

SLEEP STAGES

In order to better understand the way in which sleep bruxism affects the teeth, it is helpful to have a general understanding of what happens while we sleep.

There are two basic categories of sleep: REM and non-REM sleep. Each stage can last 5-15 minutes. The sleeper starts at stage 1, progresses to stage 4, then goes back up through the stages, except that stage I is replaced with REM sleep. One entire cycle is 90-110 minutes, with 3-5 cycles per night.

Stage 1: Lightest level of sleep. Patient may feel sensation of falling and experience sudden muscle contraction.

Stage 2: Heart rate slows and body temperature decreases. The body is preparing to enter deep sleep.

Stage 3-4: Deep sleep. Very difficult to arouse a person from this stage of sleep, and if aroused, the patient may feel disoriented for several minutes. The body repairs and regenerates during this stage. There is bone and muscle building, and the immune system is strengthened.

REM (Rapid Eye Movement):

Dreaming occurs here. Muscles are paralyzed.

The evidence shows that most bruxism episodes occur during the lighter phases of sleep (Stage 1 and 2), with only 10% occurring during REM sleep.

All cases are patients of Dr. Pamela Nicoara unless otherwise specified.

WHAT IS SLEEP BRUXISM

Bruxism is defined as the gnashing or grinding of teeth for non-functional purposes. Sleep bruxism is further identified as being involuntary bruxism during sleep. It is the most common form of parafunction of the masticatory system, and affects around 20% of the population (although values range from 6% to 91%).

Bruxism can be divided into two categories: Sleep Bruxism and Awake Bruxism as the two are thought to have different causes as per the American Academy of Sleeping Disorders 2001. However, the cause or causes for sleep bruxism is (are) unclear, and is likely multifactorial in nature.

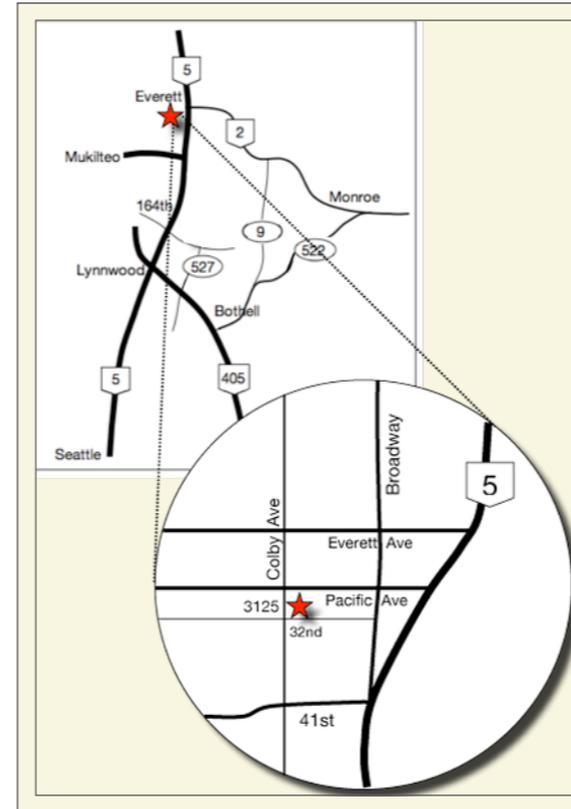
Some of the proposed causes for sleep bruxism have been high emotional stress, increased alcohol and caffeine intake, gastric reflux, occlusal disturbances, and certain medications. Current research has indicated that occlusal disturbances are not related to increasing the risk for sleep bruxism. There has also been increased evidence for the role of genetics, and that up to 20-50% of bruxism in adults and children can be accounted for by genetics. But most interesting has been an illumination into the relationship between airway resistance during sleep and sleep bruxism. This will be reviewed in greater detail in the following panels.

Please enjoy this issue of **ProbeTips** which will delve more deeply into the causes of sleep bruxism, its effect on our restorations, and what options there are for treatment.

Copyright 2012 Dr. Pamela Nicoara

Pamela A Nicoara DDS MSD PLLC

PERIODONTOLOGY IMPLANTOLOGY ORAL MEDICINE



3125 Colby Avenue, Suite H
Everett WA 98201
T: 425-374-5380 F: 425-374-5382

www.NICOARAPERIO.com
doctor@NICOARAPERIO.com

PROBE TIPS

A QUARTERLY PERIODONTAL
NEWSLETTER

BY PAMELA NICOARA DDS MSD

Sleep Bruxism



VOLUME 5, No. 2

AUGUST 2012

Sleep Bruxism

SLEEP AIRWAY DISTURBANCES

More recent research indicates that sleep bruxism may be related to cyclic micro-arousals from sleep. Micro-arousals are a brief awakening from sleep (at least 3 seconds) where there is a rise in autonomic, cardiac and muscular activity, without a complete return to consciousness.

These micro-arousals normally occur 8-14 times per hour of sleep, particularly just before REM sleep. In one study demonstrating the relationship of micro-arousal and bruxism, 80% of patients who experienced an intentional micro-arousal had tooth grinding. Interestingly, these patients had a history of sleep bruxism, and none of the controls showed tooth grinding upon micro-arousal.

