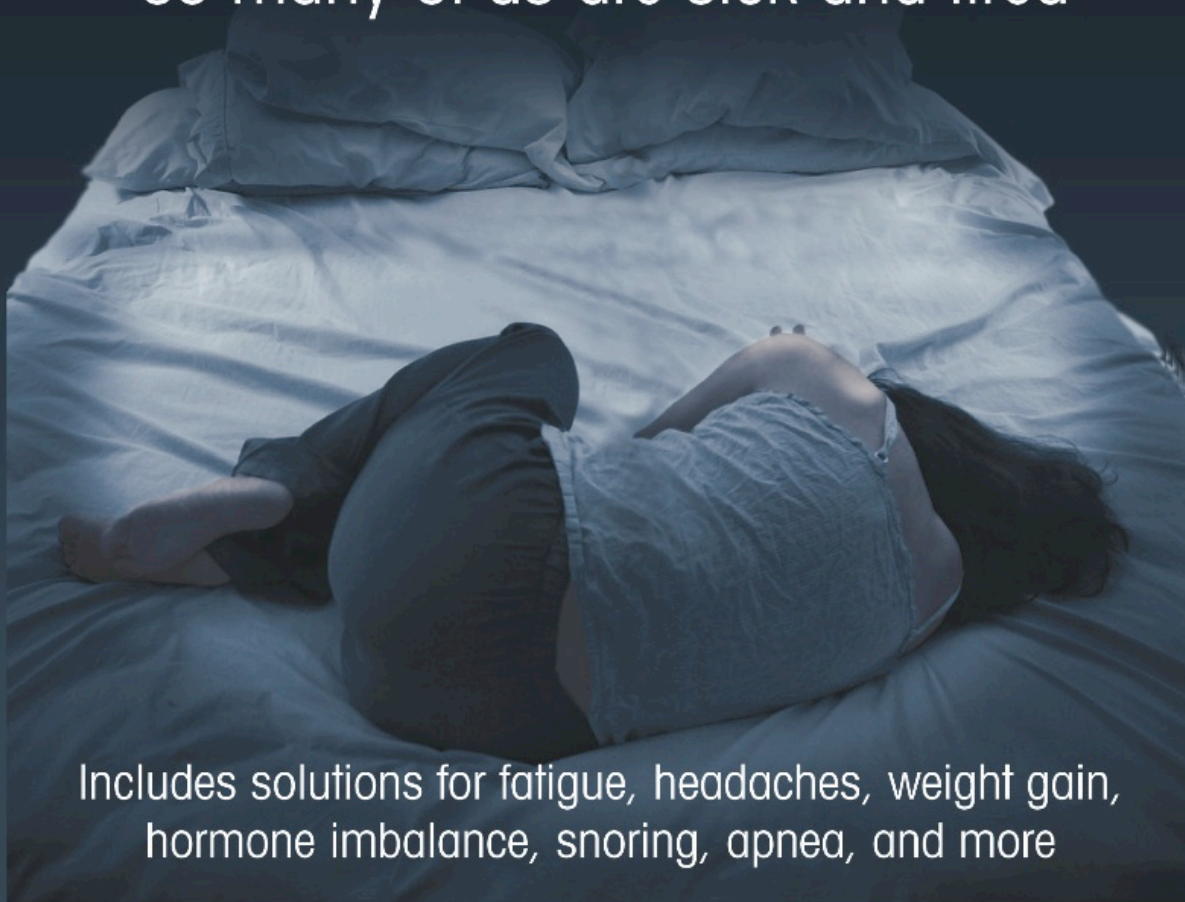


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# SLEEP, INTERRUPTED

A physician reveals the #1 reason why  
so many of us are sick and tired



Includes solutions for fatigue, headaches, weight gain,  
hormone imbalance, snoring, apnea, and more

Steven Y. Park, M.D.

## Wake up to better health.

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Are sleep-breathing problems  
making you sick?

