultant, Emory University School of Dentistry; clinical faculty, department of community health, division of physical therapy, Emory University School of Medicine, Atlanta

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.

Please address all correspondence concerning this article to: The Editor, *Patient Care*, 16 Thorndal Circle, Darien, CT 06820. Reprints are not immediately available, but a limited supply of tear sheets is available on a first-come, first-served basis.

Temporomandibular disorders



A night guard can ease pain from nocturnal teeth clenching or grinding, reduce erosion of teeth, and lessen trauma to gums and bone by freeing the mandible to slide.

to work smoothly, without resistance. The plate also alters the load on the TMJ by elevating the plane of occlusion—thereby, it is thought, reducing trauma to the joint and influencing the position of the cervical spine. Made by the dentist and fitted individually for each patient, oral appliances are usually one-time purchases and range in price from \$200 to \$300.

The bite plate, commonly used for patients with a displaced articular disk (meniscus), is worn during the day and removed for meals. Night guards, which are worn only at night, mitigate the effects of nocturnal clenching and teeth grinding; night guards can help patients who clench or grind their teeth only when asleep.

If a patient's condition does not improve with use of an occlusal appliance, you might consult with a physical therapist or dentist, or both, for evaluation of the design

and efficacy of the appliance. Keep in mind that patients with marked jaw protrusion usually cannot use an oral appliance.

Bite plates and night guards are generally intended to provide reversible therapy (see "Guidelines of the American Dental Association on treating temporomandibular disorders," page 137). Some dentists, however, make bite plates designed to reposition the mandible vertically and horizontally in relation to the cranium, and not just free it to slide. This type of therapy is widely used, although it is based on concepts of jaw malalignment or occlusal disharmony that have not been scientifically validated. Such uses of oral appliances are often *not* reversible; the usual therapy in these cases includes a second phase in which the teeth are moved by braces or capped to "stabilize" the jaw permanently in its new position. This aggressive form of therapy differs considerably from the more conservative therapy outlined previously.

Under certain circumstances, you might consider referring a patient for very conservative occlusal adjustment. The procedure may be effective only in patients who have minimal muscular involvement, a TMJ click only on closing, minimal pain, and evidence of disk derangement. Furthermore, clinical experience suggests that the best candidates for the procedure have a click only when their teeth are near the correct occlusal position. Coordinate your evaluation of the efficacy of occlusal adjustment with a dentist. The procedure is contraindicated if the patient has marked pain in the TMJ or discomfort in the masticatory muscles. Consider this procedure an irreversible therapy, and use it only after exhausting other reasonable, reversible techniques.

continued

EXPRESS STOP

Calling in other clinicians: When dental therapy is inappropriate or unsuccessful, and the patient shows no evidence of organic or structural disorders of the temporomandibular joint, consider other noninvasive therapies. These include physical therapy, transcutaneous electrical nerve stimulation, ultrasound, and biofeedback. These are practiced by physical therapists or psychological counselors, and sometimes by dentists.

If the use of occlusal appliances or occlusal adjustment is not indicated or gives equiv-

ocal results and the patient has no evidence of organic or structural disorders of the temporomandibular joint (TMJ), consider other noninvasive therapies. These include physical therapy, transcutaneous electrical nerve stimulation (TENS), ultrasound, and biofeedback. These are usually practiced by physical therapists or by psychological counselors, and less often by dentists (see "Guidelines of the American Dental Association on treating temporomandibular disorders," below).

Physical therapy Some reports based on

Guidelines of the American Dental Association on treating temporomandibular disorders

The American Dental Association, the country's largest dental association, convened a conference on temporomandibular disorders in June, 1982. The following is a summary of guidelines* for treatment, drafted by a six-member advisory committee and 62 participants, including physicians and dentists:

- » There is insufficient data comparing the different forms of therapy to establish a priority for their use, but conservative, reversible therapy is preferred when possible.
- » A warm, positive, and reassuring attitude on the part of the clinician is crucial in the treatment of temporomandibular disorders.
- » Short-term use of pharmacologic agents can be helpful. Therapy commonly includes use of nonaddictive analgesics, anti-inflammatory drugs, anti-anxiety agents, and muscle relaxants. Use of antidepressants is less frequently indicated.
- » Consider occlusal adjustment therapy irre-

*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

versible. It is not indicated as a routine therapy, nor during the acute stage of a temporomandibular disorder.

» Occlusal appliances are recommended for many dysfunctions involving the muscles of mastication and the temporomandibular joint. Use of appliances that do not permanently reposition the mandible or teeth should be considered a reversible therapy.

» Behavior therapies—biofeedback and other relaxation techniques—are indicated for dysfunctions involving the masticatory muscles and have reasonable scientific support.

» Consider surgery only after failure of currently acceptable, nonsurgical treatments, and based on a definitive diagnosis of a pathologic joint disorder or anatomic defect.

» Meniscectomy is indicated only when the articular disk (meniscus) is so deranged, damaged, or diseased that no alternative exists. The conference report did not present guidelines for mandibular repositioning therapy or for physical therapy.

clinical experience suggest that retraining the muscles of the cervical spine and of mastication can alleviate pain, increase range of jaw motion restricted because of muscle fatigue and spasm, and speed the stabilization of a temporomandibular disorder. Treatment begins with palpating the back, neck, and head to determine the extent of muscle tenderness; depending on the findings from palpation, the therapy will involve some combination of isotonic, isometric, and rhythmic mobility exercises; passive and active stretching of muscles; and passive range-of-motion techniques to improve joint mobility. In addition to manual techniques, therapy can also include one or more of the other modalities discussed here—ice, heat, ultrasound, TENS, and biofeedback.

