CHAPTER 1
ENVISION YOUR VICTORY

Discipline is the bridge between goals and accomplishment.
—Jim Rohn

Whenever patients come for their first appointment at the TMJ & Sleep Therapy Centre of Northern Indiana, one of the first things we explore is the top three health concerns they want resolved—and winning over those problems is what's known as their "victory." Victories are the ideal outcomes patients want from treatment. For fifty-one-year-old Mary, those three problems, in her words, were heavy snoring, migraine headaches, and trouble falling asleep. But Mary wasn't ready to stop there—she was also chronically fatigued and frequently awoke with a dry mouth and extremely stiff

shoulders, so those were added to the "victories" her treatment would target.

Mary had already been diagnosed with obstructive sleep apnea (OSA) by a board-certified sleep physician, who recommended for treatment either a continuous positive airway pressure (CPAP) machine (I'll go into more detail about this in Chapter 8) or an oral appliance, which is a specific and customized mouthpiece that aids with obstructive breathing at night. If those two options were ineffective, then surgery would be considered. While CPAP is a very effective treatment, it comes with a number of drawbacks that may keep patients from using it regularly, so Mary elected to first try an oral appliance. That led her to my practice.

VICTORY

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When I refer to specialists, assume they are "board-certified" —doctors that have extensive time, training, and a certification examination process that solidifies their authority in that field.

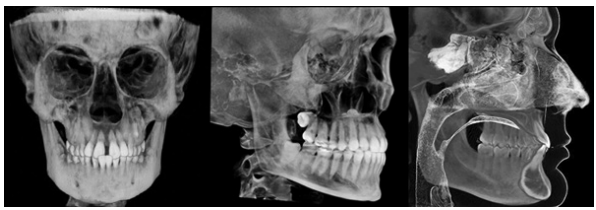
In reviewing Mary's medical history during her first visit, a number of other issues surfaced. She had high blood pressure, an under-producing thyroid, anxiety, chronic fatigue, poor circulation, chronic sinus problems, and memory lapses—and she had recently gained quite a bit of weight. During her pregnancies, she had suffered from preeclampsia, which is high blood pressure, along with elevated kidney protein and liver enzymes, among other symptoms. Lastly, she reported having a considerable amount of shoulder pain and arthritis in her neck. We often see patients with chronic pain like Mary's exhibit sleep-related bruxism or clenching and grinding of teeth at night. Their pain is very stimulating, which leads to the bruxism that can be quite painful and damaging to the teeth and TM joints.

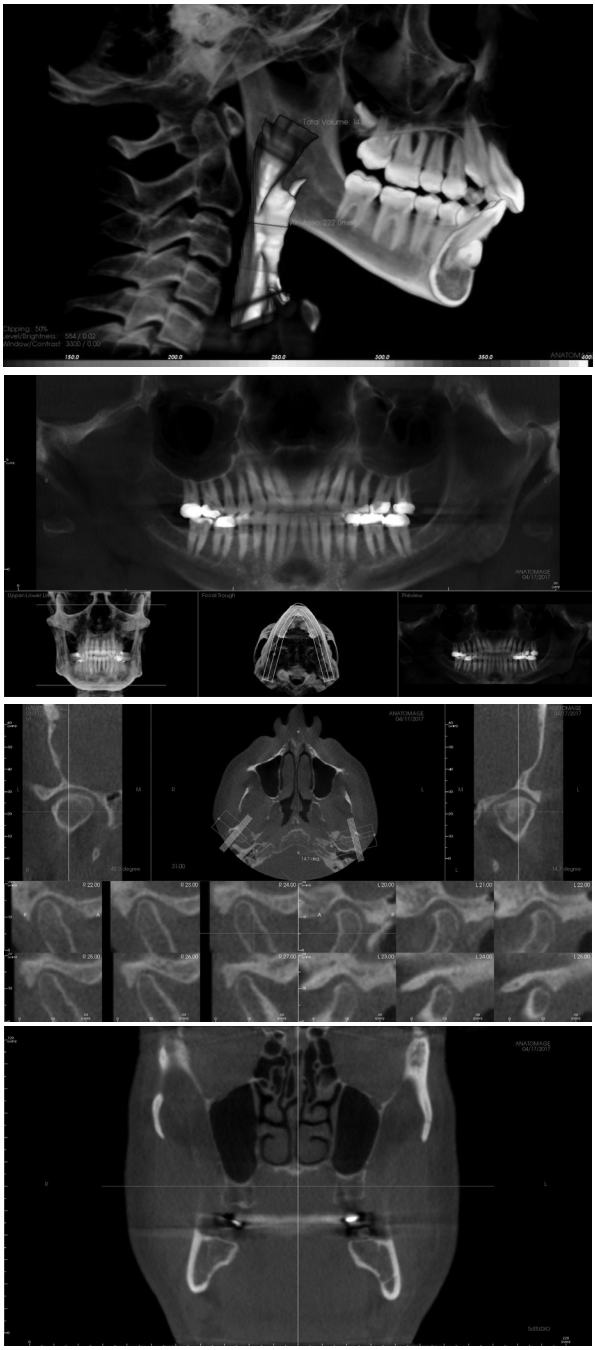
With so many health issues, it's perhaps not surprising that Mary was also depressed to the point of being under psychiatric care and taking several medications: four for anxiety, one for low thyroid, and one for chronic headaches. While Mary and her multiple issues may seem to make her an extremely challenging patient, she is an example of what I see every day in my practice.

