

Sleeping in the danger ZZZZZZZzone

By Kathleen D. Pagana, PhD, RN

EVER HEAR someone say, “His snoring is killing me”? The truth is, snoring can kill the *snorer*. It’s a symptom of sleep apnea, which strikes more than 12 million Americans. The vast majority of these sufferers don’t know they have the condition and thus go untreated, risking their health and even their lives.

Understanding the disorder

Sleep apnea is characterized by brief interruptions of breathing during sleep. Most people with the condition have periods of apnea lasting about 20 to 30 seconds, although they can last up to 3 minutes. Because the episode instigates wakefulness, the person doesn’t sleep deeply and is likely to experience excessive daytime sleepiness.

Sleep apnea can be obstructive or central.

- **Obstructive** sleep apnea (OSA), the more common type, results from upper airway occlusion by the tongue, tonsils, uvula, or soft tissue in the rear of the throat. The resulting apnea leads to progressive asphyxia, which causes the sleeper to awaken in an attempt to restore the airway. The person then falls back to sleep and the pattern is repeated—commonly, up to 500 times a night. This causes fragmented nighttime sleep and sleepiness during the day.
- **Central** sleep apnea occurs when the neural drive to the respiratory muscles is abolished for brief periods. In this type of apnea, the airway isn’t blocked; instead, the brain fails to signal the muscles to breathe. Signs and symptoms resemble those of OSA.

Associated problems

Untreated sleep apnea can be life-threatening in several ways. For one thing, it has cardiopulmonary implications: During apneic episodes, the cyclical heart rate may decrease as low as 30 to 50 beats/minute, followed by tachycardia of 90 to 120 beats/minute during the ventilatory phase. Severe bradycardia or tachyarrhythmias may result, possibly leading to sudden death.

Also, unlike healthy persons, OSA suf-

Most victims of sleep apnea aren’t aware they have it—but what they don’t know can hurt them.

ferers don’t experience a blood pressure decrease during sleep. Typically, their blood pressure rises abruptly at the end of each obstructive event, from sympathetic nervous system activation and reflex vasoconstriction.

OSA has been implicated as a risk factor in development of systemic hypertension, although the underlying reason isn’t known. It can also trigger myocardial ischemia in patients with coronary artery disease.

Assessing patients for sleep apnea

The hallmark of sleep apnea is excessive daytime sleepiness, which initially manifests during passive activities. For example, the sufferer may fall asleep while watching TV or reading. As the disorder progresses, sleepiness affects all aspects of daily life and can become disabling and dangerous. Several studies have implicated OSA in motor vehicle accidents.

Additional symptoms include loud snoring, restless sleep, morning headache, intellectual deterioration, personality changes, and behavioral disorders. In children and adolescents, untreated sleep apnea can lead to academic underachievement. (See *Key assessment questions*.)

Risk factors

On admission, assess patients for the following risk factors:

- male gender
- overweight



Key assessment questions

To help identify unrecognized sleep apnea, ask your patient the following questions:

- Do you usually fall asleep quickly?
- Are you a loud, habitual snorer?
- Do you feel tired or groggy on awakening?
- Are you often sleepy during waking hours?
- Are you overweight?
- Has anyone told you that you’ve choked, gasped, or held your breath while sleeping?

Suspect sleep apnea if the patient answers “yes” to any of these questions.

Producing a picture of sleep

Polysomnography (PSG) monitors and records multiple physiologic parameters related to sleep and wakefulness. It's painless, involves no needles, and takes place in a well-insulated room where external sounds are blocked and room temperature is easily controlled.

Before the test, the patient is instructed to avoid caffeine and sedatives. When he or she reports to the sleep center at about 9 P.M., equipment is attached and lights are turned off; monitoring begins before the patient falls asleep. The wiring set-up allows the patient to be disconnected easily during the night to use the bathroom.



Photo courtesy of Grass Technologies

Test parameters

A full PSG includes:

- electroencephalography to identify sleep stages
- electrooculography to document eye movements
- electrocardiography to measure heart rate and rhythm
- chest impedance to monitor chest-wall movements and respirations
- airflow monitoring to measure airflow in and out of the nose and mouth
- carbon dioxide (CO₂) monitoring to measure expiratory CO₂ levels
- pulse oximetry to monitor tissue oxygen levels
- sound sensors to document snoring sounds
- audio and video recordings to document restless motions and fitfulness.

If test results indicate the patient has obstructive sleep apnea, a second sleep test usually is done to determine whether the disorder can be treated with a breathing device. In some cases, a "split-night" study is done: The first half of the night is the testing phase; if testing shows sleep apnea, treatment begins during the second half.

Normal findings

Normally, PSG findings include:

- respiratory disturbance index of fewer than five apneic episodes per hour
- normal progress through sleep stages
- no interruption of nasal or oral airflow
- end-tidal CO₂ of 30 to 45 mm Hg
- oximetry of 90% or higher, with oxygen desaturation not exceeding 5%
- minimal snoring
- no disturbance of heart rate or rhythm
- no evidence of restlessness.

- age older than 40 (but be aware that sleep apnea can occur at any age—even during childhood)
- large neck size (17" or greater in men or 16" or greater in women)
- family history of sleep apnea.

Diagnosis

The definitive investigation for suspected OSA is polysomnography (PSG), which takes place in a specially constructed sleep laboratory. (See *Producing a picture of sleep*.)

In patients with a high pretest probability of OSA, overnight oximetry can be done at home to confirm the diagnosis, eliminating the need for PSG.

Treatment options

Many patients can manage mild or moderate OSA by losing weight, avoiding alcohol and sleep medications, and sleeping on the side instead of the back. Some patients may use an oral dental appliance that pushes the mandible forward and prevents the tongue from falling backward and closing the airway.

Severe OSA may warrant surgery or nasal continuous positive airway pressure (CPAP) during sleep. Uvulopalatopharyngoplasty increases the pharyngeal lumen by resecting redundant soft tissue. Nasal CPAP prevents upper airway occlusion by splinting the pharyngeal airway with positive pressure delivered by a nose mask. This is the most common and successful long-term treatment approach.

Making sleep safer for patients

Don't let a patient's snoring go unexamined. If your patient is at risk for sleep apnea or has already been diagnosed with it, stay alert for apneic episodes during hospitalization. If these occur, urge the physician to order sleep studies.

In patients with known sleep apnea who use CPAP at home, ask what the settings are and obtain an order for this machine in the hospital, as needed. Refer patients to the American Sleep Apnea Association (www.sleepapnea.org) to learn more about the disorder. ★

Selected references

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- For a complete list of selected references, visit www.AmericanNurseToday.com

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