Two or three sessions of physical therapy can resolve some patients' pain, but many patients need 2-3 sessions a week for 1-3 months. Each session lasts 30-45 minutes and costs between \$30 and \$75.

Generally, patients who are already using an occlusal appliance seem to have the best response to physical therapy and related modalities: The appliance alters the forces exerted on and by the masticatory

muscles; therapy then retrains the muscles of mastication and of the cervical spine to reduce their susceptibility to fatigue and their tendency to stress the TMJ. Some therapists, however, prefer to treat patients who are not using an occlusal appliance. Enlist the therapist's aid in evaluating your patient's need for an occlusal appliance.

Many therapists also use vapocoolant, or refrigerant, sprays, such as Fluorimethane, to evaluate muscular involvement limiting the range of jaw motion and muscle length before stretching or exercising muscles. Ethyl chloride has been in use longest, but it is the most flammable. Also, it can easily frost the skin and chill underlying fascia and muscles, causing muscle contraction and increased muscle viscosity. Sprays combining dichlorodifluoromethane and trichloromonofluoromethane are nonflammable and are less likely to have these effects. Specialists usually use vapocoolants with stretching of the masseter and temporalis, the muscles most commonly involved. To perform the procedure, follow these steps:

- Seat the patient and cover the eyes, ears, and nose with a towel.
- Using a fine nozzle, apply the spray, holding the nozzle about 45 cm (18 inches) away from the patient and aiming the spray to strike the face at an acute angle. Move the spray in one direction, about 10 cm (4 inches) a second, and follow the path of the muscle fibers. Cover the area only 2-3 times.
- While you spray, ask the patient to open and close her mouth slowly. Immediately after spraying, gently work the jaw and stretch the muscles passively in all directions: Open and close the mouth, protrude

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the jaw, retrude the jaw, and move it from side to side.

» Continue to use the spray every 2-3 days; meanwhile, have the patient perform isotonic exercises daily at home, preceding the exercises with applications of ice or warm packs. If neither ice nor heat relieves the symptoms, have the patient alternate them: 5-8 minutes each of heat, ice, and heat.

Transcutaneous electrical nerve stimulation (TENS) Between 16 and 40 percent of patients with chronic pain have partial-to-full relief of pain with TENS. Therapy must be flexible, since some patients respond to only one session lasting 35-40 minutes, while others will need several hours of stimulation. Once a physical therapist has helped the patient find the best site on the skin for the electrode and the most effective frequency, charge, and pulse rate, the patient can rent a small, portable stimulator for \$50-\$75 a month. TENS is often used in conjunction with over-the-counter analgesics or nonsteroidal anti-inflammatory agents.

Most therapists reserve TENS for treating acute, intractable pain or, in the office, as a preliminary treatment for patients who are too sensitive to tolerate manipulation.

Ultrasound This procedure may reduce muscular pain from chronic masticatory muscle fatigue, especially when associated with arthritis or other joint inflammation. Its use on the TMJ proper is contraindicated because it can aggravate inflammation. The mechanism by which ultrasound

works is thought to involve vibration of tissues and internal heating with resultant improvement in blood flow. The therapeutic range of ultrasound is 0.5-1.0 watt/cm². Ultrasound is usually administered by a physical therapist, 2-4 times a week.

Biofeedback Although its use for treating patients with temporomandibular disorders remains controversial, biofeedback has been shown to be effective initially in helping 60-70 percent of patients break oral habits of the type that result in masticatory muscle fatigue and pain.* Biofeedback therapy is usually administered by the physical therapist, psychologist, or psychological counselor. Patients usually receive two or more 30-minute sessions per week, at a cost equivalent to that of physical therapy. Some patients improve after 3-4 sessions; others will need 1-3 months of therapy. For those on longer term treatment, some therapists suggest renting or buying equipment to use at home.

Some patients may become dependent on biofeedback for relieving muscle tension. Monitor a patient's use of biofeedback to ensure that she receives the proper training and learns to relax muscles without the machine.

EXPRESS STOP

Treating organic joint disorders: When an organic temporomandibular joint (TMJ) disorder is refractory to other treatment, try injection with corticosteroids as the last step before surgery. A spurious—fibrous—ankylosis may develop in patients who traumatize the TMJ. You can break the adhesions by having the patient open the jaw progressively wider, aided by stacked tongue blades.

*For a full discussion on biofeedback, see "Putting biofeedback into perspective," *Patient Care*, January 15, 1983, page 37.

When an organic disorder such as rheumatoid arthritis (RA) or osteoarthritis (OA) does not respond to noninvasive therapies, injection of corticosteroids remains the most effective—and aggressive—nonsurgical procedure. The use of these drugs as treatment for organic temporomandibular joint (TMJ) disorders is uncommon among general dentists, and overuse by some clinicians has made their administration in the TMJ controversial; their use is probably limited to less than 5 percent of patients with TMJ disorders. Corticosteroid therapy is effective for organic TMJ disorders that occur as a result of trauma and for systemic disorders that affect the TMJ. Patients with synovitis can show a dramatic improvement with corticosteroid injection; patients with RA and OA obtain good-to-excellent relief from pain and improvement in range of motion.

