

BRUXISM

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1. Core Definition

Bruxism is clinically defined as a repetitive masticatory muscle activity characterized by clenching or grinding of the teeth and/or by bracing or thrusting of the mandible. This parafunctional habit is involuntary, meaning the individual is often unaware they are performing the activity, particularly when it occurs during sleep. The condition has a significant clinical impact, ranging from severe dental wear and fractures to chronic pain in the muscles of mastication and the temporomandibular joints (TMJs). Historically, the term was often synonymous with the gnashing of teeth during sleep, a phenomenon noted across various medical disciplines long before its formal classification as a movement disorder.

The activity involved in bruxism is generally categorized into two distinct forms: grinding and clenching. Grinding, which is the most audible and destructive form, involves dynamic, rhythmic, and forceful movements of the mandible, causing the upper and lower teeth to rub against each other. Clenching, conversely, involves sustained, powerful static contraction of the jaw muscles, leading to high compressive forces on the teeth and supporting structures without significant lateral movement. While both types exert immense pressure, grinding tends to cause rapid wear of the enamel and dentin, whereas clenching is often a primary contributor to muscle pain and tension headaches.

The definition of bruxism requires acknowledging its temporal nature, leading to the clinical distinction between Sleep Bruxism (SB) and Awake Bruxism (AB). Sleep bruxism is classified as a specific sleep-related movement disorder within the International Classification of Sleep Disorders (ICSD), emphasizing its strong connection to cyclical fluctuations in the autonomic nervous system during sleep arousal. Awake bruxism, while still involuntary, is often associated with states of concentration, stress, or anxiety, and typically involves clenching or bracing the jaw rather than audible grinding. The identification of the specific type of bruxism is crucial for determining the most appropriate and effective therapeutic strategy.

2. Etymology and Historical Development

The term **bruxism** derives from the Greek root βρυγμῆς (brygmos), meaning "the gnashing of teeth." Although the condition itself has likely plagued humans throughout history--evidenced by severe tooth wear in ancient remains--its formal recognition and naming as a distinct medical entity occurred much later. Early descriptions often referred to the phenomenon using descriptive phrases, such as the Latin term *stridor dentium*, which translates directly to "the creaking or grating of the teeth." Prior to the 20th century, bruxism was often viewed solely as a mechanical dental

issue, with treatments focusing strictly on repairing the damaged teeth.

The first significant formal clinical description of the condition is generally attributed to American dentist Marie F. S. M. P. G. H. R. J. Karolyi in 1901, who discussed the pathological grinding of teeth. However, the modern clinical term "bruxism" was popularized by Sigmund Freud's student, Paul Schilder, in the 1930s, who hypothesized a strong psychological component, suggesting that teeth grinding often represented internalized aggression or tension. This shift in understanding marked a move away from purely local mechanical factors to the inclusion of systemic and psychological etiologies, paving the way for interdisciplinary study involving psychiatry, sleep medicine, and dentistry. The alternative term *bruxomania*, mentioned in the source material, was sometimes used historically to describe excessive or compulsive awake grinding, emphasizing the potential neurotic or obsessive nature of the habit.

The formal classification of bruxism continued to evolve dramatically in the latter half of the 20th century. With the advent of polysomnography (PSG) and advanced sleep research, researchers were able to objectively measure masticatory muscle activity during sleep, confirming the cyclical nature of Sleep Bruxism and its association with micro-arousals. This led to its definitive inclusion in the International Classification of Sleep Disorders (ICSD) as a parasomnia, establishing it firmly as a neurological and sleep-related condition, rather than merely a dental artifact. This modern understanding emphasizes that bruxism is a multifactorial disorder requiring a holistic approach to diagnosis and management.

3. Key Characteristics and Classification

The primary characteristic of bruxism is the inappropriate, non-functional contact between the dental arches. This activity is distinguished from normal function, such as chewing (mastication) or swallowing (deglutition), by its intensity, duration, and lack of physiological purpose. The most critical differentiator in classification is the state of consciousness during which the activity occurs, separating the condition into Sleep Bruxism (SB) and Awake Bruxism (AB), each possessing unique characteristics, prevalence, and underlying mechanisms.

Sleep Bruxism (SB) is characterized by episodes of rhythmic masticatory muscle activity (RMMA). These episodes typically occur during the transition between sleep stages, particularly during lighter non-REM (NREM) sleep and are closely correlated with micro-arousals. The characteristics of SB often include loud, audible grinding sounds, which are frequently the chief complaint reported by a bed partner. Clinically, SB episodes are defined by short bursts of electromyographic (EMG) activity in the masseter and temporalis muscles. These episodes are often triggered by centrally mediated mechanisms, such as fluctuations in heart rate, breathing, and autonomic nervous system activity. SB is highly prevalent in children but often decreases in intensity and frequency with age, though severe cases persist into adulthood, leading to cumulative, serious dental

damage.

