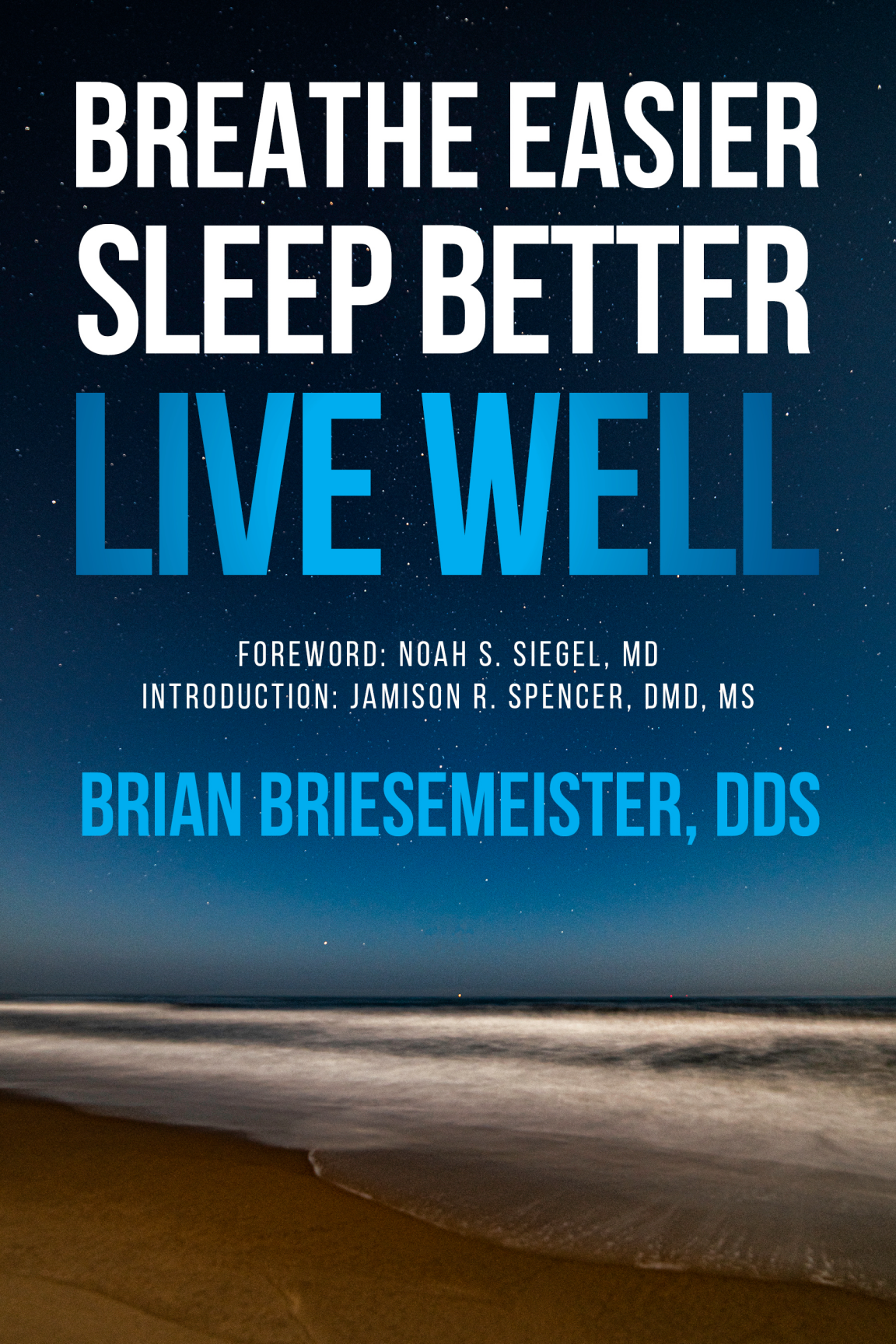
BREATHE EASIER
SLEEP BETTER
LIVE WELL

FOREWORD: NOAH S. SIEGEL, MD
INTRODUCTION: JAMISON R. SPENCER, DMD, MS

BRIAN BRIESEMEISTER, DDS



Breathe Easier, Sleep Better, Live Well

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Brian Briesemeister, DDS

Dedication

I would like to especially thank my family, friends, and dedicated patients who encourage, support, and inspire me to be more passionate about helping people live longer, more fulfilling, and healthier lives.

Acknowledgments

This book would not have been possible without the support and encouragement of my mentors and colleagues. There are many people have who helped me with this book.

A profound thank you to Dr. Jamison Spencer for his generous mentorship and sharing of knowledge and expertise. Thank you to Dr. Michael Goldberg for his hours of help with editing and assistance in conveying my thoughts into words.

Thank you, Dr. Roger Levin for your never-ending encouragement and coaching. Your zen like approach to problem solving has help refocus my energy more times than I can count.

Thank you, Salina Phelps and Angela Pickett for continuing to operate efficiently and allowing me the space to write this book.

I am honored Dr. Noah Siegel penned the forward to this book. Dr. Seigel is a respected physician in Boston who is Boarded in Otolaryngology and Sleep Medicine.

Many of my esteemed colleagues, part of an amazing Elite Mastermind in the Spencer Study Club, were essential in the various chapters of the book. I will always continue to

value our diversity and collaboration of knowledge. Thank you to all of you:

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And last but not least, thank you to Jennifer Spencer and the entire Spencer team who, alongside their renowned "Commander in Sleep" Dr. Jamison Spencer, work tirelessly educating the public and health professionals of the importance of a healthy night's sleep.

I hope you enjoy this work and my thoughts continue to go to all those impacted during the COVID-19 pandemic as it was during this time of social distancing and practice closure that this work could be done.

Editor in Chief—Dr. Michael Goldberg
Assistant Editor—Jennifer Spencer

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Foreword

By Noah S. Siegel, MD

The more I learn about sleep, the more I am enchanted by its restorative powers and the more I am motivated to better understand its mysteries. How is it that 'shutting down' for 7-8 hours per day provides the foundation of so many of our essential bodily functions? Sleep clears brains of waste products, consolidates our memories, refreshes our muscles, regulates hormones and synchronizes our organ systems. At the end of the day, my mind feels dull, I am more moody and my muscles feel fatigued. Yet in the morning, after a good night's sleep, I can focus better, my body aches less and I am ready to attack another day. Therein lies the miracle of sleep!

Despite the fact that sleep is essential to optimal functioning, the ***majority*** of us have sleep problems. Those sleep problems may be as straightforward as not getting enough of it or having difficulty falling asleep. There are also very common intrinsic sleep disorders such as obstructive sleep apnea (OSA) which is the focus of this book. It is well known that individuals with sleep apnea commonly have poor sleep quality.

Sufferers of OSA don't thrive because they don't breathe well at night. As a result, their sleep is less restorative. It is often challenging for individuals with OSA to accomplish simple daily tasks. Many sufferers are

not productive at work or lack adequate energy to optimally interact with family members. Furthermore, untreated obstructive sleep apnea is stressful to the body and increases risk for hypertension, irregular heart rhythms, stroke and neurocognitive decline such as Alzheimer's disease.

By now, I may have convinced you that untreated sleep apnea is bad and sufferers need therapy. While continuous positive airway pressure (CPAP) therapy is effective, this treatment approach is often difficult to tolerate. By 1 year, approximately half of people prescribed CPAP therapy are no longer using it. The good news is that there is no longer a 'one treatment fits all' approach. In this new era of personalized healthcare, doctors are able to match history, physical examination, medical conditions and desires with the treatment that makes the most sense for that individual. Treatment options also include oral appliance therapy, airway surgical procedures, positional therapy, weight loss therapy and surgically implantable devices.

Over the years, I have developed strong clinical partnerships with sleep dentists who offer oral appliance therapy for individuals with OSA. I steer my patients toward dentists who have committed themselves to the practice of dental sleep medicine. With so many oral appliance devices on the market, clinical experience is essential to select the right device and to make the necessary adjustments. If you're reading this, clearly you are working with a dentist who is passionate about helping people with sleep apnea.

In closing, I would like to congratulate you on taking the proactive step of picking up this book. Let this be the first in a rewarding journey toward unlocking the ***restorative powers of your sleep.***

Sleep well,

Noah S Siegel, MD

Harvard Medical School
Director of Sleep Medicine and Sleep Surgery at Massachusetts Eye and Ear
Medical Director of Otolaryngology at Massachusetts Eye and Ear, Longwood

Introduction

By Jamison R. Spencer, DMD, MS

Small Airway, Big Problem—How Sleep-Disordered Breathing May Affect Women, Children and Skinny Dudes

When most people think of sleep apnea they think of heavy, older, men.

Even medical doctors tend to only consider sending heavier, older men for sleep studies, even though younger, thinner people may present with similar symptoms.

In this book we will describe the basics of sleep, many of the important things that sleep impacts, how to get a good night's sleep, and what happens if we don't.

Our brain sometimes has to make a decision between what's good in the long term and what's necessary immediately.

Breathing MUST be maintained, or there will be no more "long term."

So why are dentists involved in this field?

Because we've learned that some people will clench and/or grind their teeth while they sleep due to an unconscious attempt to keep their airway open.

Because we've learned that such clenching and grinding can not only lead to damaging the teeth and any "restorations" (like crowns, bridges, dental implants, etc.), but can also contribute to TMJ problems, facial pain and headaches.

Because we've learned that even periodontal disease, or "gum disease" seems to be worse in people with sleep apnea.

And because dentists have a simple and easy to use therapy that is effective for most people with sleep disordered breathing issues, called "oral appliance therapy."

Oral appliance therapy, in a nutshell, involves wearing a small, custom made device on the teeth that keeps the lower jaw from falling back and obstructing the airway.

If you've ever taken a CPR course you probably remember, "head tilt, chin lift." This procedure is performed to help open the airway on the unconscious person so that when air is blown into them it actually goes into their lungs.

Several of the main muscles of the tongue attach to the lower jaw, just on the inside of the chin. Bringing the lower jaw forward has a tendency to open the airway.

You can experience this yourself. Make a snoring noise in the back of your throat (plug your nose to make sure it's in your throat and not in your nose). Now thrust your lower jaw forward and see if it changes how hard it is to make the noise. For most people, it will be harder to make the noise. This is because the airway is now more open.

The problem is, you can't just hold your jaw forward all night by yourself.

As you'll learn in this book, in dream sleep our muscles become "more floppy," sort of paralyzed, and this makes it even easier for the airway to become even smaller or collapse. Sleeping on our backs also makes it easier for the airway to become restricted.

CPAP, or continuous positive airway pressure, is an excellent treatment for sleep apnea in which the patient wears a mask attached to a machine that blows air to keep their airway open in all dimensions. For those who can tolerate its use, it's fantastic and can absolutely change their life. As dentists we always encourage our patients to stay on their CPAP if they can use it, and we prefer for patients with more severe sleep apnea to at least try CPAP.

CPAP is AWESOME... UNLESS YOU CAN'T USE IT

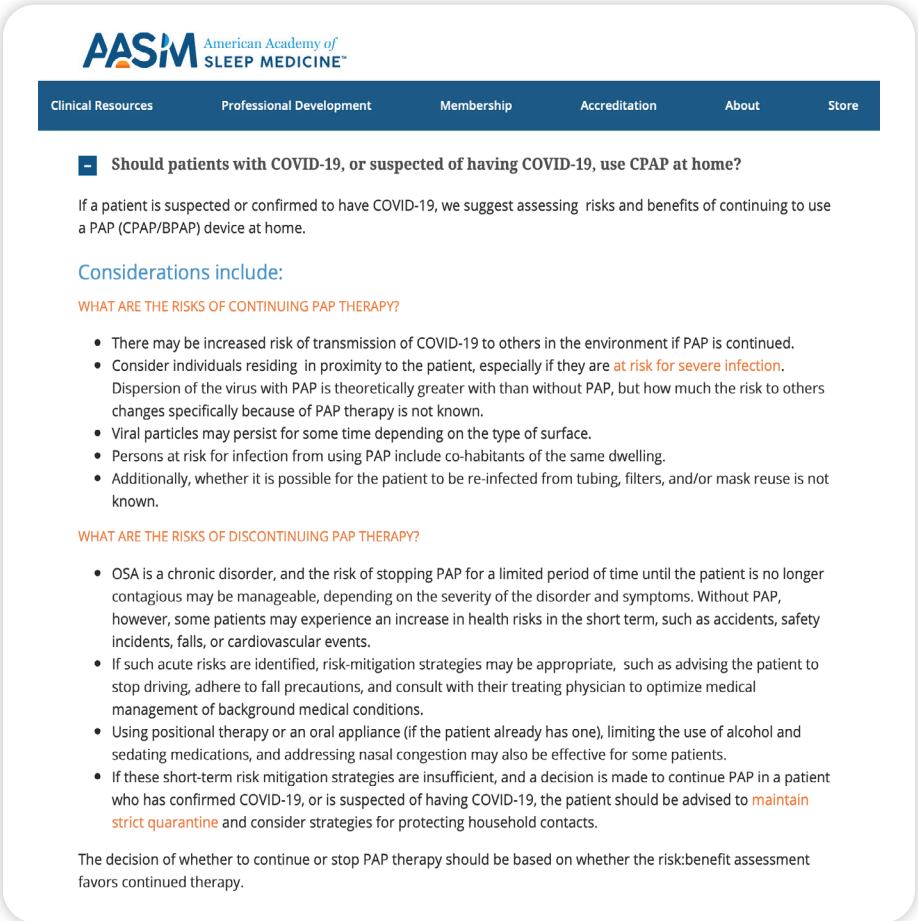
When this book was written we were in the midst of the coronavirus crisis.

This global crisis affected almost everyone physically, emotionally, and financially, and we will feel the ripple effects for many, many years to come, and certainly never forget the experience for the rest of our lives.

As doctors and scientists looked to keep people safe from the coronavirus all manner of things were deployed from simple reminders about hand washing to social distancing to wearing masks and other protective gear. Such proactive devices and practices were intended to reduce the spread of the virus.

One area that could have easily been overlooked was the use of CPAP therapy in the hospital, as well as in the home.

Doctors with the American Academy of Sleep Medicine published the following guidance on their website:



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– Should patients with COVID-19, or suspected of having COVID-19, use CPAP at home?

If a patient is suspected or confirmed to have COVID-19, we suggest assessing risks and benefits of continuing to use a PAP (CPAP/BPAP) device at home.

Considerations include:

WHAT ARE THE RISKS OF CONTINUING PAP THERAPY?

- There may be increased risk of transmission of COVID-19 to others in the environment if PAP is continued.
- Consider individuals residing in proximity to the patient, especially if they are at risk for severe infection. Dispersion of the virus with PAP is theoretically greater with than without PAP, but how much the risk to others changes specifically because of PAP therapy is not known.
- Viral particles may persist for some time depending on the type of surface.
- Persons at risk for infection from using PAP include co-habitants of the same dwelling.
- Additionally, whether it is possible for the patient to be re-infected from tubing, filters, and/or mask reuse is not known.

WHAT ARE THE RISKS OF DISCONTINUING PAP THERAPY?

- OSA is a chronic disorder, and the risk of stopping PAP for a limited period of time until the patient is no longer contagious may be manageable, depending on the severity of the disorder and symptoms. Without PAP, however, some patients may experience an increase in health risks in the short term, such as accidents, safety incidents, falls, or cardiovascular events.
- If such acute risks are identified, risk-mitigation strategies may be appropriate, such as advising the patient to stop driving, adhere to fall precautions, and consult with their treating physician to optimize medical management of background medical conditions.
- Using positional therapy or an oral appliance (if the patient already has one), limiting the use of alcohol and sedating medications, and addressing nasal congestion may also be effective for some patients.
- If these short-term risk mitigation strategies are insufficient, and a decision is made to continue PAP in a patient who has confirmed COVID-19, or is suspected of having COVID-19, the patient should be advised to maintain strict quarantine and consider strategies for protecting household contacts.

The decision of whether to continue or stop PAP therapy should be based on whether the risk:benefit assessment favors continued therapy.

There were also concerns regarding using CPAP in the hospital. One sleep physician that we spoke with referred to CPAP as a possible “viral

sprinkler," and we discussed ways that oral appliances could be used during the period that the patient wasn't able to use their CPAP.

That same sleep physician mentioned how the coronavirus crisis had made him reconsider putting all of his patients on CPAP and that moving forward he was more likely to recommend oral appliance therapy, particularly for his mild and moderate patients.

It is highly likely that the companies that manufacture CPAP machines will quickly develop a way to keep the machine from being "a viral sprinkler," and possibly by the time you read this that will no longer be a concern.

However, if you use CPAP you know that there are times when it is difficult, or maybe even impossible to use your CPAP the way you're supposed to.

Such times might include:

- When you have a head cold
- When you are suffering with allergies
- When you have a stuffed up nose
- When there is a power outage
- When power is not available
- On a long flight

Having an oral appliance as a backup to your CPAP just makes sense.

If you wear glasses you probably have more than one pair. And just like your vision is critical to your health and happiness, so is a good night's sleep.

