



OBSTRUCTIVE SLEEP APNEA

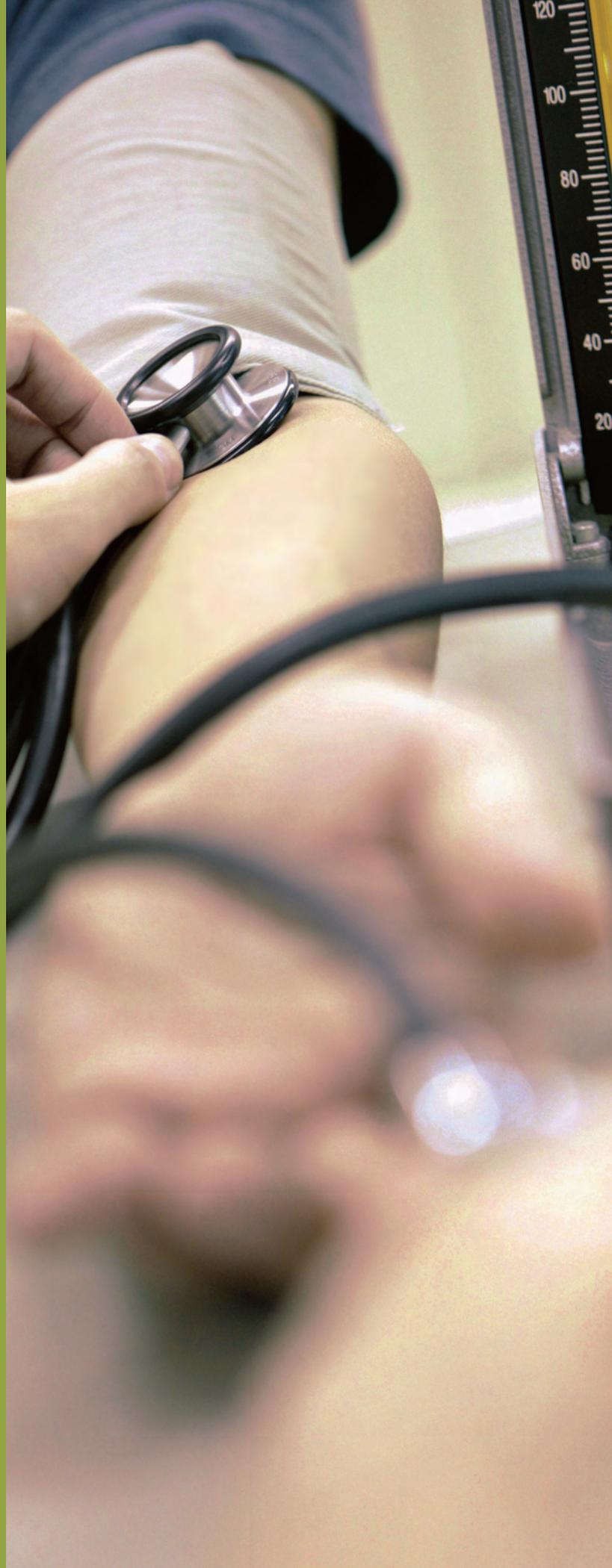
For some patients, it may be contributing to the development of other serious health conditions.

SLEEP APNEA AND YOUR PATIENTS

Obstructive Sleep Apnea (OSA) is a common breathing disorder that has been associated with an increased risk of **hypertension, heart failure, stroke, atrial fibrillation, diabetes** and other conditions. In addition to serious physiological consequences, **untreated OSA** also may also cause a **negative economic impact**. For these reasons, it is important to properly **identify** and successfully **treat patients** with obstructive sleep apnea.