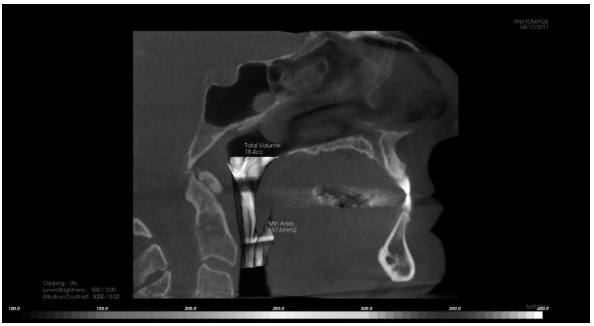
Her sleep apnea had been diagnosed as "mild" based on a score of 8.3 on what is known as an apnea hypopnea index (AHI) or respiratory event index (REI). AHI is used when referring to an in-lab sleep test, while REI is used when referring to a home sleep test. I will go into greater detail on sleep studies later in the book. Mary's score of 8.3 meant that

she was waking up and then going back to sleep more than eight times every hour during sleep. Her breathing would slow down or stop, which would wake up her brain to tell her body to start breathing again normally. Imagine what that kind of disrupted sleep does to a small child. If a child were awakened *eight times every hour* during a night of sleep, it would be pretty rough for everybody the next day. Adults are no different—they need sleep. Being disrupted constantly can wreak havoc on a person's health.

After reviewing Mary's history and discussing her victories, she underwent an evaluation to ensure that she was a good candidate for an oral appliance to treat her OSA. That evaluation included photos of her mouth and posture along with X-ray imaging of her maxilla and mandible and her airway from the tip of her nose down to her throat. The X-ray used was a cone beam computerized tomography (CBCT), which produces a three-dimensional (3-D) view of the associated structures. We use the industry's leading CBCT technology, i-CAT, which is manufactured by Imaging Sciences. It's a great tool for viewing the anatomy of the airway and the health of the temporomandibular joints (TM joint).







One of the challenges with Mary's treatment was that she had a small maxilla and mandible, which did not allow much room for her tongue. The tongue is a large muscle; only half of it is visible upon clinical evaluation, while the other half extends down the back of the throat. When the maxilla and mandible are narrow or pushed back, the result is limited room for the tongue. Mary's narrow features predisposed her to having an increase of a collapsing airway during the night when her body relaxed during sleep. And as her sleep test showed, her airway collapsed 8.3 times per hour, disrupting her sleep significantly. While her diagnosis was "mild" sleep apnea, it was apparent that her symptoms were far from mild.

Throughout the evaluation, Mary's victories were top of mind. By continually relating the plan for treatment back to those victories, there was a better chance that Mary would comply and follow through with every treatment aspect prescribed.

Since Mary's top victory was to do something about her frequent, heavy snoring, a symptom of OSA, the treatment

plan needed to address that. As I write this book, there are more than 115 FDA-approved appliances to treat OSA, so it was important to find the one best suited to her needs.

