

2018 Course #3

Self-Study Course

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Course Instructions:

- Read and review the course materials.
- Complete the 16 question test. A total of 12 questions must be answered correctly for credit.
- Submit your answers online at: <http://dentistry.osu.edu/sms-continuing-education>
- Check your email for your CE certification of completion (please check your junk/spam folder as well).

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- **TWO CREDIT HOURS** are issued for successful completion of this self-study course for the OSDB 2017-2018 biennium totals.
- **CERTIFICATE of COMPLETION** is used to document your CE credit and is emailed to each course participant.
- **ALLOW 2 WEEKS** for processing of your certificate.



Frequently Asked Questions:

Q: Who can earn FREE CE credits?

A: EVERYONE - All dental professionals in your office may earn free CE credits. Each person must read the course materials and submit an online answer form independently.

Q: Where can I find my SMS number?

A: Your SMS number can be found in the upper right hand corner of your monthly reports, or, imprinted on the back of your test envelopes. The SMS number is the account number for your office only, and is the same for everyone in the office.

Q: How often are these courses available?

A: Four times per year (8 CE credits).

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2018 Course #3



Bruxism & Treatment Options

This is an OSDB Category B: Supervised self-instruction course

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Neither I nor my immediate family have any financial interests that would create a conflict of interest or restrict my judgement with regard to the content of this course.

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Last Day to Take Course

Free of Charge:

August 2, 2018
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Educational Objectives

1. Define bruxism
2. Describe the cause of bruxism
3. Identify patients who may have bruxism
4. Discuss treatment options for bruxism
5. Review case study

What is Bruxism?

Bruxism, or the grinding or clenching of teeth, is a condition that was reported as early as 600 BC with reports of gnashing of teeth in early texts.¹ Bruxism is defined as a repetitive jaw-muscle activity, characterized by clenching or grinding of the teeth by bracing or thrusting of the mandible. Bruxism is separate from the clenching or grinding of teeth for mastication of food. Bruxism can also include habits like biting on the tongue, lips or cheeks.^{1,2} Terms such as 'occlusal habit neurosis' and 'neuralgia traumatica' have been previously used to describe the clenching and gnashing of teeth. It is also fairly common to refer to bruxism as a 'parafunctional activity,' meaning the teeth and mouth are being used in a way that is separate from eating, drinking, or speaking.¹



Bruxism in the literature and in practice has typically fallen into two main categories:

1. Clenching and/or grinding of teeth during sleep
2. Clenching and/or grinding of teeth during wakefulness

Some have classified 'bruxism' as tooth grinding during sleep, while the term 'bruxomania' can be used to describe tooth grinding during wakefulness. 'Bruxomania' was first used in 1907 in a peer review article in which Julio Endelman suggested that bruxism could be linked to psychological factors like frustration and anger. Charles F. Bodecker also reported that grinding of teeth was a nervous manifestation, and he categorized bruxism into two categories: nervousness and habit. Bodecker also realized that many patients with bruxism were not aware that they were grinding their teeth. By 1940, the term 'bruxism', as opposed to 'bruxomania', was much more commonly used in practice and treatment of the effects of teeth grinding. It was around this time that Milton Leof concluded that teeth grinding not only occurred during sleep, but during waking hours as well. Leof was also able to define two symptoms of bruxism: "that the teeth are sore or ache, and that the 'jaws are tired' on awakening in the morning."¹

Sleep Bruxism

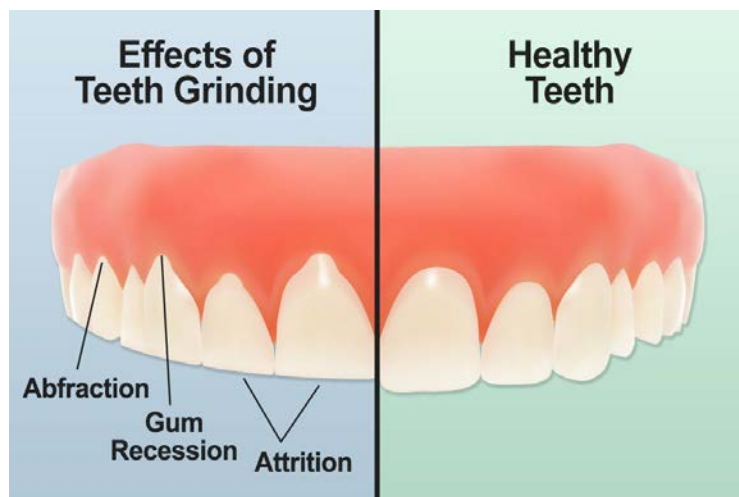
In regards to sleep bruxism, several severe symptoms have been reported. These symptoms include temporomandibular joint (TMJ) pain, tooth mobility, excessive tooth wear, destruction of expensive dental restorations, and degenerative joint disease. In sleep bruxism, patients with the most severe symptoms are more likely to have bruxism during the rapid eye movement (REM) state of sleep. Using an EMG, it was found that bruxism increases to high levels when naturally stressful life events occur, and with increased levels of urinary catecholamines.³