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*“Sleep Interrupted” is a seminal manuscript which not only reviews the upper airway anatomy and physiology in a concise reader-friendly fashion, but more importantly postulates associations between poor sleep and some everyday maladies in a manner heretofore unaccomplished. This is must reading for anyone who sleeps or breathes.”*

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*“Many physicians treat only the symptoms of illness. Dr. Park carefully identifies what is causing millions of us to be sick, and shows us how to get and stay healthy and happy.”*

— JAMES, O’KEEFE, M.D., AUTHOR OF *THE FOREVER YOUNG DIET AND LIFESTYLE*

*“The concepts in this book hold so much promise for a Kuhnian paradigm shift in the knowledge and practice of conventional medicine.”*

— DOROTHY HUNG, PH.D., ASSISTANT PROFESSOR, DEPARTMENT OF SOCIOMEDICAL SCIENCES, MAILMAN SCHOOL OF PUBIC HEALTH, COLUMBIA UNIVERSITY

*“This is an excellent book that covers sleep and the consequences of not receiving good restorative sleep in an inviting, conversational style. Once you read this book, you’ll know more about sleep-breathing problems than most doctors. It’s a must read for anyone with chronic sleep or fatigue issues, and especially for all healthcare practitioners.”*

— **BRIAN PALMER, D.D.S.**, SLEEP APNEA RESEARCHER AND BREASTFEEDING ADVOCATE

*“Billions of dollars are spent every year in intensive care units throughout the United States, attempting to treat and salvage patients at the end stage of chronic conditions. In contrast, very little time and effort is invested, in the education of the lay public, in recognizing and treating sleep disorders that can lead to a number of these chronic conditions. This outstanding and simply written book does just that. A must read.”*

— **ANITA BHOLA, M.D.**, FCCP, ATTENDING PHYSICIAN,  
CRITICAL CARE MEDICINE, SLEEP, PULMONARY AND CRITICAL CARE MEDICINE,  
ASSISTANT PROFESSOR, ALBERT EINSTEIN COLLEGE OF MEDICINE

# **Sleep, Interrupted:**

**A physician reveals the  
#1 reason why so many of us  
are sick and tired**

Steven Y. Park, M.D.



New York

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Sleep, Interrupted: A physician reveals the #1 reason why so many of us are sick and tired

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## Preface

*The significant problems we face cannot be solved at the same level of thinking we were at when we created them.*

— Albert Einstein

*“I used to be on top of the world.”*

This is a quote from a former business executive whose slowly deteriorating job performance coincided with severe fatigue, lack of focus and poor concentration.

A woman in her thirties is frustrated about the fact that a few years ago, she was the top-performing employee in her company but now can barely carry out her job due to progressive and intense fatigue during the day.

Another young woman reports that her life is falling apart, and has recently started taking antidepressants. Her job performance is suffering as well, and she’s spending too much time consulting too many doctors.

These three patients all came to see me initially for recurrent sinus infections and constant nasal congestion. It’s common knowledge in medicine that people with chronic infections are usually tired and don’t sleep well. The pain, infection, fever, and other aspects of chronic disease keep the patient up at night, leading to poor sleep quality and lack of energy during the day.

Over the past few years, I have seen countless patients in similar situations, and I used to think that their career and life situations were independent of their current medical problems. Now I realize that I was dead wrong.

I slowly began to see a link. All three of the above patients, as well as countless others who consulted me, had one thing in

common. And it was quite simple. None of them were getting a good night's sleep.

You could argue at this point that maybe job stress and poor performance could lead to poor sleep, and in particular, insomnia. But all these patients had another common feature, which is the fact that they all preferred not to sleep on their backs. This is what turned the current disease paradigm upside-down for me.

If this were a problem purely due to sleep issues only, then there would be no need for this book. But there's one more piece of the puzzle that completes the picture. And this is the fact that all the patients I was seeing also had some kind of breathing problem, which was worse at night, especially in certain sleep positions. My hunch was eventually confirmed when definitive treatment for these sleep-breathing problems led to dramatic improvements, not only in how patients felt during the day, but also with their various other medical problems as well.

Sleeping and breathing are things that we all take for granted. When your nose is stuffy during the day, you will feel uncomfortable, and take measures to breathe better. Similarly, sleep is something we don't consciously think about when we're sleeping, and when we don't sleep well, we'll be wondering how we can sleep better the next day. No one ever realizes that they did not sleep well because they were not breathing well. This connection is never made. But these two events are intrinsically related, and when I first saw how profound an impact poor breathing has on sleep, it opened up a whole new world for me. It radically changed the way I practiced medicine and surgery, and later led me to the development of the sleep-breathing paradigm, which I describe in this book.

