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Prologue

LIVING WITH A HEADACHE

Every day for twelve years I woke up with a headache. To someone who gets a headache maybe twice a month, a daily headache must seem pretty amazing, but if you're reading this book, it's probably because you can relate.

My headaches began during my senior year in high school. I was growing pretty fast and I had developed some tendonitis in my knees, so I frequently took aspirin. Since my knees hurt most of the time, my mom had strategically placed aspirin bottles in every bathroom and in the kitchen. Sometime during that year, my knees quit bothering me, but I still needed to take the aspirin. Every time I woke up in the morning, I had a slight headache, so I took a couple of aspirin. After school, another headache, so a couple more aspirin, and then maybe one before dinner.

Within a few years, I started my day with three aspirin and a Tylenol. The pain felt like a vise on my head, squeezing hardest on the temples. The base of my skull was very stiff and tender, so I'd stand in the shower with the water pounding the back of my neck, until I started to come around. By the time I was in graduate school, I started each day with four extra-strength Excedrin and an extra-long shower just to make the headache tolerable. By the end of each day, I had consumed ten to twelve Excedrin.

Not many people realized my condition. Usually, I had taken so much pain reliever that I could behave normally, and those close to me rarely knew how often I was taking aspirin. I actually assumed that my headaches were somehow normal! I mean, wasn't there an entire aisle in the supermarket dedicated to headache remedies? Commercials for headache sufferers were on T.V. all the time, so I figured my condition was normal. Certainly, if I woke up with daily chest pain, somebody would want to cut me open to see what's wrong with me, but a throbbing head was somehow acceptable.

Eventually, about once a month, I had the headache supreme. Sometimes the pain was on the right, sometimes on the left, or maybe the slam-dunk squeeze on both sides...and there was nothing I could do to stop it. Curled up in a dark room, yet close to a bathroom in case I had to throw-up from the pain, I learned to just ride it out. Nothing could stop it. I had tried different kinds of medications for this one, but nothing worked. Once I had it, I had it. Sort of like having the worst muscle cramp you can imagine, wrapped around your head.

A migraine is a headache that hurts so badly that it actually makes you nauseous and you need to curl up in a dark room. This is what I had and what the medical community calls a "common migraine". Common? Oh, great. I guess since lots of other people get these, too, and don't die either, I'm supposed to feel better. Turns out there's also a "classic migraine", which is identical to the common kind, but you need to see a weird aura and flashy lights just before the migraine hits. Of all the migraine sufferers out there, 10% get the classic kind, for which there are preventive medications and special diets, but have limited effect on the common kind.

During my education, I completed a residency in myofascial dysfunction. Myo means muscle, and fascial refers to the connective tissue coating that wraps around muscles. Dysfunction is the wonder word of the 80's. Any time that something doesn't work right, it's dysfunctional. During my residency, I treated many patients who were having the same symptoms that I was, but only half of them felt better from our state-of-the-art treatment. (I didn't feel any better, either.) Eventually, these patients were diagnosed with conditions that were unpreventable and barely treatable, like "atypical migraine", fibromyalgia, or myocytis (which means chronic muscle inflammation). Since the clinic couldn't seem to cure or prevent these patients' headaches, I think the doctors felt obligated to label them with a respectable condition.

After graduation, I explored most of the usual methods for headache treatment. Chiropractic care felt good after the "adjustment," but I was right back to where I started a day later. Occasionally, I would sense a tremendous amount of pressure and pain in or behind my sinuses, so I went to a sinus specialist who said that my sinuses were normal. Physician friends of mine prescribed various headache medications, but nothing ever prevented my headaches and common migraines.

After three years in private practice, I gave up treating patients with severe myofascial dysfunction (or "atypical" migraine, fibromyalgia, or myocytis). I figured that if my headaches hadn't improved with the best treatment that money could buy (which I received for free), how could I charge somebody for a service that I questioned myself?

In spite of my skepticism, I was convinced that my headaches were a result of some sort of muscular condition. My type of daily headache had been officially diagnosed as a muscle contraction headache, or tension-type headache (tension refers to the actual tightening or tensing that a muscle experiences, instead of emotional tension and/or stress). These daily headaches were thought to be separate from my occasional common migraines; however, I somehow felt that they were related. I believed that my migraines were actually the worst possible tension headaches. After all, my headaches presented with the same symptoms that severely dysfunctional muscles did (pain and pressure, extreme soreness, tenderness, tight-ness and throbbing). Although I was pleased to find out that I didn't have some kind of brain tumor (which I was convinced that I must have had), I felt frustrated when told I was simply suffering from "stress." I wasn't satisfied with

the current treatment methods, medications and side-effects that are designed to provide relief from the headache pain, so my goal was to figure out how to prevent my headaches.

My headaches began in 1977, and it was in the summer of 1989 that I figured it out. Over a period of several days, I designed and redesigned a comfortable method of treatment that I thought would, or should, prevent my headaches. When I was satisfied with the final version, I tried it out. The next morning I woke up without a headache. Seven years later (as of this writing), I still awake headache free, and have not had a common migraine since that summer. This entire book is dedicated to the process I went through and how the chronic headache sufferer may also find relief. I can almost guarantee that if I told you now what the cause of these headaches and migraines was and how they are prevented, you wouldn't believe me. (Besides, how many books have only a prologue and that's it?) These first few chapters are necessary for you to understand the big headache picture. Then you will find the simple solution believable and logical. In fact, you may be puzzled as to why someone hadn't already thought of it!

The first patient I treated with this new method was my girlfriend. She also awoke every day with a headache and also had regularly occurring common migraines (far more than I ever had). I hadn't been aware of it, but when she was younger, her parents had taken her to every headache specialist they could find. The neurologists confirmed she was having common migraines (such severe pain on one or both sides of the head that it causes sensitivity to light and nausea) and daily tension headaches. Her doctors couldn't help prevent her headaches, however, because "they were probably due to stress." As an adult, she was taken by friends to the emergency room for a shot of Demerol (a pain killing narcotic) on several occasions for her debilitating migraines. Of course, when I presented my hypothesis of headache cause and prevention to her, she politely told me that her headaches were different, that she had been to all the specialists, but thank you anyway. I told her that I really thought I had something that would help and wouldn't she just try it for two weeks? In hindsight, I suppose she was just humoring me, but she agreed. After two weeks, I asked her how she was doing. "Something is going on and I think it's good," she replied. "Let me try this a little while longer." Two weeks later, her morning headaches were practically gone, and she had ceased having migraines. She's not been to the hospital since. Two years later, we were married.

Eventually, word of this method of treatment and prevention spread. Several friends of mine who were attorneys insisted that I apply for a United States patent. I did, and my patent attorney warned me that a patent usually took a couple of years to get. Three months after the application was sent in, I received my first United States patent. (I've since received a second U.S. patent and one international patent.) After I had treated several hundred patients, CNN Headline News and CBS News aired features on this new method. Unfortunately, a lot of people were disappointed when they called from across the country only to find that this type of treatment was not yet available in their town.

Wouldn't you think that if someone had come up with a logical hypothesis for the cause and prevention of recurring headaches, without medications, the world would come knocking? Nope. Patients who had suffered for years with headaches and who are now pain free frequently ask, "How come everybody doesn't know about this? You've got to get it out there!" I'm trying. I've submitted a two-year study to a research journal for publication, and we now have a web-site on the internet.

I had lunch with a clinical psychologist a while back who doubles as a newspaper and book editor. He had just read my research manuscript and asked what my motivation was. "Well," I said, "I have a personal vendetta against headaches because I know how miserable they are. If someone out there is suffering as my wife or I did, I'd like to help."

His response to me was, "If you want to get the word out to your fellow headache sufferers, you ought to write a book that they can relate to!"

Well, here goes....

"Most people don't realize how head-aches limit and control your life. I used to get migraines that lasted for four days straight, every other week. Now, I get them maybe once a month, and I'm still progressing! I thank God for the people at the Headache Prevention Institute who have the insight, knowledge, and compassion to want to help people like me lead a richer, fuller life without headaches."

Sharon Koperwas, West Bloomfield, MI

Chapter 1

GETTING TO KNOW THE PLAYERS

Watching a basketball game is enjoyable when I know the players and their capabilities; however, what is most enjoyable is that element of surprise which comes from an unknown player performing 'like a Michael Jordan.' Wow! Did you see that guy? I didn't know he could do that!"

I'd like to familiarize you with some of the "players" in the chronic headache/migraine game. The most important players to us are the muscles. What we're going to discover is that some muscles are capable of much more than we realize. Muscles are responsible for the majority of the aches and pains from which we all suffer. Without realizing it, most people have a general understanding of how muscles work, and we know through painful experience what happens when they don't work correctly or have worked too much.

We'll use an example to demonstrate typical muscle dysfunction and the resultant symptoms. Clench your fist as hard as you possibly can. Now, decrease your intensity to at least 50% of maximum and remain clenching for at least ten minutes. After three or four minutes, you may find that ten minutes is a bit longer than you realized, so try to go as long as you can. While you're doing this, use the opposite hand to feel your forearm. Your forearm should feel stiff and may start to burn and ache. Your fingernails may be digging into the palm of your hand. What does it feel like when you finally finish? Even if you didn't participate in the exercise, you probably know. Your fingers feel stiff and tend to remain curled. Your forearm is fatigued and perhaps sore. What would it feel like if you did that same ten minute exercise every two hours for the rest of the day? Tomorrow or the day after, your fingers would be stiff and curled, your forearm painful, stiff, and tender to the touch, even when your fist is not clenched. Additionally, normal use of your forearm may result in a spasm or cramping of the muscles, which is very painful. These are typical symptoms of a muscle in a dysfunctional state.

In order for a muscle to do its required job and not become dysfunctional, it must receive adequate oxygen for metabolism, adequate blood flow to transport waste products out of the metabolism site, and enough rest between contractions. And even more importantly, the muscle must not participate in activities that it's not designed to do. But first, what is a muscle's job? A muscle moves one bone closer to another bone by shortening itself (i.e., contraction). A muscle is attached at one end to a stationary bone and at the other end to a moveable bone or structure. Once a muscle has completed a given task (e.g., moving an object), the muscle ends the contraction and relaxes.