Corticosteroids that are effective for treating TMJ disorders include dexamethasone acetate (Dalalone, Decadron-LA, Dexasone-LA, etc.), and methylprednisolone acetate (Depo-Medrol). Usually, the oral and maxillofacial surgeon gives the intra-articular injections. If you elect to give them, follow this technique:

» Palpate over the condyle of the affected side, anterior to the auditory meatus. Ask the patient to open and close the jaw, and find the head of the condyle and the joint space just above it. With the patient's mouth open about 1 cm ($\frac{3}{8}$ inch), inject 0.5 ml of 3% mepivacaine HCl (Carbocaine, Isocaine HCl) with a 21-gauge needle. Direct the needle inferomedially about 1 cm to reach the lower joint space. Withdraw the needle, and after a minute or two, slowly in-

ject 0.5 ml dexamethasone or 0.25-0.5 ml methylprednisolone.

» After injection, withdraw the needle and have the patient gently move the jaw to mix the synovial fluid with the corticosteroid. The patient will feel discomfort for 3-4 days and will probably need aspirin.

» Give no more than 2-3 injections per year, and space injections at least four months apart.

You will occasionally be faced with a patient who traumatized the TMJ and, while healing, developed adhesions in the joint capsule that resulted in pain and a reduced range of jaw motion. If the condition progresses to a severe spurious ankylosis (fibrous ankylosis), you can break the adhesions by moving the jaw under general anesthesia. When the condition is only of mild-to-moderate severity, try this procedure:

» Have the patient open her mouth as wide as comfortably possible.

» Insert a stack of tongue blades into the space between the upper and lower molars on the affected side so that the blades hold the patient's mouth open.

» Insert additional blades into the stack one at a time until the patient begins to feel pain or tension in the affected joint. Have the patient hold the position for 5-10 minutes, biting down gently from time to time. Repeat the procedure for the other side if it is also affected.

» Tell the patient to continue the procedure at home twice daily for several weeks. Have the patient strive for an opening large enough to allow insertion of knuckles of the index and middle fingers between her

Continued on page 152; a patient education aid begins on page 148.

VIBRAMYCIN® (doxycycline)

BRIEF SUMMARY

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Contraindicated: In persons hypersensitive to any of the tetracyclines.

Warnings: THE USE OF DRUGS OF THE TETRACYCLINE CLASS DURING TOOTH DEVELOPMENT (LAST HALF OF PREGNANCY, INFANCY AND CHILDHOOD TO THE AGE OF 8 YEARS) MAY CAUSE PERMANENT DISCOLORATION OF THE TEETH (YELLOW-GRAY-BROWN). This adverse reaction is more common during long term use of the drugs, but has been observed following repeated short term courses. Enamel hypoplasia has also been reported. *TETRACYCLINE DRUGS, THEREFORE, SHOULD NOT BE USED IN THIS AGE GROUP UNLESS OTHER DRUGS ARE NOT LIKELY TO BE EFFECTIVE OR ARE CONTRAINDICATED.*

Photosensitivity manifested by an exaggerated sunburn reaction has been observed in some individuals taking tetracyclines. Patients apt to be exposed to direct sunlight or ultraviolet light should be advised that this reaction can occur with tetracycline drugs, and treatment should be discontinued at the first evidence of skin erythema.

The antianabolic action of the tetracyclines may cause an increase in BUN. Studies to date indicate that this does not occur with the use of doxycycline in patients with impaired renal function.

Usage in Pregnancy: (See above "Warnings" about use during tooth development.) Results of animal studies indicate that tetracyclines cross the placenta, are found in fetal tissues and can have toxic effects on the developing fetus (often related to retardation of skeletal development). Evidence of embryotoxicity has also been noted in animals treated early in pregnancy.

Usage in Newborns, Infants and Children: (See above "Warnings" about use during tooth development.)

As with other tetracyclines, doxycycline forms a stable calcium complex in any bone-forming tissue. A decrease in fibular growth rate has been observed in pre-matures given oral tetracycline, 25 mg/kg q6h, but this reaction was shown to be reversible when the drug was discontinued.

Tetracyclines are present in the milk of lactating women who are taking a drug in this class.

Precautions: As with other antibiotics, overgrowth of nonsusceptible organisms may occur, including fungi. If superinfection occurs, discontinue the antibiotic and institute appropriate therapy.

In venereal disease when coexistent syphilis is suspected, a dark-field examination should be done before initiating therapy. Conduct monthly blood serology tests for at least 4 months.

Because tetracyclines may depress plasma prothrombin activity, patients on anticoagulant therapy may require downward adjustment of their anticoagulant dosage.

In long term therapy, periodic laboratory evaluation of organ systems, including hematopoietic, renal and hepatic studies should be performed.

Treat all group A beta-hemolytic streptococcal infections for at least 10 days. (For upper respiratory infections due to group A beta-hemolytic streptococci, penicillin is the usual drug of choice, including prophylaxis of rheumatic fever.)

Since bacteriostatic drugs may interfere with the bactericidal action of penicillin, it is advisable to avoid giving tetracycline in conjunction with penicillin.

Adverse Reactions: Due to oral doxycycline's virtually complete absorption, side effects of the lower bowel, particularly diarrhea, have been infrequent. The following adverse reactions have been observed in patients receiving tetracyclines: anorexia, nausea, vomiting, diarrhea, glossitis, dysphagia, enterocolitis, inflammatory lesions (with monilial overgrowth) in the anogenital region. Rare instances of esophagitis and esophageal ulcerations have been reported in patients receiving capsule and tablet forms of drugs in the tetracycline class. Most of these patients took medications immediately before going to bed. (See "Dosage and Administration.") Maculopapular and erythematous rashes, exfoliative dermatitis, photosensitivity (see "Warnings"), urticaria, angioneurotic edema, anaphylaxis, anaphylactoid purpura, pericarditis, exacerbation of systemic lupus erythematosus, hemolytic anemia, thrombocytopenia, neutropenia and eosinophilia have been reported with tetracyclines. Prolonged administration of tetracyclines may produce brown-black microscopic discoloration of thyroid glands. No abnormalities of thyroid function studies are known to occur.