Again, Mary had a laundry list of health problems: high blood pressure, gastroesophageal reflux (GERD), anxiety, migraines, and even depression. These were serious symptoms that were associated with her "mild" case of OSA—symptoms often mistakenly not recognized as being related. When it comes to something as serious as sleep apnea, I frequently ask patients, "What's more important than breathing, and next to breathing, what's more important than sleep?" Breathing is crucial for good sleep. Treating OSA often helps to improve, if not solve, a lot of other medical problems the patient is experiencing. I was recently at a conference with twelve hundred physicians, and a question was posed: "Why is the single most important thing to life—breathing—the thing that is evaluated least by physicians?" Well, that's not the case in my practice. Breathing is what we look at first and foremost.

Given the commitment to our new patients, the initial evaluation is very detailed, and includes a close look at medical history. Treatment only moves forward when the patient is completely on board with the plan and understands the goals along the way—the patient must truly understand their condition and own their problem. And those goals involve treating the origin of the patient's problems. Not a day goes by that when we are done with our exam a patient asks me, "Why didn't anyone else ever tell me about this?" Here, they

are referring to what we discovered, learned, and diagnosed during their examination.

For Mary, the goal was to normalize her breathing, reduce her inflammation, prevent airway collapse at night, keep her breathing through her nose, and help her get quality sleep.

THERAPEUTIC VS. PALLIATIVE

Instead of just giving Mary medications to treat her symptoms and help make her comfortable, otherwise known as palliative care, her treatment plan was therapeutic in nature. It didn't involve just putting earplugs in her ears or her husband's ears to keep anyone from hearing the snore. It involved actually treating the source of her snoring—her nasal passages and unstable mandibular position.

Since Mary's nose was blocked and her mandible was collapsing back, she was getting less airflow down to her throat. Less air means a buildup of negative pressure, which causes the airway to collapse and leads to the vibrations that cause the sound of snoring. It's kind of like trying to sip a thick smoothie through a flimsy straw. Sucking on the straw with increased pressure causes it to collapse on itself greater. That's essentially what can happen when the body's muscles relax and the airway becomes flimsy and ultimately collapses.

So the solution for Mary involved stabilizing her mandible to keep it from sagging back when she relaxed during sleep. That was achieved with a 3-D-printed mandib-

ular advancement appliance, which was fitted to her upper and lower teeth. The appliance used was a Panthera D-SAD (digital sleep apnea device). It positioned her mandible in an orthopedically stable position that is proven to prevent airway collapsibility while she slept. That kept her tongue and soft palate (the tissue inside her mouth) from collapsing or sagging back during sleep, eliminating her snoring.

One of the great things about that particular appliance is its durability. Since the maxilla and mandible muscles are extremely powerful, they can create a lot of damage to the teeth when the patient clenches and grinds their teeth at night (which Mary did). Studies show that clenching and grinding during sleep is as much as five times stronger than while awake. During the day, a patient's proprioception, or awareness of their clenching forces, is controlled by their cortex (voluntary motor control). During sleep, that proprioceptive control goes to the cerebellum (the back of the brain that coordinates involuntary muscle function and activity), which allows for the production of up to five times greater force without the patient being aware of those increased forces. The Panthera D-SAD—which is made of medical-grade nylon—can withstand those forces. Yet it is extremely thin and comfortable, which made it easier for Mary to wear it nightly. It is currently the thinnest appliance in our field of practice.

Other solutions for Mary included using over-the-counter nasal spray along with Breathe Right nasal strips. Those strips adhered to her nose to open her nasal passages and

allowed her to breathe better through her nose. Dietary and lifestyle changes were also made to help five-foot-six Mary drastically reduce her weight from 190 lbs.

Again, treatment is therapeutic—most of the time. It involves digging in and addressing the source of the problem. However, sometimes treatment necessarily also involves palliative measures, or management of the symptoms instead of treating the cause. That would be the case if, for instance, someone has been in a traumatic accident and their body structures are broken, torn, or permanently damaged. Then we might only be able to manage their pain and sleep problems.

A TRUSTING RELATIONSHIP

Therapeutic treatment is ideal when rehabilitation of the problem will lead to a victory. We set expectations with our patients at their first appointment. That's when we can determine whether their treatment will be therapeutic or palliative.

We want to make sure the patient knows what to expect about their treatment and their outcomes, however, we take it slowly. With most patients, we don't attempt to explain every detail up front. In that initial visit, we only want to arm them with information. The saying "knowledge is power" is certainly true when it comes to TM joints and sleep breathing disorders (SBDs). Treatment goes beyond putting a piece of plastic in a patient's mouth and expecting it to resolve all

their problems. When we help them understand the need to be compliant (not just demand it of them), and help them see their progress along the way, they are more willing to participate in their own treatment.