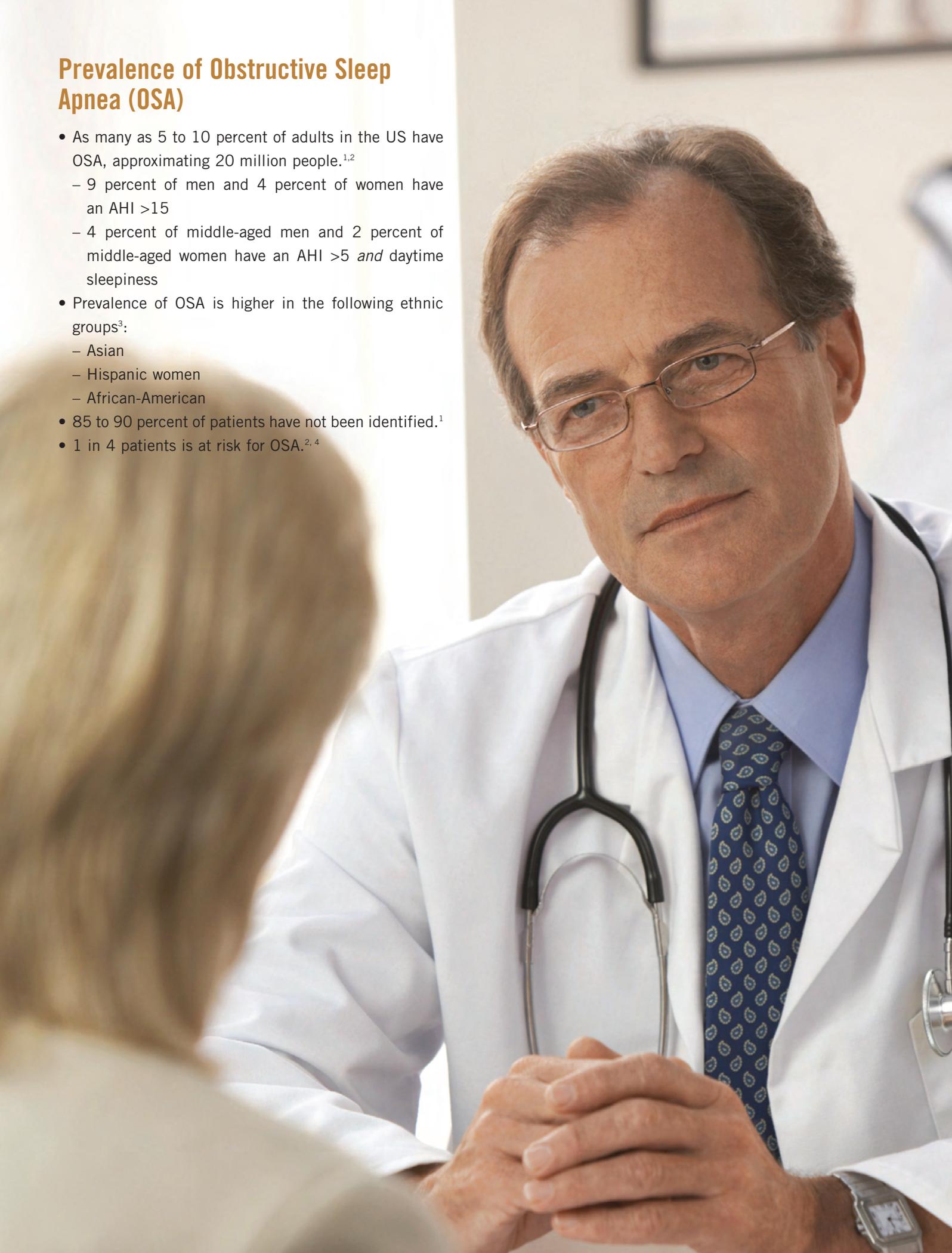
The Physician's Role

OSA may increase a patient's likelihood of developing potentially life-threatening conditions. Early screening and identification may help to prevent serious complications. Once your patients have been diagnosed and have begun therapy, close follow-up may ensure that they are receiving appropriate treatment for improved overall wellness.



Prevalence of Obstructive Sleep Apnea (OSA)

- As many as 5 to 10 percent of adults in the US have OSA, approximating 20 million people.^{1,2}
 - 9 percent of men and 4 percent of women have an AHI >15
 - 4 percent of middle-aged men and 2 percent of middle-aged women have an AHI >5 *and* daytime sleepiness
- Prevalence of OSA is higher in the following ethnic groups³:
 - Asian
 - Hispanic women
 - African-American
- 85 to 90 percent of patients have not been identified.¹
- 1 in 4 patients is at risk for OSA.^{2, 4}