During the contraction, de-oxygenated blood and waste products build up within the muscle while the oxygenated blood trying to flow into the muscle is pinched off. Once the contraction has been completed, the muscle relaxes and oxygenated blood rushes in. During our fist-clenching exercise, the forearm muscles remain contracted, preventing an adequate supply of oxygen and allowing a buildup of waste products, which wouldn't be so bad if we did it only once or twice for a minute or two. Chronic and intense fist-clenching, however, is not an activity the forearm muscles are designed to do. As a result, the forearm muscles become dysfunctional (i.e., painful and stiff). When this condition is allowed to continue, the muscles may tend to cramp or spasm. Therefore, if someone had this peculiar habit of clenching their fist, discovering how their forearm became so painful and their hand so stiff would be easy...just watch them. Treatment would be easy, too. Just figure out a way to prevent them from clenching their fist (which may not be so easy after all).

The fist-clenching example demonstrates a situation in which the muscular contraction has no specific purpose. Usually, the fingers and forearm would be working together to hold an object for a particular task. Once the task is completed (e.g., setting the object down), the muscles relax and await the next task. Chronic and intense muscular contraction without specific purpose and the resultant symptoms can result in a condition known as *myofascial pain dysfunction* (*myo* means muscle and *fascial* refers to the connective tissue that wraps around muscles).

"I had been hospitalized for a week of observation and tests at a special institute, but they still couldn't help me. It's a blessing that something so simple has made my life so wonderful!"

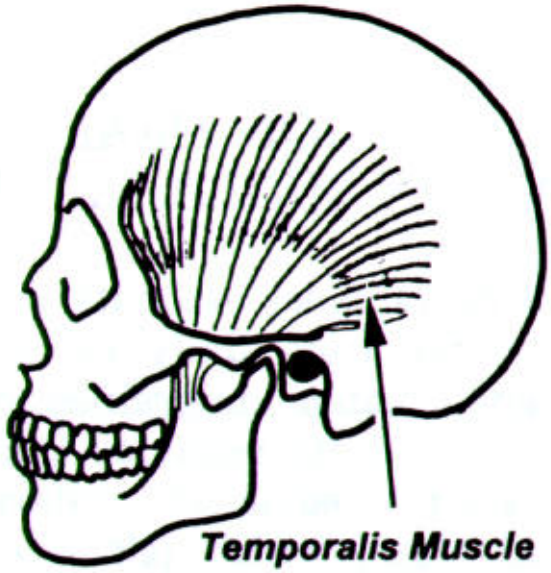
Marvel Mayer, Troy, MI

Chapter 2

THE TENSION HEADACHE / COMMON MIGRAINE PUZZLE

Medical researchers estimate that 10% of the population suffers from daily or weekly tension headaches and common migraines. At one time, the medical community assumed that the muscles of the scalp somehow developed into a dysfunctional state which felt like a tight hat band around the head, with the most pressure at the temples. The medical community later realized that the scalp muscles didn't participate in the kind of strenuous activity that would normally result in muscle dysfunction (raising the eyebrows and wiggling the ears are hardly perpetual strenuous activities). Several studies demonstrated that the muscles of the scalp showed no increased activity during a headache, compared to the normal state. Researchers then concluded that either some dysfunction in the blood vessels or in nerve conduction to and from these muscles must be the cause of the intense muscle pain. Thus, researchers have concentrated their studies on blood vessel activity and nerve conduction.

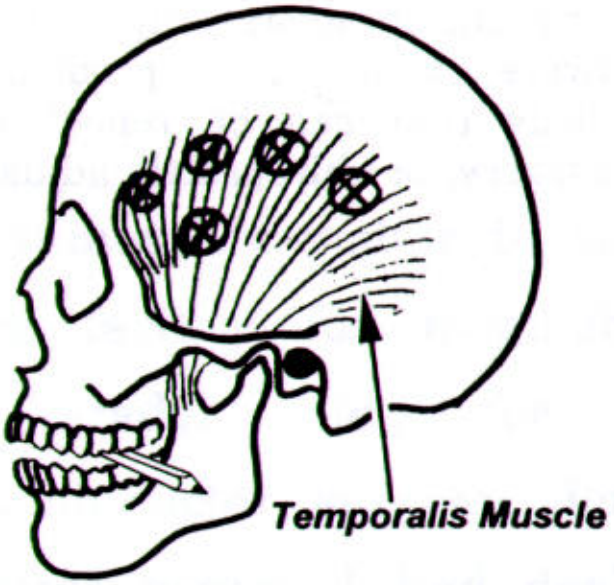
Recently, neurological research has isolated the temporalis muscle as the primary center of tension headache pain and possibly common migraine pain.



Although the temporalis muscle is located on the skull, it is technically a jaw muscle and not a scalp muscle, since its sole function is to close the jaw. Medical schools, therefore, leave the study of the temporalis muscle to the dental schools. Dental schools leave the study of headaches to the medical schools, so the temporalis muscle has been largely overlooked as a source of headaches and migraines.

The temporalis muscle has a large fan shape that covers the entire side of your head, known as the temporal area, extending from above the ear to just behind the eye. The temporalis is actually much thicker than you might imagine, but it is not readily detectable because it resides in a deep indentation in the skull. That's why it's not very obvious. While the broad, fan-shaped end of the muscle covers the entire side of the skull, the other end tapers down and reaches under the cheekbone and attaches to a special projection of the lower jawbone.

The *temporalis'* **sole** function is to close the jaw during chewing. To demonstrate how it works, place a pencil between your molar teeth as far back as you can and bite down hard, repeatedly. If you rest your fingers along the temporalis muscle, you'll feel it bulge in and out.



The temporalis is considered the strongest and most powerful muscle of the body, able to crush bones, crack hard nuts, and fracture teeth!

Researchers can't agree on whether the temporalis muscle itself is dysfunctional and, therefore, the cause of the headache, or if the blood vessels and nerves that service the temporalis are dysfunctional and cause pain to appear in the temporal region. If the temporalis muscle is the center for all these headaches and migraines, how does it become so painful?

There are basically two theories. The theory of those practicing in medicine (i.e., internists and neurologists) suggests a malfunction in the central nervous system. Think of it as a computer malfunction. Medicine's view is that there is a problem with the software system (computer lingo). The pathways that carry information and data to and from the temporalis muscle have somehow been altered. This mis-information can result in headaches, usually in the temporal region. Various medications are then prescribed to fix the problem. The other theory, the one proposed by physical therapists, orthopedists, dentists, and chiropractors, suggests a defect in the hardware, that is, a problem with the physical body that can be remedied by therapy, surgery, or chiropractic adjustment.

"I was a bi-monthly visitor to our local urgent-care facility for mega-shots of demerol, toradol, etc., for vicious migraines...no doctor, surgeon, dentist or other medical person I had dealt with for all those years had actually had the problem I did...except for Dr. Boyd. If I could turn back time, the Headache Prevention Institute would have been there before things got so very bad for me...but to be headache-free after 10 years of pain and frustration is just wonderful!"

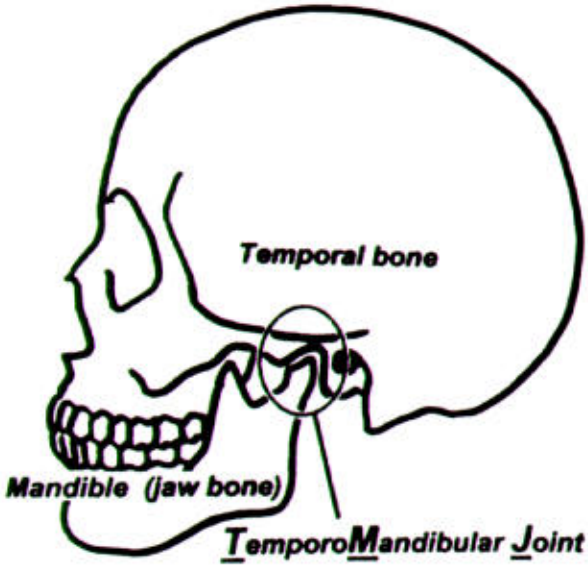
Dawn Alegre, Los Angeles, CA

Chapter 3

THE TMJ TRAP

Most headache sufferers like myself go from doctor to doctor looking for some kind of answer. Each new physician or therapist 'knows' our problem and proceeds to treat us accordingly.

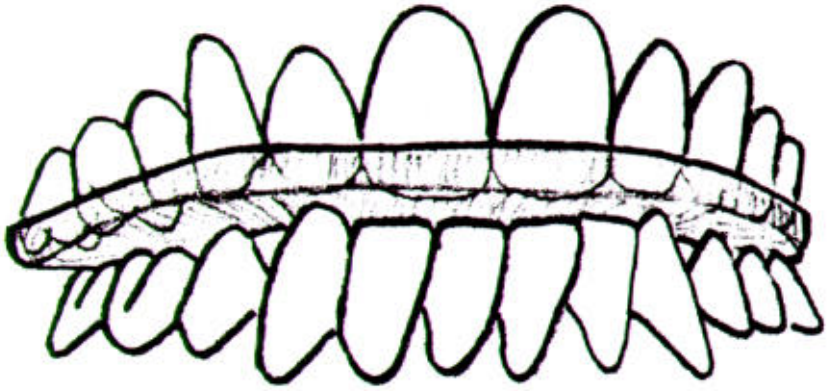
During our quest for pain relief, many of us have been told we have 'TMJ', a disorder of the jaw joint. So we visit a dentist who specializes in temporomandibular joint dysfunction (TMJ). *Temporo* refers to the temple bone of the skull, *mandibular* refers to the lower jaw (i.e., the mandible), and the joint is where the two meet, just in front of the ear canal .



The TMJ practitioner attempts to treat all the parts that control chewing: the teeth, the jaw joint, and the muscles.