A paradigm is defined as a worldview underlying the theories and methodology of a particular scientific subject. What I'm proposing in this book was described by one of my colleagues as a kind of paradigm "shift." It doesn't disprove or discredit conventional, orthodox medical teachings, but presents how we may look at "worldviews" from a completely different perspective. I will refer to the concepts presented in this book as my "sleep-breathing paradigm."

Some of my good-meaning colleagues and reviewers remarked that the concepts may seem too complicated and that I need to somehow make it simpler, bringing it down to a fifth grade reading level. I decided not to take that advice, as doing so would be a disservice to my readers, who deserve an intelligent, lucid and logical explanation for their unexplained health problems. Instead, I decided to write in a conversational tone, as if I'm talking with you face to face during a consultation.

This sleep-breathing paradigm actually poses an interesting dilemma. Evolutionary biologists have long observed that the beneficial aspects of speech acquisition and language have also been accompanied by an unexpected negative side effect: only humans can choke and die. This is due to the unique oral anatomy we possess that allows us the power of communication. I will add to this another proposed side effect—that due to various degrees of inefficient breathing while sleeping, a number of common medical and mental health disorders can arise as a result.

If you think about it, breathing is the most fundamental physiologic activity that we all must do to survive. Breathing nourishes our bodies with oxygen, as well as removing carbon dioxide. Breathing also has other life-promoting implications, as in the phrase, “the breath of life.” If there is an impediment to breathing of any kind, then it is logical that life and well-being can be interrupted, leading to various ailments and illnesses.

This new paradigm is not meant to be a definitive treatise on health and disease. Think of the concepts presented in this book not as an alternative or even a contradiction of current medical thinking, but as an added dimension in a multi-dimensional model. What started out as a simple mental exercise in my mind ended up being more than just a theory. It blossomed into a unique and useful tool by which many chronic medical conditions, as well as various ear, nose and throat conditions, can be explained and treated. In the coming chapters, you'll read how I came to realize this paradigm, along with all the supporting clinical experiences and published research studies that helped to solidify the process.

An amazing realization that came to me early on was the fact that, for the most part, the paradigm never contradicts any existing accepted clinical models. It agrees with or reconciles often contradictory views on a given subject. It's also exciting to constantly discover new clinical studies on various health issues that reinforce my paradigm—strengthening connections between known co-existing conditions, but more importantly, forging new links between medical conditions that were previously considered unrelated.

Some of you may be thinking by now that this book may be about obstructive sleep apnea. Yes, I do cover this condition, but it is only a small portion of my sleep-breathing paradigm. Obstructive sleep apnea is a distinct clinical condition which is at the extreme end of the picture that I am describing, and although not the main focus of this book, you will find more practical information about it here than many other books devoted entirely to it, including medical textbooks. Looking through the lens of the sleep-breathing paradigm will also change the way you think about obstructive sleep apnea.

Unfortunately, the group of people who most need to read and understand this book will be very resistant to it. I'm talking about other physicians. They will dismiss the findings in this book as being purely anecdotal, and not based on rigorously controlled large-scale research studies. But when was the last time a "definitive" prospective, large-scale, randomized, placebo-controlled, double-blind research study changed the way doctors practice medicine? When it comes to old habits, doctors can be the most stubborn old dogs of this world. Medical students are taught that they should look at the patient as a whole, but later in practice, it's much more glamorous looking for a magic bullet to cure cancer or an infection—if we can only find that one gene or molecule that leads to a particular cancer or depression. I can't tell you how often I come across medical articles in *The New York Times* that describe the discovery of a new technique or a new gene, where at the end of the article, states something to the effect that this exciting discovery could potentially lead to a cure in the future. How often does this ever happen?

Knowing what we know about sleep-breathing problems and health issues, it's shameful how little physicians in general ask (really ask) about the quality of the patient's sleep. All too often, a sleeping pill is prescribed without getting to the root cause of the problem.

