What is Bruxism?

Bruxism (pronounced BRUK sizm) is a common, but poorly researched behavior. It is estimated that one in four adults experience bruxism in a moderate to severe form. Many people diagnosed with bruxism have never heard of the term before.

The feeling of some researchers and authorities is that bruxing behavior in humans is universal. This office, through many years of clinical observation, agrees with this premise. Mild bruxism is normal human behavior but, the moderate to severe form may produce many unwanted health issues.

An important first step in dealing with bruxism, is understanding what bruxism actually is. A little knowledge can go a long way. If you are aware of the problem, you can at least take charge and effectively eliminate or reduce any damage.

Bruxism is commonly known as the clenching and grinding of teeth, or a "parafunctional" habit. The term parafunctional refers to any action that goes beyond normal function. Your teeth's normal function of course, is to chew food. By definition then, parafunction is any activity where you are not actively chewing food, like chewing on pencils, biting fingernails, chewing the insides of your cheek or opening bobby pins. These are all parafunctional activities, but not the type that we are concerned with in this booklet. Here, when we refer to parafunction we are referring to bruxism -- the clenching and/or grinding of teeth.

When you chew your food, you deliver a force of about 9-25 pounds per square inch (psi) to your teeth. But when you clench or grind your teeth at night, researchers have measured that the force on teeth can be up to 1500 psi in some individuals! This kind of force can crack or split a healthy whole tooth that has never even been drilled or filled! This kind of force can be very destructive on teeth, your fillings, porcelain work, implants etc., as well as the bone, which supports the teeth.

Who Bruxes?

Everyone bruxes at one time or another, so the question is not whether a person does in fact brux, rather, it is how often and to what degree do they brux. It can be mild and occasional, with no damage caused nor symptoms experienced, or, it can be frequent and violent, with major damage and/or symptoms. A hypothetical scale of bruxism can run from 1, indicating a very slight habit, to 10, which indicates a severe bruxer. For a person at level 1, symptoms and damage would be almost non-existent. Whereas, the people on the higher end of the scale would show one or several symptoms and/or signs of bruxing.

Most people are completely unaware that they brux. In fact, over 80% of heavy bruxers may be unaware of their habit (Thompson, Blount, and Krumholtz, 1994). Even people with seriously worn teeth will insist, at first, that they are not bruxers! This is not too surprising as bruxism is a subconscious behaviour which often occurs at night during sleep. A common response of patients, without symptoms, just diagnosed with bruxism is "but nothing is hurting me". To this we point out that neither does a small cavity. However, left untreated or unrecognized, like a small cavity, bruxism can eventually lead to extensive damage, from cracked teeth and fillings, to bone loss (the support of the teeth), to root canals and/or extractions. Understanding and prevention is key!

The scientific community has not discovered all the factors involved in the cause or progression of bruxism. Much more research is needed in this area. The following is a discussion of some of the contributing factors that are known or thought to cause bruxism in adults.
1. Structural
It is believed that bruxism is sometimes caused by the upper and lower teeth not fitting together properly - dentists call this 'malocclusion'. The grinding may be a subconscious attempt to grind the teeth down until they fit better together.

2. Psychological
Stress and anxiety are thought to play a major role in promoting bruxism.

3. Chemical
Bruxism is traceable to many drugs. One study found that antidepressant and antipsychotic medications may trigger or worsen bruxism (reviewed in Brown & Hong, 1999; Gerber & Lynd, 1998). In another study (Ellison & Stanzi, 1993), daily intake of the antidepressants fluoxetine (Prozac) or sertraline (Paxil) triggered more intense bruxism.

The SSRI group of medications, Prozac, Paxil, Zoloft, Effexor and others, have been shown to increase bruxism, at times intensely. It is thought that stopping these medications abruptly (rather than slowly tapering off) can cause extreme bruxism (as one of the side effects of withdrawal. Even a drop in blood concentrations (e.g., forgetting to take a tablet) may cause temporary or "mini" withdrawal side effects.

Intake of caffeine, antibiotics, other drugs and medications, as well as changes in brain chemical activity, have also been implicated in increasing a person's tendency or subconscious desire to brux.

