

# Center for Diagnostic Sciences BULLETIN



July 2005

Issue # 12

This bulletin focuses on Temporomandibular Disorders. We thank Dr. Ana Lotaif for her contribution to this issue. As always, we invite your comments, questions, and suggested topics for future bulletins. Please forward your comments to Anisa Marino at [anisamar@usc.edu](mailto:anisamar@usc.edu).

## What are Temporomandibular Disorders?

Temporomandibular Disorders (TMD) are a common subgroup of orofacial pain disorders, often incorrectly referred to as "TMJ." There are two basic types of TMD: Myogenous TMD (muscle generated pain) and Arthrogeous TMD (jaw joint generated pain).

## What is the Temporomandibular Joint?

The temporomandibular joint (TMJ) is a "loose-fitting," rotating-sliding joint with a fibrocartilage-covered, football-shaped ball (condyle), fibrous pad (disc), fibrocartilage lined socket (fossa), ligaments, tendons, blood vessels and nerves. The TMJ connects the lower jaw, called the mandible, to the temporal bone at the side of the head. If you place your fingers just in front of your ears and open your mouth, you can feel the joint on each side of your head. Because these joints are flexible, the jaw can move smoothly up and down and side to side, enabling us to talk, chew and yawn. Muscles attached to and surrounding the jaw joint control its position and movement.

Myogenous TMD usually results from overwork, fatigue or tension of the jaw and supporting muscles in jaw-ache, headache and/or posterior neckache.

Arthrogeous TMD usually results from inflammation, disease or degeneration of the hard or soft tissues within the TMJ. Capsulitis/synovitis (inflammation), disc dislocation (internal derangement) and degenerative arthritis are the most common arthrogeous disorders of the TMJ.

## What Causes TMD?

Causes for TMD are unclear, as TMD usually involves more than a single symptom and rarely has a single cause. TMD is believed to result from several factors acting together.

When we open our mouths, the rounded ends of the lower jaw, called condyles, glide along the joint socket of the temporal bone. The condyles slide back to their original position when we close our mouths. To keep this motion smooth, a soft fibrous disc lies between the condyle and the temporal bone. The fibrous disc functions as a moving shock absorber and stabilizer between the condyle and the fossa. As the jaw opens, the condyle rotates and slides forward with the disc.

It is important for the TMD sufferer to understand that the disorder can be chronic in nature and highly dependent upon multiple factors including emotional stability.

The muscles of mastication (jaw muscles) connect the mandible (lower jaw) to the maxilla (upper jaw), skull and neck. The muscles of mastication open, close, rotate and protrude the jaw, enabling you to talk, chew and swallow. The supporting muscles of mastication (neck and shoulder muscles) stabilize the skull on the neck during jaw function.

## Factors Associated With TMD:

- Trauma: Direct trauma to the jaws has been scientifically associated with the onset of TMD symptoms. Direct trauma to the jaws can occur from a blow to the jaw, hyperextension or overstretching of the jaw, and, in some cases, compression of the jaw. Lengthy or forceful dental procedures, intubation for general anesthetic and surgical procedures of the mouth, throat, and upper GI track (esophagus and stomach) can traumatize

the TMJs.

- Abnormal Habits:** Habits such as tooth/jaw clenching, tooth grinding (bruxism), lip biting, fingernail biting, gum chewing and abnormal posturing of the jaws are common and have not been proven to result in TMD. Jaw habits are often associated with TMD and may be contributing factors that perpetuate and aggravate ongoing TMD symptoms.

- Occlusion:** Dental occlusion refers to the way the teeth fit together or the bite. Historically, the dental profession has viewed malocclusion (abnormal bite) as a primary causative factor in TMD. Recent research studies do not confirm that malocclusion causes TMD. In large population studies, most patients with TMD have normal occlusion, and the majority of people with malocclusion do not have TMD.

- Psychological Factors:** Many patients with TMD report onset of jaw dysfunction symptoms or aggravation of preexisting TMD symptoms with increases in emotional stress or a psychological imbalance such as depression or anxiety. Scientific studies indicate that many TMD patients experience levels of depression or anxiety that are higher than the non-TMD population. To date, it has not been established whether depression or anxiety is present prior to the onset of TMD and contributes to its cause, or whether the chronic pain associated with TMD leads to depression and anxiety. Many patients will increase their level of tooth clenching and grinding when they experience emotional stress, psychological imbalance or pain.

- Diseases of the TMJs:** Several types of arthritis may develop in the TMJs like any other joint in the body. It is common for osteoarthritis to be present in the aging population. Many other diseases such as Parkinson's Disease, Myasthenia Gravis, and strokes lead to excessive or uncontrollable jaw movements.

- Other Factors:** Abuse of drugs and the use of certain prescription medications can affect the central nervous system and muscles to contribute to TMD.

