Sleep apnea is a breathing disorder in which abnormal pauses in breathing or shallow breaths occur during sleep. Each pause in breathing is referred to as an apnea and shallow breaths, or partial airway collapses, are called hypopneas.

Apneas and hypopneas can last from seconds to nearly a minute. In fact, these pauses can occur at a rate of more than 30 per hour. According to the National Institutes of Health, sleep apnea affects an estimated 18 million Americans.

Sleep apnea remains an under-recognized and underdiagnosed condition. Because it takes place during sleep, many patients are unaware that they have a significant medical condition. Even when noticed by a family member, patients often attribute the "snoring" and "choking" described to them as a normal byproduct of sleep.

The risk factors for sleep apnea include obesity and having a crowded upper airway, such as from enlarged tonsils, a large tongue or a crooked nose. To determine whether a patient is suffering...
from sleep apnea, he must have a sleep study, which is usually conducted in a sleep lab, though testing in the home can be performed in certain cases. The sleep specialist uses data collected from the sleep study to look at the patient's breathing in sleep, as well as to examine for other sleep disorders and factors that may be associated with these. In some cases, a second test may be required to fully evaluate for the presence or severity of the breathing problems.

The general disorder of sleep apnea is divided into three classifications:

- Obstructive Sleep Apnea (OSA)
- Central Sleep Apnea (CSA)
- Complex Sleep Apnea
- Obstructive Sleep Apnea

Affecting about 5 percent of middle-aged American adults, obstructive sleep apnea is a common condition marked by loud snoring and excessive sleepiness. It is the most common of the sleep breathing disorders and is characterized by the airway partially or completely collapsing during sleep. When the airway collapses, the brain and the body protect themselves by briefly awakening the individual and opening their airway to allow for normal breathing. Most people are not aware this is happening.

Unfortunately, as they fall back asleep, the process of airway closure tends to repeat over and over. This results in sleep disruption and, in some, low oxygen levels during sleep. This disorder tends to be worse if the person sleeps on his back versus sleeping on his side.

Symptoms include very loud snoring; choking or gasping at night; morning headaches; poor and unrefreshing sleep; daytime sleepiness.

Not only does OSA affect how a person sleeps and how he feels, it has now been associated with a wide range of medical consequences, including significant cardiovascular disease (hypertension, heart failure, strokes) and higher accident rates. As such, identification and treatment of this condition is very important.

There are a number of different treatments available. Which treatment is best depends on a number of factors, including the severity of the apnea, the patient's size and airway structure (anatomy), the other medical conditions of that patient, and the patient's willingness to accept a given treatment.
The primary treatment for OSA is the use of CPAP, or continuous positive airway pressure. By providing a steady stream of pressurized air, CPAP prevents the airway from collapsing. The most common version of this treatment comes in the form of a nasal mask system, which only covers the nose. There are also full face masks that cover both the nose and mouth, and nasal pillows with silicone tubes that fit into the nostrils.

CPAP often proves very effective at keeping the airway open during sleep, and it has been shown in a large number of studies to effectively improve the quality of life, daytime alertness, concentration and mood of the individual. Growing data suggests that it may reduce some of the medical consequences associated with apnea. But many people have a hard time adapting to sleeping with the device, so other treatments can be explored.

Alternative OSA treatments include oral appliances and surgery. Oral appliances generally work to advance the lower jaw, hoping to open space in the back of the throat. They tend to work best in patients with more mild to moderate sleep apnea and in those who may have a small or more backward sitting (posterior) jaw. Patients who use oral appliances during sleep often tolerate them; though they can have some annoying side effects, like jaw achiness, pain when chewing in the morning, headaches and drooling. Most of the time, these problems resolve with continued use of the device. Caution is urged for patients with temporomandibular joint (TMJ) disease, as the appliances put considerable stress on the TMJ and can worsen problems.

Surgery for apnea tends to be most effective in those with clear structural problems that are responsive to surgery (for instance, large tonsils, deviated septum), those with more mild to moderate sleep apnea, and those who are not obese. Patients can consider a number of surgeries: A tracheotomy (surgical tube placed in the neck) is usually curative for sleep apnea, but because it is somewhat disfiguring, it is reserved for severe cases that fail all other treatments.

Central sleep apnea

Central sleep apnea differs from OSA in that it is not caused by a blockage in the airway, but rather it is the result of a brain (hence, "central") failure to send the signal to breathe for a period of time. Thus, the airway remains open, but there is no effort made to breathe. Central sleep apnea often occurs in an off-and-on cycle, giving a rhythmic pattern to the breathing problems in sleep. This version of sleep apnea is most often the result of heart or brain problems, though in some cases no clear cause is found. The brain is the control center for breathing, but the heart can interact with the brain control centers and affect the process of breathing.

Patients with CSA often have neurological disorders (Parkinson’s disease, stroke) or heart conditions (usually heart failure), though it can also be seen in those without heart or brain problems who are sleeping at high altitudes or are on long-acting narcotic medications (morphine and OxyContin).

Symptoms are similar, with some differences, to obstructive sleep apnea and include difficulty falling asleep; frequently awakening during sleep, often resulting in a complaint of insomnia.
during the night; breathing pauses in sleep; shortness of breath upon waking; snoring, though usually not as loud as in those with OSA; daytime sleepiness; fatigue.

Patients with central sleep apnea are also encouraged to visit a sleep specialist and undergo objective testing; these cases should be studied by an in-lab sleep study and not a home test. The primary treatment is continuous positive airway pressure, though a wide variety of pressure devices are now available and, in some cases, may be more effective than traditional CPAP.

**Complex sleep apnea**

Complex sleep apnea is, in some respects, a mix of obstructive and central sleep apnea, and is probably the least common of the sleep breathing disorders. This condition is defined based on certain characteristics of a person's sleep during a sleep study. In complex sleep apnea, there is a diagnosis of OSA during monitored sleep, but then the patient develops a central sleep apnea pattern. In other words, the CPAP is effective at keeping the airway open, but the brain fails to send the signal to breathe.

The significance of having complex sleep apnea is not entirely clear. It is not known if this represents a different type of sleep apnea or something we see on a single night sleep study that resolves over time. Some patients with this condition can be controlled with CPAP, others with bi-level pressure support, and some need the newer type of device called adaptive servo ventilation. Oxygen is not considered a treatment for this condition as it is generally not a treatment for obstructive sleep apnea.

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