4. Environmental
Exposure to environmental allergens may trigger bruxism. Further, it has been observed that the lowering of barometric pressure (weather 'lows') environmental chemicals, (work hazards or a new home) and possibly light, temperature and background noise, can all contribute to an increase in systemic (our body's) stress and therefore the desire to brux.

5. Internal Factors
It is thought that the following factors may trigger or worsen bruxism:
- Fluctuations in blood sugar levels
- Hormonal fluctuations / changes
- Stimulants such as tobacco and caffeine (may cause your body to produce more adrenaline, which may worsen bruxism)
- Illness - Any affliction (e.g. flu, sinusitis...) or disease that disturbs our body's equilibrium
- Other 'triggers' such as a sprained joint, toothache or other body pains, dehydration, overeating prior to sleep, insufficient oxygen (face in pillow) or virtually anything that can disturb our subconscious 'peace' during sleep.

What are the Signs of Bruxism?

The following are some of the signs that suggest bruxism activity. Does everyone show every problem? No. We are all very different. However, all humans (and animals for that matter) brux, to one degree or other, from the time our teeth grow in.

Every individual experiences the consequences of bruxism differently, and some, not at all.

1. Tooth Wear / Tooth Fracture:
Wear occurs from the movement of the teeth against one another. The wearing of the top surfaces of the back teeth and the edges of the front teeth, is most often due to attrition, which is the wearing away of one tooth surface by another tooth surface. Attrition is the result of bruxism, or the involuntary grinding of the teeth against each other. It is not the result of normal function (i.e. chewing). The forces applied during normal chewing is insufficient to cause attrition.
2. Enlarged Facial Muscles:
The facial muscles around the jaw and the sides of the skull can become enlarged due to hyperactivity. During bruxing, these muscles work very hard.

3. Breaking of Teeth:
(including broken fillings and other dental work) Breaking of teeth - As teeth wear, the edges of the front teeth and the cusps or corners of the back teeth will begin to show microfractures or cracks. These cracks cannot usually be seen on x-rays. It takes magnified light and/or an intraoral magnified image to diagnose them. Where this becomes especially important, is that teeth with these types of fractures will either eventually chip, break a corner, or become symptomatic (i.e. pain). Any tooth which is diagnosed with such a crack, may eventually require root canal treatment (due to pain or tooth death) or even removal! The reason for root canal therapy is that the fracture usually begins on the surface of the tooth and eventually deepens until the crack enters the area of the nerve (pulp chamber or live tissue of the tooth), allowing bacteria to "leak" from the mouth, along the fracture, to the tooth nerve (pulp). The reason for removal could be if the "crack" extends too deeply, where even root canal therapy may not be successful.

4. Receding Gums and/or Teeth with Gumline Notches:
When teeth grind or are pressed hard against each other over time, they flex at the "neck" of the tooth (the part where the enamel ends at the gum line). The enamel (which ends thinly at the gum line), and root material (dentin) microfractures away. The "washing away" of these microfractured particles may be accelerated by traumatic (hard) tooth brushing. This results in an exposed area (abfraction area) at the gum line that can be extremely sensitive to touch and/or cold. It can be felt with a fingernail as a notch, groove or ditch in the root, just at the gumline.

Most people assume that receding gums occur because of age, using a hard bristled toothbrush, or the occurrence of gum (periodontal) disease. In fact, none of these reasons are correct, in a majority of the cases. Teeth with receded gums are displaying the effects of clenching and/or grinding (bruxism). The forces pushing our teeth back and forth can cause the very thin layer of bone covering our roots (on the cheek side) to "resorb" or receded and the gum follows the bone!

5. Loose Teeth
Teeth loosen because of the rocking back and forth that occurs due to clenching or grinding. A good analogy is the example of getting a fence post out of the ground by rocking it back and forth. Orthodontists use this principle to move your teeth. Orthodontic braces exert pressure on a tooth from one side. On this side, the bone supporting this tooth is dissolved and is reformed on the opposite side. In this fashion a tooth is able to move. In clenching or grinding, the pressures are continuous and usually in different directions, leading to bone being lost around the roots and not reformed.