Awake Bruxism

Awake bruxism is defined as a parafunctional activity or habit that includes clenching and grinding of the teeth during wakefulness. Because the sleep and wake states are physiologically different, sleep and awake bruxism should be considered separate entities. Awake bruxism has been linked to temporomandibular joint disorders, psychological stress and anxiety, the use of selective serotonin receptor inhibitors (SSRIs), brain stem lesions, coma, and dementia.²²

Prevalence

Although prevalence of bruxism decreases with increasing age, there are no significant differences between bruxism rates in men versus women. Up to 30% of adults report bruxism and awake bruxism is reported more frequently than sleep bruxism.⁴ Up to 40% of children experience bruxism, although it should be noted that parents report most cases of bruxism in children. Many patients are not aware that they have bruxism and therefore it is important to educate and discuss bruxism with patients. Early intervention can prevent dental problems and improve oral health.



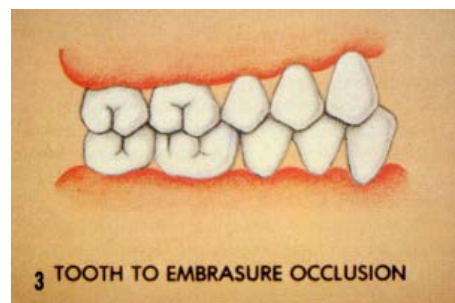
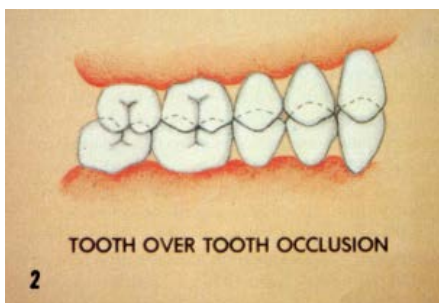
What causes bruxism?

Bruxism has multiple etiologies. Initially, it was believed that bruxism was caused by orofacial anatomy and occlusal problems. More recently, psychological factors, sleep responses and neurotransmitters are found to have a stronger role in the causes of bruxism. A person with a high-stress lifestyle, or with particular personality characteristics can have a strong relationship to bruxism.⁶ Patients who consume alcohol, coffee and use tobacco are more likely to have bruxism.⁷ There is little evidence to support that drug use is associated with bruxism.⁸ Bruxism also has been shown to be, in part, genetic.⁹ In children, second hand smoke exposure and sleep disturbances have the strongest association with bruxism.⁵

Bruxism and its Effect on Teeth

In the early twentieth century, Karolyi recognized a causative relationship between bruxism and periodontal disease. Several studies have concluded that bruxism may result in mobility, fracture, intrusion, extrusion, opening of contacts, drifting, erosion, abrasion, or pulp pathology. As bruxism is relatively difficult to diagnose, it can be identified by tooth or cusp fracture, obvious occlusal deflections, temporomandibular joint disorders, and sensitive teeth.²⁵ Tooth wear has been shown to progress much faster in bruxers than nonbruxers. Similarly, fractured cusps and fractured teeth occur more frequently among bruxers. The relationship between clenching and cusp or tooth fracture is more easily understood when the focus is placed on the excessive forces that can be exerted on opposing teeth.

Tooth mobility is typically caused or aggravated by bruxism is also a concern in patient treatment in orthodontics, periodontics, endodontics, and prosthodontics. Specific to periodontists, tooth mobility has been shown to cause open contacts, food impaction, or accumulation of local irritants. Tooth mobility can also affect post-orthodontic retention and stability, as well as unprotected endodontically treated teeth. It has been observed that teeth with cusp-to-cusp occlusion (Figure 2 below) wear more easily and become more mobile than teeth with cusp-to-embasement occlusion (Figure 3 below).²⁵



Signs & Symptoms of Bruxism

There are several signs and symptoms of bruxism, and it is very common for patients to be unaware that they have bruxism. It is important to discuss these signs and symptoms with all patients, not just those who report clenching and grinding. Asking patients if they clench or grind their teeth on a dental history or exam form is one way to introduce the topic of bruxism with patients.¹⁰ Grinding is often times heard audibly by patients while clenching is silent.