Bulging fontanels in infants and benign intracranial hypertension in adults have been reported in individuals receiving full therapeutic dosages. These conditions disappeared rapidly when the drug was discontinued.

Rise in BUN has been reported and is apparently dose related. (See "Warnings.")

Dosage and Administration: THE USUAL DOSAGE AND FREQUENCY OF ADMINISTRATION OF DOXYCYCLINE DIFFERS FROM THAT OF OTHER TETRACYCLINES. EXCEEDING THE RECOMMENDED DOSAGE MAY RESULT IN AN INCREASED INCIDENCE OF SIDE EFFECTS.

Adults: The usual dose of Vibramycin is 200 mg on the first day of treatment (administered 100 mg every 12 hours) followed by a maintenance dose of 100 mg/day. The maintenance dose may be administered as a single dose or as 50 mg every 12 hours. In more severe infections (particularly chronic infections of the urinary tract), 100 mg every 12 hours is recommended.

For children above eight years of age: See package insert for recommended dosage schedules.

Acute gonococcal infections (when penicillin is contraindicated): 200 mg stat and 100 mg at bedtime the first day, followed by 100 mg b.i.d. for 3 days.

As an alternate single visit dose, administer 300 mg stat, followed in one hour by a second 300 mg dose. The dose may be administered with food, including milk or carbonated beverage, as required.

Primary and secondary syphilis (when penicillin is contraindicated): 300 mg a day in divided doses for at least 10 days.

When used in streptococcal infections, therapy should be continued for 10 days.

Administration of adequate amounts of fluid along with capsule and tablet forms of drugs in the tetracycline class is recommended to wash down the drugs and reduce the risk of esophageal irritation and ulceration. ("See Adverse Reactions.") It is recommended that Vibramycin be given with food or milk to reduce the possibility of gastric irritation. The absorption of Vibramycin is not markedly influenced by simultaneous ingestion of food or milk.

Uncomplicated urethral, endocervical, or rectal infection in adults caused by *Chlamydia trachomatis*: 100 mg by mouth b.i.d. for at least 7 days.¹

Concomitant therapy. Antacids containing aluminum, calcium, or magnesium impair absorption and should not be given to patients taking oral Vibramycin.

Studies to date have indicated that administration of Vibramycin at the usual recommended doses does not lead to excessive accumulation of the antibiotic in patients with renal impairment.

More detailed professional information available on request.

Reference: 1. CDC Sexually Transmitted Diseases Treatment Guidelines 1982.

Temporomandibular disorders

How to use the patient education aid on temporomandibular joint syndrome

The patient education aid on the following pages describes several measures you may wish to suggest to your patients with fatigue and spasm of the masticatory muscles: a diet of easy to chew foods to give the joints and muscles of mastication time to rest and repair; changes in resting and oral habits to increase the patient's awareness of habits that can precipitate masticatory muscle pain; application of moist heat, or of alternating heat and ice to help relieve spasm and stimulate blood flow; and exercises to help alleviate jaw muscle pain and restore normal range of jaw motion.

For best results, go over the aid with the patient, underlining or circling areas of particular importance, or delegate this task to a member of your office team.

To remove the aid from the journal for copying and filing, use a razor blade to slice the page near the gutter, or "break" the spine (by pressing the journal open on a flat surface) and then carefully tear out the page.

If you want to add your name, address, and phone number to the aid, you may tape or staple your business card or typewritten message over the drawing in the upper right-hand corner before copying.

This aid was prepared with the help of the consultants for the accompanying article and was reviewed by the *Patient Care* Patient Education Advisory Board. We invite your comments on the aid's effectiveness.

This patient education aid may be reproduced by office copier for distribution by physicians to their patients. Written permission is required for any other use, including the adaptation of this aid to your specific needs.



INSTRUCTIONS

Helpful treatment for a stiff, sore jaw

When the muscles that move your jaw do not work together correctly, they may become tired and cramped. And your jaw may become stiff and sore, making chewing, yawning, or laughing painful. If this happens, give your jaw plenty of rest, moist heat, gentle exercise, and avoid stressing it. Speed recovery by following a simple regimen for about two weeks. Here's a good, basic program:

Diet

Eliminate foods that are difficult or painful to chew or require you to open your mouth wide, such as apples, carrots, nuts, hard candy, and hard rolls. You may want to prepare some of these foods specially so they will not require as much work for your jaw joints and muscles. For example, applesauce or shredded carrots are easier to chew than raw apples or unshredded carrots. This diet will give your jaw joints and jaw muscles time to rest and repair themselves.

Changing your resting and sleeping habits

Whenever you lie down to sleep or just to rest for a while, avoid stressing your jaw joints by lying on your back rather than on your stomach or side. This prevents your jaw from being pushed to one side—something that can aggravate your pain. Also try using a single flat pillow instead of a few flat ones or one thick pillow. A flat pillow will curve your neck less and is easier on the muscles of your jaw, neck, and upper back.

Changing harmful oral habits

Do you chew pencils or your fingernails? Do you bite your lips? Do you clench or grind your teeth, or tighten your jaw muscles when you drive in traffic or are in other stressful situations? Habits like these—in which a person expresses anxiety or tension by tightening up muscles—are com-

mon, although most people are unaware of them. Furthermore, once someone does become aware of a habit, it may be difficult to break because it has evolved over a long time.