6. Cheek Irritation or Tongue Indentations:
A ridge or line of fibrosed (toughened) tissue forms on the inside of the cheek that corresponds to where the teeth come together. Sometimes a person will actually bite themselves along this line (especially in the most posterior molar area). In addition to cheek or lip nibbling, the desire to brux will often show itself as other habits, such as chewing on pens, pencils, fingernails, straws, stir sticks, or simply daytime compression of the teeth against each other.

The sides of the tongue can become indented (or, 'scalloped') from pressing against the teeth during the muscular pressure that accompanies bruxism.

7. Bony Ridges (Tori):
Instead of losing bone support, some people actually form "extra" bone to support the teeth. This appears as bony ridges that can be seen and felt on the jaw bones as a knobby protrusion at the level of the roots. On the lower jaw, tori tend to form on the tongue side of the jaw; on the upper jaw, they form on the cheek side of the jaw. Some people exhibit a combination of both tori and bone loss! Producing topography similar to what is seen at the Grand Canyon.

8. Tooth grinding or tapping sounds heard by a bed partner:
The sound has been likened to "someone walking up creaking stairs" or "the cracking of nuts."

Now that we have reviewed the major signs of bruxism...
What are the Symptoms of Bruxism?

Symptoms of bruxism may range from none to multiple. Even some very heavy bruxers do not display any symptoms. Conversely, some very light bruxers may display extreme symptoms. The following are the most common symptoms, if present:

1. Sensitive Teeth
As the enamel of the tooth is worn away by bruxism the underlying dentin layer of the tooth is exposed. This causes the tooth to become sensitive to cold, pressure and other stimuli. If bruxing has caused abrasions (ditches at the gum line) these teeth may also be very sensitive.

Sometimes a bruxer experiences a recurring generalized soreness and/or a cold sensitivity. This may only last a few days, then disappear, only to reappear a couple days or weeks later. This is due to the on again/off again nature of bruxism. The sensitivity is directly related to the amount of bruxism being done subconsciously.

Moderate to severe tooth pain can be due to the compression of the tooth in the socket, that is from pressure (as when an orthodontist tightens the braces) or, from a crack in the tooth itself. This pain can also come and go. People that experience the above often find it painful to undergo routine dental cleanings. In severe cases, root canal therapy or extraction (due to tooth fracture) may be the only solution for the pain.

2. Sore Facial Muscles, Headaches and Stiff Neck and Shoulders
The muscles used to chew food are the same ones responsible for bruxism. Consequently, these muscles often feel sore or tender in the morning, or late afternoon/evening. This may make the jaw feel tight, tired, or sore or may cause pain when the sides of the mouth are touched.

When we compress or grind, almost all the muscles around the face, head and neck and spine can be involved. Therefore, the following complaints are common (from muscular fatigue or cramping):
- pain in the forehead (often diagnosed as sinusitis)
- arching pain over the eye or eyes (classic migraine complaint) or pain in the temples, sides or back of the head.
  (At times this pain can be intense and debilitating and may be diagnosed as migraine headaches. However, being of muscular origin, it is more akin to a tension headache.)
- sore, stiff neck and/or shoulders
- numbness, pain or tingling radiating into the arms and/or fingers (from muscular compression of nerves as they exit our spine)

3. TMJ Problems
Bruxism can cause problems to the Temporo Mandibular jaw joints. (TMJ) The Temporo Mandibular joint is the 'hinge' which connects the lower jaw to the upper jaw, allowing us to chew and talk. Bruxers may experience pain in the joint(s) and/or may hear a popping or a clicking. The pain in the joint very often feels as if it is coming from the ear and may be confused and misdiagnosed as an ear infection.

Joint pain is often accompanied by inflammation. Inflammation causes an increase in the blood flow around the joint. The sound of this flow is often picked up by the eardrum, and a patient may experience a fullness in the ear, ringing or a high pitched sound, or a sound similar to placing a seashell to the ear. In rare cases, patients may also loose hearing to one ear or the other, or vertigo (dizziness) due to the closeness of a nerve (auriculo temporal nerve) to the TM joints, that traverses behind the joint and eventually connects to the inner ear. The exact function of this nerve, and its role in the above symptoms, is still not clearly understood.