Intraoral signs of bruxism (Table 1) may include wear facets, fractured teeth or restorations, abfraction or loose teeth.^{10,11} It is important to note that tooth wear alone is not a reliable symptom of bruxism.⁴ The patient may also have indentations along the side of the tongue or have tori or exostoses.¹⁰ Periodontal changes may also exist, including widening of the periodontal ligament, mobility and recession.¹⁰ The existence of these intraoral findings may indicate bruxism, but the presence of these findings does not give a definitive diagnosis as these complications can be caused by other conditions.

Intra-oral	Wear facets on teeth
	Fractured teeth or restorations
	Abfraction
	Loose teeth
	Indentations on tongue
	Tori or exostoses
Extra-oral	Soreness of jaw muscles
	Joint noises in temporomandibular joint
	Headaches

Patients may also report soreness or tenderness in the muscles of the jaw, particularly the masseter and lateral and medial pterygoid muscles. Patients may also report joint noises in the temporomandibular joint.¹⁰ There is a strong correlation between temporomandibular disorders (TMD) and bruxism, although the exact relationship is unknown. Children do not experience the same relationship between bruxism and TMD.¹² Children may show signs of bruxism but may not experience any TMD pain or disorder. Adult patients often have headaches associated with bruxism, though children do not typically report headaches related to the condition.¹³ Symptoms related to the temporomandibular joint and facial muscles are often common in adults, but do not present as frequently in pediatric patients. Bruxism is more frequently associated with mechanical complications than with biologic complications. This means that the effects of bruxism can be easier to identify when a patient has compromised dental appliances than if they present with tooth wear alone.⁴

Risk Factors for Bruxism

1. **Stress** : Increased anxiety or stress can lead to teeth grinding, as well as anger and frustration.
2. **Age** : Bruxism is common in young children, but it typically goes away by adulthood
3. **Personality type** : Having a personality type that's aggressive, competitive, or hyperactive can increase your risk of bruxism
4. **Medications and other substances**: Bruxism may be an uncommon side effect of some psychiatric medications, such as certain antidepressants. Smoking tobacco, drinking caffeinated beverages or alcohol, or using recreational drugs may increase risk of bruxism.
5. **Family members with bruxism**: Sleep bruxism tends to occur in families. If you have bruxism, other members of your family may also show signs of bruxism.
6. **Other disorders** : Bruxism can be associated with some mental health and medical disorders like Parkinson's disease, dementia, epilepsy, night terrors, sleep-related disorders like sleep apnea, and ADHD.²⁴

Diagnosing Bruxism

The first step to diagnosing bruxism is to evaluate any changes in the teeth and mouth over several visits to determine if the process is progressive.²⁴ Diagnosing bruxism requires a multifaceted approach, including evaluation of patients' psychosocial behaviors, intra- and extra-oral findings, and the reporting of other symptoms. In order to definitively diagnose bruxism, polysomnography (PSG) or electromyography (EMG) should be used. PSG and EMG are used to measure the activity of the jaw muscles.^{14,15} Polysomnography and electromyography tools are not available in every office, and many practitioners should thoroughly explore signs and symptoms of bruxism for diagnosis.

Treatment for Bruxism

At this time, there is not one standard treatment for bruxism. Many dentists take more than one approach to treatment. Multifaceted treatment options can include dental treatments, behavioral treatment and medical treatments (Table 2).

The four general objectives in the treatment of bruxism are:

1. Reduce psychic tension
2. Treat the signs and symptoms
3. Minimize occlusal irritations
4. Break neuromuscular habit patterns²⁵

Several combinations of these treatment objectives have had success. The following are options for treatment of bruxism.

Home Care

Patients have several options that may help alleviate or prevent bruxism. Patients with sore jaw muscles may apply ice or heat to muscles. Gentle stretching exercises for the face, neck and shoulders may also help alleviate muscle pain. Patients should also avoid eating hard foods or foods that require a lot of chewing and avoid chewing gum.

