Obstructive sleep apnea

This common sleep disorder may increase the risk of other serious health conditions.
Prevalence of OSA

• As many as five to 10 percent of adults in the US have OSA, approximating 20 million people.\textsuperscript{1,2}
  – Nine percent of men and four percent of women have an Apnea Hypopnea Index (AHI) >15.
  – Four percent of middle-aged men and two percent of middle-aged women have an AHI >5 and daytime sleepiness.
• The prevalence of OSA is higher in the following ethnic groups:\textsuperscript{3}
  – Asians
  – Hispanic women
  – African-Americans
• 85 to 90 percent of patients have not been identified.\textsuperscript{1}
• One in four patients is at risk for OSA.\textsuperscript{2,4}

Common signs and symptoms of undiagnosed OSA
• Excessive daytime sleepiness, unrefreshing sleep, or daytime fatigue
• Gasping or choking while sleeping
• Witnessed apneas while sleeping
• Loud or disruptive snoring
• Morning headaches
• History of hypertension; new onset or refractory hypertension
• History of refractory depression
• Frequent nighttime urination

Sleep apnea

Obstructive Sleep Apnea (OSA)

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<th>Airflow</th>
<th>Thoracic effort</th>
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OSA is the absence of airflow due to an occlusion in the upper airway that lasts at least 10 seconds in spite of continual effort to breathe. Severity is measured by the Apnea/Hypopnea Index (AHI) – the number of episodes per hour of sleep.

Central apnea and periodic breathing

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Central apnea is the absence of airflow that lasts at least 10 seconds with no inspiratory effort. Periodic breathing is defined as alternating periods of hyperventilation with waxing/waning tidal volume and periods of central hypopneas or apneas. There are many forms of periodic breathing, including Cheyne-Stokes Respiration (CSR).
Effective treatment of OSA

While research into the relationship between OSA and other comorbidities continues, some studies have shown that patients in whom symptomatic OSA is effectively treated by the regular use of positive airway pressure (PAP) therapy may also see an improvement in some of the cardiovascular and metabolic conditions that co-exist with OSA:

• Decrease in both fatal and non-fatal cardiovascular events⁵,⁶,⁷
• Decreased number of arrhythmias⁸
• Decreased blood pressure⁹,¹⁰
• Improvement in glucose levels and better control of diabetes¹¹,¹²
• Improvement in insulin sensitivity and insulin responsiveness in patients with OSA¹³
• Decrease in mortality risk with patients who have ischemic stroke¹⁴

The prescribed treatment for the majority of patients with OSA is a continuous positive airway pressure (CPAP) device, which provides a continuous level of pressure to maintain an open airway and prevent apneas.

Therapy acceptance and follow-up
• Intervention during the first week to the first month of therapy demonstrated significant improvement in CPAP compliance from three months to a three-year period¹⁵,¹⁶,¹⁷
• Rescue interactions — including mask refit, humidification, support and education of both patient and support systems — significantly improved adherence to CPAP¹⁸

The short-term treatment goals of CPAP
• Improve quality of sleep
• Alleviate daytime symptoms
  – Sleepiness
  – Moodiness/impaired concentration/memory loss
  – Morning headache

Objective treatment reporting
It is important to follow up on a patient’s therapy use. While verbal and written communication provide some insight into a patient’s usage, it has been documented that patient self-reports of CPAP use significantly overstate the actual use.
Consequences of untreated OSA

Bi-level rescue protocol for non-compliant patients
If patients do not tolerate or respond to the initiation of PAP therapy, there are alternatives. One alternative to having patients drop out of therapy is to place them on bi-level positive airway pressure therapy using a BiPAP or BiPAP Auto bi-level device.

- 48 percent of patients who failed to tolerate CPAP in the sleep lab were rescued using bi-level therapy and continued to use therapy after three months.19
- Bi-level therapy is an effective salvage therapy for about 50 percent of patients who do not tolerate and/or respond to CPAP.20
- Patients having difficulty using CPAP may benefit from bi-level therapy after conventional rescue protocols have failed.20

Health impact
- Sleep-disordered breathing (SDB) has frequently been associated with various forms of cardiovascular disease.
  - Individuals with severe SDB are two to four times more likely to develop complex arrhythmias than those without SDB.21
  - Individuals with diagnosed OSA are two to three times more likely to develop hypertension.22
  - The prevalence of OSA in patients with heart failure is estimated at 40 to 70 percent.23,24
  - Individuals with diagnosed OSA are more likely to suffer a stroke than those without OSA.25,26,27
  - JNC7 recognizes OSA as an identifiable cause of hypertension.28
- Type 2 diabetes is more prevalent in patients with sleep-disordered breathing independent of other risk factors.29
- The International Diabetes Federation (IDF) recommends that individuals with diagnosed OSA are more likely to suffer a stroke than those without OSA.25,26,27
- The International Diabetes Federation (IDF) recommends that health professionals working with both type 2 diabetes and SDB adopt clinical practices to ensure that a patient presenting with one condition is considered for the other.30
- The American Society of Anesthesiologists (ASA) recommends identifying, monitoring, and treating patients with OSA in the perioperative period.31

Economic impact
Several studies review the impact of undiagnosed OSA from an economic perspective. Studies compared patients without OSA to patients with OSA who were either undiagnosed or untreated.

Patients with undiagnosed or untreated OSA:
- Had twice the healthcare costs than those without OSA.32,33
- Had an estimated 50 percent more physician visits and incurred 50 percent more physician costs than those without OSA.32,33
- Hospital stays were longer compared to those without OSA.32,33

Average physician claims for 181 patients versus control subjects for the 10 years prior to diagnosis with Obstructive Sleep Apnea Syndrome (OSAS). Difference between groups indicated by asterisk.31

Philips Respironics’ goal is to provide the most up-to-date information on clinical research with respect to the relationship between OSA and other disease states. While research has established a comorbidity relationship between OSA and the disease states discussed in this literature (see references below), research is ongoing to identify potential causative relationships between OSA and other disease states.

Obstructive Sleep Apnea (OSA) is a common sleep disorder that has been associated with an increased risk of hypertension, heart failure, stroke, atrial fibrillation, type 2 diabetes, and other conditions. There is growing evidence that early screening and identification may help prevent serious complications associated with untreated OSA. Once your patient has been diagnosed and has started on therapy, close follow-up is important to ensure that his or her sleep apnea is improving with treatment. Effective treatment of sleep apnea not only results in better sleep and improved quality of life but it may also have a positive impact on other disorders that the patient may be experiencing.

**Risk factors and identifiers for OSA**
- BMI >30 and/or upper body obesity
- Large neck girth:
  - 17 inches for men
  - 16 inches for women
- Crowding of the upper airway, including large tonsils or adenoids
- Abnormalities with the upper airway which may include a small jaw or large tongue
- Family history of OSA
- Recent work or motor vehicle accident

**Key questions to ask a patient to identify OSA**
OSA often coexists in individuals who have hypertension, type 2 diabetes, and coronary artery disease along with other life threatening disorders. Emerging evidence supports the need for a lower threshold for assessing a patient’s sleep habits and patterns. Questions to ask may include:
- Do you feel tired during the day?
- Has your breathing/snoring at night bothered others?
- Has anyone ever witnessed you having an apnea or not breathing while you are sleeping?
- Do you have a history of high blood pressure or type 2 diabetes?