Borrowing from the "can't see the forest for the trees" analogy, imagine that all the individual leaves of a tree represent all possible diseases that are known in humans. If you see the tree from above, all you see is a massive bunch of leaves. But if you look at it from below, you see that the main trunk connects to a number of thick branches, which divide further into smaller branches, and so on, until the smaller branches lead to all the leaves. In a similar way, inefficient breathing due to partial or total obstruction at night has been shown scientifically to directly or indirectly cause not only high blood pressure, but various other medical ailments described in coming chapters.

It seems to me that most research these days is focused on the extreme end process of an illness. Scientists today look for better ways of fighting bacteria after an infection begins, but almost never search for what can be done to prevent the infection from taking hold in the first place. The same applies to heart disease. The Western health model is centered around: "What can we do to prevent inflammation and damage *after* a heart attack?" instead of "What can we do to *prevent* heart disease from happening in the first place?" Treatment after a heart attack is important, but as long as you know that there are good ways of treating the effects of a heart attack, you may not be inclined to do very much in your earlier years to prevent the heart attack from even happening. You may comment at this point that doctors are already doing this by giving cholesterol lowering pills and anti-hypertensive medications. What I propose is the possibility that there will be no need at all for blood pressure or cholesterol medications if ineffective breathing patterns were corrected.

I will also allude to an observation that research in the fields of cardiovascular and cancer medicine seems to be working in parallel, but independently, almost like two parallel tree branches side by side. The real breakthroughs will happen when someone notices the

common branch that divides into the two respective smaller branches. I'm not in any way implying that my sleep-breathing paradigm is the main trunk of the tree; rather, I see it as a larger tree branch from which many more illness and disease stem.

We physician-scientists are still heavily influenced by stereotypical concepts of health and disease. Most physicians still believe that disease is an invasive, detrimental process that happens to a healthy, disease-free individual. One of the reasons that alternative and complementary medical fields are booming these days is that they provide an alternate explanation about what health and disease is. Some of these fields stress that it's not so much what's attacking your body, but how your body responds to the attack that's important. This preventive model is ideal. There are other systems or programs that tout anything as being curative, as long as it's not from the pharmaceutical industry. Undoubtedly, many of these treatments work, while many others don't. The problem is that you can't know whether or not it works until you try it. Some people end up taking a shotgun approach and try everything.

If you're reading this book, I'm assuming that you are interested in taking responsibility for your own health, and are open to new ideas and possibilities. Be warned: Some of my suggestions and hypotheses in the coming chapters will be controversial, perhaps even heretic. I just ask that you keep an open mind and try to see common conditions such as depression, high blood pressure or menopause through the viewpoint of the proposed sleep-breathing paradigm.

My hope is that this paradigm stimulates enough interest so that open-minded physicians can take these concepts and use it to the benefit of their own patients. If you are suffering from any of the various ailments described in this book, then this book may shed new light on why you feel the way you do. Every few weeks, I have a patient in my office that breaks down in tears once they finally understand for the first time why they are suffering, going from doctor to doctor, frustrated by all the unsuccessful treatments and confusing information. I don't expect that the concepts presented in this book will revolutionize the world, but my aim is to encourage people to do what

the old Apple Computer commercials said: “Think Different.” In this age of relativity, we must be willing to think differently about why we become ill, rather than what to do after we become ill. But once you are successful at thinking differently, you must then take action to see any benefits. Different chapters will elicit different reactions from different people.

The first part of this book describes how I came to discover my paradigm, some basic anatomy relevant to the paradigm, and other clinical concepts that will form foundations for later chapters. The middle section describes various common medical conditions from the viewpoint of the sleep-breathing paradigm. Finally, the concluding sections describe how you can determine for yourself if you have a sleep-breathing condition and what you can do to improve both your sleep quality and overall health.

If you are no longer “on top of your world,” if you think that it’s your job, or your new family or even your age that is making you sick and tired, you might be surprised to find that it’s the way you breath while sleeping that is at the root of all these problems. This concept is the foundation for this book and it may well be your key to a life of renewed energy, vigor, and good health.



Section 1

**The New  
Sleep-Breathing  
Paradigm**



# 1

## **Eureka! The Discovery of My Paradigm**

**I**STILL REMEMBER the exact moment it hit me.

I was lying in bed with my wife, Kathy, ready to go to sleep, when I just happened to ask her how she was doing. It had been a very difficult four months since she delivered our second son, Devin.