But sometimes it takes a little extra explanation because many of my patients' symptoms have been around a long time and have been presented to several doctors with limited answers. For instance, when it came time to resolve Mary's headaches, I had to explain that her sleep apnea needed to be treated to resolve her head pain. Initially, she didn't understand the connection between the two, so further explanation was in order. "While sleeping," I explained, "with OSA, the body becomes deoxygenated. A classic symptom of that is morning headaches. That's because the body is more or less suffocating while sleeping, as it's being deprived of oxygen resulting in hypoxia, or the deficiency of oxygen concentration in the tissues. That results in morning headaches which is an inflammatory condition."

It comes down to a trusting relationship between the dentist and the patient. This trusting relationship helps patients be victorious, because the more they know, the more they are willing to follow the recommendations given.

MARY'S VICTORY

Just two weeks into treatment, Mary felt tremendous relief. Her snoring was gone. Her headache and shoulder pain were essentially gone, only occurring around the time of her

menstrual cycle. With those levels of victories, no changes were made to her appliances, but she was still working on lifestyle changes—and she was motivated to do so because the appliance treatment was working so well.

Three months into treatment, Mary did a follow-up sleep study to validate that her OSA was treated. Sure enough, her test results came back within normal limits. Her oxygen levels were extremely good, and overall, her sleep was normalized. The sleep physician was extremely pleased with her clinical results.

She was still working on getting her weight under control, and her goal was to get off the medications she was taking for anxiety and depression.

Mary was also referred to a like-minded OB-GYN physician to help manage her menstrual cycle so that she could navigate through menopause more gracefully. Under our direction and her physicians, Mary began a low-inflammation diet, eliminating all dairy, refined or added sugar, gluten, and grains. These were recommendations specific to her conditions. She also started exercising regularly again.

As a result of Mary's treatment, she lost twenty-eight pounds in the first six months.

Ultimately, under her physician's recommendations, she was able to stop taking all her antianxiety, depression, and headache medication. These are medications she had been on for over fifteen years! Today she takes only a lower dose

of thyroid medicine and some vitamins and natural supplements for overall health.

Mary is a prime example that the body wants to heal and that in the right environment, it will. Look at it this way: A cut on a person's foot will heal unless they keep walking barefoot in the mud, don't take a shower, and wear dirty socks. A cut in that environment will take a long time to heal or maybe never will.

Today, less than a year after she first came to us for treatment, Mary says she never felt better. "I'm feeling a lot better and have lots more energy," she reported. "Working with different doctors is a key to make sure you're hitting all aspects of your life, and that you're really taking care of yourself. The one important thing I learned is that I really do need to take the advice of my trusted doctors because they do know what they're talking about. And it's hard to change your life but changing my lifestyle has given me more energy and just a love of life again."

As was the case with Mary, treatment is a progression. Once we understand a patient's victory, we create a plan to address their different needs one at a time until we have them resolved. It often takes time for the body to get so ill, and it takes time for it to heal and recover. For many patients, that begins with a good night's sleep. In Mary's case, that is basically what catapulted her into the next level of overall wellness.

Today, we see Mary on an annual basis to monitor her progress and ensure that she's wearing her appliance and main-

taining health. We also stay in the loop with her OB-GYN to ensure that she is achieving her victory of overall wellness.

HOLISTIC, COLLABORATIVE CARE

Why is a dentist identifying and treating conditions like these while fostering relationships for the patient with other providers such as an ear, nose, and throat physician (ENT), an OB-GYN, a naturopathic physician, and a primary care physician? Someone has to look into these problems and search for resolutions for these patients, something dentists are well positioned to do. In fact, according to a policy statement released by the American Dental Association (ADA) in 2017, "Dentists can and do play an essential role in the multidisciplinary care of patients with certain sleep related breathing disorders [SRBD] and are well positioned to identify patients at greater risk of SRBD."[2]

Care for disorders of the TM joint and for sleep apnea is holistic and collaborative; it is the bridge between medicine and dentistry, yet a little outside the typical wheelhouse of both. It took until 2007 for sleep medicine to become a recognized specialty and until 2017 for the ADA to tell dentists to look at breathing in patients. Medical physicians really don't venture into the world of chronic facial pain or maxilla and mandible pain, nor do they make oral appli-

2 "The Role of Dentistry in the Treatment of Sleep Related Breathing Disorders," American Dental Association, accessed April 14, 2018, https://www.ada.org/~/media/ADA/Member%20Center/FIles/The-Role-of-Dentistry-in-Sleep-Related-Breathing-Disorders.pdf?la=en.

ances for OSA. The physicians we work with are screening for these disorders and identifying risk indicators for them. For several years now, I have been hosting community education events to help physicians, nurses, and dentists better understand these disorders, and it's heartwarming to see the quality of health care improving in our area.