The first step in breaking oral habits is to recognize what they are and when and how they occur. Some physicians have their patients remind themselves, "Lips together, teeth apart," which is the normal resting position of the jaw, with the teeth not quite touching. The idea is to relax your jaw muscles as soon as you're aware that they are tight or that you are grinding or clenching your teeth. When you become accustomed to noticing when you are tense, you can begin to break the habits and help alleviate the pain and discomfort that goes with them.

Moist heat

Heat a towel by holding it under running hot water and wring it out until it's damp. (If you have a microwave oven, try using it to heat a damp towel. Set the timer for 15 seconds; if that doesn't get the towel hot enough, increase the setting gradually until the towel is hot but not too hot to handle.) When the towel has cooled enough so that you can handle it comfortably, apply it to the painful side of your face for about 15 minutes. For best results, do this four times a day—in the morning, before lunch, before supper, and before going to bed. This may decrease the pain and stiffness.

Ice

Sometimes heat does not relieve the pain and stiffness. With your doctor's approval, you can try alternating heat and ice. Apply moist heat with the steamed towel to the painful area for 5-8 minutes, then an ice pack for 5-8 minutes, and then heat again. Repeat as often as you would if you were using moist heat alone.

Helpful treatment for a stiff, sore jaw continued

Exercises

Certain exercises can help you relieve the pain that comes from tired, cramped muscles. They can also help if you have difficulty opening your mouth.

The more often you do these exercises, the more you'll relax the muscles that are painfully tense. Try these exercises in front of a mirror on rising, before meals, and on going to bed:

1. Open your mouth as wide as possible and then close it. Try to open your mouth far enough to allow you to fit the knuckles of your index and middle fingers between your upper and lower front teeth. Do 10 times.
2. Place your thumb under your chin and your forefinger over your chin, below your lower lip (a). Push upward with your thumb, using moderate force, and slowly open your mouth wide against this resistance. Close your jaw. Do 10 times.
3. With your thumb and forefinger in the same position, push against your lower jaw as you slide it forward (b). Avoid grinding your teeth and slide your jaw only as far as you can without producing pain. Do 10 times. If you find that your fingers

exert too much pressure on your chin, push your chin against the palm of your hand instead.

4. Next, place your palm on the side of your jaw and open your mouth diagonally against resistance from that hand (c). Do 10 times on each side. If these exercises increase your discomfort or make it harder for you to open your mouth, stop the exercises and consult your physician.



a



b



c

DURICEF® (CEFADROXIL)

INDICATIONS: DURICEF (cefadroxil) is indicated for the treatment of the following infections when caused by susceptible strains of the designated microorganisms:

- Urinary tract infections caused by *E. Coli*, *P. mirabilis*, and *Klebsiella* species.
- Skin and skin structure infections caused by staphylococci and/or streptococci.
- Pharyngitis and tonsillitis caused by Group A beta-hemolytic streptococci. (Penicillin is the usual drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever. DURICEF is generally effective in the eradication of streptococci from the nasopharynx; however, substantial data establishing the efficacy of DURICEF in the subsequent prevention of rheumatic fever are not available at present.)

Note—Culture and susceptibility tests should be initiated prior to and during therapy. Renal function studies should be performed when indicated.

CONTRAINDICATION: DURICEF (cefadroxil) is contraindicated in patients with known allergy to the cephalosporin group of antibiotics.

WARNING: IN PENICILLIN-ALLERGIC PATIENTS, CEPHALOSPORIN ANTIBIOTICS SHOULD BE USED WITH GREAT CAUTION. THERE IS CLINICAL AND LABORATORY EVIDENCE OF PARTIAL CROSS-ALLERGENICITY OF THE PENICILLINS AND THE CEPHALOSPORINS, AND THERE ARE INSTANCES OF PATIENTS WHO HAVE HAD REACTIONS TO BOTH DRUGS (INCLUDING FATAL ANAPHYLAXIS AFTER PARENTERAL USE).

Any patient who has demonstrated a history of some form of allergy, particularly to drugs, should receive antibiotics cautiously and then only when absolutely necessary. No exception should be made with regard to DURICEF (cefadroxil). Pseudomembranous colitis has been reported with the use of cephalosporins (and other broad spectrum antibiotics); therefore, it is important to consider its diagnosis in patients who develop diarrhea in association with antibiotic use. Treatment with broad spectrum antibiotics alters normal flora of the colon and may permit overgrowth of clostridia. Studies indicate a toxin produced by *Clostridium difficile* is one primary cause of antibiotic-associated colitis. Cholestyramine and colestipol resins have been shown to bind the toxin *in vitro*. Mild cases of colitis may respond to drug discontinuance alone. Moderate to severe cases should be managed with fluid, electrolyte and protein supplementation as indicated. When the colitis is not relieved by drug discontinuance or when it is severe, oral vancomycin is the treatment of choice for antibiotic-associated pseudomembranous colitis produced by *C. difficile*. Other causes of colitis should also be considered.

PRECAUTIONS: Patients should be followed carefully so that any side-effects or unusual manifestations of drug idiosyncrasy may be detected. If a hypersensitivity reaction occurs, the drug should be discontinued and the patient treated with the usual agents (e.g., epinephrine or other pressor amines, antihistamines, or corticosteroids).

DURICEF (cefadroxil) should be used with caution in the presence of markedly impaired renal function (creatinine clearance rate of less than 50 ml/min/1.73 M²). (See Dosage and Administration.) In patients with known or suspected renal impairment, careful clinical observation and appropriate laboratory studies should be made prior to and during therapy. Prolonged use of DURICEF may result in the overgrowth of nonsusceptible organisms. Careful observation of the patient is essential. If superinfection occurs during therapy, appropriate measures should be taken.