After our first son, Jonas, who was born three years prior, my wife was extremely tired and depressed for an entire year. All her doctors told her that it was post-partum depression, and that it would eventually go away. It did.

This time it was different. She was not as tired after the second pregnancy, but for four excruciating months, she always felt dizzy and lightheaded, made worse by moving or standing up. Her blood pressure, which was normally on the low side to begin with, was even lower, and at one point the entire right side of her body went numb, which necessitated a visit to the emergency room to ensure she was not having a stroke. She was sent home with a clean bill of health. But clearly, she was not well.

So in answer to that idle question I had asked her that resulted in my “Ah-ha!” experience, she said she was fine. She knew why I

was asking her. Pleasantly surprised by her answer, I was curious. “What do you think is the difference that made it go away?”

After a brief moment of reflection, she told me offhandedly, “Well, I did lose all my pregnancy weight.”

Then, it hit me. I still vividly remember the light bulb literally flashing on top of my head. It all made sense. I remembered that she had commenced snoring during her third trimester (as many women do), and that her father was diagnosed with obstructive sleep apnea (OSA). I knew that this condition can be hereditary. Obstructive sleep apnea is a sleep-breathing condition where you stop breathing for short periods many times every hour. We know that weight gain can aggravate this condition. Once Kathy had lost her pregnancy weight, she felt much better. In fact, back to how she felt prior to the pregnancy.

But she didn’t have obstructive sleep apnea. What she was feeling was something I had just read about in a paper a few weeks earlier. The article discussed young thin women and men who exhibited low blood pressure, experienced lightheadedness and dizziness, and complained of chronic tiredness. These patients did not have OSA but displayed the symptoms of a related but different sleep-breathing condition called upper airway resistance syndrome (UARS). I didn’t sleep at all that night.

A few days later, again while in bed after discussing, of all things, how her sleep position had changed as well, another light bulb flicked on. Earlier that day, I had just read an article on the similarity of the timing of heart attacks and the most concentrated time for rapid eye movement (REM) sleep (the dreaming stage). Another scientific paper found that people with OSA are more likely to have heart attacks in the early morning hours (midnight to 6 A.M.), whereas people without OSA are more likely to suffer a heart attack after waking from 6 A.M. to 12 noon.<sup>1</sup>

I was reminded of my days during surgical internship, when an alarming number of otherwise healthy people undergoing routine operations had heart attacks during my early morning shifts. We know that for certain people predisposed to sleep-breathing disorders, sleep position can play a major role in the quality of sleep.

What I realized was that there are some people who prefer to sleep only on their sides or their stomach. Some absolutely cannot sleep on their backs, and must sleep in the latter positions in order to breathe properly. I concluded that what was happening in these situations was that being forced to sleep on their backs for the first time in decades after surgery or another medical procedure resulted in an inability to breathe properly. This, in turn, placed stress on the heart, increasing their risk of heart attack. The critical issue here is that it's during REM sleep that the muscles of the throat are most relaxed. If susceptible people are forced to sleep on their backs, they can no longer adjust in a hospital situation by changing their sleeping position. They are simply forced to sleep on their backs as best they can. This realization led to yet another sleepless night for me. The implications were enormous.