In TMJ treatment, two particular theories attempt to explain why we have headaches. The first concerns the manner in which the upper and lower teeth meet, or 'bite', called the occlusion. Some TMJ practitioners feel that an improper bite is the cause of the headache pain. They believe that patients with a bad bite are constantly straining the jaw muscles (including the temporalis) to hold the lower jaw in such a position to create a proper bite. This strenuous activity results in myofascial (i.e. muscular) dysfunction, displayed as headaches. The TMJ practitioner's solution is to alter the teeth (by either orthodontics, crowns, grinding of the teeth, surgery, or some combination) to obtain the proper bite. The second theory assumes that the jaw-joint itself is somehow damaged, which ultimately causes headache pain. The headache occurs when the muscles that surround the damaged joint assume a tightened (contracted) posture, in order to protect and support the damaged joint. If the joint is found to be irreversibly damaged, specialized therapy and surgery are recommended.

Both theories utilize identical initial treatment. A special mouthpiece, called a splint, is fitted to the upper or lower teeth and covers the back molars and the edges of the front teeth.



A TMJ splint attached to the upper teeth

The biting surface of the splint is polished smooth and flat, so that when you bite on it, your jaw can slide around. The design of this splint, often referred to as a 'flat-plane' splint, serves two purposes. First, by preventing the opposing teeth from coming together in an improper bite, the jaw muscles can relax and allow the lower jaw to slide on the splint to the jaw's most comfortable position. This would allow the muscles to 'heal'. Supposedly, the splint has eliminated the "bite" as a cause of the headache. Second, the splint prevents the jaw from closing all the way by keeping the opposing teeth separated by the thickness of the splint. This has shown to relieve pressure in the jawjoint. Practitioners who feel that jaw joint damage is the cause of the headaches believe that when pressure and strain are relieved from the joint, the joint will 'heal', which will allow the muscles to relax and resolve the headaches.

Most patients who have mild to moderate headaches typically respond well to splint therapy; however, those who suffer with moderate to severe headaches don't do as well. As many as 75% of the patients with severe headache symptoms who are treated with TMJ splints, experience no relief or feel worse. Unfortunately, I was in this category, wearing a splint for five years with no relief.

There **are** situations in which TMJ therapy **is** indicated. Occasionally, in addition to their headaches, patients do have sore, tender, or painful jaw joints. Their jaws may move to the right or left or zigzag when opening and/or closing. Their jaw joints may make popping, clicking, or grinding sounds. Patients who experience these symptoms along with their headaches are often advised to try physical therapy, biofeedback, and chiropractic care in addition to their TMJ splints. If these methods are ineffective, patients may be referred to a counselor to help deal with life's stress. If these therapies and the splint wear have proven to be ineffective (i.e. the pain persists), surgery is often recommended. The most common TMJ surgical procedure simply 'rinses out' the joint space, flushing out the entrapped residue of inflammation and allowing the joint to heal, thereby allowing muscles to relax and curing the headache. Unfortunately, some patients' headaches return soon after surgery. These people typically learn to live with their pain with the help of prescribed medications. (If you're a TMJ patient, don't worry; this book is for you, too.)

So why do I consider TMJ a 'trap' for chronic headache sufferers? Two things have always puzzled me about the TMJ theories. First, dentists see people with absolutely lousy-looking teeth and really terrible bites all the time; *but as a group, these people don't necessarily have more headaches than those people with perfect teeth.* In fact, published literature shows that the teeth and the bite are **not** factors in predicting who will have headaches. Splint therapy can be expensive, and 75% of patients with severe headaches fail treatment, so those are pretty tough odds. Secondly, if a jaw-joint can become damaged enough to cause a headache, treatment is directed at relieving the symptoms and repairing damage. Assuming there had been no traumatic event, how does the joint become so damaged in the first place?

"Most of the "TMJ specialists" in town had worked on me one way or another. All of my teeth had been capped--twice. My jaw had been surgically broken and reset. I had been given three separate "splints" without success (I actually got worse). I was accused of being alcoholic and in need of professional counseling to rid me of my terrible headaches. I was put on "display" in front of a TMJ symposium at a local hospital so that an auditorium of doctors could try to figure me out...nobody could. But now it seems so simple! One month after visiting the Headache Prevention Institute, I'm a new man!"

Dene Davidson, San Diego, CA

Chapter 4

MAINTAINING THE MEDICAL MYSTERY

So the question remains, what really causes tension headaches and common migraines? Officially, medicine says it's not yet completely understood. The International Headache Society lists dozens of causes for headaches and migraines. No study exists to clearly indicate a simple cause of recurring tension headaches or common migraines, so medicine continues searching for a means of prevention. In fact, the *International Headache Society*, which is responsible for the categorizing and naming of headaches, recently changed the name of "muscle-contraction" and "tension" headache to "tension-type" headache. They point to research that shows no increased muscle activity during a headache compared to activity during a normal resting state; therefore, the term "tension-type" is used to describe a headache that seems to be like that of muscle contraction.

The practitioner's area of medicine usually dictates what he or she believes. The neurologist believes that the central nervous system is somehow responsible. Several different medications are prescribed until an acceptable result is achieved (if ever). Treatment rarely "cures" the headaches, but rather relieves the pain soon after onset. The internist or neurologist may prescribe medications intended to prevent muscular spasm within blood vessel walls that are located within the skull or in the brain. The ear, nose and throat doctor (E.N.T.) may perform sinus surgery. The dentist makes a "splint". The chiropractor repeatedly adjusts the curvature of the neck vertebrae, hoping to prevent further attacks, only to have the patient return with a headache a week later or sooner.

Unfortunately for the daily headache and common migraine sufferer, no one has had an answer. We learn to accept and cope with headaches as a part of our normal daily life. We're told it's just stress or our sinuses, or some lingering effect of an accident we had years ago. Ultimately, we no longer discuss our headaches. No one wants to hear about them anyway. Since we always seem to have a headache, we might as well gut it out and live with it.

NOT ME, NOT ANY MORE.

"I've had daily headaches all of my life. I've gone the route of neurologists, chiropractors, allergists, dentists, herb-alists, acupuncture, physical therapy, bio-feedback and massage therapy with no lasting results. But now, no longer do I need to decline an invitation because I have a headache! It seems so strange to wake up headache free. I can get on with my life!"

Marilyn Wasemiller, Dearborn, MI

Chapter 5

SPLITTING THE HEADACHE

Let's go back to the fist-clenching example again. Certainly, there are degrees of fist-clenching. Simply making a fist is the slightest degree of fist-clenching, and squeezing as hard as possible is the most severe degree of fist-clenching. Assume that someone has developed a habit of clenching her fist during sleep and during periods of stress throughout the day and is completely unaware of it. Imagine we are the town specialists in forearm-ache and an otherwise healthy 35-year-old female comes to us with a daily forearm-ache and stiff, curled fingers. We suggest to the patient that perhaps she is a fist-clencher. Our patient confidently denies that she does any such thing because she's having a terrible forearm-ache at that moment, and she's not making a fist. We know, however, that muscles can become very painful long after an exercise has been completed. How can we keep this patient from clenching her fist? How about giving our chronic fist-clencher a billiard ball to hold on to? Would that make her forearm muscles relax? That probably depends on how severe a fist-clencher she is. She may stop it at first, but then may get used to it and then clench the billiard ball anyway. How about using a tennis ball? Perhaps the rhythmic squeezing may keep her forearm from burning, but she'll still be fatigued, and her arm will still hurt. Our treatments, so far, have merely modified the fist-clencher's ability to clench, but haven't prevented the clenching. But what if we were to tape her outstretched fingers to a ping-pong paddle? She couldn't make a fist or curl her fingers to begin with! Soon after our paddle treatment, our patient's forearm no longer hurts. We leave the ping-pong paddle on for a few weeks until our patient *learns* not to clench her fist. We've been allowing her to remove the paddle whenever she needs to use her hand, but she re-applies the paddle at all other times. Our patient now tells us that without the paddle, she is very much aware of her fist-clenching and can catch herself before she can do any real damage. We recommend that she wear her paddle during times of particular intensity during the day (like a scarey movie) and to continue to wear the paddle during sleep, indefinitely. She readily agrees and tells us that whenever she has forgotten to wear her paddle to bed, she has awakened with a sore arm and an intensely clenched fist!

O.k., so now it's time to let you in on the big secret. Research has shown an association between intense chronic temporalis contraction and chronic headaches and migraine pain. When the temporalis contracts, it closes the jaw until the teeth touch (remember, the temporalis is really a jaw muscle, located on the scalp). Intense continual contraction of the temporalis (teeth touching or clenching) develops myofascial dysfunction of the temporalis, displayed as chronic headache and migraine pain. *It may surprise you to know that in the daytime, teeth should* ***never*** *be touching (i.e., temporalis contracting) except when eating!* ***So here is where it gets interesting.*** Everybody, when asleep and dreaming, contracts their temporalis muscles from time to time. That is to say, it is normal to clench your teeth while asleep. What sets chronic headache and migraine patients apart from the pain-free crowd is not that they are teeth clenchers (because everybody is), but rather they are **more intense at it** than others.

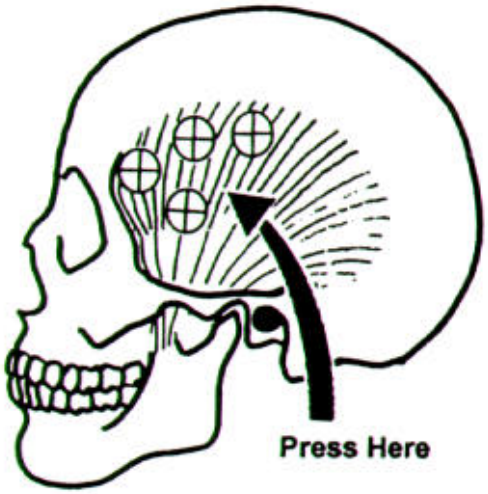
Doctors are trained to look for abnormalities. They will run a series of tests, looking for something abnormal to pop up. Once they find something wrong on your x-ray, MRI, blood work, etc., they can look in a book and find a description of the usual presentation of that abnormality. What I'm describing, however, is the opposite. Temporalis contraction is a normal function, *but it's the presentation that is unusual*. No wonder our doctors haven't found anything wrong with us. Here we've got all these wild symptoms and nothing to show for it...if your doctor doesn't intensely clench his teeth, it would never occur to him that such an activity could cause such pain.

And you're thinking, "Yeah, right. My headaches are due to sinuses , or red wine, or my neck vertebrae, etc..." Well, you're partially right (I'll be getting to those details later). Hundreds of

patients who have experienced every possible treatment imaginable are now convinced that they were chronic intense teeth-clenchers during sleep and had absolutely no awareness of it! Some of their comments appear throughout this book.