Positive direct Coombs tests have been reported during treatment with the cephalosporin antibiotics. In hematologic studies or in transfusion cross-matching procedures when antiglobulin tests are performed on the minor side or in Coombs testing of newborns whose mothers have received cephalosporin antibiotics before parturition, it should be recognized that a positive Coombs test may be due to the drug. DURICEF should be prescribed with caution in individuals with a history of gastrointestinal disease, particularly colitis.

USAGE IN PREGNANCY: Pregnancy Category B—Reproduction studies have been performed in mice and rats at doses up to 11 times the human dose and have revealed no evidence of impaired fertility or harm to the fetus due to cefadroxil. There are, however, no adequate and well controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nursing Mothers—Caution should be exercised when cefadroxil is administered to a nursing mother.

ADVERSE REACTIONS: Gastrointestinal—Symptoms of pseudomembranous colitis can appear during antibiotic treatment. Nausea and vomiting have been reported rarely.

Hypersensitivity—Allergies (in the form of rash, urticaria, and angioedema) have been observed. These reactions usually subsided upon discontinuation of the drug. Other reactions have included genital pruritus, genital moniliasis, vaginitis, and moderate transient neutropenia.

DOSAGE AND ADMINISTRATION: DURICEF (cefadroxil) is acid stable and may be administered orally without regard to meals. Administration with food may be helpful in diminishing potential gastrointestinal complaints occasionally associated with oral cephalosporin therapy.

Adults—Urinary Tract Infections: For uncomplicated lower urinary tract infections (i.e. cystitis) the usual dosage is one or two grams per day in single (q.d.) or divided doses (b.i.d.).

For all other urinary tract infections the usual dosage is two grams per day in divided doses (b.i.d.).

Skin and Skin Structure Infections: For skin and skin structure infections the usual dosage is one gram per day in single (q.d.) or divided doses (b.i.d.).

Pharyngitis and Tonsillitis: Treatment of Group A beta-hemolytic streptococcal pharyngitis and tonsillitis—one gram per day in divided doses (b.i.d.) for ten days.

Children—The recommended daily dosage for children is 30 mg/kg/day in divided doses every 12 hours as indicated:

Child's Weight	Duricef Suspension				
	lbs	kg	Dosage		
10	4.5		½ tsp b.i.d.		
20	9.1		1 tsp b.i.d.		
30	13.6		1½ tsp b.i.d.		
40	18.2		2 tsp b.i.d.		
50	22.7		2½ tsp b.i.d.		
		125 mg/5 ml	250 mg/5 ml	500 mg/5 ml	
			½ tsp b.i.d.	¼ tsp b.i.d.	¾ tsp b.i.d.
			1 tsp b.i.d.	1 tsp b.i.d.	½ tsp b.i.d.
			1½ tsp b.i.d.	1½ tsp b.i.d.	¾ tsp b.i.d.

In the treatment of beta-hemolytic, streptococcal infections, a therapeutic dosage of Duricef should be administered for at least ten days.

In patients with renal impairment, the dosage of cefadroxil should be adjusted according to creatinine clearance rates to prevent drug accumulation. The following schedule is suggested. In adults, the initial dose is 1000 mg of DURICEF (cefadroxil) and the maintenance dose (based on the creatinine clearance rate [ml/min/1.73 M²]) is 500 mg at the time intervals listed below.

Creatinine Clearances	Dosage Interval
0/10 ml/min	36 hours
10-25 ml/min	24 hours
25-50 ml/min	12 hours

Patients with creatinine clearance rates over 50 ml/min may be treated as if they were patients having normal renal function.

HOW SUPPLIED: Oral Suspension: 125 mg/5 ml and 250 mg/5 ml, 50 ml and 100 ml bottles; 500 mg/5 ml, 100 ml bottles. 500 mg capsules: bottles of 24, 100 and in 10 strips of 10 individually labeled blisters each containing 1 capsule. 1 gm tablets: bottles of 24, 100 and in 10 strips of 10 individually labeled blisters each containing 1 tablet. U.S. Patent Re 29,164

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Temporomandibular disorders

upper and lower incisors. This is approximately the minimal jaw opening that would permit dental work and allow the patient to eat most foods. A patient can usually break adhesions in 1-2 months, and may not require further treatment.

EXPRESS STOP

When surgery is needed: Patients with temporomandibular disorders rarely need surgery, unless noninvasive therapy fails, they have significant temporomandibular joint (TMJ) pain or dysfunction, or they suffer from advanced arthritis, an articular disk (meniscal) derangement, or both. Surgery resolves chronic pain for half the patients, offers a partial resolution for about a third, and fails in about 10 percent. "Enlargement" of the TMJ space is most common; disk repair is more conservative; meniscectomy is indicated for a severely damaged disk.

Specialists have estimated that less than 10 percent—probably around 5 percent—of the patients with temporomandibular disorders will require surgery. It may be indicated, however, when all of the following conditions exist:

» The patient has significant pain or dysfunction.

» You have exhausted the first and second levels of therapy.

» In consultation with a dentist, you have confirmed—by CT scan or arthrography—the presence of advanced arthritis, severe articular disk (meniscal) derangement, or both.

Whether the patient has had previous temporomandibular joint (TMJ) surgery is usually considered important since the effectiveness of each new TMJ operation de-

clines sharply as the number of operations increases.

When weighing the efficacy of a surgical procedure and when discussing the option with your patient, keep in mind the benefits and limitations of surgery: Between 50 and 55 percent of patients with chronic pain will have a complete recovery after surgery; about a third will have occasional discomfort—but perhaps not for several years—when the barometric pressure drops, or when stressing the joint (such as when eating an apple); about 10 percent will have no improvement.