Occlusal Guards

One common treatment recommended for patients with bruxism is an occlusal splint, sometimes called an occlusal guard or night guard (if worn at night). An occlusal splint is made of acrylic and sits over the mandibular or maxillary occlusal surfaces. Occlusal splints are indicated for patients with bruxism who also have tooth wear.⁶ Occlusal splints are shown to reduce the wear of the teeth, but have not been shown to eliminate bruxism altogether.¹⁶

Home care	Ice or heat jaw muscles
	Avoid chewy foods/chewing gum
	Stretching exercise
Behavioral treatment	Biofeedback
	Hypnosis
	Psychotherapy
	Sleep hygiene
	Meditation
Dental treatment	Stress reduction
Medical treatment	Occlusal splint
	Medications (muscle relaxers, benzodiazepines)
	Botulinum toxin



Frontal view of occlusal splint in the mouth.²⁶

Behavioral Treatment

Because bruxism can be related to stress and personality traits, another approach to treatment is through behavior modification. **Biofeedback** has been used as a possible treatment with mixed results. Biofeedback requires the use of electromyography to measure muscle tension. During a biofeedback session, a therapist will help the patient identify mental activities and relaxation techniques that can help regulate the bodily processes to reduce bruxing movements. Different types of biofeedback can be used for sleep or awake bruxism. Other behavioral approaches that have been used are hypnosis, psychotherapy, sleep hygiene and behavioral modifications.⁶ In order to suggest appropriate behavioral approaches a thorough history and assessment should be completed so appropriate behavioral modifications can be implemented.

Medical Treatment

Bruxism patients have also had success with several different medical treatments. Medications such as muscle relaxants, benzodiazepines, and beta-blockers can be used to treat bruxism. These medications may cause drowsiness and should only be used for a short period of time. The use of medication to treat bruxism is typically considered a short-term treatment strategy.¹⁰ The literature shows that there is not enough evidence to support medications as a long-term strategy for the treatment of bruxism.¹⁷

More recently, clinicians have been using botulinum toxin to treat bruxism. Botulinum toxin is applied locally at the masseter muscle site and causes muscle paralysis.¹⁸ Several studies show that those who receive botulinum toxin injections significantly reduced the pain related to bruxism, but did not reduce frequency of bruxism movements.¹⁸⁻²⁰ It should be noted that botulinum toxin lasts only up to 19 weeks and has improved efficacy if applied frequently.¹⁸ The literature on botulinum toxin as a treatment for bruxism is sparse and many of the studies use small sample sizes. Clinicians should approach this treatment cautiously.²¹

While the body of evidence related to the treatment of bruxism is growing, very few high-quality studies evaluate the effectiveness of various treatments. Lobbezoo et al. propose a “Triple-P” approach: Plates, Pep talk and Pills.⁶ ‘Plates’ refers to the use of occlusal splints to protect the teeth from attrition. ‘Pep talk’ refers to counseling and behavioral approaches to modify stressors. ‘Pills’ refer to pharmacologic treatment with benzodiazepines. The Triple-P approach is supported by others who also recognize that bruxism is not only a dental problem, but often involves psychological and sleep conditions that typically require interdisciplinary care.^{6, 10}

Discussing Bruxism with Patients

Bruxism is thought to be highly underreported by patients, as many patients do not know that they have bruxism until a dental care provider addresses the signs and symptoms.² Patients may or may not disclose that they have signs and symptoms of bruxism. The first step is to ask patients about clenching and grinding their teeth through medical and dental history. Follow-up questions could include asking about pain in the jaw muscles or headaches. In addition, when the examination is performed it should include palpation of the jaw muscles and questions about tenderness in the area.¹⁰

When discussing bruxism with patients it is important to keep in mind some basic principles for communication. Using simple terminology is essential in communication with our patients. For example, when describing bruxism, you would want to refer to the masseter and pterygoid muscles as “jaw muscles”. When a patient is diagnosed with bruxism, it is appropriate to let them know the proper term for the diagnosis but to also include a simple description of the condition without dental jargon. Do not overcomplicate treatment options for patients. It is important to describe each treatment option thoroughly and allow the patient to make an educated decision.

The American Dental Association offers comprehensive information for patients about bruxism:

https://www.ada.org/~media/ADA/Publications/Files/patient_49.pdf?la=en
(Page 11).

Bruxism is a broad term classifying several different motor functions is a repetitive jaw-muscle activity characterized by clenching or grinding of the teeth and/or by bracing or thrusting of the mandible. This can occur during the day or during sleep. The diagnosis and treatment options for bruxism are numerous and require a medical and dental history questionnaire, clinical examination, and discussion with the patient about health behaviors. The most common way to treat bruxism is with an occlusal splint, counseling and education, and medications. Bruxism is a complex condition that effects the teeth and jaw, and can require an interdisciplinary approach to alleviate.