Even though dentists can treat sleep apnea, only a board-certified sleep physician can actually diagnose it. That's just one of the medical disciplines we work with to facilitate an ideal patient outcome. Whichever discipline is involved, the message of the patient's victory is communicated to every referral provider. The patient has enough to worry about; they shouldn't have to worry about repeating their story over and over to every provider involved in their care.

Now, many ask what specialty is responsible for the TM joint. There's a long-winded history behind TMD. It was first discovered by an ENT (ear nose throat) physician, then it evolved into the realm of dentistry for treatment. So who should treat it today? The physician? The dentist? The ideal answer is both. In later chapters, I'll describe some of the origins of TMD and OSA, and you'll see how it's almost impossible for either of these providers to treat the problems alone. That's why it takes a collaborative approach from an interdisciplinary team.

Now, I routinely lecture to dentists across the country on how to better identify sleep disordered breathing for their patients. As dentists, we are in a unique position to identify some of the most common risk indicators for sleep disordered

breathing. The table below illustrates and explains the relationship between these findings that every dentist should now. I firmly believe that every dentist should be identifying these clinical findings in their routine examinations.

CLINICAL FINDINGS THAT MAY INDICATE A RISK FOR SLEEP-BREATHING DISORDERS

CLINICAL OBSERVATION	POTENTIAL RELATIONSHIP
Tongue	
Coated	Risk for gastroesophageal reflux disease or mouth breathing
Enlarged	Increased tongue activity; possible OSA
Scalloping at lateral borders (crenations)	Increased risk for sleep apnea
Obstructs view of orophrynx	Mallampati score of I and II: lower risk for OSA; Mallampati score of III and IV: increased risk for OSA
Teeth and periodontal structures	
Gingival inflammation	Mouth breather, poor oral hygiene
Gingival bleeding when probed	At risk for periodontal disease
Dry mouth (xerostomia)	Mouth breather; may be medication related
Gingival recession	May be at risk for clenching
Tooth wear	May have sleep bruxism
Abfraction (cervical abrasion/ wear)	Increased parafunction/ clenching
Airway	
Long sloping soft palate	At risk for OSA
Enlarged/swollen/elongated uvula	At risk for OSA/snoring

CLINICAL OBSERVATION	POTENTIAL RELATIONSHIP
Extraoral	
Chapped lips or cracking at the corners of the mouth	Inability to nose breathe
Poor lip seal; difficulty maintaining a lip seal	Chronic mouth breather
Mandibular retrognathia	Risk for OSA/snoring
Long face (doliocephalic)	Chronic mouth breathing habit
Enlarged masseter muscle	Clenching/sleep bruxism
Nose/nasal airway	
Small nostrils (nares)	Difficulty nose breathing
Alar rim collapse with forced inspiration	At risk for OSA/sleep-breathing disorder
Posture of the head/neck	
Forward head posture	Airway compromise and restriction
Loss of lordotic curve	Chronic mouth breather
Posterior rotation of the head	Tendency to mouth breathe

I've put myself in the middle between the patient and all of our referral partners to get optimum patient outcome. My job is to be the quarterback in these situations and help ensure that everybody on the team is following the game plan. And that game plan is determined by the patient's victory—the win. That's what we're all trying to accomplish.

Every patient does not have to see other providers. The cases I illustrate in this book highlight the multiple levels of symptoms we can address for our patients. Often a patient only needs to work with us. However, in some more complex cases, it really is impossible to experience a victory without that collaborative team. In upcoming chapters, I will explain the details behind these patient cases. You'll see how the practice that I've developed can help directly with many problems—

and when it can't, we can find someone who can help. That's a commitment I make to my patients: I want to give them hope to uncover the origin of their problems and get them to achieve the level of wellness they want and deserve.