If muscles that connect the lower jaw to the skull (on one or both sides) – the pteryoid group of muscles – become overworked, they may go into spasm, not allowing the jaw to move smoothly. This may result in popping, or clicking of the joint, or even "lockjaw", where a person cannot open or close their mouth. (continued...)
(TMJ Problems Continued...) Joint pain often radiates up the side of the head (temples), and is often confused with head-pain. However, most times, joint pain and spasm of the temple muscle (temporalis) occur together, making it difficult to differentiate one pain (joint) from the other (muscle).

If only one joint is involved in spasm or dysfunction a person's jaw may not open or close in harmony, but deviate to one side or the other.

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**How is Bruxism Treated?**

In my practice, I have observed that bruxism and its consequences are more widespread than is generally accepted by the health professions. Since realizing the urgent need for more attention to this problem in 1982, I have devoted many years to clinical assessment and analysis of my patients and have gained insight into a number of treatment approaches.

Bruxism is not a disease which can be cured by medication or surgery. Bruxism is part of normal human behavior and if it becomes aggressive to the point that it causes damage to the teeth, or causes symptoms in the individual, intervention is strongly recommended. Recognition, awareness and prevention is the only treatment.

The objective of treatment begins by identifying the causes and then trying to control the behaviour. The goal of treatment is to prevent further damage to your teeth and reduce the symptoms caused by bruxism. Treatment for bruxism varies depending on the causes, and your symptoms. However, there is no simple solution or magic cure.

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**Behavior Modification**

Tooth clenching/grinding during the day is a very different problem than night grinding. Daytime bruxism is a habit that can be retrained. It just takes a little time and effort to do so.

The objective of behaviour modification is to get the bruxer to change behaviour by learning how to rest the tongue, teeth and lips properly. When some people become aware of their problem, simply advising them to rest their tongue upward with teeth apart and lips shut may be enough to change their behaviour and relieve discomfort. For other people, placing the tongue gently between the upper and lower front teeth will help to remind them not to brux during the awake hours. Some patients may benefit from a dayguard. (A custom-fitted daytime guard that is used to control this daytime behaviour)

We advise our patients as follows: First, try to become aware of when you are bruxing. When you are conscious of it, make an effort to relax your jaw. You want to have your lips lightly together with your teeth apart. We suggest you place post-it notes at home and at work to initially act as a reminder, until the habit of observing yourself is developed. The dash of a car, bathroom mirror, and computer terminal are popular places to post these notes. At regular intervals (every 5 to 15 minutes) check yourself. Are the lips together and teeth apart? If they are not, re-establish this position. Repeat this, day in and day out, until detection of this behaviour is automatic. Many people, once they are aware they are bruxing, will "catch" themselves clenching or grinding throughout the day, and can control the daytime behaviour themselves.
Stress Relief

As much as possible, avoid stress. Learn stress management and relaxation techniques. Seek professional counselling if necessary. Counselling can help when stressful stimuli cannot be handled. Try to work off stress through exercise and physical activity. If you have been physically inactive for an extended period of time, or have any medical complications, check with your health care provider before beginning any exercise routine.

Nutritional Supplements

Magnesium's vital role in nerve and muscle function led at least two researchers to the suspicion that bruxism may be traceable to insufficient consumption, or inefficient utilization, of this trace metal. Magnesium-deficient diet is said to cause frequent teeth grinding in both sleeping and awake pigs (cf. Lehvila, 1994, p. 219). In humans, the suggested treatment involves magnesium supplements. According to Plocenjak (1990), for instance, prolonged magnesium administration nearly always provides relief of bruxism. This confirms the earlier report of Lehvila (1974), which claimed remarkable reductions (and sometimes even disappearance) in the frequency and duration of bruxism episodes in six patients who took, once a day, a tablet of assorted vitamins and minerals (which included 25 mg {in children} or 100 mg {in adults} of magnesium), for at least five weeks. When the supplements intake stopped, the bruxism returned.

