

Are You Sleeping with the Enemy?

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If an intruder tried to suffocate you with a pillow hundreds of times a night, you'd call the police. In the case of sleep apnea, the airway blocks off and breathing will stop for up to several minutes--but the victim has no idea it's even happening. According to Ralph Downey III, PhD, of the Sleep Disorders Center at Loma Linda University Medical Center in Loma Linda, California, "The body, in essence, is being assaulted by the damage done from intermittent lack of oxygen to the heart, brain and other important organ systems, and yet such an assault goes unreported. That is, patients who have these symptoms don't always have their sleep apnea corrected. Perhaps in the light of a metaphor such as the one of being assaulted by our own sleep disorder, people would take more care of their sleep. Their hearts will thank them."

Truth be told, sleep apnea may well be the most significant, costly, easily treated, and least understood public health issue facing our nation. The most recent studies predict that between 50 and 60 million Americans are "at high risk" for having sleep apnea. And very few of them have the slightest idea what sleep apnea is, much less that it may be affecting their lives in profound ways.

The Basics

Apnea is the medical term for "stopping breathing." Sleep apnea is the temporary cessation of breathing during sleep, for intervals of 10 seconds up to minutes in length, depriving the body of oxygen. At some point the body arouses just enough to resume breathing and disrupt sleep, but usually not enough to awaken the individual. As a result, most people suffering from sleep apnea are not aware of their condition. In the most common type, obstructive sleep apnea (OSA), the airway blocks off when the tongue and/or other soft tissues in the throat relax and the individual simply stops breathing, sometimes for several minutes. This sequence can be repeated hundreds of times a night.

Apart from disrupting normal sleep patterns, sleep apnea wreaks havoc on the victim's body due to oxygen deprivation and physiological response patterns that occur during apnea events. There is no physiological signal stronger than oxygen deprivation to the brain. When blood oxygen levels are low, the body shunts blood from any and all organs, including the heart, to be sure the brain gets all available oxygen. On top of that, the sympathetic nervous system kicks in and releases a tremendous flood of stimulants and stress hormones, such as epinephrine (adrenaline) and cortisol, resulting in the well-known "fight or flight" response to danger.

Suppose somebody were to sneak up on you in the dark and lunge at you when you least expect it. Your heart races, the endocrine system instantly pumps out inordinately powerful stimulants. Sleep apnea victims are constantly confronted with a similar phenomenon and the accompanying red alert, each time their oxygen levels drop to a critical point. Another cruel twist happens when blood oxygen levels hover just above the

critical desaturation level, getting just enough oxygen on board to avoid the arousal but not enough to provide the oxygenation that the body needs to stay healthy. The desaturation graph is remarkable for a very precipitous drop around the mid-to-upper 80% range for most people with sleep apnea.

Repetitive apneic events disrupt the normal physiological interactions between sleep and the cardiovascular system. Sleep fragmentation, with its accompanying increased sympathetic activation, triggers vascular endothelial dysfunction, increased oxidative stress, inflammation, increased platelet aggregability, metabolic dysregulation; in addition, it undoubtedly helps initiate and accelerate the progression of cardiac and vascular disease. Persuasive data implicate sleep apnea in the development of hypertension, and sleep apnea also contributes to cardiac ischemia, congestive heart failure, cardiac arrhythmias, and cerebrovascular disease and stroke.

At least if you've been attacked by a mugger you know to avoid ever going down that dark alley again. Sleep apnea, conversely, does not tip its hand. The victim's conscious mind has virtually no recollection of the hundreds of assaults occurring during sleep every night.

It should not be surprising that common symptoms of sleep apnea include things like loud snoring and a gasping or snorting sound, high levels of daytime fatigue, irritability, depression, malaise, loss of productivity and work performance, extreme mental and physical exhaustion, loss of judgment, short-term memory dysfunction, and a number of other symptoms.

The Astounding Prevalence of Sleep Apnea in America

The numbers are shocking. The most recent studies have shown that one in four adults in the United States (31% of all men and 21% of all women over 18) is "at high risk" for OSA, based on analysis of the National Sleep Foundation's 2005 Sleep in America survey. Another study showed that **one third** of all people over 18 (who visit a primary care doctor) are at "high risk" for sleep apnea. Based on the 2000 Census, that means that between 50 and 60 million Americans likely suffer from sleep apnea. This is far higher than previous estimates that projected that between 10 and 18 million Americans have sleep apnea. Increasing awareness of sleep apnea and improved survey screening tools, along with an aging U.S. population, seem to be factors in the increase in OSA prevalence estimates. No longer should sleep apnea be thought of as an affliction of middle-aged, overweight men. The disorder is dependent on a number of factors (including, in particular, anatomy) and afflicts untold millions of otherwise young and fit women and men.