Perhaps one of the unexpected benefits of using an oral appliance as a CPAP backup is that any potential side effects, such as minor tooth movement or transient discomfort, tend to be eliminated since the device is only used from time to time.

We have had many people over the years use an oral appliance as a CPAP backup. Some people choose to use their CPAP several nights a week, and their oral appliance a few nights a week, thus eliminating any of the potentially annoying side effects they may experience over time with nightly use of either therapy.

Oral appliance therapy is not just for people who can't use their CPAP. CPAP is an excellent treatment for obstructive sleep apnea, but even the best treatment is completely ineffective if it can't be used. And going even one night without therapy is not a good idea.

You may recall a few years ago that US Supreme Court Justice Antonin Scalia was found dead in bed, with his CPAP sitting on the nightstand next to him, not even plugged in.

Related to this, Dr. Nancy Collup, a sleep physician and then Editor-In-Chief of the Journal of Clinical Sleep Medicine, wrote:

> *We don't want to use scare tactics to convince our patients to use their CPAP nightly. But for patients with cardiovascular risk factors like Justice Scalia, missing their CPAP for one night could set them up for increased risk of sudden death and stroke; perhaps even taking it off early may increase the risk since REM sleep is often later in the night and the most vulnerable stage of sleep for OSA patients.*
>
> https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4865546/#

If you, or someone you love, is using CPAP, please consider having an oral appliance as a backup. Going without treatment for even a single night is not a good option, and with oral appliance therapy being easy, effective and affordable getting a backup is super simple to do.

I hope that you will enjoy this book. Please feel free to jump around. It's not a novel. Look for the topics in the Table of Contents that interest you the most right now whether you are looking for information for yourself or a loved one. Mark it up and tag the pages that you want to talk to your sleep dentist about. The more you read the more likely you'll start to see signs and symptoms of sleep disordered breathing in those around you. This is an EXTREMELY common problem, with the vast majority of those with the problem undiagnosed and untreated—many of whom are being treated for other presumed issues, rather than the core issue.

We wrote this book to be informational. It is not designed to be a summary of current research. It is based on clinical experience and research evidence, with a strong leaning toward the day-to-day practical experience of helping literally thousands of people suffering with sleep-disordered breathing.

Perhaps it can help you or a loved one too.

Preface

I, LIKE MANY OF YOU, WAS diagnosed with obstructive sleep apnea and had dealt with the symptoms for most of my life. It is regrettable that these symptoms weren't recognized earlier which may have saved me countless days of feeling tired and maybe saved me from buying so much coffee over the years, although I do enjoy a good cup of coffee. Fortunately for me, I met a physician who suspected I had symptoms of obstructive sleep apnea which was confirmed after several tests. For me, the treatment was life changing. No longer did I have to hit the snooze button 5 times because I just need that extra half hour of sleep. I also don't hit the proverbial wall of feeling tired around 3pm. I was able to live and work full of energy. This change led me to my passion of helping patients with obstructive sleep apnea and TMJ dysfunction. During that journey I have been able to meet so many great people, and I've been privileged to be able to help hundreds of people reclaim their lives by helping them sleep better and reduce their pain. I hope you enjoy this book, and it helps you or a loved one live a longer, more restful, or pain free life.

1

Breathing's Important...Right?

The Nose Knows

WHAT IS THE FIRST THING that we do as humans when we are born? What is the last thing we do as humans before we leave this earth? BREATHE!!!!!

Breathing is the most fundamental of needs. It trumps the need for food and water. Some might argue that your beating heart or brain function is more important. The reason you have a heart is for the purpose of pumping blood throughout the body. Blood provides oxygen to your organs, oxygen obtained by breathing. Your brain will not function if deprived of oxygen for more than 6 minutes. Where does this oxygen come from? Breathing! It all comes back to breathing.

If breathing is SO essential, shouldn't you be doing it correctly? This might seem like a ridiculous question given that breathing is something we, as humans, do automatically. However, most of us DO NOT breathe correctly.

By not breathing correctly, you are not optimizing oxygen consumption. This might sound like a silly question, but why is oxygen important? Every cell in your body needs oxygen 24/7. Without oxygen you die. It's that simple.

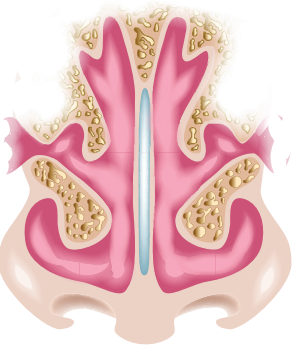
Clearly breathing is important! How do you breathe? Just notice what your body does while you are breathing normally. Do you breathe through your nose or mouth? Does your chest rise or your stomach expand or both? Where is your tongue positioned? What kind of posture do you have? How long is a breath for you?

So what does proper breathing look like? If you are breathing properly, then you are breathing comfortably through your nose with your lips together, teeth apart, with your tongue at the roof of your mouth. It also includes using your diaphragm, as well as your back and stomach, not your shoulders and neck. Sounds simple right? Unfortunately, many people do not breathe in this manner.

Let's practice optimal breathing. Sit, or stand tall and pay attention to your posture. Now breathe in, making sure that your lips are together, your teeth are apart, and your tongue is touching the roof of your mouth. After focusing on your mouth position and breathing through your nose, focus on your upper body. When you breathe in, make sure your stomach, lower back, and chest expand. When you breathe out, make sure these areas contract. DO NOT breathe in by raising your shoulders or extending your neck. This qualifies as shallow closed breathing and does not optimize your air intake.

Feels good, right? Breathing in this manner gives you a feeling of relaxation—every yoga instructor out there encourages you to breathe this way. For some people it is difficult or impossible to breathe this way. It's not your fault. There are many anatomical and/or genetic characteristics that prohibit healthy breathing. Let's discuss them.

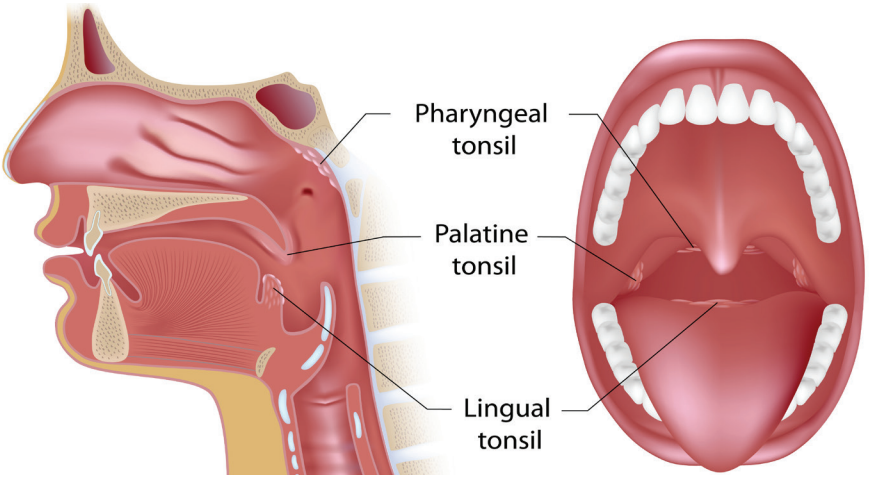
1. The nose contains ridges called turbinates (we will discuss their function shortly.) If these turbinates or ridges become enlarged due to chronic inflammation or poorly positioned turbinate



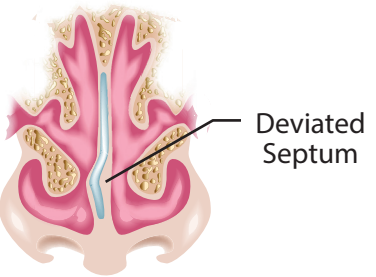
Normal Septum

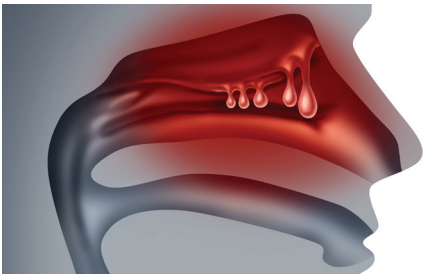
bones, they will obstruct airflow into the nose which will promote mouth breathing.

2. Allergies cause sinus congestion, which makes it difficult to breathe through the nose and will lead to mouth breathing.
3. Chronic sinus infections will lead to mouth breathing.



4. Large tonsils and/or adenoids (also called the Pharyngeal tonsil) decrease the ability to get air from the nose to the lungs.
5. If the middle of the nose is shifted to the left or right (called a deviated septum) this obstructs one side of the nose and decreases the ability to breathe properly.
6. Polyp formation in the nasal passage decreases the size of the nasal airway.
7. The shape of the nose can prohibit proper breathing. For example, some people have narrow nostrils or have a bridge of the nose that is flat.





8. The shape and/or size of the jaw can affect the ability to breathe through the nose.
9. Stress promotes shallow, rapid, abnormal breathing that is easier to accomplish by breathing through the mouth.
10. Chronic health conditions such as asthma, COPD, pulmonary hypertension and anemia will cause mouth breathing because the body feels it needs to get air in faster than nasal breathing can provide.

Why is it so important to breathe through your nose as opposed to your mouth?

1. The nose is your FIRST defense against bacteria and viruses that can make you sick. Remember the turbinates that were mentioned above? They are essential in this process. It is the job of these ridges, along with hair-like projections in the nose called cilia, to keep as many germs, dust, and debris out of your lungs as possible. Your sinuses produce mucus, otherwise known as snot. This mucus also assists in the capture of unwanted air debris and germs. By breathing through the mouth, this first line of defense is eliminated.
2. The turbinates also humidify and warm the air we breathe. This is important so that the airway does not shrink making it more difficult to breathe. This can be particularly bad for people with asthma.
3. Mouth breathing can cause the airway to not function at its normal capacity because the air is cold and dry. A dry airway leads to poor oxygen exchange.
4. Dryness due to mouth breathing can also cause dental diseases such as decay, misaligned teeth, and gum disease.
5. By exhaling through the nose, the process of breathing is slowed down and a back pressure develops in the airway. This allows more oxygen to be transferred from the lungs to the bloodstream.

6. Mouth breathing in children can impair facial growth causing a small airway and lifelong breathing problems. This impaired growth often appears in a longer face, less pronounced cheekbones, lower chin and narrow jaws. Think Napoleon Dynamite!

WHY DOES ALL OF THIS MATTER?

It all contributes to optimal oxygen levels and optimal health. Oxygen is ESSENTIAL for cellular activity. Since EVERY PART of your body is made up of cells, and cells dictate the function of your organs, your body relies on oxygen in order to function properly. Proper breathing allows for optimum oxygen consumption and is one of the best things we can do for our cells.

2

Why Can't You Breathe Properly at Night?

DIANA IS SURE HER BROTHER Robbie loves her dearly . . . or at least he does NOW. But when he challenged 8-year-old Diana to ***'The Great Snorkeling Competition,'*** she should have known to suspect he was up to mischief. As they sunk below the surface of the pool, Robbie managed to breathe effortlessly into his snorkel. Diana, on the other hand, was struggling to pull the air through the snorkel and into her lungs. "Why is this so difficult for me?" she thought. Her brain was telling her body to resurface NOW!...and so, despite her best efforts, Robbie won by a landslide. Diana licked her wounded ego and vowed never to snorkel again—after all they were underwater choking hazards!

Little did Diana know that Robbie, like most big brothers, had rigged the challenge...and given Diana a half-pinched-off snorkel! Her lifeline had been compromised from the start.

When we go to sleep at night our brains have the important job of maintaining our lifelines. If our 'snorkels' or airways become compromised it will affect how well we rest. But HOW do our airways get blocked? What keeps the air from getting into our lungs?

It depends! We'll start by assuming your older mischievous siblings have nothing to do with it! The point or points of blockage may be different for each person. Let's go through these from the top to bottom.

1. **THE BRAIN**. Our brain may stop telling our body to breathe. This looks like long pauses in breathing without ANY effort by the chest and belly to pull air in and is called central sleep apnea. It is not really a physical blockage, BUT it does result in the same decreased oxygen to the brain.

2. **THE NOSE**. Have you ever noticed how hard it is to sleep when you have a stuffed-up nose? The nose is ideally where we pull the air from the outside world into our body. It acts as both a filter and a moisturizer for the air. If our nose is plugged up, we will have less volume of air coming into the lungs... which means less oxygen to the brain. Some of the common reasons our nose becomes clogged include: chronic allergies, polyps (or outgrowths within the nose as described in Chapter 1), deviated septum (the wall separating the right and left side of the nose is bent, also described in Chapter 1), or the sides of the nose may collapse inward when you inhale.

3. **THE MOUTH**. Our mouths house a lot of soft stuff that, once relaxed, can fall back into our airway during sleep. Some of these structures include: the tongue, the soft palate (the soft ceiling behind your back teeth), and the dangling uvula we all know from the opera-singing cartoons.

   What makes these tissues slump backwards? Gravity! When we begin deep sleep, the muscles in our body relax so that we don't act out our dreams. Gravity then goes to work, especially when we sleep on our back, pulling the soft tissues towards our throat and limiting our airway.

   If you snore, this is where all that noise comes from! The soft tissues vibrate as the air is being forced between these floppy tissues. Both the condition and size of these tissues can also affect their tendency to cause a blockage. For example, if these tissues are BIGGER due to fat deposits or inflammation, they already take up more of the airspace. Or, if these tissues lack tone (meaning they don't hold their structure while relaxed) they will fall inwards more easily as well.

   What about the teeth and jaws? Let's imagine that the teeth and jaws are a garage and the tongue is the car. If the teeth are crowded and the jaws are narrowed, like a compact-sized car space and the tongue is a full-sized SUV, then we are going to struggle to keep the tongue out of the airway. This is important to recognize ASAP, especially in children, because we may be able to up-size the garage space to make breathing easier! More on how this is done later!

4. **THE THROAT**. Our throat is the main pipe through which all this air will travel to reach the lungs. This may be blocked by everything upstream (the nose and mouth) OR by other structures located along this tube. Big adenoids and tonsils are a common suspect, especially in children.

These tissues tend to enlarge in response to inflammation from three issues:

1. Chronic environmental and food allergies… like grasses, dust, dairy and wheat.
2. Snoring… the chronic vibration causes the tissues to become swollen.
3. Mouth breathing… air breathed in through the mouth is not filtered, warmed or moisturized by our nose, so it tends to irritate and dry out all the soft tissues downstream in the throat and the tubes leading to the lungs and then the lungs themselves (see Asthma in Chapter 9).

Short-term conditions like sickness may also cause the tonsils and adenoids to get bigger as the body is fighting off the illness.

Wow, that's a lot of ways our 'snorkels' can get clogged! You can see why it is SO important to find out WHERE the obstruction is for YOU!

3

Signs of Sleep-Disordered Breathing In Adults and Children

"Knowing is half the battle."

-GI Joe

THE GOAL OF THIS CHAPTER is to give you some tools so you can help yourself and your loved ones seek proper evaluation and treatment. The signs and symptoms of sleep apnea are like stars in a constellation. Once you start identifying the stars, you can see the constellation.

Adults with sleep-disordered breathing will often have some of the following symptoms:

- Waking up tired and unrefreshed, no matter how many hours of sleep you get (excessive daytime sleepiness or chronically fatigued)

- Insomnia—seems strange, but your body can be actually trying to keep you awake so you don't stop breathing while asleep
- Waking up frequently during the night to go to the bathroom
- While asleep, gasping for breath or pauses in breathing
- Waking up gasping or choking
- Heartburn or waking up with stomach acid in your mouth
- Frequent napping
- Loss of interest in life, hobbies and intimacy
- High blood pressure (adults)
- Hyperactivity/Attention Deficit Disorder (children)
- Snoring loudly
- Morning headaches
- Trouble concentrating
- Depression & anxiety
- Sleep difficulties
- Jaw pain in the morning

The American Dental Association directed all dentists to screen patients for sleep-disordered breathing in 2017—just like dentists have been asked for years to screen every patient for oral cancer. When your dentist screens you for sleep-disordered breathing, here are a few things they should be looking for (be prepared for a yucky tongue picture on the next page, haha!):

- Difficulty lying back to receive dental procedures
- Tooth wear from grinding or clenching (flat spots on the pointy parts of your teeth)
- Looking at the back of your throat for a congested airway

- Scalloped tongue (see the "pie crust" looking ridges on the sides of the tongue?)
- Swollen, reddened or elongated uvula
- Size of tonsils

After reading through all those symptoms you are probably wondering if you have a sleep-disordered breathing disorder! Here is a quick screening tool you can use at home. For each question that you answer yes, give yourself 1 point.

1. Do you snore?
2. Are you frequently tired, or feel sleepy?
3. Has anyone seen you stop breathing in your sleep?
4. Do you have high blood pressure?
5. Are you overweight?
6. Are you over the age of 50?
7. Is your neck circumference larger than 15.75 inches?
8. Are you male or a post-menopausal female?

What's your score?