CONSEQUENCES OF UNTREATED OSA

Health Impact

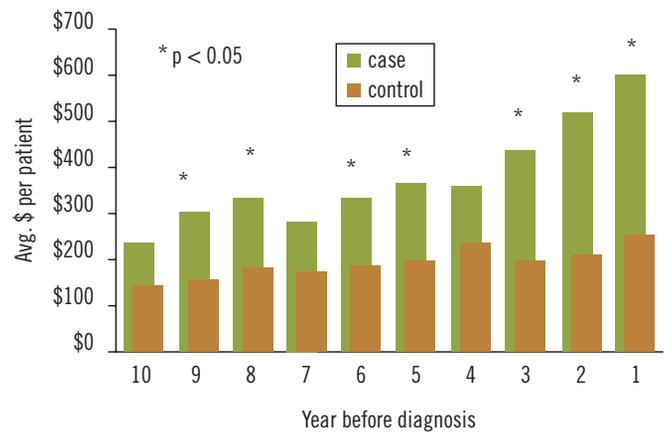
- Sleep-disordered breathing (SDB) has frequently been associated with various forms of cardiovascular disease.
 - Individuals with severe SDB are two- to four-times more likely to develop complex arrhythmias than those without SDB⁵
 - Individuals with diagnosed OSA are between two and three times more likely to develop hypertension⁶
 - The prevalence of OSA in patients with heart failure is estimated at 40 to 70 percent^{7, 8}
 - Individuals with diagnosed OSA are more likely to suffer a stroke than those without OSA^{9, 10, 11}
 - JNC7 recognizes OSA as an identifiable cause of hypertension¹²
- Type 2 diabetes is more prevalent in patients with sleep-disordered breathing independent of other risk factors.¹³
- The American Society of Anesthesiologists (ASA) recommends identifying, monitoring, and treating patients with OSA in the perioperative period.¹⁴

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.^{15, 16}
- Had an estimated 50 percent more physician visits and incurred 50 percent more physician costs than those without OSA.^{15, 16}
- Spent longer in the hospital setting and more days in the hospital compared to those without OSA.^{15, 16}



Average physician claims for 181 patients versus control subjects for the 10 years prior to diagnosis with OSAS. Difference between groups indicated by asterisk.¹⁶

Effective Treatment of OSA

The majority of patients with sleep apnea are prescribed treatment with a continuous positive airway pressure (CPAP) device. CPAP devices provide a continuous level of pressure to maintain an open airway and prevent apneas.

The short-term treatment goals of CPAP are to:

- Improve quality of sleep
- Alleviate daytime symptoms
 - Sleepiness
 - Moodiness/impaired concentration/memory loss
 - Morning headache

While research into the relationship between OSA and other co-morbidities 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 events^{17, 18, 19}
- Decreased number of arrhythmias²⁰
- Decreased blood pressure^{21, 22}
- Improvement in glucose levels and better control of diabetes^{23, 24}



FIRST IMPRESSIONSSM

Providing your patients with a favorable first impression to therapy can positively impact their acceptance of OSA treatment. Respiroics' First Impressions Program offers educational programs, unique tools and innovative technologies so sleep professionals and homecare providers can help to ensure that patients are compliant with therapy.

Therapy Acceptance and Follow-Up

- 46 percent of patients on CPAP use their device four hours per night 70 percent of the week.²⁵
- Intervention during the first week to first month demonstrated significant improvement in CPAP compliance from three months to a three-year period.^{26, 27, 28}
- Rescue interactions – including mask re-fit, humidification, support and education of both patient and support systems – significantly improved adherence to CPAP.²⁹

Objective Treatment Reporting

It is important to follow up on patients' therapy use. While verbal and written communication provides some insight into patients' usage, it has been documented that self-reports of CPAP use by patients are significantly over-reported.