One of the disturbances that is believed to cause a micro-arousal from sleep is dry mouth. Research indicates that bruxers swallow less while sleeping, and 50% of bruxers end a tooth grinding episode with a swallow. It is thought that perhaps tooth grinding is intended to help create saliva.

Other causes of micro arousal include snoring, and more importantly, sleep apnea. Sleep apnea is a lack of breathing for ten seconds during sleep. In either instance the airway is restricted. The airway restriction can be for a variety of reasons, including large tonsils, large tongue, large neck/heavy chest, deep palate, genetically small airway, or class II malocclusion.

DIAGNOSIS

Sleep bruxism is diagnosed through clinical evidence and more definitively through EMG recordings of the masticatory muscles (polysomnography or PSG). Clinical signs and symptoms include hypertrophic masseter or

temporalis muscles, tongue indentation, tooth wear, jaw muscle tenderness, morning headaches, and mouth breathing. Combined with audio/visual recordings to confirm sounds such as tooth grinding, snoring and changes in breathing, PSG is considered the gold standard for diagnosis.

EFFECTS OF BRUXISM ON THE BODY AND THE TEETH

A patient with up to 25 bursts of bruxism per hour of sleep is classified as a moderate to severe bruxer. Considering the sleep cycles listed on the panel earlier, this is a considerable amount of time spent awake or bruxing. It would make sense, then, that sleep bruxers are 7.7 times more likely to complain of morning fatigue, and 4.5 times more likely to report morning headache or migraine.

In the mouth, the effects of bruxism can include tooth wear, tooth fracture, tooth ache, tooth movement and mobility, TMJ dysfunction, and prosthetic failure. Please note, however, that bruxism is not the only cause for the oral problems listed.

Interestingly, and although further long term research is needed, implant success does not seem to be significantly reduced because of bruxism alone, although obviously the superstructure can experience fracture as noted above.

BRUXISM EFFECTS ON TOOTH RESTORATION DESIGN

As dentists, we understand that teeth with severe wear will be harder to restore due to short clinical crown and lack of ferrule. When there are already compromised restorations in a patient exerting higher clinical loads, it would follow that restorations would fail more frequently in a patient who is a bruxer.

Steps to help reduce this risk would include clinical crown lengthening to improve retention, or adding boxes or grooves to the preparation design. Using single units over fixed partial dentures are suggested since single units may be easier to control. Minimizing the extension of the FPD can be beneficial, and splinting of teeth should be minimized. In addition, group function, rather than canine guidance is advised, as well as keeping cuspal inclines shallow if possible.

With regard to material choice, a metal occlusal surface may be preferred over ceramic in situations where a natural dentition is opposing. Zirconia is promising in bruxers because of the strength of the material, but systematic reviews still demonstrate chipping over time, and more research is necessary.

TREATMENT OF BRUXISM

There is currently no known method for curing bruxism. However, several treatment options are available to help reduce the extent of bruxism, as well as the harmful secondary effects of bruxism.

With regard to daytime bruxing, behaviour modification in the form of habit awareness, habit reversal techniques, biofeedback, and relaxation techniques are available. Patient awareness may also affect the extent of sleep bruxism.

Because of the multifactorial nature of sleep bruxism, various treatments would be aimed at reducing each of the potential causes of sleep bruxism, including:

1. Avoiding possible triggers such as tobacco, alcohol, caffeine, or certain drugs (SSRIs actually increase bruxism).
2. Commence use of certain medications (Clonidine or Clonazepam).

3. Addressing airway disturbances through:
 - a. Referral for sleep analysis if there is evidence of snoring, hypertension, and daytime sleepiness.
 - b. Evaluation for the use of mandibular advancement device or CPAP machine.
 - c. Evaluation for tonsilectomy.
 - d. Evaluation for orthodontic or orthognathic procedures to resolve narrow palate or retrognathia (particularly for growing children).
4. Use of an occlusal guard.

The use of an occlusal guard is definitely controversial. Outcomes are highly variable among patients. It obviously does not stop bruxism, and in 20% of bruxers, can actually increase sleep bruxism, particularly when using a soft appliance. The benefit to decreasing bruxism in most seems to be limited to the first 2-6 weeks of use regardless of type of splint, where bruxism rate returns to baseline after that. The only benefit is that it may retard the amount of destruction of the teeth and our restorations, and may make the patient aware of their habit. For those who can tolerate their use, and do not increase their bruxism habit while wearing it, it is worth fabricating.

REFERENCES

- Int J Prosthodont.* Gagnon et al. 2004.
The Cochrane Collaboration. Macedo et al. 2008.
J Oral Rehab. Lavigne et al 2008.
J Prosthodont Res. Johansson et al 2011.
Sleep Med Rev. Barclay et al. 2012.
Dent Clin N Am. Carra et al. 2012.

complete references available on request
Copyright 2012 Dr. Pamela Nicoara