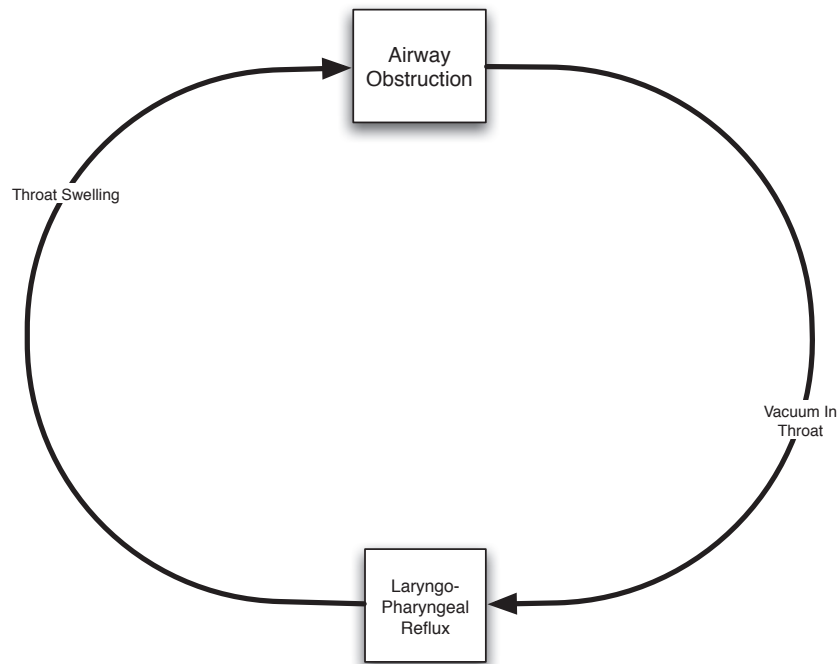
Both these events prompted me to think about other curious things I had observed in the previous few years of practice. Almost every patient with a sleep-breathing problem such as UARS or OSA had some degree of throat acid reflux. Furthermore, many of these same people preferred not to sleep on their backs. The kind of acid reflux that we see in an ear, nose and throat practice is different from the typical heartburn acid reflux, or gastroesophageal reflux disease (GERD). When the acid reaches the throat, it is called laryngopharyngeal reflux disease, or LPRD. In most cases, LPRD is silent, the only symptoms being throat clearing, post-nasal drip, a lump sensation in the throat, hoarseness, cough, choking, or difficulty swallowing. This is probably one of the most common conditions that an ear, nose and throat (ENT) doctor encounters every day.

Interestingly enough, there are numerous studies that show an association between the following pairs of conditions: LPRD and OSA,<sup>2</sup> GERD and asthma,<sup>3</sup> LPRD and chronic sinusitis.<sup>4</sup> In many of these studies, treating the former sometimes, but not always, heals the latter. As I began to research hundreds of articles, I began to see a pattern. In the linked examples given above, LPRD has been shown to be associated with OSA, and LPRD has been shown to be associated with chronic sinusitis, but there appeared to be no cross-linkages,

that is, I could find no papers reporting a connection between OSA and chronic sinusitis, for example.

To my amazement, this pattern continued with other non-ENT conditions such as high blood pressure,<sup>5</sup> heart attacks,<sup>5</sup> depression,<sup>6</sup> diabetes,<sup>7</sup> and pre-eclampsia in pregnancy,<sup>8,9</sup> to name a few.

One day, as a simple mental exercise, I wrote down the two most common conditions that I encounter as paired symptoms. These are: acid reflux of the throat and any form of upper airway obstruction. I then spaced the two conditions far apart on a large blank sheet of paper. I drew a curved line with an arrow from one to the other, forming a complete circle (see Figure 1.1). Going back to the research literature, there were numerous papers supporting or suggesting each arrow.



**Figure 1.1**

For example, with total upper airway obstruction, a tremendous vacuum effect is created in the chest and throat, literally sucking up stomach acid into the throat. There are many other proposed

mechanisms for this condition, such as a relaxation of the lower esophageal sphincter, which normally prevents stomach contents from regurgitating into the esophagus. There are also numerous studies that suggest that acid in the throat can aggravate airway collapse merely by numbing the protective airway reflexes present in normal people.<sup>10</sup> These pressure sensors in the throat can detect when there is impending collapse and send a signal to the brain to tighten up throat and tongue muscles.<sup>11</sup>