One method to determine if intense teeth clenching (i.e., chronic, intense temporalis contraction) is a cause of your headaches is to press on your temporalis muscle.

Don't be too gentle. You should be able to press as hard as you want and not feel any pain or soreness. Try several different spots. You may notice that some areas are more painful than others. When I do this to my patients, they advise me that it obviously hurts because I'm pressing so hard. Wrong. There should be no pain at all. It should feel the same as when you press on your forehead at the hairline. Ask somebody who never has headaches to do this on themselves...they'll barely hurt at all. If you can find some sore spots, good for you; keep reading!



Consider the person who, instead of a painful forearm, feels pain and pressure on the side or sides of the head. Could it be that the temporalis muscle is painful (i.e., headache) because intense due to intense contraction during sleep?

During the daytime, even the slightest *touching* of the teeth requires contraction of the temporalis muscles. I used to think that since teeth seem to fit together pretty well, they should be together, right? Wrong. Although it seems harmless enough, daytime teeth-clenching (usually during stressful events) acts as an irritation to pre-existing dysfunctional temporalis muscles (caused by the nighttime clenching). Remember, when your hand is at rest, it should not be gripping an object; and when you're not chewing food, your jaw should be at rest, *so your teeth should not be touching*. Simply allowing the teeth to touch requires a continual contraction of the temporalis muscle. Once the teeth are in contact, any degree of intensity of temporalis contraction and resultant clenching is likely to occur, *without that person's awareness*. The episodic and often severe continual contraction of the temporalis muscle during sleep results in its dysfunctional state, **which may not be painful until a later time**. This is one reason why some medical studies find no increase in muscle activity during a headache.

Another example of this delayed muscle pain occurs in the weekend athlete who plays a hard game of football on Saturday, and whose muscles are sore and painful on Monday.

What can we do for these intense nighttime jaw-clenchers? What if we placed the hard, acrylic, flat-plane TMJ splint in their mouths? Would that make their temporalis muscles relax? The answer probably depends on the intensity of their jaw-clenching habit. These patients may lessen the intensity of their clenching at first, but once they get used to the splint, they clench into it anyway, sometimes harder! That's how TMJ treatment gets a bad reputation...clenching patients sometimes *get worse*. Some doctors will try to make a splint out of a soft plastic, but that simply allows these patients to *chew* into the splint, thus maintaining their muscular fatigue and headache.

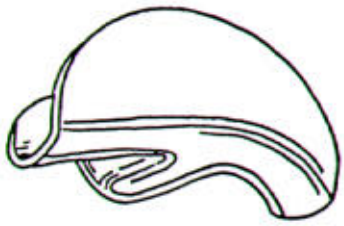
Just as the remedy for the fist-clencher was to create a situation in which her fingers couldn't curl, the remedy for the jaw-clencher is to prevent the back teeth from touching each other or from *touching objects that are sandwiched between them* (like the splint). **Essentially, an 'air-space' should exist between the upper and lower teeth when not chewing.**

Remember how to feel for the temporalis muscle? It is difficult to sense the bulging in and out of the temporalis without biting down on something with the back molars (like the pencil). Now place the pencil between your front teeth (so it sticks straight out) and bite on it while feeling your temporalis.

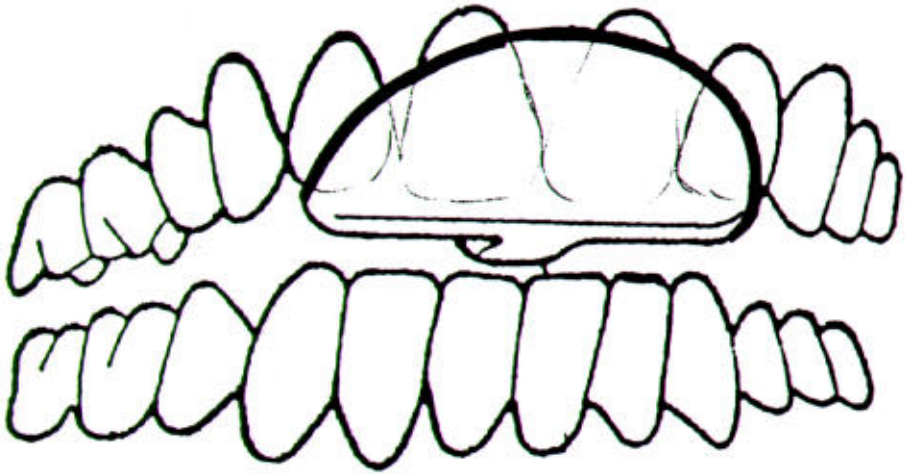
Does it bulge out less, or at all? The contraction is minimal when your back teeth are kept apart and not biting something! What if you could figure out a way to keep the pencil attached to your front teeth while you were asleep and dreaming and during stressful events during the day? Even though you would look ridiculous, your temporalis muscles would have time to relax, allowing their dysfunctional state to subside and headaches to resolve.

This is, essentially, the thought process that I went through. I had been wearing a TMJ (flat-plane) splint for five years, with no resolution of my headaches. I was making other people wear one, so I felt guilty if I didn't, too. At this point I realized that I was wasting my time and my patients' money on the traditional TMJ splint. My goal was to design an appliance that would significantly decrease muscle activity enough to rid me of my headaches.

Finally, in the summer of 1989, I designed the ***Migranex*** *tension prevention system*. The *Migranex* system consists of two mouthpieces, one for day, and one for night.

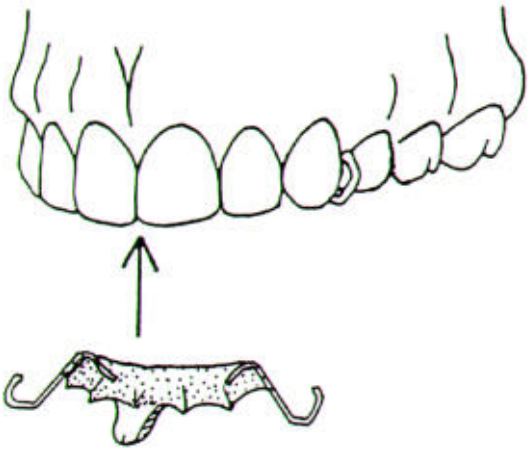


The *Migranex* appliance for nighttime (while sleeping)



The nighttime *Migranex* appliance inhibits the severe intensity of temporalis muscle contractions while dreaming.

The *Migranex* appliance for daytime (except for when eating)



The daytime *Migranex* appliance prevents casual daytime temporalis contractions (clenching). Daytime clenching activity irritates the myofascial dysfunction that had been developed during sleep. The daytime appliance would not be effective at night.

The *Migranex* appliances keep the teeth discluded ('disclude' means to separate, while the term 'occlude' means to meet or bring together) while sleeping and during stressful daytime events. Dentistry has been trying to influence muscle activity by controlling the occlusion (the bite). ***The occluding of the teeth, however, is already a dysfunctional act when not chewing***. The Migranex system keeps the teeth from touching each other, which prevents temporalis muscle over-activity and the resultant headaches! **The first morning after wearing the *Migranex* appliance, I awoke without a headache!**

The first *Migranex* appliance I made was very bulky and awkward. I wore it only at night. I was single, so it didn't matter if I had a Frisbee in my mouth, as long as I didn't have a headache. What I had designed was anti-dentistry. All of my training had been focused on the extreme importance of 'the bite' and how it affected everything else. *I was now suggesting not only that the bite was not so important, but also that biting was not normal to begin with (when not chewing).* I kept this idea pretty much to myself, thinking that the 'dental god' might strike me down for such sacrilege.

Soon after, I began dating my wife. Like the rest of us headache sufferers, she put on a pretty good act for a while. Little did I know that most of the time, just before our dates, she would take all the pain medications she could stand (not because I wasn't good looking or anything...). The first time I met one of her brothers, he asked her, quite casually, "Hey Kath, how's the headaches?" "Oh, I'm doing fine...." I could almost see it written on her face, "Shut up, you idiot, do you want him to *know*?!" I don't think a girl wants a guy to know that she has a headache before they get married!

Later, after extensive questioning, I discovered her long history of migraines. While growing up, it was not unusual for her to miss a family function, because of one of her headaches. It had become part of her, and her family practically expected it. She told me that the only thing which

helped a little bit was a drug called Fiorinal. When I looked it up, I found that *"Fiorinal is indicated for the relief of the symptom complex of tension (or muscle contraction) headache."* Wow! Tension headache! I thought maybe I could help her.

More than anyone else, I think my wife is responsible for the comfortable, current *Migranex* designs. I had been satisfied with my original bulky (yet effective) version, but Kathleen wanted something comfortable to wear at night that would prevent her headaches, and at the same time, something she could wear in public during stressful daytime occasions without embarrassment. Eventually, with her encouragement, I came up with *two* designs that were just right: a daytime appliance that was hidden from view and didn't make speech difficult, and a nighttime appliance that was comfortable to wear and prevented her headaches...maybe that's why she married me.

"My husband had been out of work for six months because of his migraines. We had seen everyone who was supposed to be "the best" in the south, but with no luck. I read about the Headache Prevention Institute and contacted them. Now, thanks to the Migranex system, my husband comes home from work smiling and plays with the kids...without a headache!"

Kim Reid, Selma, AL

Chapter 6

HOW DOES IT WORK?

The *Migranex* tension prevention system takes advantage of a protective reflex which prevents the temporalis muscles from contracting with intensity. Here are some examples of this protective reflex. Let's say you've just taken a candy bar out of the freezer. How do you know if it's too hard to eat? Easy, you bite on it with your front teeth. If it's so hard that your lower front teeth can barely make a dent in it without hurting, you know it needs to thaw out a bit. What if you're really hungry, however, and just can't wait any longer? Simple, just use your back molars and start crushing away! How about when you're eating carrots? You can nibble on the skinny ones with your front teeth, but the big fat ones need to go between your back teeth in order to break off a piece because it would hurt to use your front teeth. Or imagine you're having a bowl of thick'n'chunky beef stew. If you accidentally bite the spoon with your lower front teeth...yeow!...You instantly open your mouth. What if there is a piece of bone in the stew? Unfortunately, you may discover it by chewing on it with your back teeth and splitting a molar in half!