## **What are the TMD Signs and Symptoms?**

A variety of symptoms may be linked to TMD. Pain, particularly in the chewing muscles and/or jaw joint, is the most common symptom. Other likely symptoms include:

- Limited movement or locking of the jaw
- Radiating pain in the face, neck or shoulders
- Painful clicking, popping or grating sounds in the jaw joint when opening or closing the mouth
- A sudden, major change in the way the upper and lower teeth fit together

Symptoms such as headaches, earaches, dizziness and hearing problems may sometimes be related to TMD. It is important to keep in mind, however, that occasional discomfort in the jaw joint or chewing muscles is quite common and is generally not a cause for concern.

## **How is TMD Diagnosed?**

Because the exact causes and symptoms of TMD are not clear, diagnosing these disorders can be confusing. However, a comprehensive history of the patient's description of symptoms, combined with a comprehensive physical examination of the face and jaw, provides information useful for diagnosing these disorders.

The TMD Evaluation may include:

- Comprehensive history of all jaw/head/neck symptoms, medical history, dental history, personal history, family history and psychological history.
- Comprehensive physical evaluation of the TMJ's, cervical spine, muscles of the jaw/head/neck, neurological-neurovascular structures, teeth, gum and soft tissues. The examination includes feeling the jaw joints and chewing muscles for pain or tenderness; listening for clicking, popping or grating sounds during jaw movement; and examining for limited motion or locking of the jaw while opening or closing the mouth.
- Psychological evaluation including a brief interview and testing when indicated.
- Additional tests including X-rays and diagnostic imaging, biopsies, blood tests, urinalysis, neurological tests and diagnostic injections.