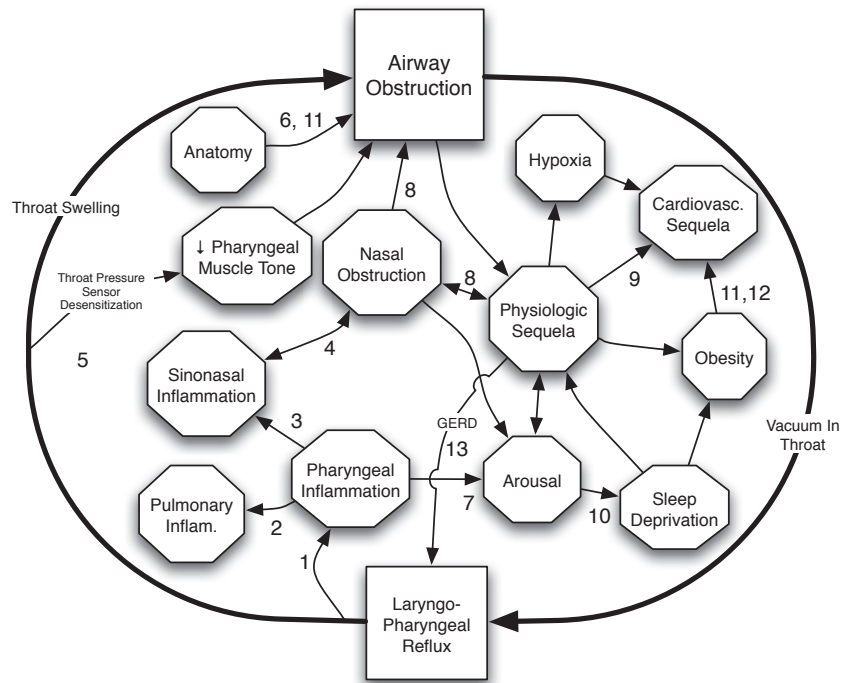
When acid is present in the throat it can cause more swelling of the delicate surrounding tissues, which promotes additional throat collapse, thus further aggravating this vicious cycle. A recent study suggests that for people who snore, the tremendous soft tissue vibrations caused by snoring can numb or deaden these pressure receptors, worsening any pre-existing upper airway obstruction.

From each of the arrows, I connected arrows to other conditions that came up in my research. Once I “connected” all the dots, the results were truly amazing (see Figure 1.2). What I will describe in the remainder of this chapter is an overly simplified internal physiologic process that can occur within your body as a result of upper airway obstruction and acid reflux in the throat. You may feel a bit overwhelmed by all the lines and arrows in these figures, but rather than focusing on the specific details, concentrate on the “big picture” instead. I will describe only a handful of representative examples in this chapter, and elaborate more in future chapters.

As Figure 1.2 shows, once stomach acid or any other caustic material (such as alkaline bile or pepsin, a digestive enzyme) from the stomach reaches the throat, laryngopharyngeal reflux occurs which promotes swelling of the throat tissues (Arrow 1). In addition, this material can travel down the windpipe and cause swelling and inflammation in the lungs (Arrow 2).

Stomach contents can also move up into the nose, ears, and sinuses (Arrow 3). This can cause swelling and congestion in the nose (Arrow 4), which can further cause a vacuum effect downstream in the throat and increase the potential of throat collapse. Diminished activity in throat pressure receptors due to chronic acid exposure (or

vibrations) prevents throat muscle tension during times of collapse, aggravating further collapse (Arrow 5).



**Figure 1.2:** A diagrammatic representation of the interconnectedness of various physiologic processes, all precipitated by the vicious cycle of obstruction and throat acid reflux.

Certain anatomic features, such as a small mouth or dental abnormalities, can also accelerate throat collapse (Arrow 6). Acid in the throat can also cause you to wake up frequently in the middle of the night (Arrow 7). These “arousals” can occur consciously or subconsciously. They also prevent you from getting sufficient deep sleep and a restful night.

Arrows 8 shows that nasal and airway obstruction in general results in certain changes in the body’s physiology, the end result being lack of oxygen (hypoxia) to the body. Over time, repetitive obstructions and breathing cessations can lead to an internal stress response, leading to cardiovascular complications (Arrow 9). Multiple arousals can lead to sleep deprivation (Arrow 10), which increases stress hormone levels (e.g, cortisol), which makes you eat more and gain weight. Weight gain (Arrow 11) also enlarges the fat cells

in your throat and tongue, narrowing the airway, aggravating the original vicious cycle. Weight gain also raises your risk factors for heart disease (Arrow 12).

Finally, certain physiologic factors that involve an imbalance of the involuntary nervous system can lead to loosening of the sphincter that separates the stomach from the esophagus, allowing acid to readily access the throat (Arrow 13).

Hopefully, you'll have your own eureka moment about your fatigue and other health problems as you read through the following chapters.