Here's what's happening. Your lower front teeth (called incisors) are designed to warn you that what you're about to eat may be too hard to chew on. Whenever the lower incisors are put under moderate to severe pressure, they signal the temporalis muscles to relax before pain and damage can happen to them. This is called the *jaw-opening-reflex*. It is designed to prevent you from putting something too hard into your mouth that may be damaging to your back molar teeth. The back molars, on the other hand, do practically the opposite. Whenever something comes in contact with them (like frozen-solid Snickers Bars, a piece of bone, or TMJ splints), the back molars signal the jaw-closing muscles to bite down hard because they figure, since there's something between them, it must be time to chew!

The *Migranex* appliances take advantage of the jaw-opening reflex by only allowing contact to be made on only one or two of the lower front teeth (incisors), and never allowing any of the back teeth (or canine teeth) to touch. Thus, when the mouth is being closed, a lower incisor will touch

the *Migranex* appliance, signaling the temporalis muscles to relax! **Of course, the Migranex appliance cannot be worn when actual eating and chewing are taking place.**

We tension headache and common migraine sufferers have developed a habit of pressing some or all of our teeth together when we are concentrating on something. We may squeeze our teeth together just a little bit or go for a full- on clench. Research has shown that we usually have absolutely no awareness of our habit. No one else is aware that we're doing anything abnormal because our clenching (whatever the degree) is a silent and motionless act. Wearing the daytime appliance for a month or so (except when chewing) allows us to have a more intimate awareness of our habit and keeps us from clenching during the day. Intense clenching during sleep, however, especially while dreaming, is impossible to stop (without heavy doses of medication), so we continue to wear the appliance at night. I find myself biting on my nighttime appliance when I wake up; **however, I don't have a headache because the *Migranex* tension prevention system inhibits the intensity of clenching, thus preventing the headache**. It's during certain stressful parts of the day (like during scarey movies, driving, balancing your checkbook, etc.) and especially at night, when patients might be clenching or touching their teeth, that the *Migranex* appliance is worn. Essentially, the *Migranex* appliance is a simple habit breaking device for daytime, and prevents the sleep disorder of intense clenching at night.

During the research and development of the *Migranex* system, we did an electro-myo-graph (EMG) study of the temporalis muscle. An EMG records the intensity of a muscle contraction by measuring the electrical activity through the muscle during the contraction. We wanted to know how the maximum clenching intensity of the temporalis would be affected by the *Migranex* appliance as compared to using a TMJ appliance.

Twenty-two patients who woke up with headaches were selected. Maximum clenching activity of the temporalis was recorded on each patient by placing the EMG electrode pads on the patient's temporalis muscle and having the patient clench his/her teeth as hard as he/she could. All of the patients were then fitted with a *Migranex* appliance and asked to clench into it as hard as they could. On average, the patient's muscle contraction was reduced to **one-third (33%)** of maximum! Each patient was then fitted with the TMJ flat-plane splint and asked to clench into the splint as hard as possible. On average, patients were able to clench at **104%** of maximum! This means headache patients who have myofascial pain dysfunction of the temporalis can actually *intensify* their condition when using the traditional TMJ splint!

What if you believe thay your headaches are different and are caused by a sinus condition or some food allergy and are not related to muscle contraction?...KEEP READING.

"At 82 years old, I'd been having constant headaches and migraines for more years than I'd like to remember. It was absolutely marvelous to find relief after just two weeks of using the *Migranex* **tension prevention system. I promised myself I'd give Dr. Boyd a big hug when I saw him, but since I already paid him, I figured we're even!"**

Edith Pratt, Escondido, CA

Chapter 7

THE SYNDROME

There appears to be a particular similarity of symptoms in the patients treated at the Headache Prevention Institute which we like to call *chronic clenching syndrome* (CCS). A syndrome is a group of symptoms (complaints) which, when taken individually, don't tell you much, but as a group can help to diagnose a certain condition.

Typically, CCS patients wake up with a headache. Most of the time the headache is focused in the temporal region and often extends to the forehead. Occasionally, the headache comes from the back of the neck, at the base of the skull (some patients get only this kind, which I'll explain later). They may have visited a chiropractor several times, with limited improvement. In addition to their headaches, CCS patients typically suffer from other symptoms. Their teeth are sensitive to cold and they occasionally experience 'phantom' toothaches (their dentist cannot find a reason for the pain). Many have experienced episodes at a dental office in which a tooth wouldn't get numb after several injections. Their necks are stiff and sore. Their ears sometimes itch, tingle, ring, or feel stuffy, plugged, or clogged. Some patients are constantly trying to clean their ears, or at least they're sticking something into their ears, just to scratch. Their jaws may be stiff and sore, and fatigue easily after a chewy meal. Some patients have recurring 'sinus' headaches, although their physicians have assured them that their sinuses are within normal limits.

TOOTHACHES AND SENSITIVITY

When I was in dental school, students practiced doing novocaine injections on each other. Unlike most everybody else, I never seemed to get very numb when I was the target for the lower molar teeth. In fact, I've had only one filling done on a lower back molar as an adult, and that was performed by a fellow dental student. I remember being able to sense the drilling, even though I was not supposed to. I thought, "Well, no wonder people get the creeps when you drill on them, if it feels like this!" The typical chronic headache patient may have few fond memories of dental treatment.

One of the more frequent ways chronic clenching syndrome (CCS) can be diagnosed is when a patient goes to their dentist with a toothache. Typically, the tooth is very sensitive to cold; however, the patient cannot always pinpoint the exact tooth. Instead, the patient will point through their cheek, instead of directly on a specific tooth. The patient is convinced there are 'cavities' due to several toothaches, usually on the same side, some on top, some on the bottom. An x-ray rarely shows any need for fillings or crowns, and the teeth look normal. I'm afraid to guess how many fillings, crowns, and root canals have been done unnecessarily by dentists because the patient requested something be done, even though no reason for the pain could be found. My mother-in-law is a good example. Before I knew her, she had been complaining, for over a year, of a toothache located in an upper, back molar. First, a filling was done. Later, a crown (sometimes called a cap) was placed over the tooth. When she still had a toothache, a root canal was done. Her tooth actually hurt more after the root canal was done, so the tooth was extracted. Guess what? When I met her, she told me of this weird toothache she was *still having*. (Ever notice that you tell a dentist your worst dental nightmare when you first meet him?) We were in her living room at the time, so I asked her to open up and let me peek. I said to her, "Hey, there's no tooth in there!" Then she told me her horror story and concluded that some part of the tooth must have been left behind after the extraction. I announced that I'd like to do a little test on her. I put my finger on the side of her face and gently pushed under her cheekbone. She hit the roof. All that time, it had been a painful jaw muscle (the one I had just pushed on) giving her all the problems, a result of clenching!

What's going on? Teeth are not designed to be temperature sensors. If they were, nobody would ever get a pizza burn on the roof of their mouth! The teeth would touch the hot cheese and warn you to stop. **Teeth do sense temperature when they are in distress, however**. For example, if decay is deep enough into a tooth, the nerve can easily sense temperatures and acidic foods while

eating. This type of decay is easily detected by the dentist. Although I never had any tooth decay, I used to have to drink icy drinks out of a straw and keep my cheeks sucked in a little to protect my teeth from hurting from the cold. So why do they hurt? Here's the deal. The intense pressure and compaction that an individual tooth experiences from clenching is tremendous. The root of each tooth is coated with a shock-absorbing nerve and ligament liner that becomes strained and bruised. This is very distressing to the teeth and they respond by being temperature sensitive. They are trying to tell you something is wrong, even though an x-ray of that tooth will look normal. To demonstrate, imagine grabbing a molar with a pair of pliers and twisting the tooth from side to side for a few minutes. Hours later, that tooth would still be aching and sensitive to cold. This is exactly what happens when intense clenching occurs. Instead of the pliers applying the pressure, an opposing tooth is applying the pressure. Of course, it's the muscle that is really supplying the force. This is why many patients feel that they have two toothaches. It takes a lower tooth to push on an upper tooth, so sometimes *both hurt*. Typically, these patients have been having headaches, simultaneously, with their toothaches, but never make the connection.

STIFF AND SORE NECK

What does clenching have to do with a stiff and sore neck? Muscles generally work in teams. It's difficult to have one muscle (like the temporalis) tighten up without having muscles from the supporting 'team' tighten also. When a patient's jaws are squeezed together, the neck muscles that support the entire skull assume a tightened posture at the same time. These muscles are primarily located in the back of the neck; therefore, the habitual intense jaw-clencher practically always experiences a stiff and sore neck.

HEADACHE AT THE BACK OF THE NECK

Some patients' headaches originate primarily from the back of their necks. There is a certain type of jaw-clenching activity that particularly involves and engages these neck muscles. Instead of pressing the back teeth together, patients with these symptoms will have their lower jaw positioned slightly forward, pressing the lower front teeth into the back side of the upper front teeth. This type of activity doesn't fatigue the temporalis as much because the back teeth are not squeezed together, yet still puts a tremendous strain on the neck muscles. Why? The neck muscles are trying to pull the head back to keep it erect because the forward jaw-thrusting makes the head want to tilt forward. The constant strain on the neck muscles results in the headache felt at the back of the neck radiating up the back of the skull.