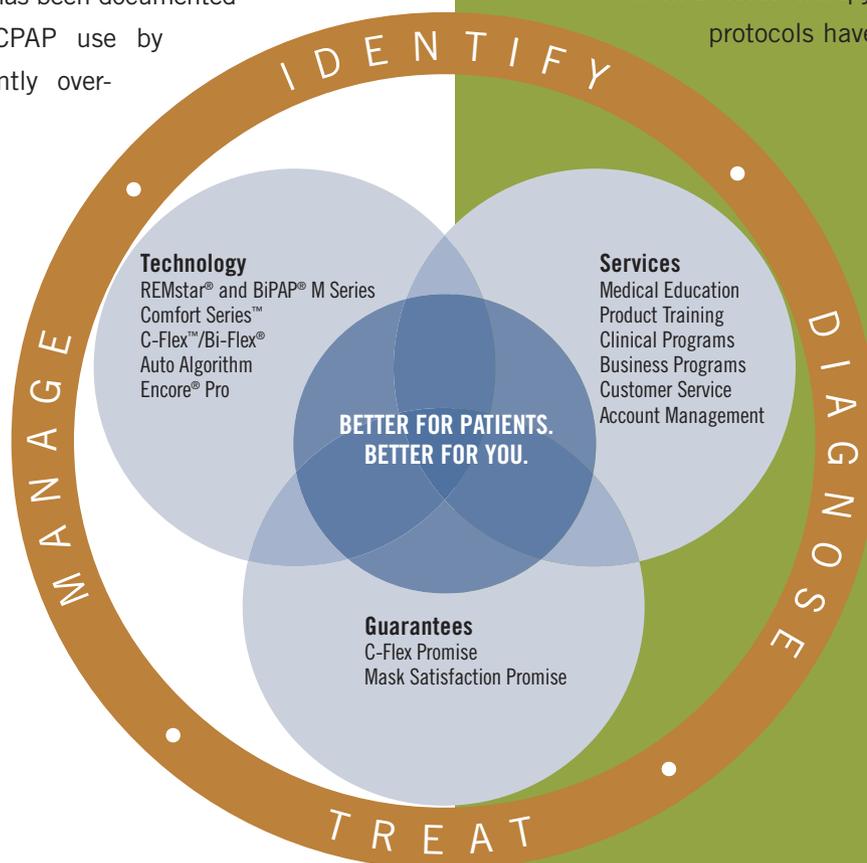
LASTING IMPRESSIONSSM

The Lasting Impressions Program can help providers establish a sleep apnea management program to improve patient compliance and quality of life. An important component to the program is to convert non-compliant CPAP patients to bi-level therapy.

Bi-level Rescue Protocol for Non-compliant Patients

Respiroics' Lasting Impressions Program is intended to help patients continue their PAP therapy when they are not able to tolerate, or do not perceive a response to, standard CPAP treatment. An 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 3 months.³⁰
- Bi-level therapy is an effective salvage therapy for about 50 percent of patients who do not tolerate and/or respond to CPAP.³¹
- Patients having difficulty using CPAP may benefit from bi-level therapy after conventional rescue protocols have failed.³¹



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 co-morbidity relationship between OSA and the disease states discussed in this literature (see references [when applicable]), research is ongoing to identify potential causative relationships between OSA and other disease states.

¹Young T., et al., *NEJM* 1993;328:1230-1235

²Young T., et al., *AJRCCM* 2002;165:1217-1239

³O'Connor, et al., *Sleep* 2003;26(1):74-79

⁴Hiestand, D.M., et al., *Chest* 2006;130:780-786

⁵Mehra, R., et al., *AJRCCM* 2006 :173:910-916

⁶Peppard, et.al., *NEJM* 2000;342:1378-1384

⁷Javahari, S., *Cur Treat Options in CV Med* 2005;7:295-306

⁸Sin, D., et al., *AJRCCM* 1999;160:1101-1106

⁹Goldstein, L.B., et al., *Stroke* 2006;37:1583-1633

¹⁰Yaggi, H.K., et al., *NEJM* 2005;353 :2034-2041

¹¹Arzt, M., et al., *AJRCCM* 2005;172:1447-1451

¹²Chobanian, A.V., et al., *J Hypertension* 2003;42:1206-1252

¹³Reichmuth, et al., *AJCRRCM* 2005;172:1 590-1595

¹⁴Practice Guidelines, *Anesthesiology* 2006;104(5):1081-1093

¹⁵Bahammam, A., et al., *Sleep* 1999;22(6):740-747

¹⁶Ronald, J., et al., *Sleep* 1999;22(2):225-229

¹⁷Marin, J.M., et al., *Lancet* 2005;365:1046-1053

¹⁸Campos-Rodriguez, et al., *Chest* 2005;128:624-633

¹⁹Doherty, L.S., et al., *Chest* 2005;127:2076-2084

²⁰Gami, A.S., et al., *Circulation* 2004;110:364-367

²¹Becker, et al., *Circulation* 2002;107:68-73

²²Logan A.G., et al., *ERJ* 2003;21:241-247

²³Babu, et al., *Arch Int Med* 2005;165:447-452

²⁴Harsch, et al., *AJRCCM* 2004;169:156-162

²⁵Kribbs, N., et al., *Am Rev Resp Dis* 1993;147:887-895

²⁶Weaver, T., et al., *Sleep* 1997;20(4):278-283

²⁷McArdle, N., et al., *AJRCCM* 1999;159:1108-1114

²⁸Pepin, J.L., et al., *AJRCCM* 1999;160:1124-1129

²⁹Engleman, H.M., et al., *Sleep Medicine Review* 2003;7(1):81-99

³⁰Szumstein, S., et al., *Sleep* 1999;22:Abstract Supplement

³¹Gay, P.C., et al., *Sleep* 2005;28:A210

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