If you scored 0-2 you have a low risk of having sleep-disordered breathing, 3-4 means you have moderate risk, and 5 or more indicates you are at very high risk. Please keep in mind this only estimates your risk. Even people with a low risk can have sleep apnea. This is not a substitute for speaking with your doctor.

If you scored 3 or more please set up an appointment with a physician ASAP!

What about Children?

Identifying sleep-disordered breathing in children is crucial for their wellbeing and development. We will address this in depth in Chapter 7.

If a child snores—AT ALL—they need to be evaluated for sleep-disordered breathing by a sleep professional. Children have some of the same symptoms as adults, but also have a few others as well. Watch for these in a child:

- Snoring
- Pauses in breathing during sleep
- Snorting, coughing or choking sounds
- Mouth breathing
- Bedwetting
- Sleep Terrors
- Restless sleeping
- Circles under the eyes (these can often look slightly pink or purplish)
- Grinding their teeth at night

Untreated sleep-disordered breathing will often result in many areas of life being challenging for children. If a child is experiencing difficulty in the some of the following areas, it could be a symptom of untreated sleep-disordered breathing:

- Difficulty paying attention
- Learning problems
- Behavioral problems
- Hyperactivity
- Poor weight gain or growth
- Poor school performance

It is essential that if you think you or a loved one is at risk that you seek medical help. Do not let your fear of the test or treatment prevent you from getting evaluated and diagnosed.

This is a matter of life and breath.

4

Are You At Risk?

If you were to imagine the typical person who is at risk for obstructive sleep apnea (OSA) who would come to mind?

You would be in good company if you first think of someone who is overweight, middle aged, male, and who snores like a freight train—perhaps this description even applies to your spouse, family member, or friend who has already been diagnosed with OSA (or who you suspect may have it).

This commonly held mental image of the stereotypical sleep apnea patient is based in truth—multiple scientific studies confirm that middle-aged, obese males who snore loudly are indeed among those at highest risk for this serious and potentially deadly condition. Our medical community has long focused on this type of patient as it has struggled to manage this epidemic.

A recent discussion with a primary care physician reinforced this. As we discussed that clinic's methods of identifying those at risk for sleep apnea, this physician quipped, "Well, we don't miss many of the fat old men!" This was an illuminating statement, as we have become aware that sleep apnea can potentially affect just about every age group, and both sexes, depending on individual circumstances.

It is now well understood that OSA is a complex, chronic condition that is influenced by MULTIPLE factors. The Mayo Clinic has stated that some of those factors are:

- Being male
- Excess weight
- Being older
- Thick neck circumference
- A narrowed airway
- Family history
- Use of alcohol, sedatives, or tranquilizers
- Smoking
- Nasal congestion

Right off you can see that the first three factors listed DO describe our stereotypical OSA patient! But this is not the whole st ory; so let's tackle these risk factors individually to gain a better understanding of who is truly at risk for OSA...

Being Male

Multiple studies confirm that men are two to three times as likely to suffer from sleep apnea compared to women, and this may be due to several reasons.

First, men tend to report more classic signs of OSA such as heavy snoring and excessive daytime sleepiness, whereas women more often complain of OSA-related symptoms such as insomnia, anxiety, and headaches/TMJ related pain (this may result in fewer sleep testing recommendations from family physicians for females). Second, females are generally more aware of their partner's sleep problems, so they more frequently witness their partner's apnea events and then perhaps encourage their male bed partners to get testing. There also appears to be an airway protecting function of the female hormone estrogen that may account for this lower prevalence among women.

This may explain why some studies show that men tend to have more severe OSA and longer apnea events than females. It may also explain why women's risk for sleep apnea increases dramatically after menopause.

Excess Weight (and a thick neck circumference)

As of 2019 approximately 42% of the American adult population are considered obese, and sleep apnea is more common in obese patients compared to those of normal body size. This really makes sense if you think about it; as we get bigger on the outside—especially if fat deposits occur in the neck and in tissues surrounding the upper airway—our airway gets smaller and less able to resist collapse. As obesity rates have increased over the past few decades, so has the prevalence of sleep-disordered breathing.

Obesity is such a key factor in OSA that many people who lose significant amounts of weight may find their sleep apnea reduced from severe to a milder condition, or that their OSA is even fully resolved. Weight loss may be easier to achieve with active therapy such as CPAP or Oral Appliance Therapy due to the therapies' positive effect on the hormones that regulate hunger. A more rapid weight loss can occur for severely obese patients that have bariatric surgery.

Being Older

As we age, two things tend to happen that increase our risk for OSA: we tend to gain weight, and we tend to lose muscle tone. Loss of muscle tone can directly affect our airway because the airway now collapses more easily. In general, rates of OSA are higher for older (over age 40) versus younger adults. However, sleep apnea can affect people of ALL ages, including teens and children, although at lower rates.

A Narrowed Airway/Family History

A narrowed airway is the crux of the whole problem—almost all the other risk factors mentioned here relate to this! It is easy to understand that if the airway is physically smaller due to the presence of excess fat or large tonsils, even a small degree of collapsing during sleep would further compromise your airway. Dentists are occasionally asked if there is a genetic or family history component to sleep apnea, and the answer is... yes!

Your family genetics may mean you're more likely to have smaller jaws, or to have a high palate, or are prone to obesity—all of which increases

your risk for OSA. Studies now suggest very strong genetic foundations for this condition. A narrowed airway is one of the most common causes of sleep apnea in children—in this instance due to large or swollen tonsils or adenoids that cause a physical narrowing of the airway as opposed to the collapsing airway more commonly seen in adults.

Use of Alcohol, Sedatives, and Tranquilizers

These substances are often used for insomnia, but they may also affect your airway and worsen your OSA. Many people drink alcoholic beverages in the evening, sometimes with the mistaken thought that it helps them sleep better. However, research shows that alcohol doesn't really help you sleep better but instead creates a more sedative effect. Alcohol may also cause you to wake up in the middle of the night as it is processed by your liver. This could be because the chemical byproducts have been shown to promote a more awake state, or because it is a diuretic which promotes awakening to urinate. We all know that alcohol is a relaxant, and it can cause a direct relaxation of your airway muscles, thereby promoting or worsening underlying sleep apnea. It has even been suggested that some hangover symptoms are due to the increased level of sleep apnea caused by alcohol's effects on the airway.

Because other sedatives like Benzodiazepines (Valium, Xanax, etc...) and tranquilizers also cause muscle relaxation, they may also worsen your sleep apnea. Newer sleep aids such as Ambien and Lunesta seem to

have less direct effect on the airway, but come with their own unique and challenging side effects.

Smoking

The ill health effects of smoking are so well documented that everyone is aware of its inherent dangers, but less known are the potentially damaging effects on your sleep from tobacco use. Smoking has been shown to disrupt your normal sleep cycles and damage the function of your very important upper airway muscles. And, the inflammation smoking causes in your throat means the upper airway may be more swollen which in turns makes the overall airway smaller.

Nasal Congestion

Nasal congestion is common among those of us who suffer seasonally or through the year with allergies, commonly referred to as Allergic Rhinitis. Because nasal congestion can cause swelling in your upper airway, it may worsen both snoring and underlying sleep apnea. Nasal congestion can be so profound that it promotes mouth breathing, which has also been shown to worsen airway collapsibility (this could also be caused by a physical blockage in the nasal anatomy such as the deviated septum mentioned earlier). If you do suffer from chronic nasal congestion, you will likely suffer from dry mouth while sleeping which also increases risk of dental decay and gum disease.

Fortunately, solutions do exist: you can use an over-the-counter (OTC) nasal decongestant spray such as Flonase, an OTC allergy medication such as Zyrtec, or consider consulting with an Ear, Nose and Throat specialist (ENT) to determine whether a minor surgical procedure could improve your nasal breathing long-term. There are also numerous remedies for dry mouth we can help you with!

As you may now realize, there are MULTIPLE risk factors for OSA – how many of these apply to you or your loved ones?

If risk factors exist, a consultation with your primary care doctor or a sleep physician is warranted. The bottom line, however, is there are many of us who lack these common risk factors but may still suffer from sleep apnea. For example, we now know that many otherwise healthy, slender,

young females without any of the above risk factors are prone to UARS (Upper Airway Resistance Syndrome), thought by some to be a milder form of OSA but that can cause many of the same symptoms as sleep apnea. While it is important to understand these common risk factors, anyone who suffers from poor sleep in general is encouraged to discuss their issues with a medical professional.

5

Your Sleep Apnea Could Be Causing... Heart Disease, Diabetes and Stroke

The Big 3

We all agree that snoring can be super annoying to listen to, especially if you are trying to sleep next to that snoring person. But, how many of us realize the person snoring next to us may also be suffering from OSA, which puts them at a much higher risk of suffering from a heart attack, diabetes and stroke?

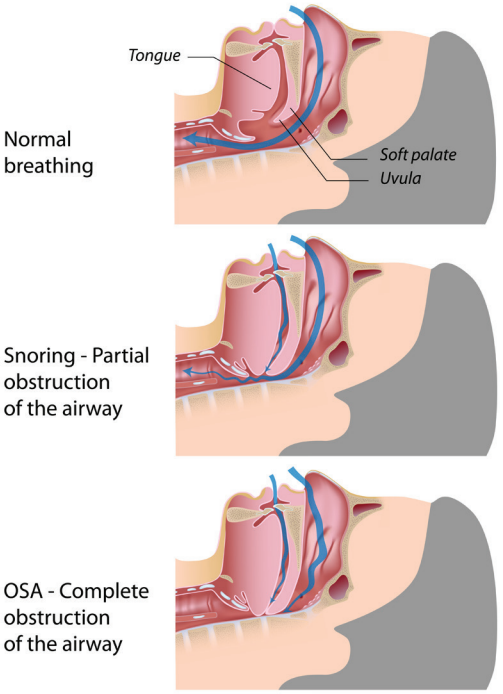
By ignoring snoring and OSA we may unknowingly be putting ourselves into higher risk categories. A study from The Journal of Clinical Sleep Medicine in 2008, found people who have OSA increased their risk of cardiovascular disease by 140%, stroke by 60%, and coronary heart disease by 30%.

What is especially worrisome is that heart disease is already the #1 cause of death in the United States. Strokes are responsible for 1 out of 20 deaths per year according to the Center for Disease Control (CDC) and are also the leading cause for long-term disability in the U.S. To tie it all together, diabetes is an underlying condition for all of them. Wow! Hats off to modern medicine and research for discovering this information.

So how does OSA increase a person's risk for all of these conditions?

When your body has trouble breathing, either because of snoring or apneas (stopping breathing), the oxygen level in your blood starts to decrease. 95% to 100% blood oxygen levels are considered ideal and below 90% is considered low.

When oxygen levels drop into the low range, it's actually the increased levels of carbon dioxide that will trigger a response from your brain to increase the oxygen level.



The body accomplishes this by increasing your heart rate. As your heart beats harder and faster it pumps more and more blood through your lungs to deliver more oxygen to your brain.

But remember with OSA, the airway is obstructed or blocked. Your heart, not in a restful state, will need more energy to do this. Insulin is released into the body to convert sugar (glucose) into energy for fuel to power the heart. While this happens, your glucose levels remain high to power the body under stress.

Studies have shown long-term high levels of insulin actually cause the cells to become immune to the insulin further increasing blood sugar levels.

As the brain senses lower oxygen levels it releases a stress hormone called Cortisol. Cortisol is part of the "fight or flight" response released under stressful conditions, such as not being able to breathe.

Cortisol also works to increase your glucose levels and increases blood pressure by tightening blood vessels. Tightening blood vessels increases blood pressure and an increase of blood pressure is a risk factor for heart

disease, heart attack and stroke. (We will discuss the "fight or flight" response in greater detail in the next chapter.)

In the meantime, consistent elevated glucose levels contribute to diabetes. Frequent urination is a common symptom of increased levels of glucose in the blood. It's difficult to get a good night's sleep while having an obstructed airway. So if you have diabetes or know someone that does, now the additional burden of having to wake up often to urinate compounds the problem.

There are two types of strokes. The most common stroke is called an ischemic stroke, which accounts for about 85% of strokes. Ischemic strokes occur when a blood clot or a fatty deposit called "plaque" blocks blood flow to the brain in an artery. The less common type of stroke is called a hemorrhagic stroke. Hemorrhagic strokes happen when a blood vessel in the brain has become weakened and bursts, leaking blood into the brain itself, or into the space between the skull and brain.

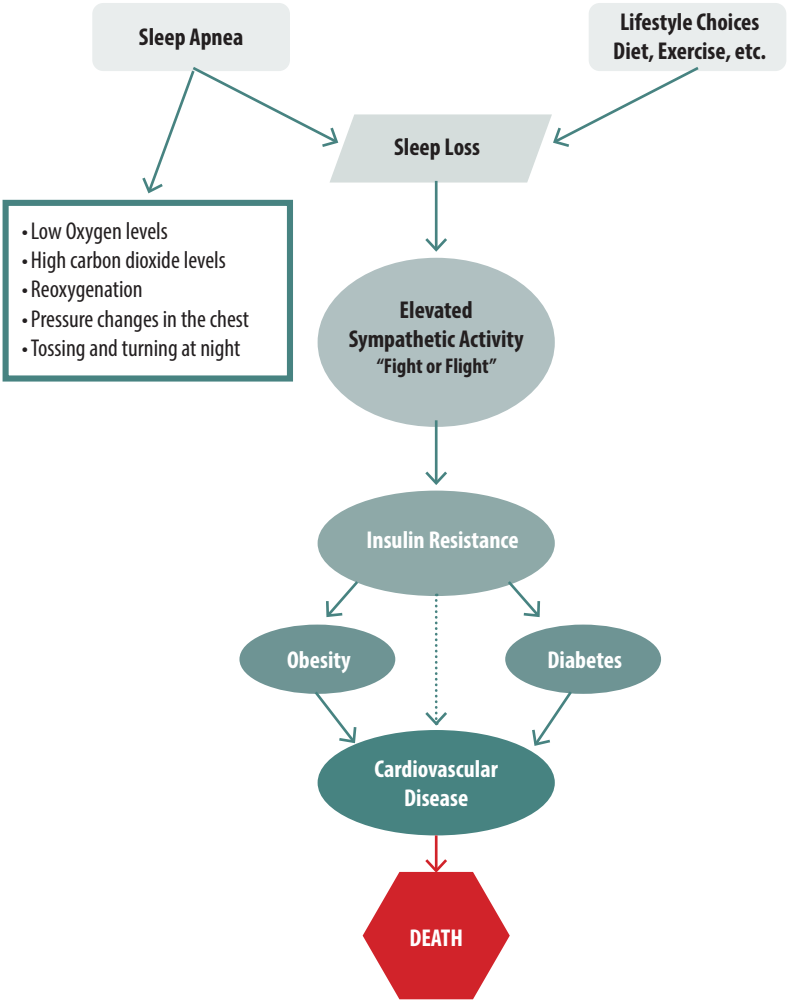
As mentioned earlier, the effects of OSA increase blood pressure and lower blood oxygen concentration. The body responds with the "fight or flight "response. In scientific terms, we call this the sympathetic nervous response.

The response is not designed to last hours on end, like sleeping (or trying to sleep) at night. Rather, as the name suggests, it's designed to help you survive. Stay and "fight" or leave the scene to survive, "flight." In short durations of increased heart rate and supporting hormone levels, this response works rather well. Many of you have experienced this feeling if you've ever been startled abruptly.

But, when the sympathetic switch is left on (a person with sleep apnea) the long-term effects of this response are unhealthy. It leads to high blood pressure (hypertension) and an irregular heartbeat called arrhythmia (atrial fibrillation). Two well-known risk factors of both types of strokes are hypertension and atrial fibrillation.

Chronic increases in blood pressure weakens the blood vessels over time. These blood vessels are most susceptible to developing clots and fatty plaques, called atherosclerosis. Atherosclerosis increases the risk of having a stroke. It also contributes to lower blood flow to the brain. When a person with atherosclerosis wakes up and gets out of bed, it takes longer to restore the proper amount of blood to the brain, compared to a person without atherosclerosis.

Now imagine this scenario playing out night after night, week after week, month after month, and year after year. We can quickly understand why treating OSA should be a priority to not only treat and lower risk factors, but to also maintain a healthy lifestyle. As we learn more and more about sleep apnea and its overall effects on the human body, it becomes quite clear that treating this condition should be a top priority.



And by the way, as if the big 3 aren't enough, the same process described above, has been postulated to be a root cause of Alzheimer's disease. We'll go into more of the unfortunate consequences of sleep apnea in the next few chapters.

6

Sleep Apnea AND MORE TROUBLE? Depression, High Blood Pressure, Obesity and Liver Disease

Pictured here is Francis Grose (1731-1791). He was an English antique collector/dealer and gifted storyteller. His friend, Rev James Douglas, drew this portrait depicting Grose as a thick-necked man asleep with his mouth partially open. If you close your eyes, you can almost hear his snoring thundering through a meeting he was attending with fellow antique dealers. He was known as a great drinker, eater and of course, he loved his sleep. He ultimately died suddenly of an assumed stroke at the age of 60.