Night Guards

Prevention of tooth wear by placing a plastic barrier such as a night guard appliance between the top and bottom teeth is the best known solution to prevent night-time bruxism. A plastic appliance sandwiched between the teeth, absorbs the stress and wears away when the teeth start to brux or clench, rather than the teeth wearing away. Night guard therapy should begin as soon as premature ditches or cracks in the teeth or other signs or symptoms are detected. In this office we routinely use the FDA approved nightguard known as an NTI Device as we believe it is the best treatment for bruxism. It is customized to each patient. (continued...)

Other Factors to Consider

More research is clearly needed in this area. Indeed, if such claims apply to even a small proportion of bruxers, they merit a close look because taking these supplements is comparatively convenient, safe, and free of side effects. Medications: Some medications can promote or exacerbate (worsen) bruxism. Your doctor will advise you if such is the case. Food/chemical intolerance: Not all foods or substances agree with ones physical makeup. Food intolerances can lead to an increase in internal stress and increase the behaviour of bruxism. Tracking and experimenting with the consumption or elimination of certain substances (chocolate, caffeine, gluten are the most common), may be advisable. Ask your doctor.

Avoidance of noxious chemicals: Paints, glues and other noxious chemicals, at home or work, should be avoided. (New-home owners often experience an increased desire to brux.)

Hydration: Dehydration may also cause systemic stress. Make sure you consume adequate amounts of fluids each day. Anoxia: Ever get a headache after holding your breath too long under water? The lack of proper oxygenation can also lead to an increase in internal stress or tension. When driving, studying, watching T.V., or at the computer, make sure to take a deep breath from time to time, to clear the stale are out of your lungs. Ask us for more details. Diet: "I can't eat breakfast, but usually have a coffee in the morning, then later a muffin or a Danish. Why do I get a headache by 11:00 a.m.?” Proper morning diet ensures proper and level blood sugar levels throughout the day, keeping the pancreas, brain, nervous system and the body components 'humming' smoothly. Conversely, too much food and sugars late at night can over tax the system. Ask for more details.

Sleep: Proper sleep is vitally important for our systemic relaxation. Too much food at night or the wrong foods, alcohol, smoking and/or sleep disturbances (sleep apnea) can all disturb our rest. Ask for more details.
(Night Guards Continued...) The nightguard is hard enough to be durable, but since it is softer than teeth it will protect them from wear. When the nightguard is tried on, it is adjusted to fit your bite evenly and smoothly. It is very important that the fit of the nightguard be just right. Periodic adjustment, or replacement of the nightguard may be necessary --depending on the frequency and intensity of your bruxing habit. Recently, we have started incorporating a slightly softer material into our night-guard design, with very promising results.

The NTI is not for everyone. Roughly one out of 300 patients will not be able to tolerate this appliance. On rare occasion, you may need a change in night guard design. It is very important that a patient make a 100% effort in following the doctor’s directions, and that you present yourself for follow-up discussions on your progress. Medication – in care cases, certain relaxants may be prescribed to help the chewing muscles relax.

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**Neck Exercises and Neck and Upper Back Massages**

Bruxism fatigues the jaw muscles and can put them into spasm. Jaw muscles work antagonistically with muscles of the back of the neck to balance the head. Relaxing and comforting one of these muscle groups will help relax the other. Similarly, chiropractics, physiotherapy, and/or massage therapy may be important treatment adjuncts.

Other Tips To Help Reduce Bruxism

- Hold a warm, damp cloth next to your face for 10 minutes before you go to bed to help calm your jaw muscles.
- Relax before bedtime by meditating, taking a hot bath or stretching.
- Do not eat anything sweet within 6 hours of going to bed. If you are hungry, have a light protein-and-fiber snack.
- Do not overeat close to bedtime.
- Consult with your dentist about any and all medications you are taking
- Try to identify foods or additives that do not agree with your body chemistry (lactose, gluten, food dyes, etc.)
  - Consulting a naturopath or homeopath could prove useful
- Check www.NTI-tss.ca or headacheprevention.com
- Observe, observe, observe your daytime jaw positions and tension

As with all health related matters, prevention is key. Treating the results of bruxism before they become significant problems is the best way to avoid major troubles in the future. If you have any questions about any of these points, please ask.