## What is the TMD Treatment?

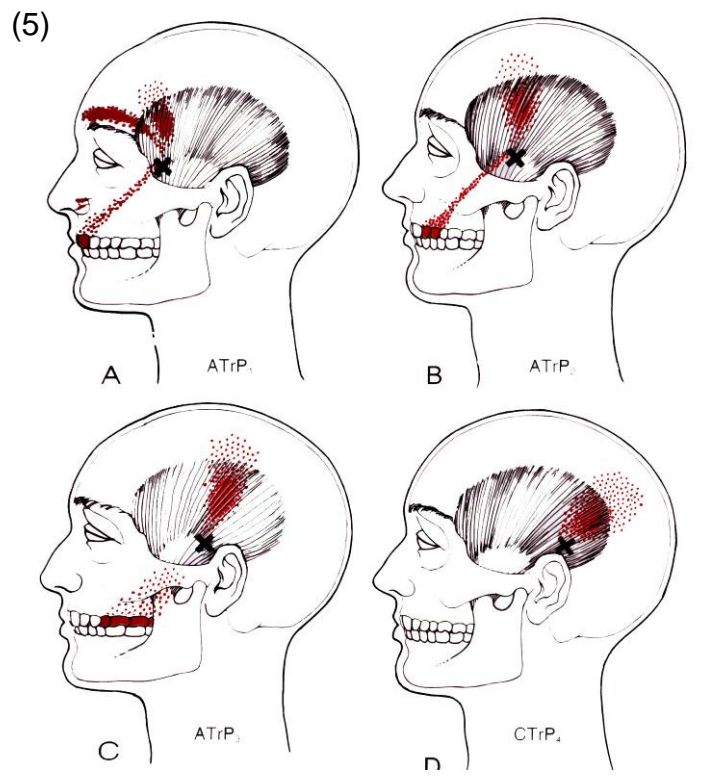
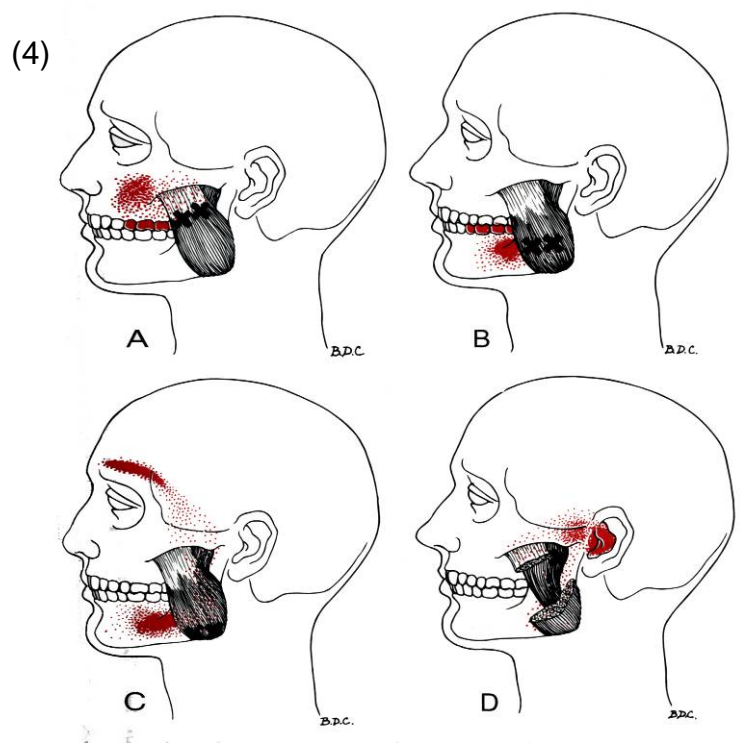
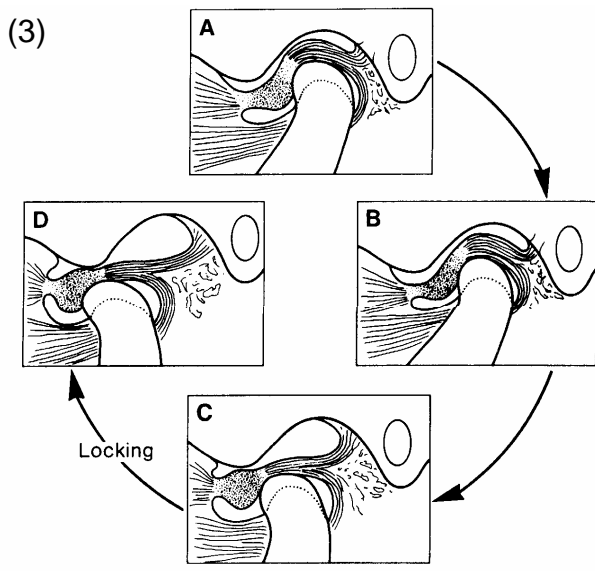
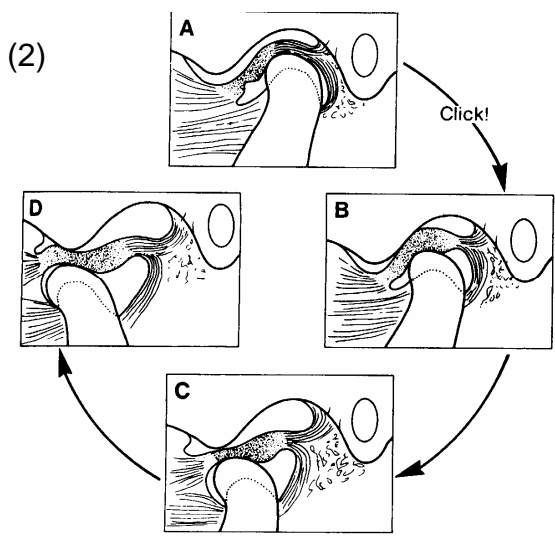
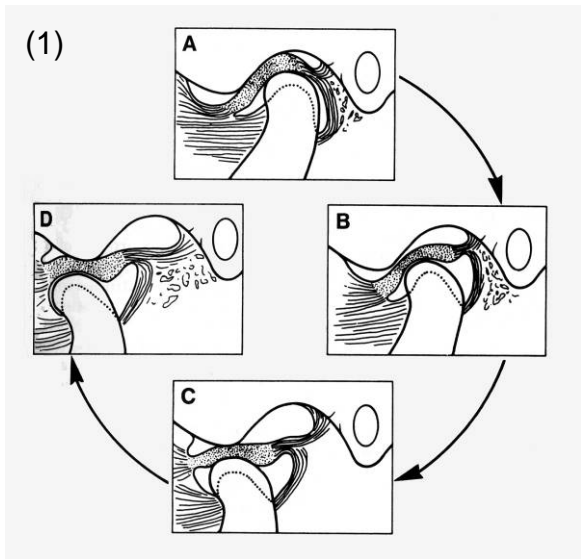
Because there is no known "cure" for TMD, management of patients with TMD symptoms is similar to management of patients with other orthopedic or rheumatologic disorders. The goals of TMD management include a decrease in adverse pressure or loading on the jaw joints, and restoration of function of the jaw and normal daily activities. These goals are best achieved by identifying all contributing factors and implementation of a well defined management program to treat physical and emotional/psychological factors. The management options and sequence of treatment for TMD are consistent with other musculoskeletal disorders found in the body. As in many musculoskeletal conditions, the signs and symptoms of TMD may be temporary and self limiting without serious long term effects. For these reasons, special effort should be made to avoid aggressive or nonreversible therapy such as surgery, extensive dental treatment or orthodontic treatment. Conservative management techniques such as behavior modification, physical therapy, medications, jaw exercises, intra-oral appliances (orthotics), and joint and muscle injections have proven to be safe and effective in the majority of TMD cases. Most patients suffering from TMD achieve good long term relief with conservative (reversible) therapy.

### **Patient self care should include:**

- Limiting jaw opening (yawning, etc.) to no more than 2 finger widths.
- Resting of the jaw by avoiding heavy chewing (e.g. gum, bagels and tough meats).
- Avoidance of grinding and clenching of the teeth by keeping the teeth slightly apart and the jaw relaxed.
- Avoidance of leaning or sleeping on the jaw.
- Avoidance of tongue thrusting and chewing fingernails or non-food objects.
- Avoidance of playing wind, brass and string instruments that stress, retrace or strain the jaw.
- Use of cold/ice packs or moist heat compresses.

## Please see diagrams on next page:

- (1) Normal TMJ disc position
- (2) Anterior disc displacement with reduction
- (3) Anterior disc displacement without reduction
- (4) Masseter trigger points
- (5) Temporalis trigger points



*Did you know?*

**Number of patients *Screened, Accepted, Rejected & Redirected* in the  
Center for Diagnostic Sciences from May 1, 2005 to June 30, 2005**