This sketch is thought to be the first illustration of obstructive sleep apnea syndrome. While Grose never had the chance to have a home, or lab sleep test done, it is not a far leap to assume he had some form of obstructive

sleep apnea. Taking it a step further, we could also guess that Grose also suffered from high blood pressure and as the picture depicts, he was obese as well. In fact, Grose was thought to be 5 feet tall and 22 stone or 308 lbs. At this weight and height his body mass index, or BMI, would have been 60 (between 18.5 and 24.9 is considered healthy). Grose possesses some common risk factors for sleep apnea as discussed in Chapter 4.

Depression, High Blood Pressure, Obesity and Liver Disease

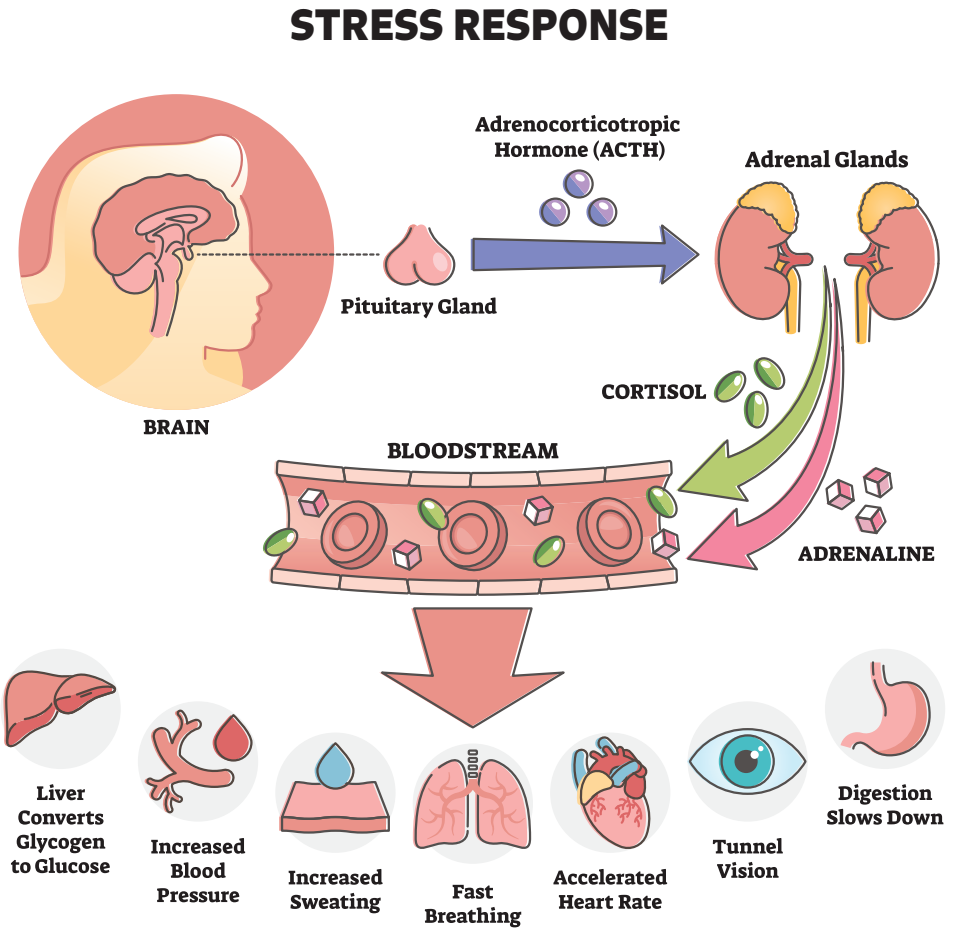
Some other illnesses associated with sleep apnea outside of the Big 3 are depression, high blood pressure, obesity (see Grose above) and liver disease. All these conditions are due to the body's inability to regulate itself correctly.

Sleep apnea, as described in other chapters, deprives the body of oxygen. The lack of oxygen stresses your body out. Have you ever been swimming in the ocean and unexpectedly been pushed down to the bottom by a wave? When you finally make it to the surface, your heart is beating 90 miles an hour, you can't catch your breath and you're shaking. Your "fight or flight system" that we discussed in the last chapter has kicked in. Sleep apnea causes that same response because your body cannot breathe. Only it's at night, in the comfort of your own bed and not in the ocean. You are fighting to stay alive.

NO OXYGEN • YOU DIE

And, your brain wants to keep you alive. So, you wake up, disrupting your sleep and all the important stuff that happens while you sleep.

High blood pressure is known as the silent killer because you have no obvious symptoms until it has done significant damage to your body. Increased blood pressure can cause a heart attack or like in our friend Grose's case a fatal stroke (one of the BIG 3, mentioned in the previous chapter).



The activation of fight or flight is responsible for increasing your blood pressure. Your body is pumping blood faster because it senses danger. Only in the case of obstructive sleep apnea, it's not lack of oxygen because of ocean waves on top of you.

The stress hormone cortisol also increases in the fight or flight response. Struggling to breathe every night encourages your body to store fat. See Francis Grose as exhibit 1 of this phenomenon.

Other metabolic conditions such as nonalcoholic fatty liver disease (NAFLD) and insulin resistance are affected by your flight or flight response. Over 20 studies have linked obstructive sleep apnea and nonalcoholic fatty liver disease due to the low nighttime oxygen levels. The liver can try to repair itself from this condition, causing scarring and reducing its ability to function.

Pinpointing the exact link between sleep apnea and depression has proved complex for researchers. Serotonin plays a regulatory role in both mood and the upper airway. Although the exact scientific relationship is not understood yet, we do know that untreated sleep disorders greatly increase the likelihood and severity of depression, anxiety and other mood disorders.

As many as 46% of adults with confirmed obstructive sleep apnea also report symptoms of depression. Lack of sleep is associated with the inability to regulate our mood. We have all heard the phrase "waking up on the wrong side of the bed." Sometimes we say this in good fun to our family members or bed partners, but lack of good quality sleep can do real damage to our thoughts and our ability to deal with our emotions. E. Joseph Cossman captured the relationship of sleep and emotion with this quote, "The best bridge between despair and hope is a good night's sleep."

Depression, high blood pressure, obesity and liver disease are all linked with obstructive sleep apnea. Some sleep sufferers will develop one of these illnesses while others will develop one or two on top of the Big 3. Increasing good quality sleep will not magically cure these illnesses but it will give your body the necessary rest to begin repairing itself.

Save the "fight or flight" response for the ocean and not for your bed.

7

Wait, There's Even MORE! Acid Reflux, Broken Teeth, ADHD & Headaches

So far we have talked about a lot of really scary consequences of untreated sleep disordered breathing. Things that cannot be ignored—heart disease, diabetes, stroke, depression, diabetes, obesity and liver disease. But some symptoms can be easier to ignore or to attribute to other causes. Acid reflux, broken teeth and ADHD will be addressed in this chapter.

ACID REFLUX

What in the world does acid reflux have to do with sleep disordered breathing?! When we struggle to breath, negative pressure is produced. The negative pressure acts like a vacuum cleaner sucking stomach acid up from the stomach into the airway.

Most people attribute their acid reflux to just overeating spicy or acidic foods. Since it can be treated with over the counter medications it can be easily missed as a sign of obstructive sleep apnea. Severe reflux can result in waking up with a mouth full of acid and a choking feeling. Mild reflux can go unnoticed for years. Dentists will often notice erosion and pitting

teeth as a result of long term acid reflux. We often see erosion in both children and adults.

Have you ever had a really dirty pan and tried all sorts of things to clean it off? One of the best tips I ever got from my grandmother was to use an abrasive substance (salt, baking soda etc.) with a lemon or vinegar. Works like a charm with baked on food! What if I told you it also works on your teeth?!

During apneic episodes a person will often clench or grind their teeth together. If you also have reflux you have the acid in your mouth. The combination of abrasion and acid can have drastic consequences on tooth structure. It is pretty much the best way to dissolve or remove tooth structure other than picking up a drill!

BROKEN TEETH

The other result of the clenching and grinding can be broken teeth. Over the last several years, I have begun questioning patients on a deeper level whenever they come in with a fractured tooth. Many of these patients have been subsequently evaluated and diagnosed with OSA. Sadly, it is not surprising. Why? Well, when a patient clenches or grinds to open their airway they are literally fighting off strangulation. Our bodies can do amazing things when they are pressed into action. The force that a person clenches or grinds with actually exceeds what they are capable of during

the waking hours. This can also result in TMJ pain (more in that in the next chapter) and headaches.

In the past dentists were taught to make a nightguard. The grinding and clenching was attributed to stress. Is anything more stressful than being choked? I think not!

What was even more frustrating for both dentists and patients is that these nightguards would often not be tolerated. Why? Well, the mouth and airway are already crowded in cases of obstructive sleep apnea so adding a big piece of plastic really doesn't make a lot of sense. Now, not all patients that clench and/or grind have sleep disordered breathing so as dentists we could not predict for whom a nightguard would work and for whom it would be a total waste of time and money!

ADD/ADHD

Sleep deprivation and ADD/ADHD have a lot of the same symptoms when it comes to learning difficulties. If you have ever stayed up all night with a baby or studying you know the feeling!

- Inability to Pay Attention
- Difficulty staying on topic
- Forgetfulness
- Poor impulse control
- Inattention
- Frustration completing difficult tasks or assignments

So, sleep deprivation and ADD/ADHD can produce the same kind of symptoms. Sadly, this can lead to a missed diagnosis and/or misdiagnosis (e.g. misdiagnosis: a patient with OSA being diagnosed with ADD/ADHD instead of OSA or vice versa; e.g. missed diagnosis: failure to diagnosis either the OSA or ADD/ADHD). I'll use a story to illustrate.

When a colleague's daughter Rowan began having difficulty in school and the teacher brought up the possibility of learning disabilities. My colleague was surprised. Rowan was super energetic and very smart. She had already had her tonsils removed due to OSA so she was taken immediately for testing for learning disabilities AND back to the sleep physician. My colleague really thought it was just the sleep apnea rearing it's ugly head again. During this time she was struggling to read—her parents often accused her of not trying!

I bet you can guess the results of the testing! Not only did she have ADD, but she also had severe dyslexia and OSA! Not only was her brain working differently than "normal" but she was also so sleep deprived she would have been struggling without any other learning disabilities. Talk about a perfect storm!

During sleep our brains repair themselves. Her brain wasn't getting this crucial need. She was getting just enough oxygen during sleep to wake up again, but not enough to function properly.

This is why it is so critical for us to screen children for sleep disordered breathing. The consequences can be lifelong. Getting Rowan treatment

for ADD and OSA wasn't difficult. What was really difficult was undoing her growing belief that she was just not smart or capable.

Of course, it is not always the case that all people with OSA have ADD/ADHD or vice versa, but it is important that they can be related.

HEADACHES

Frequent morning headaches are often related to sleep disordered breathing. Sleep disordered breathing causes pauses in normal breathing lasting more than 10 seconds. During these pauses blood oxygen levels drop. Disturbances to sleep cycles occur and result in decreased deep, restorative sleep. Lack of REM sleep has been shown by researchers to increase migraine headaches.

Tension headaches are caused by contractions of the head and neck muscles. If you are struggling to breathe all night long, tension headaches may be the result because of the gasping, grinding and/or clenching all night long.

Even sinus headaches can sometimes be attributed to sleep disordered breathing if there is also acid reflux. The acid can actually travel all the way up into your sinuses and cause sinusitis and headaches.

So, if you frequently wake up with morning headaches it is very important to rule out sleep apnea as the cause or a contributing factor. I know my headaches improved dramatically once I was treated for obstructive sleep apnea.

We need quality sleep for our physical health, our biochemical processes, brain and memory function, immunity and emotional stability. When people don't get quality sleep a dizzying array of symptoms can result. Very few diseases can produce such a vast array of symptoms because very few diseases impact every single system of our bodies. To be our healthy, we need to focus not only on getting the right quantity of sleep, but also on the quality of our sleep. Sleep is a pillar of good health.

8

TMJ- The Great Imposter

Too often, people with chronic head pain are told by otherwise well-meaning and caring doctors that "It's all in your head" or "You'll have to learn to live with it— there's nothing you can do about it".

Unfortunately, migraine-like headaches, tension headaches, dizziness, ear pain, ear congestion, and eye, face, head, and neck pain are realities for sufferers. And yes, THEY are in your head!

THERE IS HOPE!

Often, there's a lot we can do about it. At least, there are many things that we can try before surgery!

Many times, a person wouldn't consider seeing a dentist for the above problems because their teeth themselves are not painful. Or, at least the pain isn't perceived as coming from the mouth. But that might not be the case.

We know that a person's mouth and teeth affect many aspects of one's overall health: for instance, when the bite is out of balance, the

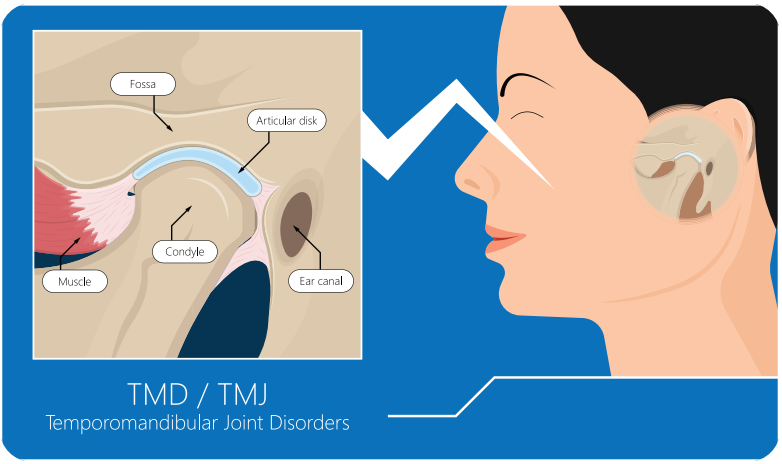
rest of the body can be out of whack. Did you know that many athletes wear bite orthotics, just like foot orthotics, to balance the bite? They find it increases strength and performance.

The symptoms of pain described earlier can often be related to TMJ, muscle and/or jaw imbalances.

So what is TMJ? Many people, doctors, nurses, and insurance companies use the term TMJ. TMJ is an abbreviation for "temporo-mandibular-joint" or jaw joint. In fact, everybody has 2

TMJ's, one in front of each ear. The TM joint is formed by the temporal bone of the skull (temporo) and the lower jaw or Mandible.

The TMJ is the most complex joint in the entire body.



It is a gliding, sliding joint, unlike the ball and socket shoulder joint. There is a cartilage "disc" between the bones that allows the joint to glide and slide smoothly.

It is the only joint in the body where the end point in the range of motion is not defined by

muscles, ligaments and tendons but instead by how the teeth come together. If the bite is not right, the joint can be pulled out of alignment and serious problems can develop.

And, if you lose your teeth, or they shift a lot, forget about it! The jaw won't even know where to go!

These TM joints move every time we talk, chew, or swallow. An average person swallows 2000 times a day! In a normal swallow the person's upper and lower teeth come together. Doing this more than 2000 times a day with an unstable bite causes the surrounding muscles to work extra hard. This starts a cycle of tissue damage, muscle tenderness, and pain.

Pain is the end result. It is not the cause. Pain is your body's way of informing you of a problem. It's actually a defense mechanism. In this case, the problem is an imbalance of the jaw.

This is really important to understand. If PAIN were the real culprit than taking pain relievers would be the solution. But since the real issue is the IMBALANCE, taking pain relievers covers up the problem and never resolves the cause.

The result is a dependence on pain medication or systems that are called by the medical establishment, PAIN MANAGEMENT. Let's hope that we can help you get to the CAUSE of the problem so we can minimize the use of medications or pain management systems.

TMJ problems often start innocently with as little as the muscles not functioning in harmony on both sides. Clicking and popping sounds in the ear are not normal, with or without pain. The sound is an indication that the disc (cushion between the skull bone and lower jaw) is displaced forward or out of place.

If your knee made noises every time you walked, would you be worried? Maybe you might not be able to walk properly.

Well, what about a clicking jaw? This could eventually affect your ability to chew, swallow, and talk. Why wait until you can't do those things that we so often take for granted?

TMJ disease may progress from muscle soreness and tenderness to clicking/popping with any jaw movement, to locking when the mouth is closed or open, to limited opening, and finally to total breakdown of the jaw bone or mandible. As the stages progress, pain usually increases. In the early stages, there might not be any pain and the damage goes on silently. Remember, as we said above, pain is your body's way of telling you that there's something wrong. Listen to it when it speaks!

Some of the symptoms of TMD (temporomandibular disorder) are TMJ pain, headaches, neck pain, limited neck rotation, ear pain, ear congestion, limited mouth opening, pain spreading to the eyes, shoulder, neck, or back, clicking or popping of the jaw, locking jaw, clenching and grinding of the teeth, dizziness, teeth pain or sensitivity without any cavities or oral health disease, and trigeminal neuralgia.

The main nerve controlling the TMJ is the trigeminal nerve. The trigeminal nerve supplies input to the teeth, the mandible on both sides, the sinuses, the opening/closing muscles, the chewing muscles, and is coupled to the Atlas and Axis (C1 + C2) vertebrae in the neck.