Do you grind your teeth?

Do you often wake up with a dull headache or a sore jaw? Do you sometimes find yourself clenching your teeth? Until you experience pain or have a dental checkup, you may not realize that you have a condition called "bruxism," a habit of grinding or clenching the teeth.

Many people are unaware that they grind their teeth because they do it while they sleep. Bruxism often occurs in the early part of the night and can disturb sleep partners. The clenching and grinding may be quite audible. Others make no sound while bruxing their teeth and do not realize they are doing it until the dentist discovers unusual wear spots on their teeth. Bruxism may be mild and occasional or aggressive and frequent.

People who grind or clench their teeth may wake with a headache, earache or toothache. Their facial muscles may be sore and the jaw joints tender. Besides causing discomfort, grinding can eventually damage dental restorations and may loosen teeth. Bruxism also can cause damage to the temporomandibular joints—the joints on each side of the mouth that connect the lower jaw to the skull. The pressure from clenching and grinding can cause cracks or fractures in the teeth. As the tooth enamel is worn away, the underlying layer of dentin may be exposed. This causes the tooth to become sensitive to temperature changes and pressure.

Bruxism can develop at any age. Pain or discomfort from colds, ear infections, allergies and other ailments may cause children to grind their teeth.

Although the causes of bruxism are not really known, several factors may be involved. Stressful

situations, problems in sleeping, an abnormal bite, and crooked or missing teeth may contribute.

Regular dental checkups are important to detect damage in the early stages. Your dentist can diagnose and treat irregular wear on teeth and determine the source of facial pain that may result from bruxism.

Based on your dentist's diagnosis, one or more treatments may be recommended. Your dentist may suggest a nightguard that can be worn while sleeping. Custom-made by the dentist from soft material to fit your teeth, the nightguard slips over the teeth in one jaw and prevents contact with the opposing teeth. The nightguard relieves some of the pressure of grinding and clenching.

If stress seems to be a major cause of bruxism, it may be helpful to find ways to relax, such as listening to music, reading a book, taking a walk or enjoying a warm bath. Applying a warm, wet washcloth to the side of the face may help relax muscles that have become sore from clenching. If you have difficulty handling stress, counseling may point to effective ways of dealing with stressful situations.

An abnormal bite, one in which teeth do not fit well together, may lead to grinding. Treatment may involve reducing the "high spots" on one or more teeth. For serious cases, your dentist may suggest reshaping or reconstructing the biting surfaces with inlays or crowns.

Grinding is a common occurrence for many people at some time or another. If you routinely grind your teeth, see your dentist. ■

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"For the Dental Patient" provides general information on dental treatments (and dental careers) to dental patients. It is designed to prompt discussion between dentist and patient about treatment options and does not substitute for the dentist's professional assessment based on the individual patient's needs and desires.

Case Study

This short case study has 4 associated quiz questions. The case study questions are listed below, and they are questions 13 through 16 on the quiz page.

A 43-year old female presents for a recall visit. This patient has been coming to your practice for four years. She lives with her partner and her two children and she is employed as a paralegal in a large law firm. She has a history of good oral hygiene and is at low risk for caries. In reviewing her medical and dental history, the hygienist notes that she is taking Lisinopril and a multi-vitamin. She has a history of hypertension. She presents with the complaint that her jaw has been hurting on and off over the past three months. Intra oral examination reveals good oral hygiene, 2-3 mm probe depths, localize bleeding on probing, a broken amalgam restoration on the mesial of #30. Radiographs and clinical examination reveal no caries.

What questions in the dental history would help determine if the patient has bruxism?

- a) Do you have wear on your teeth?
- b) Do you clench or grind your teeth during the day or at night?
- c) Do you have periodontal disease?
- d) Are you at high risk for cavities?