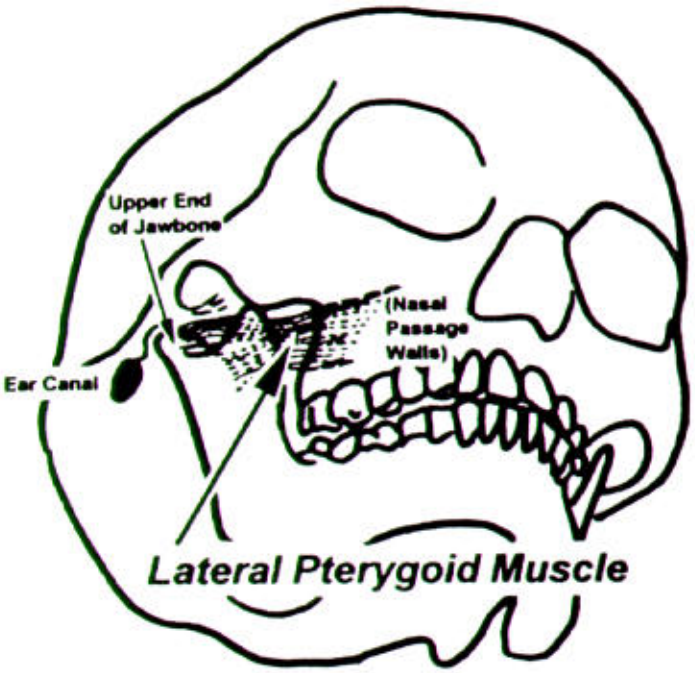
UNSUCCESSFUL CHIROPRACTIC CARE

The clenching patient with chronic temporal tension headaches or back of the neck headaches is the chiropractor's worst nightmare. My chiropractor assured me that he could get rid of my headaches. He had shown me an x-ray of my neck and pointed out how my neck bones were lining up to form a straight line, instead of the curve that they were supposed to be in. Through chiropractic adjustments, he attempted to realign my neck bones to regain the proper curve. This should, I was told, relieve me of my headaches. Since I was actually there to have him fix my lower back (which I periodically mess up), I figured what the heck, as long as I'm coming here, go ahead and take a crack at it (sorry). After a few visits, my back was good as new, but my headaches hadn't changed. I went twice a week, and each time I needed the same adjustment as before, as though nothing had been accomplished. Maybe by now you've figured out what was happening. I'd go home from my visit feeling pretty good, but during the night, I'd clench my jaws together, which would re-establish my headache. This would tighten my neck muscles and pull my neck bones back into a straight line. My clenching habit kept goofing up everything the chiropractor had just done!

SENSITIVE OR RINGING EARS

I remember going to the ear doctor during the time when I was having amazing headaches. I was concerned that there was blood on the Q-tip after I had cleaned my ears. "A-ha!" I figured. "This must have something to do with my headaches!" The ear doctor looked into my ear and asked me, "What are you doing in there? There's a scab deep in your ear canal!" I told him that something had been bugging me deep in my ear, and I had been trying to clean it out. He announced that I had rubbed right through the skin.

O.k., so how come our ears feel so weird? Actually, this one is easy. Put your little finger in your ear while opening and closing your mouth. Now clench you teeth together. You can feel a lot of action in there! The over-activity of your jaw makes your ear canal extra-sensitive. In many cases excess wax is produced, as if some little bug were in your ear canal, and your body was trying to protect itself. Another reason for sensitive ears may be a dysfunctional muscle called the lateral pterygoid (tare-a-goid). The lateral pterygoid basically moves your jaw from side to side and/or pulls it forward, whereas, the temporalis closes your jaw. One end of the lateral pterygoid attaches itself to the jaw bone way up next to your ear.



When the lateral pterygoid is dysfunctional, pressure and swelling occur in the jaw joint space, which is directly adjacent to the inner ear, where hearing takes place. This swelling can sometimes cause a ringing sensation, called *tinnitus*. How does the lateral pterygoid become dysfunctional, you ask? Simple. By over-doing its normal job. Just as the temporalis becomes dysfunctional by closing the jaw too much and/or too hard, the lateral pterygoid becomes dysfunctional by pulling the jaw to one side (while your teeth are together), too much and/or too hard. Clenching your teeth on only one side requires the temporalis and lateral pterygoid to work at the same time. The temporalis is closing your jaw enough so that your teeth can touch, while one of the lateral pterygoids is pulling your jaw to the side. This is called a unilateral or one-sided clench. When clenching occurs from side-to-side-to-side, it is called grinding (or bruxing). As the lateral pterygoid becomes dysfunctional from all this over-activity, the swelling that occurs in the jaw joint space pushes on parts of your inner ear (they are right next to each other), and this is where

hearing and balance take place. So when the lateral pterygoid is dysfunctional, it is not unusual for patients to have a ringing in their ears or to feel dizzy.

JAW JOINT PAIN

With all this talk about swelling of the jaw joint space, it must be obvious why the jaw joint becomes tender. The jaw joint is designed to deal with the forces and strains that are put upon it *during* ***normal*** *chewing*; however, the intense strain put on the jaw joint during unilateral clenching is very damaging. Given enough time, the strain from unilateral clenching causes such damage that even constant rest can not heal the joint. In fact, at the Headache Prevention Institute, we have the patient wear a *Migranex* appliance for two to four weeks. If their headaches and jaw joints have not shown significant improvement (less painful and considerably less tender), I immediately refer them to an oral surgeon to have their jaw joints evaluated. This occurs about 10% of the time.

CLENCHING VS. GRINDING

If you simply had your teeth pressed together, and neither lateral pterygoid was working, you'd be clenching your teeth; but, if your mouth was closed just enough so that your teeth could touch (a function of the temporalis), and each lateral pterygoid started working, alternately pulling your jaw to the left and then to the right, you'd be grinding your teeth (a right and left motion while the teeth are touching). *Clenching* the teeth and *grinding* the teeth are two separate activities. People who exclusively grind their teeth (and don't clench), rarely get headaches. In order to grind your teeth, the temporalis must *relax* enough to let the jaw move around so that the teeth aren't locked together, but must contract *slightly* to keep the teeth together. The temporalis is relaxed enough to keep it from hurting, but it still becomes fatigued, which is important to remember for later in the book. Some people do a little of both. After a clenching episode, they'll have a headache. If they've been grinding only, however, they won't have a headache. Unfortunately, dentistry seems to combine the terms 'clenching' and 'grinding', as though they were interchangeable. They're not. If a patient reports that she is having headaches, and a dentist sees that the patient grinds her teeth (the teeth will have tell-tale wear spots on them), the dentist may mistakenly assume that the grinding causes the headaches. Then he attempts to prevent the grinding with the traditional splint, believing that the headaches will be relieved. **This gets him nowhere because it's the clenching that causes the headaches**.

Medicine and dentistry have not acknowledged that clenching and grinding are completely different and separate activities and, therefore, need to be addressed differently and separately! I'm convinced that this lack of acknowledgement has kept headache and jaw dysfunction *prevention* research at a standstill. Treating and preventing grinding of the teeth is a piece of cake, but it has little to do with headaches. Preventing clenching is a whole different matter, requiring a totally different approach (which is what I'm doing).

The *Migranex* system simply provides an 'air space' between the teeth and keeps them from touching ***when they're not supposed to be touching***. In other words, the *Migranex* system prevents the temporalis and lateral pterygoid muscles from contracting when they're not supposed to be contracting. By doing so, the myofascial dysfunction of the temporalis' and lateral pterygoids is prevented, thereby preventing headaches, toothaches, neck pain, ear conditions, and jaw pain.

No wonder headache sufferers are accused of being hypochondriacs! They visit neurologists for headaches, dentists for tooth and jaw aches, chiropractors and P.T.'s for their stiff and sore necks, and E.N.T.'s for their ringing, itchy ears.

But you've got *sinus* headaches? No problem, let's talk about that in the next chapter.

"Today I am free of throbbing head pain, and a painfully stiff neck (I can now turn my head, not my body, while backing my vehicle out of the garage). No more Imitrex shots in the wee hours of the morning. My eyes are not at half-mast (due to pain and medication). I now have energy, I can excercise, and I feel like a new person!"

Suzanne Hubbard, Clarkston, MI

Chapter 8

SOLVING THE SINUSES

Well, now that we've talked about the lateral pterygoid, I might as well give you the rest of its story. Some might think this is complicated stuff, but I hope to make it as simple as it really is. Ready? Remember, we said that one end of the lateral pterygoid attaches to the top end of the jaw bone. The other end attaches to the walls of the nasal passages. I've mentioned earlier that the lateral pterygoid moves your jaw from side to side. Actually, you have two lateral pterygoids: a right one, and a left one. The lateral pterygoid on the right pulls your jaw to the left, and the one on the left pulls your jaw to the right.

When your temporalis closes your mouth enough so that your teeth can touch, and then you move your jaw over to the left a bit and hold it there, you'd be using the right lateral pterygoid to do so. Essentially, you'd be clenching your teeth on the left side. If you were to hold that position long enough, guess what? The right lateral pterygoid becomes dysfunctional. Where, then would it hurt? At one or both ends of the muscle, where it attaches at the jaw joint space, or at the other end, along the nasal passages. Frequently, when a lateral pterygoid muscle becomes dysfunctional, it will cause pressure and pain in and around the nasal passages and sinuses, and is called a ***sinus headache***. Not only does the patient feel pain and pressure from the sinuses, but also a dysfunctional lateral pterygoid will cause the sinuses to produce a discharge (a runny or stuffy nose). This patient is in a real fix. A visit to the sinus specialist for a special x-ray reveals nothing particularly wrong with their sinuses. Antibiotic therapy rarely resolves the condition. The patient is convinced, however, that there is definitely a problem with the sinuses. The patient maintains the conviction by observing that they do get some relief from sinus headache medications. Let's take a good look at sinus headache remedies. Sinus headache remedies contain high dosages of analgesic (pain medication) for muscle pain and decongestants for a stuffy, runny nose, the two symptoms that result from a dysfunctional lateral pterygoid!

Fortunately, the *Migranex* system also inhibits the activity of the lateral pterygoid muscles, so sinus headaches are relieved!

Chapter 9

SETTING IT OFF

FOOD ALLERGIES

So red wine gives you a headache? Or is it chocolate? Perhaps it's a combination of things. Most of us have tried to figure out just what it was that caused our last headache. Maybe you've been advised to keep a log of what you eat and drink to help you figure out what it is that gives you headaches.