There are 10 cranial nerves that reside in the brain and exit to control bodily function. There are 2 nerves, the trigeminal and facial, that affect the 136 different muscles or 68 pairs of "dental muscles". Of all the cranial nerves in the brain, the trigeminal provides more than 50% of all the input into the brain.

With so much brain input, you can appreciate how a misalignment of the TMJ, triggering the trigeminal nerves in an abnormal way, can lead to problems in the rest of the nervous system and may not only cause abnormal muscles contractions but impact other brain-nerve mediated functions as well.

When the lower jaw moves downward (opening the mouth), it generates a pulling force, loosening the muscle in the neck around C2, the

axis vertebrae. Likewise, the jaw moving upward (closing of the mouth) generates a pressure which tightens muscles in the neck around the C2 vertebrae. This means that when the bite is off and has lost its height, it could aggravate the muscles around C2 in the neck when the mouth is closed. Therefore, a disruption to the TMJ could affect positioning of C2, neck pain, and possible collapse of the neck vertebrae. C2/axis plays a key role in the balance of the entire spine.

And the problem works both ways. When there is a posture problem and/or the spine is too curved, it could affect how the jaw lies because of the interaction of the muscles that connect the jaw to the rest of the body.

That's why a thorough examination to evaluate a potential TMJ problem may also include an analysis of your posture (which could be a formal test or an experienced professional just observing your posture). Sometimes, a postural problem can, by nature of the interactions of the muscles contribute to a jaw imbalance as well. Such as jaw imbalance might result in grinding or clenching, symptoms, which might show up long before any pain.

Have you have been told you grind or clench your teeth? Do you have some of these signs of grinding or clenching?

- Worn down or chipped teeth
- Recession of the gums (without gum disease)
- Notches in the teeth
- Indentations on the sides of the teeth
- A taller or shorter looking tooth or multiple teeth
- Extra bone growth (called tori), on the roof of the mouth, sides of the upper or lower jaw, or inside of the lower jaw (the bumps you might feel with your tongue)
- Broken caps and/or Tillings
- Teeth that are sensitive to cold

So, what is the connection between these factors?

Clenching or grinding might indicate that there's an imbalance. It also might indicate that there's an even more insidious and dangerous problem.

A lot of studies have found that people with TMJ issues also have sleep breathing issues.

During sleep, when the airway (breathing tube) collapses, the body's automatic response is to open it up. The brain will do anything to get oxygen! One of the things it may do is force the muscles to push the lower jaw forward in order to open the airway and allow for breathing. Or your brain may cause you to clench your teeth to keep the airway from collapsing back on itself.

Whichever path your brain chooses is beyond your conscious control. This is one of the reasons some of the people who swear they never clench or grind their teeth actually have wear patterns on their teeth (which typically take years to develop). It's the brain's way of protecting you from suffocating and it's triggered by a lack of oxygen in the bloodstream.

This oxygen deprivation to the lungs, the blood and eventually to the brain can lead to contraction of the TMJ joints and muscles. This constant motion of the TMJ all night causes tension in the TMJ because it is trying to keep the airway open. It also leads to clenching and grinding.

As mentioned in previous chapters, some of the consequences of sleep breathing disorders are cardiovascular issues, high blood pressure, strokes, daytime sleepiness, snoring, atrial fibrillation, depression, difficulty concentrating or thinking, and short term memory loss.

TMD is commonly linked to chronic fatigue syndrome, fibromyalgia, and sleep breathing disorders. It's the reason I included this chapter in a book about SLEEP.

In fact, the NHLBI or National Heart Lung and Blood Institute considers sleep apnea (sleep breathing disorder) to be a TMJ disorder.

You might hear different terms for problems involving the TMJ. Dentists sometimes refer to it as TMD (the D standing for dysfunction). Some may call it neuralgia (nerve problem), others myalgia (muscle problem) and yet others, arthralgia (joint problem). Whatever it's called, getting to the ROOT CAUSE of the problem is the best way to make it go away and prevent it from coming back.

And, if an airway blockage at night is the cause, then resolving the airway will be the first step in helping to relieve the TMJ symptoms.

But remember, you probably only sleep 7-8 hours a night. What happens during your waking hours can be just as important. So, an imbalance of the jaws, muscles and teeth can still play a role in continued discomfort, even after the sleep issue is resolved.

Being evaluated by someone who appreciates the entirety of the airway-posture-joint- muscle-nerve-teeth complex is the best way to assure that YOU will get a resolution to any discomfort you might be experiencing.

9

Sleep-Disordered Breathing and Asthma

Asthma is a condition where your lungs react to things that normally shouldn't affect you, making it difficult to breathe.

As we've discussed, obstructive sleep apnea (OSA) occurs when your muscles relax and the soft tissues in your mouth, throat and nose interrupt your breathing during sleep.

You might not see the relationship immediately, but asthma and obstructive sleep apnea are closely linked to each other. People with asthma are much more likely to have OSA and for those who do have OSA it makes their asthma worse.

OSA is a serious health risk and if left untreated often leads to death. A partial airway blockage produces a sound: snoring. A completely blocked airway will not make any sound and is completely silent. Sleep apnea is a combination of both obstructions that occur during sleep. Aside from sleepiness, it can create a higher risk for high blood pressure, heart attack, stroke and insulin resistance.

If you suspect you have sleep apnea, you should seek treatment right away, especially if you have asthma. Schedule a consultation with your qualified dentist who can then refer you to a physician for an evaluation,

diagnosis and treatment. The physician may direct your dentist to fabricate an oral appliance if it's appropriate and you are a candidate.

Both sleep apnea and asthma are life threatening and have inflammation in common. Let's explore more so you can see how they are connected.

There are 2 key factors that play a role in the asthma and obstructive sleep apnea connection:

- Mouth-breathing
- Inflammation

Mouth Breathing and Asthma

Mouth breathing is a huge factor in the development of asthma and obstructive sleep apnea. The nose (not the mouth) should be used during breathing. This is what is known as nasal breathing. As stated in Chapter 1, the nose has better air conditioning capacity.

By enlarging the nostrils a person's nasal breathing improves drastically in the majority of people. Studies show that when people suffering from nighttime or morning asthma enlarged their nostrils during sleep they reduced their nighttime asthma. Any inexpensive nasal dilator such as Nozovent or Mute (or even Breathe Right Strips) will help keep the nostrils enlarged while sleeping.

Mouth breathing leads to the drying and cooling of the lining of the lungs causing the airway ducts to constrict and the asthma to worsen.

Inflammation in Asthma and Obstructive Sleep Apnea

Inflammation is an immune response in which white blood cells produce chemicals to fight a foreign substance and occurs in both asthma and obstructive sleep apnea. Obstructive sleep apnea produces a chronic, low level of inflammation in an adult or child. Factors such as heredity, lifestyle and your environment are capable of increasing this level of inflammation to epic proportions.

Belly fat produces inflammation that occurs before the start of obstructive sleep apnea. This same inflammation may also affect the lungs and cause asthma. Even as early as puberty, metabolic factors such as having a large waistline, high blood pressure, high levels of fat, cholesterol and sugar in the blood are driving the development of sleep apnea, just as we see in adults.

Researchers have found that inflammation in the lining of the upper airway results in it being more collapsible and makes OSA worse. Inflammation causes the inner lining of the airways to swell and produce mucus. This makes the airway more sensitive to asthmatic triggers.

Likelihood of asthma developing into obstructive sleep apnea according to the Centers for Disease Control and Prevention Report:

- **Risk**—having asthma was a risk factor for an asthmatic patient developing obstructive sleep apnea. Asthma patients face an almost 40% greater risk for sleep apnea than asthma-free patients. This risk depends on the degree of therapeutic control of the patient's asthma: controlling asthma meant reducing the risk for being diagnosed with sleep apnea. The more uncontrolled the asthma is the more severe the sleep apnea is.
- **Severity**—people with obstructive sleep apnea and asthma also appear to have more severe asthma symptoms than people with asthma without obstructive sleep apnea.
- **Duration**—the longer a patient had bronchial asthma, the more likely that the patient would develop obstructive sleep apnea.
- **Obesity**—people with a BMI of 30 (obese) or more have a much higher risk of having asthma than those with a lower BMI. It is thought that belly fat tissue produces inflammatory substances that might affect the lungs and cause asthma.
- **Gender**—evidence suggests that the effects of asthma and obstructive sleep apnea may be worse in women.

Asthma and Obstructive Sleep Apnea Overlap

- They occur together at the same time in a high number of cases
- They share risk factors including

1. Rhinitis—runny nose, sneezing, and stuffiness
2. Obesity
3. Acid reflux
4. The worse the asthma severity the worse the obstructive sleep apnea severity and vice versa
5. Inflammation exists both inside the body and the airway
6. Both have an effect on the immune system
7. Asthma-controlling medications (corticosteroids) can cause patients with asthma to develop obstructive sleep apnea.
8. If obstructive sleep apnea is not adequately controlled it becomes harder to control the asthma because irregular lack of oxygen during sleep causes airway inflammation and prevents formation of healthy tissue.

Steps to Take Now

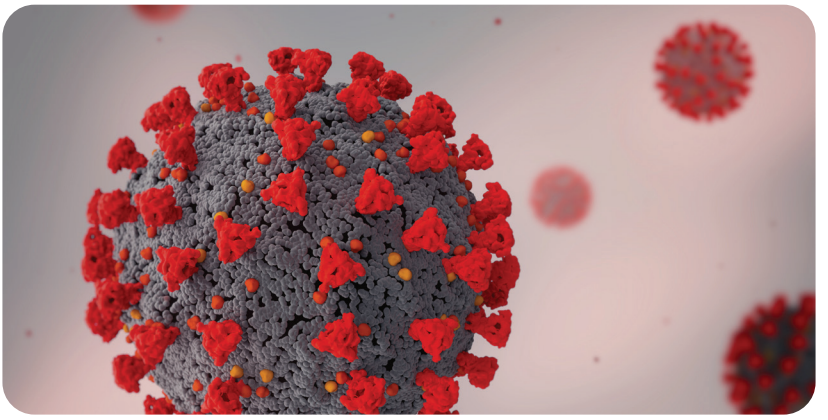
1. If you are not sure if you have asthma or OSA let your dentist know so you can be referred to the right physician for an evaluation.
2. If you or a loved one has asthma make sure you also get checked for OSA especially children.
3. Patients with both conditions should strive for the best control of asthma, which in turn can improve your OSA or decrease chances of developing OSA.
4. If you have OSA continue to use your CPAP (continuous positive airway pressure).

5. If you have both OSA and asthma, CPAP use has shown to improve asthma-specific quality of life especially in older patients.

What To Do if You Cannot Tolerate Wearing Your CPAP

1. Let the physician who prescribed the CPAP know and inform your dentist.
2. Ask for and discuss other options to treat your sleep apnea.
3. The physician will request an evaluation by your dentist to see if you are a candidate for oral appliance to treat your OSA.

Asthma and OSA are lifelong diseases that will not go away on their own. Ongoing treatment and regular follow-ups are necessary to help you manage these conditions. Nasal breathing programs have shown to work for asthma and obstructive sleep apnea.



10

COVID-19, Pandemics and Sleep Apnea

Ah yes, "COVID-19", the "novel coronavirus"! Just reading the name most likely evokes thoughts and emotional responses in your body, which are then followed by a string of hormonal reactions that are likely inducing a decrease of your immunity as we speak. You don't even have to be infected by the virus to be affected by it!

Our thoughts alone can affect our immune systems. That's the power of our brains. That's why it's often referred to as the control center.

We're told: wash your hands, cover your cough, don't touch your face, don't worry about a mask, it won't help...WAIT! Then we're told that you need to wear a mask AND gloves, stay 6 feet apart, don't leave your house but make sure you "get out" and exercise and eat healthy. Clean everything in your house, and keep it clean, manage your stress (sure...)! It's dizzying!

Did you hear the part about sleep? No?

Sleep 7-8 hours EVERY night or your immune system will be as non-existent as toilet paper was in the beginning of the pandemic. In case you missed it, like most people did, here's the scoop.

Think of your immune system like a giant military defense force, the largest you could ever imagine and one that never rests. Every night when you sleep, your personal defense system is especially hard at work. For instance, remember the last time you had the flu (or maybe you had the

coronavirus)? All you likely wanted to do was curl up in bed and sleep for days. Well, there is good reason for that!

Sleep fights against sickness by deploying your immune military and its arsenal of protection. While you rest, your body is waging war on the enemy infiltrators to make you well again. Destroying viruses, killing bacteria, and even obliterating cancerous tumor cells, is what your immune system does best, mostly while you sleep!

This process is so necessary to keep you alive, that your immune system continues to set off alarm signals of exhaustion, bringing in more troops until you're better. The more sleep you get, the faster you will recover.

Your body needs sleep in order to fight illness, but it also needs sleep in order to stay healthy.

If you reduce your sleep by just a few hours for one night, your military defense system dramatically falls apart. Natural killer cells, the Navy Seals of your immune system, identify dangerous enemies, such as COVID-19, and eliminate them. Studies show that healthy people who had slept only 4 hours for a SINGLE night, had their natural killer cells reduced by 70%.

That's seven deaths for every ten Navy Seals you have in your body after just one night of bad sleep! What's even worse is trying to regenerate them. Once you miss out on sleep, you can't just "catch up" by trying to sleep more the next night. The damage is already done. In fact, so much so that evidence of a damaged immune system from just a short disruption of sleep is still present up to a year later!

Studies have proven again and again that adults need 7 to 8 hours of sleep each night to bolster their immune system, while children and teenagers need at least 10, if not more.

So the next time you find yourself in the middle of a pandemic, or any other time you want to keep from getting sick, consider the immense value of sleep.

Recommendations such as washing your hands and wearing a mask help keep the virus away, and are definitely a good idea (think of that as a partial wall around your body). But if just one virus gets through that wall, who is left to defend you?

How many Navy Seal cells are on your team?

How many do you want to still be there in the morning?

11

Second Hand Sleep Apnea? I'm sleeping with a grizzly bear— how your ***BED PARTNER***'s snores can affect your health!

In many bedrooms across the country (and world), there is a competition. Sometimes it's a battle for the blankets. Other times it's a tiff over the temperature. But on any given night, in as many as 50% of bedrooms, it's a fight to fall asleep first. He or she, who falls asleep first, wins. There is no trophy for the winner in this game. Instead, the prize is: NOT having to listen to the other partner snore. All. Night. Long.

The ability to sleep through the night with a snoring bed partner is actually pretty rare. When someone in the family snores, no one gets much sleep. The non-snoring partner goes to bed with a human and is awakened to the sound of a grizzly bear or a chainsaw (worst case is a bear WITH a chainsaw) sleeping next to them. And now they are doing anything BUT sleeping. They try earplugs, but they don't stop the noise. They throw a hard elbow to their partner's ribs, but that only helps for a few minutes. They might even kick their partner out of bed or move to

the couch themselves. All of these might be temporary fixes but none are long-term solutions.

So what's the big deal? Why is it so bad to have a snoring bed partner? There are 2 big ways that having a bed partner with snoring or sleep apnea is harmful to the non-snoring bed partner. Poor sleep quality will not only affect the physical and mental health of the non-snoring partner, but it can also be detrimental to the couple's relationship.

For 40+ years, we have known that secondhand smoke is deadly. Even though only one person is actually smoking the cigarettes, the other family members are exposed to the smoke and are at high risk for lung disease and cancer. Similarly, secondhand sleep apnea can also cause severe problems. As shown in earlier chapters, sleep disorders have serious and deadly health consequences. Although having a snoring bed partner doesn't cause you to have pauses in breathing or drops in oxygen levels, it does cause major sleep disruption. Chronic sleep disruption and/or deprivation can easily lead to weight gain and mood disorders, such as anxiety and/or depression. It also causes excessive daytime sleepiness, which is the leading cause for car accidents and poor job performance.

In addition to serious physical and mental health risks, permanent damage can be done to the relationship between the partners. Sleep

disruption can lead to moodiness, anger and conflict that extend well beyond the walls of the bedroom. Tired and cranky people are quicker to disagree or respond in anger, often saying things they don't really mean or wouldn't normally say. But like toothpaste squeezed out of a tube, hurtful words cannot be taken back once they are said. Many of these couples end up in costly therapy or counseling.

"Laugh and the world laughs with you.
Snore and you sleep alone."

~Antonin Burgess

Dr. Oz told a story on The Today Show about "Sleep Divorce," where couples sleep in different rooms in order to get more restful sleep. As mentioned in the previous chapter, The National Sleep Foundation reports that up to 25% of American couples are already sleeping in separate rooms, and even more wish they were. But who enters into a long-term relationship with the goal of sleeping in different bedrooms? Intimacy can suffer when physical walls are between partners, thus setting the stage for emotional walls to develop. And though it may help temporarily, this physical separation is more of a band-aid rather than a solution to the underlying problem.