Awake Bruxism (AB) is characterized predominantly by involuntary, sustained clenching or bracing of the teeth and jaw, sometimes accompanied by subtle grinding movements. Unlike SB, AB is rarely loud and is often unnoticed by external observers, making self-reporting the primary diagnostic tool. AB tends to occur during periods of intense concentration, detailed work, or emotional stress, when the individual is distracted or absorbed in a task. While AB does not involve the same central neurological sleep triggers as SB, it imposes chronic, high-level pressure on the TMJs and associated muscles, leading to symptoms like facial muscle fatigue, myofascial pain, and tension headaches. Understanding these distinct patterns is vital, as the treatment for clenching during the day may rely heavily on behavioral modification, whereas nocturnal grinding requires management via occlusal protection.

4. Etiology and Associated Psychological Factors

The etiology of bruxism is generally regarded as multifactorial, involving a complex interplay of central, peripheral, psychological, and environmental factors. Early dental models focused heavily on peripheral causes, such as malocclusion or specific tooth interferences, believing that mechanical irregularities triggered the grinding response. However, modern research, particularly concerning SB, strongly supports a **central nervous system (CNS) origin**. SB episodes are often preceded by increased cardiovascular and respiratory activity and are associated with neurotransmitter dysregulation, suggesting that the brainstem acts as a central pattern generator for the rhythmic jaw movements.

Psychological factors play a profound and well-documented role in both forms of bruxism, directly aligning with the source content's mention of internal emotional states. Stress, anxiety disorders, and personality traits are major contributors. Individuals exhibiting type-A personality traits--characterized by competitiveness, high achievement drive, and a tendency toward perfectionism--are statistically more likely to develop bruxism. The source's reference to "inner feeling of tension, frustration, fear, and anger" accurately reflects the psychological hypothesis that bruxism serves as an unconscious outlet for suppressed emotional energy or physiological arousal, especially during periods when the conscious mind is relaxed (sleep) or heavily focused (awake).

Furthermore, environmental factors and lifestyle choices significantly influence bruxism severity and frequency. The consumption of certain substances, notably caffeine, alcohol, tobacco, and recreational drugs, is known to increase muscle excitability and disrupt normal sleep architecture, thereby exacerbating SB. Specific medications, including certain selective serotonin reuptake inhibitors (SSRIs) used to treat depression and anxiety, have also been linked to the induction or intensification of bruxism as a potential side effect. This intricate network of neural, psychological, and pharmacological triggers necessitates a thorough patient history that goes beyond mere dental

observation to identify the primary driving forces behind the parafunctional habit.

5. Clinical Presentation and Complications

The clinical manifestations of chronic bruxism are diverse and can affect multiple body systems, extending far beyond the mouth. The most recognizable signs are often dental: severe and accelerated tooth attrition, where the occlusal surfaces of the teeth are flattened and worn down. This wear can expose the underlying dentin, leading to tooth sensitivity, particularly when consuming hot or cold foods and liquids. In extreme cases, bruxism can lead to the fracture of dental restorations, cusps, or even entire teeth roots, significantly compromising the structural integrity of the dentition and requiring complex and expensive restorative treatments.

Musculoskeletal pain is another central complication. Chronic, forceful muscle contraction--both clenching and grinding--results in hypertrophy (enlargement) of the masseter and temporalis muscles, sometimes leading to a visibly square jawline. More significantly, this overactivity contributes directly to temporomandibular disorders (TMDs). Patients frequently experience morning headaches, particularly in the temporal region, and diffuse facial pain. The constant strain on the temporomandibular joint can lead to joint capsule inflammation, disc displacement, and restricted jaw opening, often accompanied by painful clicking or locking sounds upon movement.

Beyond physical pain, bruxism carries a substantial impact on quality of life, particularly concerning sleep. While the bruxism episode itself represents an arousal event for the patient, severe grinding can cause significant sleep fragmentation, leading to daytime fatigue, irritability, and diminished cognitive function. If the grinding is loud, it also severely impacts the bed partner's sleep quality, leading to relationship strain and, often, the reason the patient first seeks diagnosis. Consequently, the complications of bruxism are not just structural or mechanical but encompass neurological, psychological, and social dimensions, reinforcing the need for prompt and comprehensive management.

