Wolfe F, Clauw DJ, Fitzcharles MA, et al. The American College of Rheumatology preliminary diagnostic criteria for fibromyalgia and measurement of symptom severity. Arthritis Care Res 2010;62:600–610.

Chronic pain disorders are known to be comorbid with other chronic pain disorders. Orofacial pain disorders are no exception and have been reported to occur frequently in people with fibromyalgia, so much so that some investigators feel they are more closely related than previously suspected. Wolfe et al, on behalf of the American College of Rheumatology (ACR), report on their efforts to develop an alternative method to arrive at the diagnosis of fibromyalgia. The stated objectives of this research were to eliminate the tender point examination and introduce a severity scale (SS).

This multicenter study of 829 previously diagnosed fibromyalgia patients and age- and gender-matched controls who had pain of noninflammatory origin, such as degenerative neck or back pain, used physician physical and interview examinations, including a widespread pain index (WPI) and a measure of the number of painful body regions. Random forest and recursive partitioning analyses were used to guide the development of a case definition of fibromyalgia, to develop criteria, and to construct a SS scale. Approximately 25% of fibromyalgia patients within the study did not satisfy the ACR 1990 classification criteria at the time of the study. The most important diagnostic variables were WPI and categorical scales for cognitive symptoms, unrefreshed sleep, fatigue, and number of somatic symptoms. The categorical scales were summed to create an SS scale. The authors combined the SS scale and the WPI to recommend a new case definition of fibromyalgia: (WPI > 7 and SS > 5) or (WPI 3–6 and SS > 9).

The authors conclude that this simplified definition of fibromyalgia correctly classifies 88.1% of cases classified by the ACR classification criteria, and does not require a physical or tender point examination. The SS scale enables assessment of fibromyalgia symptom severity in persons with current or previous fibromyalgia, and in those to whom the criteria have not been applied. Furthermore, they feel it will be especially useful in the longitudinal evaluation of patients with marked symptom variability. *(DN)*

Pigg M, List T, Petersson K, et al. Diagnostic yield of conventional radiographic and cone-beam computed tomographic images in patients with atypical odontalgia. Int Endod J 2011 Jul 26 [epub ahead of print].

When patients present with persisting dentoalveolar pain in association with a tooth or teeth, whether previously endodontically treated or not, to what degree of diagnostic certainty should the conscious clinician go? Given that patients with atypical odontalgia (AO) often have altered sensibility in the affected area, thereby making pulp and periapical testing results suspect, is it worth the exposure of the patients to radiation to obtain a cone-beam computed tomography (CBCT) image of the area? Pigg et al present initial data addressing this complex issue by exploring diagnostic imaging of teeth and pain.

Twenty patients (mean age 54 ± 11 years) participated; 20 were diagnosed with AO and 5 with symptomatic apical periodontits (SAP). AO inclusion criteria were chronic pain (> 6 months) in a region where a tooth had been endodontically or surgically treated, with no pathological cause detectable in clinical or radiologic examinations. SAP inclusion criteria were recurrent pain from a tooth diagnosed with apical periodontitis in clinical and radiographic examinations. Radiographic examination, including panoramic, intraoral radiographs, and CBCT images, was performed with the main outcome being periapical bone rarefaction. Intra- and interobserver reliability, as measured by kappa statistic, ranged from 0.19 to 0.65 and highlights the variability of dental radiographic interpretation. By consensus agreement, 60% of patients with AO had no periapical bone destructions detectable with any radiographic method. Overall, CBCT rendered 17% more periapical bone destructions than conventional radiography.

The investigators conclude that CBCT of teeth in patients with AO improved identification of patients without periapical bone destruction, which may facilitate differentiation between AO and SAP. They also recognize that this finding has an unknown net positive or negative effect on patient care. *(DN)*

Weissman-Fogel I, Moayedi M, Tenenbaum HC, et al. Abnormal cortical activity in patients with temporomandibular disorder evoked by cognitive and emotional tasks. Pain 2011;152:384–396.

It is often described that patients suffering from chronic pain self-report a feeling of impaired memory and/or reduced cognitive ability. Research assessing subjects who have temporomandibular disorder (TMD) pain has demonstrated reduced performance in neuropsychological tests of cognitive function. The exact reason for this poor performance is not known but suggests dysfunction in brain networks related to these tasks. This article by Weissman-Fogel et al assessed task-evoked brain activity by using functional magnetic resonance imaging (MRI) and used a case-control study design to explore this hypothesis.

Seventeen female subjects with nontraumatic TMD and 17 age-matched healthy female controls underwent functional imaging while performing Stroop tasks comprising neutral words, incongruent numbers, or emotional words, including TMD-specific words. Group differences in task-related brain responses were assessed. Connectivity between two pairs of coupled brain regions during the cognitive and emotional tasks, the prefrontal-cingulate and amygdala-cingulate, was also examined. TMD subjects had slower Stroop reaction times for all tasks when compared to their pain-free controls.