Worst-case scenario? Your partner awakens you because they are having a sleep apnea-induced heart attack. Or you wake up in the morning to find they've passed in their sleep. Both are very real possibilities for someone with sleep apnea. That's a nightmare no one should have to live, and yet it happens every day.

When a person is snoring or has sleep apnea, everyone suffers: the one doing the snoring, the one hearing the snoring, and the relationship between them. But there is great news! There are easy and effective ways to treat it; resulting in everyone getting deep and restful sleep, which not only saves lives but also relationships.

12

Sleep and Pregnancy

Pregnancy and sleep-disordered breathing. Is that really a thing? One more item to add to the list for women to worry about!

Pregnancy is full of so many emotions and concerns: excitement, hope, being fulfilled, love, fear, and anxiety to name just a few. The point, however, is not to add one more reason for anxiety, but to have the ability and knowledge to provide a more restful and healthy environment for women and their little ones on the way.

In fact, a healthier sleep with proper breathing decreases stress and anxiety. Quality sleep helps our hormones regulate better so we can be calm, think through our fears, eat healthier, and function better. As a result, expectant mothers feel more confident about this beautiful but sometimes uncertain time of their life, and the baby benefits as well.

Although we have already covered the definition of sleep-disordered breathing and sleep apnea in previous chapters, it is well worth repeating here so we can see how it affects pregnancy...

The phenomenon of sleep apnea is when the airway begins to collapse, either partially or fully, creating an obstruction in breathing. When this happens, the "fight or flight" response that we've mentioned before triggers a host of reactions, creating great stress on the body. Breathing gives us oxygen. A dip in oxygen levels when we are not breathing creates a spike in blood pressure which is part of that fight or flight response. As this happens over and over again during the night, the whole cardiovascular system is put in a state of distress.

For pregnant mothers this causes a very high risk of preeclampsia and preterm delivery. These babies are twice as likely to have low birth weights and be placed in the NICU (neonatal intensive care unit). Pregnant women who might live at high altitude such as in Colorado live with

chronically low oxygen levels and may already be predisposed to blood pressure disorders.

The feeling of a fight or flight response is usually not something any of us enjoy (except maybe on a roller coaster or those who like skydiving). Adrenaline and cortisol are the hormones that rush through the body to create that feeling, with cortisol being the primary stress hormone.

The event of a breathing obstruction during sleep causes a surge in cortisol. Again, there is a domino effect as that imbalance of hormones increases blood sugar levels and leads to a high risk of gestational diabetes in pregnant women. In fact, if there is a severe level of sleep apnea during mid pregnancy, the chance of gestational diabetes is twice as high.

Expectant mothers have been under-recognized as a group at risk for apnea. Mothers need a restful sleep for themselves and their babies. However the research is clear and the prevalence of obstructive sleep apnea can be as high as 26% in the third trimester.

With this knowledge, what can be done about it?

CPAP is often prescribed for sleep apnea and has been shown to be effective. It works by pushing air into the airway at whatever pressure is needed to blow open and prevent collapse of the airway that occurs during an oxygen-depleting event. CPAP works! Unfortunately, many people find it cumbersome or claustrophobic. It is hard enough to find a comfortable position during pregnancy without adding a machine to the mix!

Dental appliances also treat sleep-disordered breathing and are easy to wear and get used to. The additional bonus is that it also helps relieve the extra snoring, which often occurs during pregnancy too.

Dental appliances to treat sleep apnea have grown in popularity over the years. The American Academy of Sleep

Medicine recommends sleep appliances as first line treatment for mild and moderate sleep apnea. Oral appliances gently hold the lower jaw in a position that keeps the airway open, providing the restful night sleep that is so crucial especially for pregnant women. Your medical insurance carrier might even cover it!

The expectation of new life sparks a level of love and a protective role in women that is undeniable. A good night's sleep can only enhance that miracle.

> *"No one else will ever know the strength of my love for you. After all, you're the only one who knows the sound of my heart from the inside."*
>
> *– Kristen Proby, Fight with Me*

13

Breathing Isn't Just for Nighttime!

Mary just gave birth to a baby girl, her first child. She had some minor sleep issues during her pregnancy, but the baby, Caroline, was perfect. Of course, babies take a lot of work and Mary breastfed too. She was always on call for Caroline, so it wasn't unusual for Mary to feel tire

When Caroline was 2 years old, Mary was no longer breastfeeding and was able to sleep through the night, but she still found herself tired. She thought it was her new normal—she was a mom to a toddler, after all.

One day, Mary developed a terrible pain in her jaw that radiated into her ear. She went from dentist to dentist, but none were able to find out what was wrong. She finally went to an Ear, Nose and Throat doctor, who gave her a sleep questionnaire. That questionnaire showed that she might have sleep apnea so a home sleep study was recommended. It showed only very mild evidence of sleep apnea, with an AHI score (you'll read about AHI in Chapter 17) of 4. She didn't qualify for any treatment.

Mary's primary care physician had diagnosed her with Epstein Barr and Fibromyalgia but that didn't explain the jaw pain, so Mary kept searching.

She finally made her way to a dentist who was well trained in both dental sleep medicine and TMJ. It turned out that Mary suffered from a syndrome called UARS, Upper Airway Resistance Syndrome, which is very hard to diagnose by standard methods and tests.

As mentioned before, most people (including many doctors) think that a typical sleep apnea patient is an overweight, older male. We refer to this as "confirmation bias." We see what we know. We don't see what we don't know. Excess weight is a common finding among people with sleep apnea and it is also more common in men and older people in general. Most of us are unaware that there is another phenomenon primarily affecting thin, young women, usually with thin noses and narrow faces.

You see, breathing is something that is done all day long, not just a night (obvious, I know!). Sometimes people with smaller airways can have a hard time getting air into the lungs in a way that is efficient and allows for the proper absorption of oxygen. We refer to this kind of airflow as "turbulent." In such situations, the body will try and maneuver itself to get a smoother flow by positioning the head, neck, and jaw in different positions. Doctors refer to this as "posturing." Really, it's just a way for the body to adapt to get the oxygen it needs.

Such "better air" positions might be responsible for these people having bad backs, muscle aches, headaches and even TMJ problems like Mary had. As we've seen in previous chapters, when the body has to work hard to get oxygen, it goes into a "fight or flight" mode. Cortisol is made that keeps the body UP. But, that's not only unsustainable, it's unhealthy and leads to many of the symptoms we see.

Because people with this phenomenon, Upper Airway Resistance Syndrome (called UARS), also have problems getting adequate air moving from their lungs to their organs at night, they often have all of the symptoms of people with sleep apnea:

- Difficulty initiating or maintaining sleep (Insomnia)
- Snoring – but not always
- Chronic fatigue
- Cognitive impairment (brain fog)
- Anxiety
- Depression
- Headaches
- Non-refreshing sleep
- Excessive daytime sleepiness
- And many others.

Many people like Mary also complain of not being able to sleep on their backs. They need their bedroom environments just right: the right temperature, the right pillow, and minimal sounds or a noise machine. These people tend to not get adequate amounts of deeper sleep so they attempt to accommodate by altering their bedrooms in an attempt to improve their quality of sleep.

UARS is an ALL DAY problem, as we breathe all day long.

Mary wound up getting a nighttime sleep appliance and a daytime, jaw repositioning appliance, that she wore on her lower teeth. These repositioned her jaw so that she was able to breathe better. The flow of air became smoother and gentler on her lungs. The pain in her jaw went away. Mary is now considering orthodontics so her jaw can be properly positioned without the use of an appliance.

UARS is often overlooked. If you suspect you might suffer from this, please find yourself a dentist who understands both dental sleep medicine as well as TMJ issues because, as mentioned before, they are often connected!

Mary is now happy, energetic, and pain free. She's undoubtedly a better mommy to Caroline as well.

14

Sleep Apnea and Menopause

Sleep apnea awareness is growing all around us. Most people appreciate the need for a good amount of restful sleep. Yet, many people fall short of national recommendations or even their own personal expectations. Thankfully, more and more people are being tested and, when appropriate, treated for sleep-disordered breathing.

Unfortunately, sleep apnea is often stereotyped as mostly affecting older, overweight men and therefore, many women are not getting evaluated for

the problem. As you've seen with Mary's story in Chapter 11, young women are not immune from sleep-disordered breathing problems. Older women aren't immune either.

According to research, men are 8 times more likely to be tested for sleep apnea than women. One of the main reasons is that the "classic" symptoms of sleep apnea such as very loud snoring and excessive sleepiness during the day are more common in men. Women with sleep apnea often present with more subtle symptoms such as insomnia, fatigue and mood disorders.

Snoring might not be quite as loud and disruptive due to the shape and size of the female airway. Instead of being tested and treated for sleep apnea they are given medications and left with no help for the underlying problem. This is especially true for middle-aged women who are pre-menopausal or actually starting menopause.

Insomnia, frequent awakenings, mood swings, hot flashes, memory loss, fatigue—all of those symptoms are often accepted as part of "normal aging" and leave a woman with no choice but to suffer from a lack of restful sleep.

What is often ignored is the fact that many of these symptoms are actually caused by the development of sleep apnea. Studies indicate that more than 20% of women will develop sleep-disordered breathing in midlife.

Why do women develop sleep apnea later in life?

It turns out that to some extent, women are protected from sleep apnea by hormones—estrogen and progesterone. The hormones maintain the airway's muscle tone and keep it from collapsing.

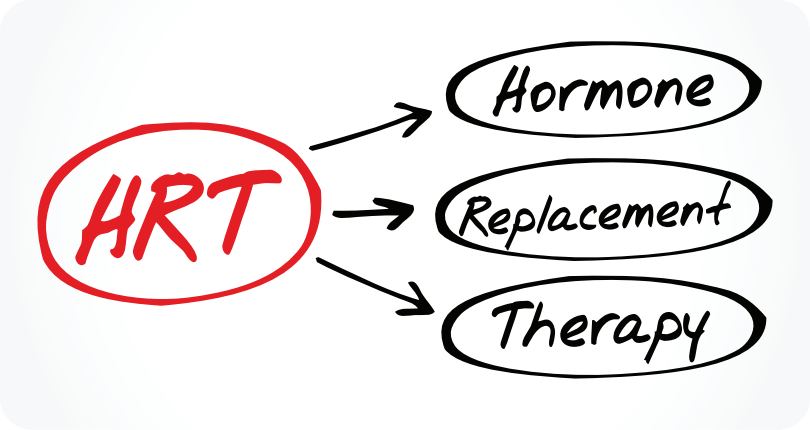
As the level of these hormones begin to decline, the incidences of sleep apnea in women increase. In fact, older women have the same risk of developing sleep apnea as their male counterparts.

Women who have hysterectomies and similar surgeries that affect their hormones have the same issues. They too are more prone to sleep apnea.

And, it seems that women who have sleep disturbances are also more prone to depressed mood, clinical depression, and anxiety.

The good news is that with proper treatment, sleep quality can be dramatically improved. In fact, there are several studies that found when women were treated for a sleep disturbance, that sleep treatment

enhanced the effectiveness of other treatments for mood changes or alleviated their symptoms entirely.



But if sleep apnea is due to a hormonal imbalance in these women's midlife years, then what about hormone replacement therapy?

Good question, and a complex one.

According to a well-known sleep doctor, "The decision to use HRT is a highly individualized one, a decision women should make in consultation with their physicians, and with consideration of their health and family medical history, age, where they are in the menopausal transition, the severity of their menopause symptoms and the effectiveness for them of non-hormonal therapies in relieving those symptoms."

It turns out that use of estrogen and progesterone for longer than 5 years is linked to an increased risk of breast cancer.

Because of the complexity of hormone replacement therapy (HRT), a more conservative approach to resolving sleep apnea might be preferable. Oral appliance therapy (OAT), might be part of the solution. It might allow a lower dose of HST or negate its need at all. Certainly, it's worth a try?

There are so many things that are out of our control. Seeking help for sleep problems is a choice, as is choosing the treatment that is right for YOU!

15

How is Sleep Apnea Diagnosed?

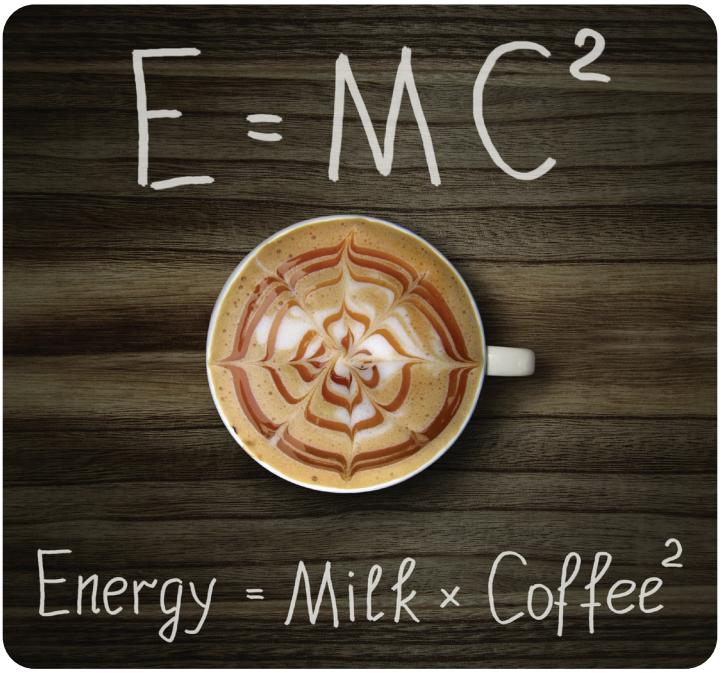
How do you know if you have obstructive sleep apnea? We've gone over many of the symptoms, and probably by now you are "sure" you have it! But just in case you're in doubt, let's repeat some of them here with some more "in depth" explanations.

Symptoms like snoring, silent pauses in breathing followed by choking and gasping sounds are all very common and obvious. Interestingly, people who suffer from sleep apnea are often unaware of just how much their sleep is disrupted. It is usually a bed partner or a family member that brings it to their attention as their own sleep is disrupted by the loud and often scary sounds.

Other symptoms like unrefreshing sleep, fatigue, morning headaches, memory loss, and daytime sleepiness are also common. However, since most people suffer from sleep apnea for many years (and some of its effects come on gradually), they might think that these symptoms are "normal"—they don't even know what a good night's sleep feels like! Even worse, they often label themselves as lazy or unmotivated without realizing that they just never get a good night's rest and have to power through the day because of their disease.

It is estimated that more than 15 million people in America suffer from undiagnosed sleep apnea. Many of these symptoms are so common that

we, as a society, consider them "normal". In truth, it might currently be "normal" to drink 4 cups of coffee and a Monster drink just to get through the day because so many people do it, but that doesn't mean it's right or healthy, or makes sense.



But to a doctor or dentist who is trained in sleep-disordered breathing, it does make sense. Through asking the right questions and gathering information they can suspect that you have a disease and recommend a sleep test that will study your nighttime breathing, detect the abnormalities and determine if you have a disease. The sleep test will also determine the extent of the problem. Depending on how often the breathing is disrupted while you sleep, sleep apnea is classified as mild, moderate or severe. This information is crucial to develop successful personalized treatment recommendations.

A sleep test is a non-invasive study of your nighttime breathing and some other body functions. Depending on your needs and doctor's recommendations, the sleep test can be a polysomnograph (performed in a clinic) or at your own home with a home sleep test.

Polysomnography is a very detailed study of your sleep. You will spend a night in a sleep laboratory. There will be a private bedroom and you can bring your own nightclothes. After you arrive and check-in, a specially trained technician will attach small adhesive electrodes and other monitoring equipment to your body. These will help to record brain activity, heart rate and rhythm, oxygen levels in your bloodstream, and leg and other muscle movement. After the technician is done, you will be left alone to relax in your room. After you fall asleep the technician will monitor the instruments in a nearby control room. All the data from the instruments and electrodes will be recorded. Later on, a medical doctor who specializes in sleep disorders will evaluate the data and provide an accurate diagnosis based on the results of the test.

Since children's sleep is complex, they can only be tested for sleep apnea with polysomnography. When a child is tested, 2 bedrooms are usually provided—one for the child and an adjoining room for the parent.

Home Sleep Apnea Test is another option to diagnose obstructive sleep apnea.

A home sleep test is performed in your own home. You will receive a kit with instructions and before you go to sleep at night you will set it up yourself. There are many different kits available but most will include a nasal cannula (a tube that goes under your nose to monitor airflow), pulse oximeter to monitor heart rate and blood oxygen level (usually a comfortable clip on your finger), a chest belt to monitor breathing pattern and a recorder to gather all the data. After you return the kit, the data will be analyzed by a sleep doctor.

With a home sleep test, only airflow and oxygen are measured and the numbers are sometimes affected by the lack of monitoring of the other functions and parameters. However, there is an obvious convenience to this test as it can be done at home. Home sleep tests should be used in

people that have a fairly significant level of obstructive sleep apnea as they tend to often overlook subtle changes in breathing.