Now let's look at it a different way. Perhaps there are certain things that set off a painful response from the temporalis because it is in its dysfunctional state. A good way to picture this is to imagine that you are a dysfunctional temporalis muscle, and we're going to assign you a personality. You've been in a contracted state most of the time, and you are becoming very irritable. You're tired, fatigued and stressed out. Since you are tight and contracted, your blood supply is being pinched off. You're low on oxygen, so you feel suffocated (which is really starting to make you anxious). To top it off, all of your nighttime hyperactivity and decreased blood flow has allowed all of your waste products to build up around you and now you're wallowing in it...YUK! You're thinking, "Hey, I'm in a bad mood, so don't start with me!" So what happens now? The person you're attached to drinks some red wine. In the little bit of fresh blood supply you do get, you find these weird chemical impurities that are found in red wine, not to mention the alcohol itself! Under normal circumstances, when you're not in such a dysfunctional state, you could overlook this and still be able to function normally. In fact, all of the other muscles around the body can handle it just fine, but not you. You're already in a bad mood, and this red wine stuff is the last straw! So what do you do? You get cranky. You start hurting. "Hey! What's going on out there?! Who's putting all these strange impurities in my blood supply? Boy, that really makes me mad!"

Get the idea? So you figure you must be allergic to red wine. Or was it the chocolate? Perhaps it's too much sugar. Chinese food. Spicy things. Dairy products. You name it.

Once you understand what kind of condition your temporalis muscle is in, the way it reacts to impurities in its blood supply is not such a mystery. Now that my temporalis is not overly fatigued, I'm able to eat and drink whatever I want, and I don't get a headache. For the temporalis muscle that is in a dysfunctional state, the smallest thing can set it off. Whatever it is that stresses you out, stresses out your temporalis, and presto, instant headache. Stress could be anything, from something you ate, to the relationship you're in, **to the stress the female body goes through during a monthly period**. No wonder we headache sufferers have a whole list of things that give us headaches!

MENSTRUATION

Menstruation is a particularly good example. For some women, menstruation is a physiologically stressful event on their body. Many women, who generally don't get headaches through the month, have headaches and/or migraines before, during, or after menstruation. They're told it's hormones, a *menstrual migraine*, so hang in there. And if these headaches appear during pregnancy? "No pain medication for you, you're pregnant."

But something in addition to hormones may be at work. Studies have estimated that as much as 40% of the population are prone to intense clenching or grinding of their teeth at some time or another. Remember, teeth grinding is entirely different than teeth clenching. Grinding is a dynamic activity, and the jaw keeps moving, instead of holding still while clenching. Jaw muscles certainly get tired and fatigued from grinding, but rarely does the temporalis display any pain (headache) in the person who exclusively grinds her teeth. By the way, someone does not necessarily have to make grinding noises or have wear marks on her teeth to be considered a grinder. Teeth grinding may go entirely unnoticed. Let's assume now that a woman you know casually grinds her teeth from time to time, or clenches during sleep only mildly. She has no awareness that she does this, nor does anyone else. Her temporalis muscles are fatigued but not

hurting. Then, she begins her menstruation cycle. Her body experiences hormonal fluctuations that are natural, but physiogically stressful. Her casual grinding now changes. She stops moving her jaw around, no longer grinding but now intensely clenching, or the mild clenching now becomes intense. Her temporalis muscles are already fatigued, and now with the prolonged intense contraction of the temporalis... Poof! Instant headache. No one has seen or heard a difference in her behavior, she just started having headaches. Over two-thirds of our 'menstrual migraine' patients have had complete relief of their headaches with the *Migranex* system.

ACCIDENTS AND TRAUMA

The same sort of 'grinding becomes clenching' or 'clenching intensifies' thing can happen after a traumatic event, such as a car accident. The event doesn't have to be a physical trauma, either. It could be a move to a new city, an addition to or subtraction from your family, obtaining or losing a job, to name a few. These can all be considered traumatic events. Take automobile accidents, for example. Let's say two people are sitting in a car and get hit from behind, and it's not very hard, either. It's just enough for the car to need a little body work. The passenger is perfectly fine, while the driver starts getting terrible headaches. What's the difference? Perhaps the driver rarely or never had headaches before; but, by looking at her teeth, you see the tell-tale wear marks that she has had a history of grinding her teeth. Another possibility is that her teeth may look perfectly normal, but she has had a history of occasional headaches, prior to the accident. But not like now. Now she has intense headaches, all the time. The wear marks on her teeth, or her history of headaches, tell you that her muscles were sitting ducks for the headache supreme. All it took was some traumatic event to set off a clench-fest. Her passenger, who has no previous grinding habit, or history of headaches, seems to be doing just fine. Unfortunately for the driver, she may experience headaches for years to come. She may be told she has had some kind of semi-permanent brain or neck injury. If her clenching doesn't stop, neither will her headaches. Of course she starts believing that maybe she really did have some sort of terrible injury. She will go through endless doctor visits, physical therapy, chiropractic visits, and possibly surgery with little relief. Patients like these are told they will now have to endure their conditions and learn to live with them. Take your settlements and be on your way.

Be aware, that it *is* possible for injury to occur to the jaw joint (TMJ). Entire textbooks have been written on the treatment of such instances. Rarely will any type of mouth splint, by itself, cure the headache from true TMJ injury. Most patients with a jaw joint injury require specialized physical therapy and, occasionally, surgery.

Occasionally we see a patient who has been in an accident and has been through months of various treatments for headaches. All of the treatment had been directed at the jaw joint, the doctors assuming that a damaged jaw joint was the cause of the headaches. They'll have tried physical therapy, mouth splints, chiropractic care, and medications, but nothing to prevent chronic clenching, *the perpetuating cause of the headaches*. Some patients have even undergone jaw joint surgery because the doctors had assumed that a TMJ injury *must* be the cause of the headaches, since nothing else was working. Right after the surgery, the headaches stop, but four to six weeks later, the headaches come back. This makes sense...would you clench your teeth just after jaw joint surgery? Not me, ouch! I'd wait until my surgery healed a bit.

Typically, these patients' headaches will stop within several weeks of using the *Migranex* system. Ideally, they'll continue with their physical therapy and chiropractic care. As the *Migranex* system suppress the intense muscle activity, the remaining symptoms (injured neck and shoulders, for example) can be successfully treated by the physical therapist and chiropractor.

WEEKENDS AND HOLIDAYS

My wife recalled that her headaches were actually worse on weekends and on holidays. Boy, was I relieved that I wasn't the only one with such symptoms! One neurologist suggested that she was probably pulling the covers up over her eyes to avoid the light when she tried to sleep in on weekends. He said this created a build-up of carbon dioxide in the air she was breathing, which intensified her headache. She assured me that that couldn't be the case because she always slept in a room with black-out shades, so she never could tell if the sun was up or not. My wife and I shared another curious feature of our headache histories. A nap in the middle of the day seemed to help our headaches, but sleeping all night always worsened them, especially when we'd sleep in.

Actually, the explanation for this is simple. Sleep is comprised of several different stages. Of particular interest are the several hours just before waking, when dreaming takes place. This is when teeth grinding and clenching commonly occur. Headache sufferers are clenching their teeth during their dreams. When they awake, the temporalis muscles are fatigued and painful...morning headache. If they decide to stay in bed longer, they lengthen their total clenching time and, therefore, the headache is worse.

Taking a nap during the middle of the day for some seems to relieve the headache. A nap provides continuous muscle relaxation, with little or no clenching time, therefore, the headache sometimes subsides. However, the longer the nap, the more likely clenching will occur with the accompanying headache!

The medical community is aware that some type of activity during sleep is causing morning headaches, but their remedy is to medicate the pain. When I attended an *orofacial pain* (jaw and face pain) conference in February of 1994, a question was asked of a prominent neurologist on what should be done for chronic morning headache sufferers. His reply? Have your patients set their alarms earlier and earlier, until they determine when they can awaken themselves before the headache starts. Once they've done that, take lots of aspirin and go back to bed!

"I have had migraines for thirty years. I have gone to many "experts" and tried all the recommended drugs. Sometimes the side effects were worse than the migraines. The thought of having headaches the rest of my life was despairing. Since visiting the Headache Prevention Institute, I had not had a migraine. I feel like a new person. Thank you for my miracle!"

Sharon Goralewski, Rochester Hills, MI

Chapter 10

WRAPPING IT UP

The Headache Prevention Institute approaches headaches and migraine pain from an angle that no other health care provider has before. Everything we do is different. We are highly specialized in that we look for and treat one condition only: *spindular dysfunction of the temporalis muscle* (SDT), a neuromuscular sleep disorder. It is an extraordinairily common condition which typically goes undiagnosed and therefore, unprevented. We treat and and prevent SDT without drugs or surgery. Our results are unprecedented. Hundreds of patients who had been told that they would just have to live with their headaches and migraines are now pain free and are in control of their lives. It's non-surgical, requires no drugs, has no harmful side effects, and requires no multiple visits to the doctor's office.

The *Migranex* system provides a way for headache sufferers to live practically headache free. We don't want to change medicine, dentistry, or any other health care field, *but simply add to it*. The

doctors and staff at the Headache Prevention Institute are all ex-headache sufferers. We have a particular enthusiasm for headache prevention because we know how miserable headaches can be, and we'd like to see fewer of them around. *Headaches are **not** normal. They're **not** supposed to be part of everyday life. They **don't** have to be a mystery.*

So what do you do now? The consultation and examination to determine whether or not you are a candidate for *Migranex* therapy is complimentary. If you choose to undergo treatment and are not satisfied with your results, ***there is no charge***. You probably think that there is some kind of catch, but there isn't. We run the Headache Prevention Institute like a business, not like a *practice.* When's the last time you paid for something that you really wanted, but when you took it home, you weren't satisfied? Since you weren't satisfied, you didn't pay for it!

Our product is headache and migraine pain prevention. If our clients (patients) do not receive the product that they requested (headache prevention) to their satisfaction, they don't pay anything. (The Chicago Bulls don't pay Michael Jordan to practice, he's paid to make the shot; yet we pay our doctors to practice, even if we don't get better.) At the Headache Prevention Institute, we take the risk, not you.

Remember! Before there were antibiotics, what we would now consider a simple infection would cause terrible pain and misery. Maybe some day we'll look back and find it strange that people actually had to live with chronic headaches with little relief and no prevention!

"As a registered pharmacist, I figured I had seen every specialist there was to see, or taken every medication possible. The *Migranex* **system made so much sense, I'm sure it will one day soon be available everywhere, because it works for me!"**

Alan Medoff, R.PH., Ramona, CA

Chapter 11

ANY QUESTIONS?

"What is the success rate?"

