

# An Introduction to Orofacial Pain

Jeffrey A. Crandall, DDS\*

## KEYWORDS

- Orofacial pain • Comorbidities • Pain processing • Chronic pain
- Temporomandibular disorders • Headache • Neuropathic pain

## KEY POINTS

- Orofacial pain (OFP) primarily consists of musculoskeletal, neurovascular, and neuropathic pain conditions.
- Pain processing involves nociception, perception, suffering, and pain behavior.
- These 3 conditions are often accompanied by a variety of comorbidities.
- The clinical presentation of OFP often includes biological, psychological, social, behavioral, and belief system components.

The assessment, diagnosis, and management of orofacial pain (OFP) disorders is often a complex, multifactorial, and multidisciplinary process. The articles in this issue provide the reader with the most current information regarding these conditions and appropriate, evidence-based care for patients who are suffering with these afflictions. In its simplest form, OFP consists of 3 categories: musculoskeletal pain, neurovascular pain, and neuropathic pain. Many of these patients, however, present with various comorbidities that may influence these conditions in a multitude of ways.

In 2014, the National Institutes of Health/National Institute of Dental and Craniofacial Research reported that the prevalence of temporomandibular joint disorder (TMJD) signs and symptoms ranged from 5% to 12%, based on several studies from around the globe.<sup>1</sup> The prevalence of myofascial TMJD in women has been calculated as 10.5% (95% CI, 8.5%–13.0%)<sup>2</sup> and the prevalence of temporomandibular joint (TMJ) osteoarthritis has been found to be 25% in younger adults and as high as 70% in adults over 70 years of age.<sup>3</sup>

A study published in 2010<sup>4</sup> found that 49% of TMJD patients experienced tension-type headaches, 14.5% suffered migraine without aura, 12.9% had probable migraine, 7% suffered migraine with aura, and 4.8% had probable tension-type headaches. Another study of headache patients<sup>5</sup> explored the prevalence of TMJD in

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Surgery Health Care Service, University of Vermont Medical Center, 111 Colchester Avenue, Burlington, VT 05401, USA

\* 40 Timber Lane, South Burlington, VT 05403.

E-mail address: [jacrndl@aol.com](mailto:jacrndl@aol.com)

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patients with chronic daily headache and episodic headache. The prevalence of TMJD was found significantly higher in both the chronic daily headache group ( $P = .0018$ ) and the episodic headache group ( $P = .05$ ) when each was compared with the control group. These findings suggest that there is a significant crossover between TMJD and various headaches.

Neuropathic OFP is much more heterogeneous<sup>6</sup> and likely to be a stand-alone diagnosis, as described in an article (See Janina Christoforou's article, "Neuropathic Orofacial Pain," in this issue). As such, the prevalence of each of these disorders is usually independent of the other neuropathic OFP disorders as well as TMJDs and headaches.

## PAIN PROCESSING

In many ways, pain affects the entire body but is an experience that occurs within the cortical brain. The process begins with the stimulation of a variety of nociceptors distributed throughout the body and creates neural impulses that are in response to a threat of or real tissue damage.<sup>7</sup> Along with visual, auditory, olfactory, and other stimuli, pain can also create a reflex startle or withdrawal response, in some cases known as hyperreflexia.<sup>8</sup> Ultimately, this may be the generator of a self-protective or so-called fight-or-flight response.

It is beyond the scope of this article to describe the details of the nature of pain. Suffice it to say that nociception leads to the perception of pain, causing the personal experience of suffering, which results in pain behavior. An excellent and detailed description of this process is found in *Bell's Oral and Facial Pain*.<sup>9</sup> A detailed description and accompanying graphics also is on the Web site, <http://neuroscience.uth.tmc.edu/s2/chapter07.html>.<sup>10</sup> After the biological phenomenon of nociception, the experiences of perception, suffering, and pain behavior are subject to a broad variety of excitatory and inhibitory influences, also known as the pain modulation concept. Perception of pain is the conscious awareness of an event that has caused tissue damage. But as this awareness becomes more relevant and persistent, the internal emotional response of suffering is initiated. Suffering involves personal and complex interactions between the pain perceiving cortex and the emotional centers, including the thalamus, limbic system, and the reticular activating system. In acute pain, interpreting the magnitude of the tissue damage influences pain behavior. A paper cut generally leads to little or no perceived threat and basic self-care whereas, conversely, more severe trauma results in the immediate search for help. Suffering and pain behavior in the acute model are often accompanied by visible and auditory cues that a person is in distress.

Chronic pain is an altogether different experience and transforms acute pain behavior into a phenomenon that affects mood, work, and social interaction, also known as the biopsychosocial model. Also, conversely, mood, work, and social influences can affect the experience of pain and its interpretation. These patients often present as highly stressed, anxious, and/or depressed and may become hostile. They also may become dependent on family and doctors and can rely on medications and surgeries for treatment. Even the anticipation of pain in the absence of a real stimulus may become a trigger for pain behavior.<sup>11</sup> Fear can become a component of suffering as well, processed through the central nucleus of the amygdala with connections to the thalamus and neocortex.<sup>12</sup> The consequence of chronic suffering may include behaviors, such as avoidance, exaggerated startle response, and hypervigilance, all of which are comparable to posttraumatic stress disorder (PTSD).<sup>13</sup> Thus, when evaluating an OFP patient, it is necessary to consider the influence of the following comorbidities.

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