If your home sleep test says you DO NOT have sleep apnea, that may NOT be true and your results should be discussed with your doctor to see if an in-lab study would be appropriate to diagnose more complex sleep-disordered breathing. **If your home sleep test says you DO have sleep apnea it is always correct.**

The sleep test is a non-invasive and easy way to diagnose obstructive sleep apnea. Many people are surprised to find out just how bad their sleep quality is. They also feel relieved to find out that some of the vague symptoms that they have suffered through the years are actually caused by a very real disease.

The best news is, once the disease is identified, there are non-invasive treatments available to help you to get a better night's rest and ultimately a better quality of life.

16

What Do the Numbers Mean?

The information gathered during your sleep study—either a home study (HST) or an in-lab study (PSG)—is used to determine your problem and the severity of it. And, while the numbers do tell your doctor a lot, there's more to helping you than JUST the numbers.

During the study, the number of times you stop breathing (apnea) and the number of times you have a reduction in airflow (hypopnea) are recorded. Reduction in the level of oxygen (oxygen desaturation) in your blood is also noted. This information is used to classify the presence and severity of obstructive sleep apnea (OSA).

Types of Airway Obstructions

- Apnea—a complete collapse of the airway, breathing stops for 10 seconds or more and airflow to the lungs is blocked.
- Hypopnea—a partial collapse of the airway, breathing is reduced for 10 seconds or more and airflow to the lungs is restricted.

The **Apnea Hypopnea Index (AHI)** is the number of apneas and hypopneas per hour of sleep. **AHI** is calculated by adding the apneas and

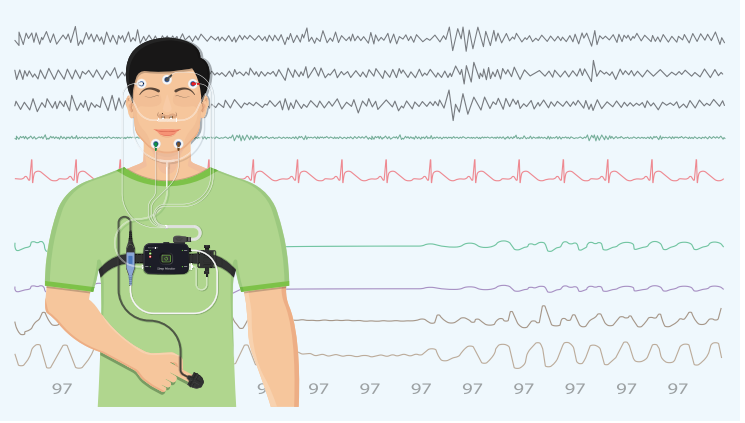
hypopneas together and then dividing that number by the number of hours you slept, like this:

$$\text{AHI} = \frac{\text{Apneas + Hypopneas}}{\text{Total hours of sleep}}$$

Once you have your AHI you can use this table to classify your OSA severity:

AHI	Severity of OSA
<5	"Normal"
5-15	Mild OSA
15-30	Moderate OSA
>30	Severe OSA

Your sleep study results may also include another number called the **Respiratory Disturbance Index (RDI)**. This number includes apneas, hypopneas and other additional breathing irregularities. So, the RDI is often higher than the AHI.



When having episodes of apnea or hypopnea during OSA, the level of oxygen in your blood may fall, depriving your body of much needed

oxygen. This is known as oxygen desaturation, and is another number you will find on your sleep study.

At sea level, normal blood oxygen saturation is usually around 96-97%. During sleep a desaturation to 90% is generally considered mild, dips to 80-89% moderate and below 80% severe.

The **Oxygen Desaturation Index (ODI)** is another index on your sleep study report. This index is measured by the number of times per hour that the oxygen level in your blood drops by a certain percentage from your baseline number. The American Academy of Sleep Medicine (AASM) counts a 3% drop as a desaturation and Medicare uses a 4% drop.

Once you have your sleep study results, you and your doctor can review them and then based on the presence, severity of the disease and individual factors can determine the best course of treatment for you.

Understanding your numbers is important, but they are only one part of the complex puzzle making up your sleep. The treatment decision that YOU and your doctor will make should take into account many different variables to help you achieve your ultimate goal of restful, refreshing and health-promoting sleep.

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Treatment Options

So now you've been diagnosed and you're looking at your options. How can these different sleep conditions be treated?

There are three commonly prescribed treatments for obstructive sleep apnea (OSA)—CPAP therapy, oral appliance therapy and surgery. There are other methods that may help decrease snoring and improve sleep apnea such as nose dilators, weight loss and avoiding sleeping on your back. All or some of these options are available alone or in combination to help control your snoring and/or sleep apnea and successfully bring your number, the Apnea Hypopnea Index (AHI) below the magical score of 5.

CPAP Therapy
CPAP stands for "Continuous, Positive, Airway, Pressure."

This option is considered by many to be the gold standard for sleep apnea treatment. It is available for people who have mild, moderate or severe sleep apnea. **CPAP** is a machine that pushes a stream of air continuously through your airway, moving the soft tissues in the back of the throat and opening the airway. Other positive air pressure devices that are available are **BiPAP** (which allows the pressures in the machine to change as you breathe in and out) and **APAP** (which automatically adjusts the pressures based on your breathing patterns during the night).

While this therapy is successful almost 100% of the time that it is properly used, we know from multiple studies that the "positive airway pressure" success rate is only 50%-60%. **The low success rate is because many patients do not use PAP therapy consistently.** This can be for many reasons including comfort, poor mask seal, sinus issues or claustrophobia.

Oral Appliance Therapy

There two types of Oral Appliance (OA) therapies: mandibular advancement devices (MAD) and tongue repositioning devices (TRD). There are many FDA approved styles of MAD's available. All appliances gently reposition the lower jaw forward to open the airway and prevent the soft tissues from falling back and collapsing.

TRDs hold the tongue forward and like the MAD prevent the airway from collapsing. The issue with TRDs is that most people find them uncomfortable.

While MAD's are available for patients with mild, moderate and severe apnea, they are most useful as a stand-alone therapy for those patients

who have mild and moderate OSA. This therapy has a compliance rate of 77% and a success rate approaching 80% for those patients who have mild to moderate OSA and 50% for those who have more severe OSA. MAD's are less successful at reducing a patient's AHI than CPAP but have a higher rate of use. There are many factors associated with the higher success of MAD's including female gender, younger age, lower AHI, lower BMI, smaller neck circumference and lack of back sleeping.

Wearing a MAD can result in some mild and temporary side effects including excess saliva or dry mouth and tooth, gum or TMJ discomfort. These minor side effects can readily be relieved by a dentist who understands how to care for people with these devices.

Surgery

There are many surgical options to treat OSA. The goal of surgery is to physically alter and/or open up the nasal, oral, or throat air passages. Some of the surgical techniques available include nasal and sinus surgery, UPPP (where part of the soft tissue in the upper back of the throat is removed and/or reshaped), upper and lower jaw surgery, tongue reduction and a surgical implant procedure called "Inspire" where a surgeon places a

pacemaker type device in the chest with a wire that goes up to and then under the tongue to stimulate a nerve when a person starts to snore. All of these surgical procedures have success rates that vary greatly and most could either be used alone or in combination with CPAP and/or OA therapy.

Other potentially helpful treatments include:

Weight Loss/Exercise

While losing weight and exercising are great for improving overall health, they can also lower the severity of someone's sleep apnea score, or AHI. Many times, these programs are used in combination with CPAP and OA therapies. Bariatric surgery is also a weight loss option for people who have a high body mass index (BMI) and have had difficulty losing weight on their own.

Side Sleeping

Fifty percent of all people have worse sleep apnea and snoring when they sleep on their backs instead of their sides. There are many devices on the market and even some do-it-yourself tricks (like sewing a tennis ball into a tee shirt) that can help prevent back sleeping and encourage side-sleeping.

Combination Therapy

This strategy is often used when standalone treatments, such as CPAP and MADs, don't work alone. Often, people will have better success when they combine either CPAPs with MADs or MADs with side sleeping. Weight loss and exercise are always great additions because of the many other health benefits they have. Lastly, surgery can be a standalone treatment, but often may require the assistance of other therapies to provide optimal results.

Myofunctional Therapy

Since muscles also help control the airway, their tone and how they function can impact the process of breathing. Sometimes children are forced to use their muscles improperly and these patterns continue throughout life. A myofunctional therapist can help retrain these muscles to function optimally and help support the airway. Such therapy is often used in conjunction with the ones mentioned above.

There's no single treatment that's right for everyone. That's why a thorough examination and DIAGNOSIS of the underlying cause is so important.

When it comes to human health, there's never a "one size fits all" solution.

18

Do-It-Yourself Remedies

The Good, The Bad, and The Costly

I bet you are thinking that we will tell you there are no good Do-It-Yourself solutions for sleep apnea?? That is not the case! There are absolutely some great things you can do on your own to help yourself.

Of course there are also some very dangerous things out there that can get you into a whole lot of hot water, be very costly to fix, and can even do quite a bit of damage—including not adequately treating your sleep apnea—which puts your life at risk. The degree to which DIY remedies will help varies depending on the severity of your sleep apnea and the type of sleep apnea you have. It is best to discuss these remedies with either your sleep physician or qualified dentist, to determine if any of them could be a benefit to you.

I am guessing you wouldn't put your life at risk to save some money, but many people make exactly that same mistake. I hope this chapter will prevent anyone from putting their lives on the line for a few dollars or convenience.

The Good

Practicing good sleep hygiene is one of the best things you can do to naturally improve sleep.

- Avoid alcohol within 3 hours of bedtime.
- Avoid caffeine after 1 in the afternoon.
- Drink plenty of hydrating fluids.
- Get regular exercise.
- Maintain a healthy weight.
- Eat a balanced diet.
- Keep a consistent sleep schedule.
- Keep the room you sleep in dark and cool.
- Avoid electronics and screen time at least 2 hours before you go to bed.

Nasal dilators like Mute, Nozovent, and Breathe Right Strips can help by keeping the nasal passages open and enhance airflow. This can be helpful if you have a compromised or obstructed nasal airway.

Vitamin supplementation has shown to be beneficial as well. For instance, low levels of vitamin D are associated with poor sleep quality and sleep quantity. Additionally, several studies demonstrate a lack of vitamin D may also affect the severity of sleep apnea, with lower D levels linked to more severe cases of OSA.

A 2009 study showed that a combination of Vitamin C (100 mg) and Vitamin E (400 IU) taken twice daily reduced episodes of apnea, the interrupted breathing that is the hallmark, or main symptom, of OSA. This C and E combination also improved sleep quality and decreased daytime sleepiness.

There's evidence that B6 also aids sleep—and affects our dreams. The role of Vitamin B12 is interesting. Several studies have demonstrated that

this vitamin is involved in regulating sleep-wake cycles by helping to keep circadian rhythms in sync. However, more research is needed.

Some people have what is called a "positional component" to their sleep apnea. For some people, staying off of your back will, essentially, cure your sleep apnea. For other people, staying off your back will only improve your sleep apnea but not completely cure it.

If you do not have what is called a "positional component" to your sleep apnea, then positional aides that help keep you off your back will not help you at all and will be a waste of money.

If you do have a "positional component" to your sleep apnea, you can purchase these positional aides online. Many are available on Amazon. Some examples are the Slumberbump and Zzoma. They are essentially pillows that you wear like a belt and if you try to roll onto your back, they don't let you. Or make your own with a t-shirt, a tube sock, a few tennis balls and some large safety pins. Combining positional changes with other treatments for sleep apnea can optimize outcomes.

There are also devices that you wear either around your head, your neck or your midsection that vibrate if you roll onto your back. The fancy term for these devices is "vibrotactile" stimulation. They are similar to a doggie shock collar on the lowest levels. I don't think anyone needs to worry about yelping in the middle of the night if you roll on your back, but it will certainly wake you up to get you off your back! Pricing varies quite

a bit, ranging typically between $100 and $300 and they do require a prescription from your sleep physician.

The Bad

One could argue that the vibrotactile stimulation devices could be in this category. They don't actually hurt you, but they have the potential to be "uncomfortable," shall we say? And they wake you up if you roll on your back, which is something we're trying to minimize.

Another device that is readily available online is a tongue retaining device, or TRD, which were mentioned in the previous chapter. A TRD is a little suction cup that holds the tongue forward while you sleep. Again they don't hurt you, but they are not exactly comfortable and few people who have teeth (and thus have other options) chose to use them. Imagine falling asleep with your tongue stuck to a frozen flagpole.

The Costly

The items mentioned here might be costly in several ways. They may hurt your pocketbook without delivering any value to your health, could actually harm your health as well as your pocketbook, or cause unwanted side effects that can be very costly to fix or manage.

Medications that claim to "fix" or "cure" sleep issues. Unless a medication was prescribed or recommended by your sleep physician, it should not be used. There are too many unsubstantiated claims out there to name, so unless it is recommended by your physician or other sleep professional that knows YOUR specific health history, do not take it.

Melatonin can be beneficial if you have trouble falling asleep or maintaining a consistent sleep schedule. I would recommend speaking with a sleep physician prior to starting this on your own, as there may be other non-medication ways to achieve the same results.

Myofunctional Therapy done by a skilled therapist can be a fantastic adjunctive treatment. But it requires proper initial evaluation and

measurement of progress to be effective. Looking it up on YouTube will likely not give you the evaluation and guidance needed for this type of therapy to be effective.

Fitness Trackers can be a wonderful adjunct to professional treatment but should not be relied upon exclusively to determine if you may have sleep apnea or to determine if an appliance is working. They can give important information, but do not provide a total picture.

Over-the-counter oral appliances are WAY bulkier than custom appliances, do not hold up well and have been proven to not adequately treat sleep apnea. They HAVE also been proven to really mess up many people's teeth. This can be incredibly costly to fix via orthodontics, restorative and/or cosmetic dentistry and in some severe cases, jaw surgery.

A skilled, qualified dentist, who can discuss your particular situation and the risks ahead of time to help you make an educated decision, should provide YOUR oral appliance. Beware of any dentist that only offers one appliance or does not discuss follow-up appointments. **The piece of plastic is not what you are paying for when you see a trained professional. The expertise of the provider is the most important factor for an appliance to work.**

As you can see there are many things you can do at home to improve your health. Hopefully, you are now enlightened to other things that, at best waste your time, and at the worst, can actually do harm. It is always best to consult with an expert when it comes to matters of your health. You have learned in previous chapters that untreated or inadequately treated sleep apnea can have very serious medical side effects—treatment for sleep apnea should not be taken lightly.

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My Dentist Does What? What Your Dentist Has to Do With Sleep-Disordered Breathing

Dentists have been trained, in the interest of public health, to spot other diseases such as high blood pressure, oral cancer, and now sleep and breathing issues. Many healthy patients see their dentist more frequently than their physician—every 6 months vs. 1 time per year on average.

Dentists know that what happens in the mouth, doesn't stay there, it affects the entire body. Many patients do not realize that the first 2 years of dental school and medical school are remarkably similar. Dentists even do full body dissection during dental school. The doctors who have contributed to this book all appreciate oral health as part of total health and incorporate that knowledge into their practices.

So, even your routine dental visit to the hygienist might not look as "routine" as it used to. It may include x-rays, oral cancer screening, nutrition counseling as well as a gum analysis and treatment to help remove bacterial deposits and instructions on how you can take care of these issues at home.

We might also have you fill out a questionnaire so we can help assess the quality of your sleep. Two of the more commonly used sleep screening

forms are the STOP BANG and the EPWORTH Sleepiness Scale. (It shocks me every time I see a physician and I am not asked to fill out these forms. It is probably why my sleep apnea was not diagnosed until so late in life.)

These questionnaires often spark discussion as people might be aware of a problem or perhaps even had a sleep test and have been told they have sleep apnea. Some might have even tried to use a CPAP but couldn't find a mask they could tolerate. Even those people who don't have sleep apnea always seem to know and love someone who does.

These discussions make many people aware that there are other solutions to sleep-disordered breathing that are effective, comfortable

alternatives.

Dentists trained in TMJ and dental sleep medicine are also trained to spot the telltale signs of sleep-disordered breathing like worn and chipped teeth or ridges in your tongue. They know that "grinding" can mean a whole lot more and that jaw pain might be a sign of you not getting enough oxygen.

Such specially trained dentists know the intimate relationship that exists between the mouth and the rest of the body and specifically between how you breathe and how the mouth and jaw are positioned and function. Sadly, your dentist's role in the breathing process (and hence the sleeping

process) is not well-known or appreciated yet by many dentists since this cutting edge field is not really taught in many dental schools yet.

If your dentist suspects that you have an airway problem, you might be referred to your physician, an Ear, Nose and Throat doctor or even a sleep physician. You might be tested with either a home sleep test (HST) or be asked to sleep overnight in a special sleep center.

The important thing is that you get diagnosed so you can be treated properly. Dentists can play an important role in recognizing the problem, help you get the diagnosis, then help you use your CPAP or offer you a treatment option like an oral appliance to help solve the problem.

Breathing is something that involves the structure in and around the mouth. Why wouldn't a dentist, who specializes in that part of the body, be involved?

Specially trained dentists have been in the forefront of the collaborative movement to work with your entire healthcare team to achieve a common goal: **YOUR EXCELLENT HEALTH AND WELLBEING**.