In our original study, sixty-nine patients who complained of daily headache and occasional migraine pain were treated with the *Migranex* tension prevention system. All of the patients were in otherwise good health. After four weeks of nightly *Migranex* use, 90% of the patients had ceased having morning headaches and occasional migraine pain. Since then, our success rate overall has changed and is now closer to 70%. We now see patients who have literally been all over the country seeking headache and migraine relief, and they are very challenging. Some of those do not have success with the *Migranex* system. They have been to the finest neurologists in the world, and the cause of their condition remains a puzzle. However, even with those cases factored in, we continue to have a high rate of success (or we'd be out of business by now!).

"What do teeth have to do with headaches and migraine pain?"

Actually, teeth have nothing to do with headaches and migraine pain. Let's not forget the simple definition of migraine: a headache so intense that it causes nausea and light and/or sound sensitivity. It doesn't matter what kind of teeth you have, or where your teeth are located, but it does matter what you do with the muscles that control your teeth (like clench).

Medical science has not yet figured out how to prevent common migraines, just how to medicate the attack. I don't believe the medical community understands how intensely headache/migraine sufferers use their temporalis muscles! Maybe it took someone who had tension headaches and common migraines, and had a background in muscle physiology and jaw dynamics, to figure it out.

Here's an example. I was visiting a clinical psychologist who specialized in biofeedback for patients who have tension headaches and common migraines. I was curious to know what my maximum clenching reading would be on his EMG (electro-myo-graph) machine. These machines are used to tell how tense a muscle is; that is, how much a muscle is contracting. My request was somewhat strange because bio-feedback is supposed to teach you to achieve the most relaxed state. After gluing the electrode pads to my temporalis muscle, I clenched as hard as I could, and the reading went off the scale. The doctor recalibrated his machine. I clenched as hard as I could, and again, off the scale. This happened once more before he could set the machine to accurately measure my clenching intensity. I asked the therapist if he suffered from chronic headaches and migraines. He didn't. Just for fun, I suggested we wire him up to see what his temporalis muscles were capable of. We left the machine at my last calibration setting for his first trial at maximum clenching. He couldn't get a reading! We recalibrated the machine to its original setting. This time we were able to record his maximal reading. We discovered that my temporalis muscles were three times more powerful than his. I was the Arnold Schwarzenegger of clenching! Here was a headache specialist who had no idea of what a headache patient's temporalis was capable of!

Here's another example. A research group set out to see if *normal* clenching could cause common migraines. Migraine patients were instructed to clench their teeth at one-third of their maximum ability for thirty minutes. The researchers assumed that this should be more than adequate to cause a migraine (if it were possible) because previous studies had shown that clenching activity was less than one-third of maximum during migraines. Therefore, they figured that one-third of maximum would be more than enough to cause a migraine. I've been suggesting that clenching occurs well before the migraine and is far more intense than one-third of maximum. The researchers advised the subjects that they would be allowed to take a break every ten minutes for a rest. To the researchers' surprise, most of the subjects breezed through the experiment, without stopping to rest, and no one got a migraine. What the researchers hadn't realized was that the subjects had been in 'training' for years! These were the All-Stars of clenching, and one-third of maximum didn't even tire them. What the researchers did prove then, was that migraines can be *prevented by limiting the intensity* clenching!

"Can the *Migranex* appliance stabilize the jaw joint and is it good for TMJ patients?"

Mouthpieces for TMJ patients are supposed to do three things: protect teeth *while grinding*, decrease strain and pressure in the joint *during clenching and grinding*, and decrease muscle activity. The *Migranex* system prevents teeth grinding by providing an air space between the teeth. Second, jaw joint strain occurs only when clenching or grinding occurs *on the side opposite the joint.* The *Migranex* appliance design provides for the least amount of joint strain possible by not allowing clenching or grinding on either side. Finally, the *Migranex* appliance decreases maximum temporalis muscle activity by 66 to 82 percent while the traditional TMJ splint actually increases muscle activity in some patients; thus a *Migranex* appliance is an ideal splint for TMJ patients.

"Do the teeth move?"

No. The way dentists and orthodontists move teeth is by applying a slow, constant pressure to the teeth, and the teeth then move away from the pressure source. The protective jaw muscle relaxing reflexes that the *Migranex* appliance activates prevents the amount of force necessary to move the lower front teeth when they contact the appliance.

Back molars, to maintain their positions, require regular chewing stimulation. For example, if a lower molar has been extracted, there is nothing for the upper molar to contact against during chewing, thus eliminating its normal regular stimulation. The upper molar, over several months, slowly drops down a little, or 'supra-erupts', looking for the lower opposing molar (which is gone) to chew against. Some dentists might quickly assume that supra-eruption of the back molars is possible with the *Migranex* system. However, **since it is impossible to use the *Migranex* system while eating**, the back teeth receive daily stimulation during normal chewing, so they ***never*** have a chance to supra-erupt.

However, there are situations where it ***seems*** as though teeth have moved following months of *Migranex* use. Patients have reported that as their headaches begin to taper off, they notice that their teeth don't meet the same way they used to. Their 'bite' has changed, and they naturally assume that their teeth must have moved. Here's what really happens. First, it is important to understand that the jaw bone is like a big, flexible horse-shoe that is merely suspended from your skull by a 'sling' of muscles. Similar to a garage door whose springs swing the door closed, the jaw muscles swing the jaw closed. These muscles are particularly powerful, and when they are in a dysfunctional state they are capable of 'bending' your jaw-bone ever so slightly, and are capable of holding the jaw bone within it's joint space in an unnatural position (which presents as headaches or TMJ). In this condition, the patient develops a familiar bite. Once the muscles are allowed to relax and become comfortable, the jaw-bone 'unbends', and the way the jaw-bone is suspended from your skull changes slightly, allowing the jaw to seat better into the joint space. The lower jaw actually assumes its natural shape and orientation, and its *arc of closure* changes. Just as the fit of the closed gararge door changes when the tension of the springs changes, so does the fit of the teeth change when the jaw closes after the tension of the muscles changes. The arc of closure is the path on which the muscles take the jaw during closure. Since the muscle tension is different, the path is different, and therefore, so is the final point of closure. Patients then notice changes in the way their teeth fit together. *It is important to remember that this is an improvement over the original condition and is a desired effect.* In traditional TMJ therapy and in *Migranex* therapy, once the patient's TMJ symptoms or headaches are gone, the dentist and/or the patient may want to modify the teeth so they fit to the patient's comfort.

"Why is it that I can feel a headache coming on and I'm certain that my teeth aren't touching?"

Remember pushing on your temporalis muscle and finding some spots that were more painful than others? Those painful spots are called *trigger points*. Here's how they are created: Within every muscle there are specialized muscle cell bundles called *spindle fibers* which extend the full length of the muscle. Spindle fibers are like individual rubber bands which your *sympathetic nervous system* has special control over. The sympathetic nervous system controls the reactions to fear and threat, like hair standing on end, pupils dilating, muscles tightening, cold sweat, etc.). The sympathetic nervous system adjusts the tension of the spindle fibers that sets the overall 'tone' of the muscle. When the spindle fibers are tightened, the overall length of the muscle is shortened. When the spindle fibers are relaxed, the muscle is more easily stretched and lengthened.

In some patients, the sympathetic nervous system works overtime and maintains several of the spindle fibers of the temporalis in a contracted state. Over a period of time, these fibers themselves become painful, and are called *trigger points*. When a stressful event occurs, the sympathetic nervous system over-reacts and begins to tighten the already fatigued and sore spindle fibers of the temporalis. The patient becomes aware of a general tightness over the scalp, followed by a headache. Ex-migraine patients who are now headache-free after wearing the *Migranex* system often wonder why their injectable drug, Imitrex, stopped their migraines. It is most likely that the Imitrex interrupts the sympathetically controlled spasming of the spindle fibers.

This is where the *Migranex* appliance comes in handy. Even though the back teeth aren't clenched, the lower front teeth will still tap on the appliance and activate the jaw-opening reflex. This causes the temporalis muscles to *relax* and counteracts the tightening of the spindle fibers!

By the way, it is also the presence of trigger points within the lateral pterygoid muscles (the muscles responsible for moving your jaw from side to side) that chronically bends the jaw bone. When the trigger points resolve, and the spindle fibers relax, the jaw bone 'unbends'. In addition, it is the trigger points within the lateral pterygoid muscle which present with 'sinus' pain.

"My mother had taken me to every specialist in Oklahoma...but when we booked a flight to the Headache Prevention Institute, I knew she was desperate (she'd never been on a plane before)! We arrived on a Friday afternoon and left Sunday morn-ing...without a headache! Words cannot express my gratitude."

Anita Clark, Tulsa, OK

"Dr. Boyd's analysis of the causes of persistent headaches is the most *logical and complete* formulation I have seen. The use of the *Migranex* **appliance to break the cycle of muscle spasm and subsequent pain is a simple, safe and effective way to alleviate often intrac-table headaches. While there are cer-tainly other factors operative in the causation of headaches, the use of the appliance would appear to be an excel-lent first choice in their treatment. Other approaches such as drugs, man-ipulation and acupuncture are time consuming, expensive and/or may have significant side effects, *while not addressing the basic problem*. Use of the *Migranex* appliance with adjunctive therapy of other modalities as needed would seem to be the ideal way to approach patients with chronic headaches."**

Carl Muchnick, M.D., Los Angeles, CA

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Dr. James P. Boyd
Director

Dr. Boyd had suffered from daily morning headaches and occasional migraine pain for twelve years. Through independent research and insight from his own condition, as well as training at the University of Southern California School of Dentistry's Myofascial Pain Clinic as senior resident, Dr. Boyd identified a primary cause for chronic tension headache and common migraine pain and developed a method of prevention. Dr. Boyd has received two United States patents and one international paten and has been featured on CNN Headline News, CBS and ABC News.

Dr. Boyd is the founder and director of the Headache Prevention Institute in Bloomfield Hills, Michigan. Unique in its field, the Headache Prevention Institute is dedicated to the diagnosis, treatment and prevention of a particular neuromuscular condition which has been shown to be a primary cause of the majority of headache and migraine symptoms. An additional industry first is that the Headache Prevention Institute does not accept a fee for treatment services unless the patient receives satisfactory relief from their headache and/or migraine pain.