To alleviate the pain in her jaw the patient should be instructed to do the following at home:

- a) Ice or heat jaw muscles
- b) Avoid chewy foods or chewing gum
- c) Jaw stretching exercise
- d) All of the above

Which of the following may help determine if the patient has bruxism:

- a) Palpating the masseter and lateral and medial pterygoid muscles for tenderness
- b) Measure the percent of teeth with wear facets
- c) Evaluate how far they can open their jaw
- d) Determine how many teeth have widened periodontal ligaments

Using the “triple-P” approach to treat this patient a dentist would do the following:

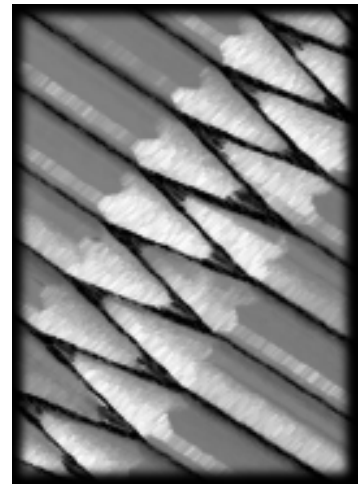
- a) Palpate, prescribe, plates
- b) Prescribe, plate, pressure
- c) Periodontal treatment, prescriptions, psychology
- d) Plates, pep talk, pharmacologic therapy

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Post-Test Page 1

- Answer each question ONLINE (link provided on SMS website)
- Answer 12 of 15 questions correctly to pass
- Answer post-course survey questions and click “Finish”
- Deadline is August 2, 2018 4:30pm



1. Bruxism can be defined as:
 - a) Wear on teeth
 - b) Jaw-muscle activity that clenches or grinds teeth
 - c) Muscle soreness in the jaw
 - d) Pain in the temporomandibular joint
2. Bruxism occurs in:
 - a) Children
 - b) Men
 - c) Women
 - d) All of the above
3. Which of the following is a risk factor for bruxism?
 - a) Class I occlusion
 - b) Orthodontic treatment
 - c) High-stress lifestyle
 - d) Gender
4. Why is it important to ask patients about clenching or grinding teeth?
 - a) Most patients are not aware of clenching or grinding activity
 - b) A high percentage of men grind their teeth
 - c) Grinding teeth can cause sleep apnea
5. Common signs and symptoms of bruxism are:
 - a) Smoking, nail biting, gum chewing
 - b) Snoring, waking in sleep, restlessness
 - c) Tooth mobility, tooth wear, headache
 - d) Bad breath, bleeding, tongue indentations
6. Botulinum toxin works to treat bruxism by:
 - a) Reducing stress
 - b) Protecting the teeth
 - c) Reducing tooth mobility
 - d) Paralyzing the muscle in the jaw

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Post-Test Page 2

- Answer each question ONLINE (link provided on SMS website)
- Answer 12 of 15 questions correctly to pass
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- Deadline is August 2, 2018 4:30pm

7. Which of the following is a common treatment option for bruxism?
 - a) Occlusal splint
 - b) Vitamins
 - c) Orthodontic treatment
 - d) Surgery
8. Which of the following is an intraoral sign of bruxism?
 - a) Muscle soreness
 - b) Headache
 - c) Tooth wear
 - d) Noises in the jaw when opening and closing
9. The goal of an occlusal splint for a patient with bruxism is to:
 - a) Prevent tooth wear
 - b) Realign occlusion
 - c) Increase muscle activity
 - d) Prevent headaches
10. Which lifestyle risk factor for bruxism?
 - a) Intense exercise
 - b) Smoking
 - c) Disordered eating
 - d) Poor sleep hygiene
11. Which of the following is not a common treatment option for bruxism?
 - a) Medication
 - b) Behavioral modification
 - c) Occlusal guard
 - d) Surgical treatment
12. Tooth wear alone indicates that a patient should be diagnosed with bruxism.
 - a) True
 - b) False

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Post-Test Page 3

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Case Study Questions:

13. What questions in the dental history would help determine if the patient has bruxism?
- a) Do you have wear on your teeth?
 - b) Do you clench or grind your teeth during the day or at night?
 - c) Do you have periodontal disease?
 - d) Are you at high risk for cavities?
14. To alleviate the pain in her jaw the patient should be instructed to do the following at home:
- a) Ice or heat jaw muscles
 - b) Avoid chewy foods or chewing gum
 - c) Jaw stretching exercise
 - d) All of the above
15. Which of the following may help determine if the patient has bruxism:
- a) Palpating the masseter and lateral and medial pterygoid muscles for tenderness
 - b) Measure the percent of teeth with wear facets
 - c) Evaluate how far they can open their jaw
 - d) Determine how many teeth have widened periodontal ligaments
16. Using the “triple-P” approach to treat this patient a dentist would do the following:
- a) Palpate, prescribe, plates
 - b) Prescribe, plate, pressure
 - c) Periodontal treatment, prescriptions, psychology
 - d) Plates, pep talk, pharmacologic therapy