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Your Dentist and Your Physician

By now you know more about sleep-disordered breathing than almost everyone around you! But if you haven't experienced the journey from suspected sleep apnea to effective treatment yourself, then you might be wondering what it looks like! What would a person expect when being seen for sleep apnea therapy?

This chapter will take you through the process of becoming healthier, happier and more refreshed by managing your sleep apnea with a custom oral appliance.

The first step on the journey is realizing you have a problem. Many people "self-refer" to a doctor or dentist because they think something is going on.

Others come at the insistence of their spouse who is probably suffering from "secondhand" snoring and sleep apnea, even though the offending person themselves reports sleeping well. Their spouse may actually fear going to sleep, feeling they need to stay awake watching their loved one stop breathing for more than half a minute multiple times through the night so they can poke them to start breathing. When the exhausted spouse does finally fall asleep, they doze off only to be awakened by loud disruptive snoring.

Not all people snore and not all people visibly or audibly stop breathing and then gasp to start breathing again, but many do and their bed partners suffer along with them. A person can arrive for help expressing a combination of embarrassment, irritability and/or exhaustion. After all they are sometimes in the office "for the spouse" but likely they know something is just not right.

At a consultation appointment you will be asked about underlying medical conditions such as Type II Diabetes and High Blood Pressure among others. Vitals will be taken to determine your neck size, height, weight and BMI (body mass index).

If you self-refer and have never had a sleep study, the doctor or dentist will discuss a sleep study with you and then send out a request or referral for one. Once a sleep study is done you will discuss the results with your medical doctor. If you are diagnosed with sleep apnea, your physician will talk to you about treatment options. The most common treatment is CPAP. **Oral appliances are now recognized along with CPAP as a first line treatment option for mild and moderate sleep apnea by the American Academy of Sleep Medicine. If you think you won't be able to tolerate CPAP for some reason and you want to try an oral appliance, you may need to advocate for yourself and talk to your medical doctor to let them know you want to try oral appliance therapy first.** When your doctor refers you back to your dentist, the process of beginning your journey to healthy sleep using an oral appliance has begun!

The next step is a thorough dental examination and impressions of your teeth. This examination is thorough, painless, and easy to tolerate.

At this appointment your dentist will discuss different oral appliances that might work for you, depending on your nighttime patterns, condition of your teeth and gums, and many other factors. Together you will select one that will work best for you.

Your sleep dentist then takes over while you return home or to work and your custom oral appliance is designed and made just for you. It is customized around your unique teeth, fillings, crowns and any teeth you might be missing.

The custom device is generally available for fitting and delivery within 2-4 weeks. At your fitting appointment your oral appliance will be adjusted for comfort and you will learn how to take care of it. A morning aligner will be made so that you can monitor your teeth for any changes. Any questions you have will be answered and you will place and remove the appliance by yourself. Printed instructions will also be provided for take home reading and reference.

Your dentist knows how important it is to keep your medical doctor and your general dentist informed of your progress. Letters are sent to them after your consultation appointment, your fitting appointment, and various other appointments. When needed your dentist will reach out to your doctor to discuss your case as well. A team approach is definitely the best approach!

Now that you have your appliance it is very important that you check in with your dentist at follow-up appointments to make sure the appliance is working well for you and is taking care of your sleep apnea. The most expensive therapy is one that doesn't work as well as it should!

Here are some things you can watch for as you progress on this journey:

- Most people report that their appliances are comfortable, easy to use and easy to care for.
- The majority of people report they are sleeping better, snoring less and have resolved the daytime fatigue and sleepiness they previously thought were "normal."
- They also often report their spouse is sleeping better too and are incredibly grateful.

- They can wear their appliance every night, all night and would miss wearing it since they feel so much better. Some people even get a spare appliance for travel or for a second home, not wanting to ever be without it.
- They report that since they have more energy, they are exercising more, craving bad food choices less, and have lost weight.
- Their physicians are happy knowing their patients have found a therapy they wear well and is helping them sleep better and live better.

The only way to REALLY KNOW the effectiveness of your oral appliance is to have a follow-up sleep study once your symptoms have resolved. It is extremely important to know the appliance is working optimally. You may need more than one follow-up study while you are trying to find the perfect position of your appliance or once you and your dentist think you've found the spot, based on your symptoms.

Letters are again sent to your medical team once the appliance has been proven effective. Now that you are sleeping better and snoring less, your sleep dentist will recommend returning to meet with your medical doctor to discuss possibly adjusting any medications you're on to manage medical conditions that could have been improved through the treatment of your sleep apnea.

Finally, you will be on a yearly appointment schedule. At these annual visits your dentist will check for wear and tear on your appliance, tighten and adjust anything that needs to be addressed and make sure your appliance is still performing, as it should.

Great results are possible! The vast majority of patients improve their sleep apnea with a custom oral appliance and for most it is truly a blessing and a lifesaver!

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Potential Complications

When it comes to complications, it's important to put things into perspective. **The complication of NOT being treated for sleep apnea is DEATH!** Or, if your sleep apnea is causing you to be tired during the day, then when you're driving and fall asleep at the wheel, it could also result in other peoples' DEATHS as well. This scenario happens every day in America!

You hear of people dying in their sleep all the time. Some even look at it as the "best" or "natural way to go." There's nothing good about gasping or choking for breath and nothing natural about dying in your sleep prematurely.

Most people who die in their sleep do so because of sleep apnea related issues like heart attack and stroke.

You can understand someone dying when they're shoveling a foot of snow or doing other hard labor that puts a strain on their heart. But shouldn't sleep be a time when the heart relaxes???

Indeed, it's only when the heart is over-taxed, overworked and lacks enough oxygen, as happens during a sleep apnea event, that it can succumb and stop working. Death during sleep is NOT NORMAL. That's a pretty serious and sad consequence to leaving your sleep apnea untreated.

OK, with that in perspective, let's talk about the potential complications of various treatments.

Many treatments for snoring, sleep apnea, UARS and even TMJ have been discussed. Every treatment can have negative, sometimes unintended consequences. EVERY SINGLE ONE!

Even the do-it-yourself ones can have unforeseen, sometimes severe complications including giving a person the false sense of security that they are actually solving their problem, when in fact, they might be making it worse. The most important thing to remember is that because DEATH is the ultimate complication, YOU should do everything YOU can to make certain that any treatment YOU decide to use is EFFECTIVE at solving the problem.

US Supreme Court Justice, Antonin Scalia, had sleep apnea, which was treated with a CPAP. Yet, when he died, the CPAP was on his nightstand, unused. He suffered the ultimate consequence of treatment that wasn't used properly.

Get diagnosed properly, get treated adequately and get followed-up with properly to ensure that the problem has been resolved. And, just

because it was resolved a few years ago, doesn't mean that it hasn't come back!

When you have been diagnosed with sleep apnea, you need monitoring FOREVER.

Want to know about the other complications?

CPAP—The complications involved with CPAP therapy include:

- Runny nose, earache, sore eyes
- Sore or inflamed skin
- Feeling claustrophobic
- Dry mouth
- Difficulty tolerating forced air, including air leak out the mouth or eyes
- Sleep interruptions of bed partner
- Stomach filling with air
- **Side Bar**—Recently some doctors are recommending people who have COVID-19 should not wear a CPAP to avoid spreading the virus to others.

Dental Oral Appliance—The possible side effects of wearing a sleep apnea mouth device include:

- Bite changes (the upper and lower teeth may seem to align themselves differently in the morning)
- Developing spaces between teeth leading to food getting stuck between them
- Dry mouth
- Excessive saliva
- Tooth and/or jaw discomfort
- **Side Bar**—Keep in mind that dogs LOVE these appliances—they make for very expensive chew toys. When you get one, keep it out of Fido's reach.

Inspire—This is a "pacemaker" like device that is surgically implanted in your chest. Side effects and risks include:

- All the complications of a surgery under anesthesia
- Tongue soreness and/or weakness

- Infection
- Damage to the nerve
- Discomfort from stimulation
- Extremely Expensive (although this isn't a side effect, it is definitely something to consider)
- **Side Bar**—The Inspire requires periodically replacing batteries, which means additional surgeries.

Health/Wellness—

- In some cases weight loss can help sleep apnea symptoms for obese individuals. Overweight people often have thick necks with extra tissue in the throat, which may block the airway. There is no guarantee that losing weight will eliminate the sleep apnea although it may help, and will certainly improve overall health.
- **Side Bar**—This approach is unlikely to make a difference in people with a narrow nasal passage or airway.

Some Additional Notes:

Oral Appliances: when these are made well, adjusted properly and monitored, there are few complications. The most common ones are bite shifts and teeth shifting. Your Dentist should be showing you how you can prevent these and how YOU can monitor your mouth for slight changes.

Jaw or TMJ discomfort: can occur whenever muscle and jaw positions are changed. These are usually due to the body's adjusting to the new positions and are temporary. They should, however, be brought to your dentist's attention.

Remember, little problems are usually easy to fix. When they grow and become bigger, it's harder and often more costly to fix.

Surgery: There are many surgical procedures other than Inspire (the pacemaker type surgery) that can be used to help resolve these problems. Each has its own set of complications, which should be thoroughly discussed with the surgeon BEFORE a commitment is made to proceed.

Before doing an invasive, irreversible procedure you should always ask yourself, "Is there a more conservative way to solve this problem?"

CPAP: While this is still considered the "gold standard" of sleep apnea care, there are issues to be aware of. Like Justice Scalia, if you don't wear it, it can't work. And many people find it uncomfortable and inconvenient, especially when they travel or have a cold.

All treatments CAN have negative consequences. That's why they have to be done properly, checked to see if they're working properly and monitored regularly to see that they continue to serve the function that they were intended to serve—**TO SAVE YOUR LIFE.**

22

Performance Enhancing Sleep

Three hundred yards to go! The four athletes had broken away from the main peloton of cyclists at mile 70. Working as a 'team of competitors,' they take turns pulling and drafting to stay out front. The years of sweat-fueled conditioning has propelled them up sharp climbs and over miles of cobblestones to find themselves now staring at the finish line. . . their camaraderie over the last 30 miles, suddenly a distant memory. Now they slow and watch. . .who amongst them will start the final attack towards the finish line?

Who has enough fuel left in the tank to sprint for the win? Who has the mental sharpness to decide when and how to lead the attack towards the podium? Was it the athlete that logged only 5 hours of sleep? Was it the athlete that got 8 hours of poor quality sleep?

The endurance and sport specific judgments needed for these cyclists to grab the win rely on three pillars: DIET, TRAINING, AND SLEEP. A lot of energy and money is typically funneled into supporting athletes with the most well-planned nutritious meals, and the most sophisticated training regimens...all custom designed to meet the athlete's personal strengths and weaknesses.

But what about the third pillar…SLEEP? Could concentrating on a personalized sleep-training regimen translate into improved sports performance and sleep recovery?

We've learned that a significant percentage of our general population has an underlying sleep-disordered breathing issue, like snoring, upper airway resistance syndrome, or obstructive sleep apnea. We also have learned that these conditions lead to decreased decision making skills, decreased release of hormones that support immune function, muscle recovery from damage and fatigue, and lead to poor food choices. So, what percentages of our athletes fall inside this pool of undiscovered sleep-breathing issues? Probably more than we may think!

In the world of an elite athlete, oftentimes the separation between 1st and 2nd place can be a mere 1-2% difference in power output between you and your opponent. So as we're testing an athlete's VO2 max, fluid dynamics through air or water, and power output…let us add in a sleep screening. Let us find out IF and WHAT underlying sleep issue may be keeping this athlete from their best performance. Let us use the techniques outlined in this book to clear the airway for these athletes to maximize sleep-related recovery!

And, speaking of performance, there are other types of performance that getting the proper quality and quantity of sleep helps too…if you get the drift!

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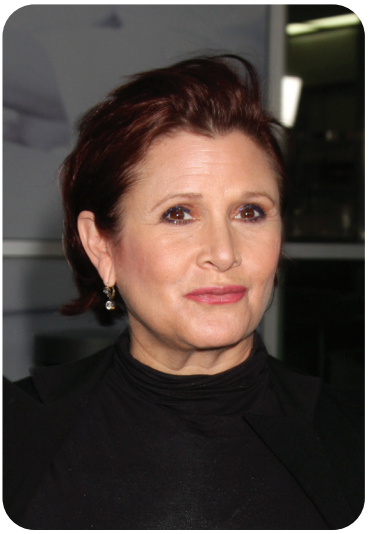
Sleep For Success

What do Carrie Fisher and NFL player, Reggie White have in common?

Both died from health problems related to sleep apnea, experiencing sudden cardiac arrest. And US Supreme Court Justice Anthony Scalia may have died because he failed to use his CPAP machine the night he passed away.



Research suggests that people with undiagnosed sleep apnea are more apt to die in their sleep due to sudden cardiac arrest. Most cardiac events occur during the day for those with no signs of sleep apnea. Sleep apnea leads to low blood oxygen levels and therefore an increase in CO^2 (carbon dioxide) in the blood, leading to surges in heart rate and blood pressure. This puts a stress on the walls of the heart and can even lead to electrical heart arrhythmias like "A-Fib", which can also lead to a stroke.

Other celebrities with sleep apnea that you may recognize include William Shatner, Shaquille O'Neal and Rosie O'Donnell. However, more than 22 million Americans have undiagnosed sleep apnea. These people are all around you, and might even look back at you in the mirror. They have a three times higher risk of stroke, diabetes and premature death as well as cardiac arrest.

That's why many dentists are now asking their patients to fill out questionnaires regarding their sleep patterns. Your sleep dentist might get occasional pushback from people asking, "Why does my dentist need to know this?" followed quickly with the common excuse, "I'm old. Snoring is normal," or, "I'm a mother, of course I'm tired." Yet as dentists, we care about our patients overall health so we'll keep taking the questionnaires, health histories and dental findings. In fact, the American Dental Association has asked every dentist to screen people for sleep apnea! As

physicians of the mouth we will continue to guide our patients to seek treatment for their potential sleep apnea.

Joseph was a 47-year old man who presented with several signs of possible sleep-disordered breathing. He was overweight and admitted to being tired by the middle of the day. His excuse was that he doesn't sleep well because he has to get up several times each night to use the bathroom. Despite what his sleep screening questionnaire indicated, as well as what his teeth (badly worn), his tongue (large and scalloped along the sides), the back of his throat, large tonsils and uvula showed, he said, "There's no way that I have sleep problems. But I may snore a little bit."

A take home screening pulse oximeter indicated that he might have undiagnosed sleep apnea. However he refused the recommendation to be seen by a sleep physician. It wasn't until several months later that he finally had a polysomnogram (which is the sleep test done in a sleep clinic). The results were astounding.

Joseph scored 189, which means that during every hour he slept, he stopped breathing for over 10 seconds, 189 times per hour!!!! A normal score is less than 5 such non-breathing events per hour. He was not breathing for over 30 minutes of every hour!

His sleep physician was surprised that he was still alive with that high a number. Joseph was fitted for a CPAP. He now has less than 3 events per hour and has lost over fifty pounds. With his ability to sleep well, his metabolism has revved up so along with the weight loss, he also has more energy throughout the day.

And Joseph had been going to a urologist because of his excessive night-time bathroom trips and a little problem he was having called ED. Joseph was suffering from Erectile Dysfunction, something that was also affecting his marriage.

Joseph and his wife are now both happy campers. No more trips to the bathroom, no more snoring, more energy and the ability to perform are just a few of the benefits that Joseph and Mrs. Joseph are now enjoying.

Joseph's story is an excellent example of the importance of sleep and finding the right professional, in his case, a dentist that led him to a sleep physician, that put him on CPAP; that saved his life!

Someone once summarized a dentist's work this way: "On a good day, we save a tooth. On a GREAT day, we save a life."

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About Dr. Brian Briesemeister

Dr. Brian Briesemeister is the Founder and Clinical Director of Center for Sleep and TMJ, a medical practice limited to helping patients with obstructive sleep apnea and TMJ disorders. Dr. Briesemeister graduated from Howard University with a Doctorate of Dental Surgery degree. He was trained in comprehensive general dentistry, treating the whole patient not just the mouth. He has advanced training in temporomandibular joint disorders, myofascial pain, occlusion, minimally invasive dentistry, minimally invasive cosmetic dentistry, and Botox in conjunction with orofacial pain. Dr. Briesemeister has taken hundreds of hours of continuing education and has studied one on one with some of the world leading clinicians in dental sleep medicine and TMJ dysfunction. Recognized as a diplomate and qualified dentist by the American Academy of Dental Sleep Medicine, Dr. Briesemeister is one of the most sought-after clinicians in his area for the treatment in the areas of dental

sleep medicine and TMJ dysfunction. He holds active memberships in the American Academy of Sleep Medicine, American Academy of Dental Sleep Medicine, The American Academy of Craniofacial Pain. Dr. Briesemeister has been a guest lecturer for Howard University School of Dental Medicine, clinical consultant for Eastern Virginia Medical School division of public health, and lectures for dental and medical study clubs.

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