6. Diagnosis and Assessment

Diagnosing bruxism relies on a combination of patient history, clinical examination, and objective measurement, as no single test is universally definitive, particularly for Sleep Bruxism. The initial step involves a thorough clinical dental examination to look for physical evidence. Dentists look specifically for characteristic wear facets--polished, flat areas on the chewing surfaces of the teeth that indicate heavy abrasive contact. They also assess muscle tenderness and hypertrophy in the masseter and temporalis muscles, check for indentations on the tongue or cheek lining (linea alba), and evaluate the function and health of the TMJs.

Subjective reporting plays a crucial role, especially for Awake Bruxism (AB). Patients are often asked to track their jaw habits during the day using techniques like 'contingency management' or

journaling. For Sleep Bruxism (SB), however, self-reporting is notoriously unreliable since the activity is involuntary and unconscious. The most common indicators for SB are reports from a bed partner who witnesses the audible grinding or the patient waking up with severe jaw pain or stiffness. Questionnaires regarding morning symptoms and stress levels are also standard components of the initial assessment.

For definitive diagnosis of SB, **Polysomnography (PSG)** remains the gold standard. PSG involves recording various physiological parameters simultaneously during sleep, including brain waves (EEG), muscle activity (EMG of the jaw muscles), heart rate, and respiration. This allows clinicians to confirm the presence of rhythmic masticatory muscle activity (RMMA) and correlate it specifically with sleep stages and micro-arousals. While PSG is expensive and complex, ambulatory EMG monitoring devices have emerged as practical alternatives, allowing patients to measure masseter muscle activity in their home environment over multiple nights, providing a more ecologically valid assessment of the frequency and intensity of nocturnal bruxism episodes.

7. Management and Treatment Modalities

The management of bruxism is generally aimed at two primary goals: reducing the destructive consequences of the habit (protecting the teeth) and reducing the frequency and intensity of the parafunctional activity (treating the cause). Treatment modalities are highly individualized and depend on the classification (SB vs. AB) and the primary etiology identified.

The most widespread and effective physical intervention involves the use of **occlusal devices**, commonly known as nightguards or splints. These custom-fitted acrylic appliances are designed to cover the occlusal surfaces of the teeth, creating a protective barrier that prevents tooth-to-tooth contact, thereby minimizing wear and distributing the immense forces across the entire arch. While splints do not necessarily stop the grinding habit itself, they are critical in preventing irreversible dental damage and can provide immediate relief from muscle soreness by promoting muscle relaxation and joint stabilization.

Addressing the central and psychological components of bruxism requires behavioral and pharmacological approaches. Since stress and anxiety are major drivers, treatments such as Cognitive Behavioral Therapy (CBT), biofeedback, and general stress management techniques (e.g., meditation, exercise) are highly recommended, particularly for managing Awake Bruxism. Biofeedback, in particular, uses monitoring devices to make patients aware of their muscle tension, teaching them to consciously relax their jaw muscles when activity levels spike. Pharmacologically, treatment is limited. While some muscle relaxants are occasionally prescribed short-term, and low-dose tricyclic antidepressants have been used off-label, injections of **botulinum toxin (Botox)** into the masseter muscle have gained popularity in severe, refractory cases. Botox weakens the muscle enough to reduce the force of grinding and clenching without interfering with normal

functions like chewing.

8. Significance and Impact

Bruxism holds significant importance across dentistry and sleep medicine due to its high prevalence and potential for severe, chronic complications. Estimates suggest that Sleep Bruxism affects between 8% and 31% of the general population, with a higher incidence observed in children and adolescents, while Awake Bruxism may affect as many as 22% to 30% of adults. This high prevalence means that bruxism constitutes a major public health concern, driving substantial healthcare costs associated with restorative dental work, management of chronic pain, and treatment for associated TMDs.

The long-term impact of untreated bruxism is cumulative and often irreversible. It is a leading non-cariogenic (non-decay-related) cause of tooth loss and the failure of complex dental procedures, such as crowns, bridges, and implants. Furthermore, the chronic pain and sleep disturbance associated with bruxism severely diminish an individual's quality of life. The condition's recognition as a bona fide sleep movement disorder underscores the necessity for integrated care, where dentists, sleep specialists, and mental health professionals collaborate to address both the physical manifestations and the underlying neurological and psychological triggers. Effective management not only saves the patient's dentition but also substantially improves sleep quality and reduces chronic pain burden.

9. Further Reading

[Bruxism \(Wikipedia Entry\)](#)

[Bruxism Diagnosis and Treatment \(Mayo Clinic\)](#)

[Historical Development of Bruxism Concepts \(PubMed Review\)](#)

[International Classification of Sleep Disorders, 3rd Edition \(AASM\)](#)