There are three types of surgery commonly performed on the TMJ: “enlargement” of the TMJ space, repair of the disk or disk ligaments, and meniscectomy (see “Guidelines of the American Dental Association on treating temporomandibular disorders,” page 137). Implant of a condylar prosthesis is rarely necessary except in cases of advanced rheumatoid arthritis or severe trauma to the TMJ.

The most frequently done procedure is “enlargement” of the TMJ space—slight reduction in the height of the condyle and, often, a reduction of the articular eminence. The rationale is that widening the joint space will allow the disk to seek a proper position since it will not be caught between the articular eminence and the head of the condyle. The reduced condylar head, furthermore, will present a smooth surface on which the disk can traverse.

A more conservative approach is to attempt to repair a deranged disk, usually by taking up the slack in the ligaments of the disk and reattaching them to draw the

disk into the proper position and prevent it from displacing anteriorly. Prognosis is most favorable when the disk is only slightly displaced. When osteophytes are present, the surgeon will also recontour the articular eminence and condyle.

When the disk is severely deranged or perforated, most surgeons will elect a meniscectomy and replacement with an alloplastic (Teflon, Silastic) implant. These procedures are most often required for patients with advanced arthritis.

Most surgical procedures take 1-2 hours, and require a hospital stay of no more than 2-3 nights. The patient can expect some pain and stiffness on jaw motion for 6-8 weeks. In consultation with the surgeon, establish a rehabilitation program or prescribe an oral appliance to alleviate discomfort and restore normal jaw strength and range of motion. ▷

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A partial list of clinics specializing in temporomandibular disorders

Clinic	Comments
<p>Pain Management Center UCLA School of Medicine Department of Anesthesiology Center for the Health Sciences AR-200 Los Angeles, CA 90024 (213) 825-4291</p> <p>and</p> <p>Temporomandibular Joint and Facial Pain Clinic UCLA School of Dentistry Center for the Health Sciences Tiverton Avenue Los Angeles, CA 90024 (213) 825-8082</p> <p>UCSF TMJ Clinic S 604 San Francisco, CA 94143 (415) 666-4411</p>	<p>Both clinics: treat patients with facial pains, work closely together. <i>Pain Management Center</i>: specializes in managing chronic or complicated head, neck, and orofacial pain, with special interests in persistent dental pain, trigeminal neuralgia, migraine, myofascial and vertebrogenic pain, and undiagnosed craniofacial pain. <i>Temporomandibular Joint Clinic</i>: focuses on diagnosis and treatment of temporomandibular disorders and uses pharmacotherapy, exercises, physical therapy, vapocoolants, diathermy and moist heat, transcutaneous electrical nerve stimulation, biofeedback, and orthopedic and occlusal appliances. Also equipped to perform temporomandibular joint (TMJ) X-rays and TMJ surgery.</p> <p>A diagnostic clinic, specializing in biomechanical problems of the temporomandibular joint. Procedures include supplementary tomography, arthrography, nuclear bone scans, CT scans, jaw motion studies, symptoms reversal with short-term drug therapy; also uses biofeedback and physical therapy modalities; access to wide range of subspecialists at UCSF medical center.</p>
<p>College of Dentistry Pain Clinic University of Florida Hillis Miller Health Center Gainesville, FL 32601 (904) 392-4396</p>	<p>Primary interests include orofacial pain, arthritis, and headache. Emphasis on noninvasive therapies but also performs temporomandibular joint surgery.</p>
<p>TMJ Facial Pain Clinic Emory University School of Dentistry 1462 Clifton Road NE Atlanta, GA 30322 (404) 329-6780</p>	<p>Comprehensive care in treatment of temporomandibular joint disorders, occlusal disorders, and muscle dysfunction in the face and neck. Staff includes dentists, a physical therapist, and a clinical psychologist. Consultants include specialists in oral and maxillofacial surgery, orthodontics, neurology, and otolaryngology.</p>
<p>Diamond Heachache Clinic 5252 North Western Chicago, IL 60625 (312) 878-5558</p> <p>TMJ and Facial Pain Research Center University of Illinois Medical Center 801 South Paulina Chicago, IL 60612 (312) 996-7571</p>	<p>Orofacial pain is a secondary interest. Therapies include transcutaneous electrical nerve stimulation, biofeedback, pharmacologic agents, operant conditioning, and psychotherapy.</p> <p>Primarily a research clinic; emphasis on diagnosis and treatment of myofascial pain dysfunction syndrome; some surgical procedures. Currently evaluating several forms of therapy. Will generally not take patients from great distances, but will refer them to a clinic in their area.</p>
<p>Oral Diagnosis-Facial Pain Clinic University of Louisville Health Sciences Center 500 South Preston Street Louisville, KY 40292 (502)588-5072</p>	<p>Areas of interest include orofacial pain, headache, and pain from head and neck cancer.</p>
<p>Oro-Facial Pain Unit LSU Medical Center 1100 Florida Avenue New Orleans, LA 70119 (504) 947-9961 Ext. 38605</p>	<p>Patients are screened and referred to an appropriate specialist. The team includes an oral and maxillofacial surgeon, a psychologist, a neurosurgeon, a social worker, and physical therapist.</p>

Clinics are arranged alphabetically by state. This list does not pretend to be complete, but represents a compilation of clinics listed by the American Society of Anesthesiologists and by other sources. Information is current as of July, 1983. Inclusion in the list does not constitute endorsement by the consultants for the accompanying article or by Patient Care Communications, Inc.