Furthermore, TMD subjects showed increased task-evoked responses in lateral prefrontal and inferior parietal areas, regions implicated in attention; in the amygdala and pregenual anterior cingulate, regions implicated in emotional processes; and in the supplementary and primary motor areas, regions implicated in motor planning and performance. TMD subjects also had activation of the default-mode network (medial prefrontal and posterior cingulate) and exhibited decoupling of the normally correlated activity between the prefrontal and cingulate cortices and between the amygdala and cingulate cortex.

The investigators conclude that their findings suggest subjects with TMD pain have slower behavioral responses due to attenuated, slower, and/or unsynchronized recruitment of attention/cognition processing areas. They then speculate that these abnormalities may be due to the salience of chronic pain, which inherently requires attention. *(DN)*

Gustin SM, Peck CC, Wilcox SL, et al. Different pain, different brain: Thalamic anatomy in neuropathic and non-neuropathic chronic pain syndromes. J Neurosci 2011;31:5956–5964.

In a typical clinical orofacial pain practice, a variety of patients present with the complaint of pain mediated by the trigeminal nerve. Historical experience leads to classifying them into different groups, such as musculoskeletal or neuropathic, based on the predominating signs and symptoms. This classification seems to be justified since efficacious treatments can be very different between these groups, sometimes with little crossover. On the other hand, it is not uncommon to encounter patients with more than one chronic orofacial pain disorder. Such empirical evidence suggests distinct as well as shared pathophysiological processes may be underlying these groups of disorders. This article by Gustin et al compares two groups of orofacial pain patients with pain-free controls by using noninvasive brain imaging techniques.

These investigators used standard anatomic magnetic resonance imaging to assess group-wise differences in brain volume, referred to as voxel-based morphometry, and in a subset assessed the ratio of N-acetylaspartate to creatine, a marker of nerve viability, via magnetic resonance spectroscopy. Both brain imaging techniques were guided by functional imaging results designed to identify more precisely the active regions of interest within each person. Using these techniques, the investigators assessed groups of subjects who had temporomandibular disorders (TMD), (defined by the Research Diagnostic Criteria for TMD; Dworkin and LeResche, 1992) and trigeminal neuropathic pain (TNP) (defined according to Nurmikko and Eldridge, 2001) with healthy controls who were age- and gender-matched to their respective subjects with chronic pain. As expected, TMD subjects were younger and the TNP subjects were taking more medications, but otherwise these groups were well matched for gender, pain intensity, and pain duration. They found no significant regional gray matter volume change in TMD patients, while TNP patients had reduced gray matter volume in the primary somatosensory cortex, anterior insula, putamen, nucleus accumbens, and the thalamus, whereas gray matter volume was increased in the posterior insula. A subset analysis revealed that the thalamic volume decrease was only seen in the TNP patients classified as having trigeminal neuropathy but not those with trigeminal neuralgia. Furthermore, in trigeminal neuropathy patients, magnetic resonance spectroscopy revealed a significant reduction in the N-acetylaspartate to creatine ratio, in the region of thalamic volume loss.

The authors suggest that their data supports the position that TMD and TNP have a different underlying pathogenesis where neuropathic pain conditions that result from peripheral injuries may be generated and/or maintained by structural changes within the brain, such as the thalamus. *(DN)*

Davidson S, Zhang X, Khasabov SG, et al. Relief of itch by scratching: State-dependent inhibition of primate spinothalamic tract neurons. Nature Neurosci 2009;12:544–546.

Patients presenting to the orofacial pain care provider are well known to have a complaint of pain, but sometimes they complain of a different dysesthetic sensation—itch. While the observation of relieving itch by scratching is well known, the underlying neural mechanisms mediating this phenomenon are unknown. Since itch and pain have several neurological similarities, and are both clinically relevant, discovering how itch is mediated likely will be helpful clinically. This article by Davidson et al explores the neural mechanisms in nonhuman primates.

Microelectrode recordings were made from dorsal horn spinothalamic tract (STT) neurons that responded to scratch of the skin and that were manipulated with intervals of scratch and pain, with and without itch which was induced by intradermal injection of histamine. These STT neurons responded to histamine and were therefore deemed to transmit pruritic information to the brain. In eight neurons, scratching the cutaneous receptive field of primate's STT neurons produced inhibition during histamine-evoked activity but not during spontaneous activity or activity evoked by a noxious stimulus induced with capsaicin.

The investigators suggest that scratching inhibits the transmission of itch in the spinal cord in a state-dependent manner. They further postulate that itch produces a state whereby scratching engages a central inhibitory mechanism, one or either local inhibitory interneurons and/or descending mechanisms from the brain. *(DN)*