The Unacceptable Human and Economic Toll

According to the National Commission on Sleep Disorders Research, 38,000 cardiovascular deaths a year in the United States are directly attributable to sleep apnea. On top of that, sleep apnea is associated with a large number of serious, co-morbid medical and psychological conditions, such as hypertension, abnormal heart rhythm, sleep deprivation, stroke, heart disease, diabetes, depression, memory loss, poor

judgment, and change in personality. As a result, undiagnosed and untreated sleep apnea victims are significant consumers of healthcare services.

In Canada, sleep apnea victims were shown to consume 23 to 50% more medical services in the five years prior to diagnosis than control subjects, with hypertension and cardiovascular disease accounting for the majority of increased costs. A recent study from Israel showed that healthcare utilization was 1.7-fold higher by sleep apnea patients compared to the control group, with 25% of the sleep apnea patients who consumed the most resources accounting for 70% of the total healthcare expenditures. Other studies have demonstrated that successful sleep apnea treatment results in significant improvement in co-morbid conditions, including, specifically, cardiovascular disease, hypertension, diabetes, stroke, and depression.

Cardiovascular disease is the most significant killer in the United States, resulting in over 685,000 fatalities and \$40.4 billion in healthcare costs annually. Hypertension healthcare costs in the United States are approximately \$19 billion. While it is not known what percentage of all cardiovascular and hypertension healthcare costs is attributable to untreated sleep apnea, in light of the fact that between 50 and 65 million Americans are at high risk for the disease, it stands to reason that undiagnosed and untreated sleep apnea account for hundreds of millions—perhaps billions—of healthcare dollars spent treating conditions that could be more effectively and far more economically treated as a sleep disorder. The human value in savings of physical pain and mental anguish associated with invasive procedures, surgeries, and chronic disease and death cannot be quantified.

Collateral Impacts

Collateral impacts arising from 50 to 60 million clinically sleep-deprived people in the United States are certainly incalculable. One report focusing on highway safety impacts from sleep apnea concluded that more than 800,000 sleep apnea-related highway accidents occurred in 2000, resulting in 1,400 fatalities and costing nearly \$16 billion. If the same analysis were performed today using the new, much higher sleep apnea prevalence rates, the highway safety impacts would probably be twofold higher. Because extreme daytime exhaustion is prevalent among OSA victims, sleep apnea-related losses due to reduced worker productivity, industrial accidents, clerical mistakes, and so forth would be almost impossible to estimate, but, given the numbers, would no doubt amount to the billions of dollars annually. On top of this, the personal quality of life impacts—depression, personality changes, lack of judgment, irritability, utter exhaustion—cannot possibly be measured in economic terms.

Simple, Economic Treatment

The best news in sleep apnea is that it is a condition that is easily and economically treated. Continuous positive airway pressure (CPAP) therapy is the treatment of choice for obstructive sleep apnea and has been proven to be highly effective in treating sleep apnea and improving a number of co-morbid conditions. CPAP therapy consists of a ventilatory device that applies positive airway pressure at a constant, continuous pressure to help keep the airway open, allowing the patient to breathe normally during sleep. A number of other treatment options are also employed, such as surgery and dental

appliances but questions remain as to the effectiveness of these treatment alternatives.

Where To Go from Here

Perhaps the biggest challenge in addressing the sleep apnea health crisis is lack of public awareness (including many doctors). Just to put this into context, 13,658 Americans died from AIDS in 2003 while at least 38,000 died from cardiovascular disease related directly to sleep apnea. Yet while virtually everyone over 14 knows about AIDS, precious few of the 50 to 60 million Americans plagued by sleep apnea have any idea that a treatable sleep disorder is impacting every aspect of their lives. At the same time, a little awareness on the part of the patient or his or her doctor is all that it takes for treatment to start and, hopefully, for the suffering to end.

Unfortunately, a large number of doctors are still not very familiar with sleep apnea or its treatment. Primary care physicians are in an excellent position to screen people for sleep apnea, as one in every three adults they see, on average, will be “at high risk” for the condition. An excellent place to start (both for doctors and for individuals) is to fill out a one-page, ten-question survey called the “Berlin Questionnaire” that is widely available on the Internet (<http://www.pur-sleep.com/uploads/BerlinQuestionnaire.pdf>). This questionnaire is simple and fast, and is highly predictive of sleep apnea—the positive predictive value of the survey for people scoring as “high risk” is 89%. Sleep apnea victims often have to work hard to convince their doctor (or insurance company) to refer them for a sleep study, so a “high risk” showing on the Berlin Questionnaire might be enough to convince them to move forward with further tests. If people are not satisfied with their medical care they should get a second opinion, preferably from a sleep disorder specialist. A number of overnight screening assessment tools are also available. A formal sleep study is necessary, however, to diagnose sleep apnea and obtain CPAP treatment.