continued

A partial list of clinics specializing in temporomandibular disorders continued

Clinic	Comments
<p>Myo-Oral Facial Pain Clinic University of Maryland Dental School 666 West Baltimore Street Baltimore, MD 21201 (301) 528-7370</p> <p>The Mensana Clinic Greenspring Valley Road Stevenson, MD 21153 (301) 653-2403</p>	<p>Primary interests include dental pain, orofacial pain, and headache. All conventional therapies; psychotherapy coordinated with the psychophysiological laboratories and departments in the medical school.</p> <p>Emphasis on psychogenic pain; treats inpatients and outpatients.</p>
<p>Massachusetts General Hospital-Facial Pain Unit Room 230 Parkman Avenue Boston, MA 02114 (617) 726-2740</p>	<p>Multidisciplinary group including oral and maxillofacial surgeons, a psychiatrist, and a neurosurgeon.</p>
<p>Orthodontic Department University of Detroit School of Dentistry 2985 East Jefferson Detroit, MI 48207 (313) 446-1841</p>	<p>Primary function is diagnostics; provides instruction for junior and senior dental students.</p>
<p>The TMJ and Chronic Craniofacial Pain Clinic University of Minnesota University Hospital 420 Delaware Street SE Minneapolis, MN 55455 (612) 373-8730</p>	<p>Comprehensive approach, including restorative dentistry, physical therapy, psychological counseling, behavior techniques, and oral and maxillofacial surgery.</p>
<p>Headache Unit/Department of Dentistry Montefiore Hospital 111 East 210th Street Bronx, NY 10467 (212) 920-4981</p> <p>TMJ & Orofacial Pain Research Clinic The State University of New York at Buffalo Department of Oral Medicine School of Dentistry 244 Farber Hall 34-35 Main Street Buffalo, NY 14214 (716) 831-2243</p> <p>Facial Pain Group Queens Hospital Center Department of Dentistry 82-86 164th Street Jamaica, NY 11432 (212)990-2881</p>	<p>Multidisciplinary approach, involving staff from six departments. Patients are first seen by a dentist, treated or referred to the pain treatment center or the headache unit.</p> <p>A multidisciplinary approach; diagnostic capabilities include electromyography, tomography, and a variety of X-ray procedures; therapy includes the use of oral appliances, physical therapy, medical agents, and psychological counseling.</p> <p>Emphasis on noninvasive therapies: psychotherapy, physical therapy, biofeedback, and oral appliances to correct malposition of the mandible.</p>

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continued

Temporomandibular disorders

A partial list of clinics specializing in temporomandibular disorders continued

Clinic	Comments
<p>Facial Pain Clinic Columbia University School of Oral and Dental Surgery 630 West 168th Street New York, NY 10032 (212)694-3528 (first, to register) then (212)694-4185 (for an appointment)</p> <p>Oro-Facial Pain Center New York University College of Dentistry 421 First Avenue New York, NY 10010 (212) 481-5921</p> <p>TMJ Facial Pain Clinic St. Luke's Hospital 421 West 113th Street New York, NY 10025 (212) 870-6091</p>	<p>Primary areas of interest include orofacial pain, psychogenic pain, and arthritis. Founded in 1948 — is the oldest clinic of its type in the country.*</p> <p>Multidisciplinary approach; conventional therapies, operant conditioning, acupuncture, and neurosurgery.*</p> <p>Multidisciplinary approach, with primary interests in orofacial pain and headache.</p>
<p>TMJ-Oral Facial Pain Clinic Miami Valley Hospital 128 Wyoming Street Dayton, OH 45409 (513) 223-6192 Ext. 3904</p>	<p>Multidisciplinary approach, with special emphasis from the departments of psychiatry, ENT, internal medicine, and physical medicine.</p>
<p>TMJ and Facial Pain Clinic University of Pennsylvania School of Dental Medicine 4001 Spruce Street Philadelphia, PA 19104 (215) 898-6094</p> <p>TMJ Clinic University of Pittsburgh School of Dentistry DeSota Terrace Pittsburgh, PA 15216 (412) 624-3212</p>	<p>Multidisciplinary approach; general dentists, oral and maxillofacial surgeons, and a dental radiologist on the staff. Referrals to neurosurgeons, neurologists, otorhinolaryngologists, internists, psychiatrists, and orthopedists.*</p> <p>Treatment emphasizes resolving muscle tension and includes splint therapy, low- and high-voltage electrical stimulation, and biofeedback.</p>
<p>University of Tennessee Memorial Hospital Department of Oral and Maxillofacial Surgery 1924 Alcoa Highway Knoxville, TN 37920 (615) 971-3963</p>	<p>Multidisciplinary approach; staff includes prosthodontists, orthodontists, general dentists, and oral surgeons. Consultants include a physiotherapist, psychologist, and a biofeedback specialist.</p>
<p>TMJ Clinic University of Texas Dental School San Antonio, TX 78284 (512) 691-7478</p>	<p>Emphasis on multidisciplinary approach to diagnosis and treatment; coordinates referrals to departments of general dentistry, surgery, neurology, psychology, and to other specialists as required.</p>
<p>TMJ and Facial Pain Center Virginia Commonwealth University Box 566, MCV Station Richmond, VA 23298 (804) 786-3448</p>	<p>A broad range of interests, including temporomandibular joint pain, myofascial pain dysfunction syndrome, posttraumatic neuralgias, typical and atypical facial neuralgias, and vascular orofacial and head pain. Therapy includes medical and nonmedical treatments, physical rehabilitation, and orthopedic appliances.</p>

*Closed during August.

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