

# What's New in Dentistry

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**Patient compliance with TMD treatment varies widely.** TMD or temporomandibular disorders are an interrelated, but heterogeneous set of conditions characterized by pain in the TMJ or masticatory muscles, limited vertical range of mandibular motion, and noise in the TMJ during mandibular function. Although various types of treatment are possible for these symptoms, most clinicians attempt conservative approaches before resorting to irreversible techniques. However, conservative approaches require patient cooperation in order to be effective. Some treatments elicit better cooperation than other self-treatments. A study published in the *Journal of Orofacial Pain* (2004;18:203–213) evaluated patient compliance with five conservative TMD treatment techniques (jaw relaxation, jaw stretching, heat application, cold application, and occlusal splint use). These researchers associated compliance with changes in pain intensity, pain-related activity interference, and jaw use limitations. The sample consisted of 81 TMD patients who were given one to five treatment recommendations as part of usual care in a TMD specialty clinic. Compliance with each recommendation was determined from electronic interviews conducted three times daily for two weeks. The results of this study showed that the average compliance with the various treatment modalities ranged from 30% up to 80%. The average overall compliance was about 55%. These researchers showed that cooperation with jaw relaxation was the highest (80%), followed by jaw stretching (65%), splint usage (43%), cold application (31%), and heat application (30%). Participants with higher initial pain intensity and jaw use limitations were more compliant with the recommended treatment regimen. The authors conclude that further research is needed to evaluate the long-term effects of compliance with recommended therapies.

**Early loading of single-tooth implants is highly successful.** The timing of restoring and loading single-tooth dental implants is controversial. Whereas in the past, implant restoration was generally delayed until four to six months after implant insertion into the bone, recent studies are suggesting either early or immediate loading of single-tooth implants. In order to establish a consensus of recent well-constructed studies, the data from six articles addressing early loading was compared statistically and published in the *International Journal of Oral and Maxillofacial Implants* (2004;19:92–102). The authors define early loading as restoration of the implants at least 48 hours after implant

placement, but at a shorter time interval than conventional healing. Immediate loading is defined as attachment of a restoration into occlusion within 48 hours of surgical placement. Variables that were considered included single or multiple tooth conditions, immediate or delayed placement in extraction sockets, effect of implant surface, bone quality, implant stability, surgical technique, occlusal design, effects of cigarette smoking, and stability of results. The results showed that the combined data from these six studies of over 1000 implant patients showed a survival rate of 98%. The authors conclude that in general, implant survival with immediate restoration is comparable to the results with conventional and early loading protocols.

**Nitric oxide is involved in painful temporomandibular disorders.** Nitric oxide is a neurotransmitter. Its synthesis occurs through the oxidation of specific amino acids that results in production of nitric oxide. Nitric oxide has various functions, and it is believed that this chemical is involved with mediating nociception, food intake, drinking, and modulation of the sleep-wake cycle. Recent research has shown that nitric oxide may have an important function in pain perception. Researchers have shown that painful temporomandibular joint conditions may be associated with higher levels of nitric oxide in the synovial fluid, but its involvement in these cases has not been fully described. A study published in the *Journal of Dental Research* (2004; 83:693–697) aimed to elucidate the relationship between temporomandibular joint issues and sleep patterns, with specific focus on nitric oxide mechanisms. The sample for the study consisted of 48 laboratory animals that were randomly divided into various groups. Either an inhibitor of nitric oxide synthesis or a donor of nitric oxide was randomly injected into these experimental animals after a toxic solution was injected directly into the temporomandibular joints of these animals. Then the authors measured the quality of the sleep of the animals. The orofacial pain group of animals showed a reduction in total sleep time and an increase in sleep latency compared with control animals. If the inhibitor of nitric oxide synthesis was injected into the orofacial pain animals, there was increased sleep time, sounder sleep, and reduced sleep latency. In conclusion, the nitric oxide synthesis inhibitor improved sleep efficiency, and the authors therefore believe that there is some involvement of nitric oxide in painful temporomandibular joint conditions.

**Periodontal attachment loss increases during radiation therapy.** Head and neck radiation therapy is often necessary for patients who develop carcinoma of the mouth, pharynx, and larynx. Obviously radiation therapy is directed at killing cancer cells, but it can have a detrimental effect on the adjacent normal tissues of the head and neck. A potential area of concern is damage to the periodontal ligament housing the teeth during radiation therapy. A study published in the *Journal of Periodontology* (2004;75:1178–1187) evaluated the effect of six to eight months of head and neck radiation therapy on the periodontal health of 27 patients. The authors evaluated the probing depth, clinical attachment level, gingival recession, plaque index, and bleeding upon probing. The results of this study showed that the greatest changes occurred in clinical attachment level over time. Overall, 70% of the patients showed a loss in clinical attachment. Over 90% of the sample showed evidence of attachment loss in the mandible. The data showed that the attachment loss was directly related to the field of radiation and was greater when the jaws were actually included in the irradiated field. These researchers recommend that the periodontal status of radiation therapy patients should be evaluated prior to and after administration of radiation in the oral-maxillary-facial region to help insure that periodontal health is maintained in oncology patients.

**Clinical examination sufficient to diagnose internal derangements.** Internal derangements of the temporomandibular joint are common and involve either anterior or posterior displacement of the meniscus as the mandible goes through its functional movements. In many cases, the dis-

placement produces a distinguishable click or pop as the disk is pushed from its proper location over the condyle. Diagnosis of internal derangement can be verified with clinical examination, magnetic resonance imaging, or through a technique called opto-electronic movement recording. A study published in the *Journal of Orofacial Pain* (2004;18:138–147) compared the accuracy of these three techniques in diagnosing internal derangements in a sample of 42 participants. The sample consisted of 22 women and 20 men. In a prescreening examination an independent examiner determined that 10 participants showed no signs of an internal derangement and served as the control group. The remaining 32 participants showed clinical signs of an internal derangement in at least one of their TMJs. During the experiment each of the participants was examined using the three techniques to detect internal derangements (clinical examination, magnetic resonance imaging, and opto-electronic movement recording), by clinicians who are experienced in each of the three techniques. Then the accuracy of the diagnoses was compared among these three techniques. The results of this study showed fair to good diagnostic agreement between clinical examination and the use of opto-electronic movement recording for diagnosing internal derangement. However, intermethod agreement between the MRI technique and either of the other two function-based techniques was poor. In conclusion, the authors state that for a function-based diagnosis, there is probably no need for sophisticated condylar movement recording techniques (opto-electronic movement recording), since the agreement with a carefully performed clinical examination is fair to good.