Diagnosis and Treatment of Obstructive Sleep Apnea in Adults

This guide provides actions for employers that want to use comparative effectiveness research (CER) findings about the diagnosis and treatment of obstructive sleep apnea in adults in their health plans and programs. It is based on research funded by the federal Agency for Healthcare Research and Quality (AHRQ). See the Resources section at the end of this guide for consumer decision-support information on sleep apnea.

Impact on Employers

Obstructive sleep apnea (OSA) is a chronic and potentially serious condition that occurs while sleeping when the muscles at the back of the throat relax too much to allow normal breathing. More than 12 million Americans have OSA. It is most common among middle-aged and older adults, and people who are overweight. The prevalence of sleep apnea has increased, and this may be related to the growth in the obesity rate.

Severe cases of OSA are associated with increased risk for diabetes, high blood pressure, heart failure, stroke and accidents due to sleepiness. Research shows that “before diagnosis, patients with OSA have increased rates of health care use, more frequent and longer hospital stays, and greater health care costs than after diagnosis.” Although there is an index against which to diagnose sleep apnea, known as the apnea-hypopnea index (AHI), there is no clear definition of the level of breathing abnormality that warrants treatment. OSA is diagnosed when AHI is greater than 15 events per hour, or when there is an AHI of 5-14 accompanied by heart disease, high blood pressure, history of stroke, impaired cognition, mood disorders, insomnia or excessive daytime sleepiness. OSA can be diagnosed with portable home monitors or lab sleep studies.

Spending on sleep testing is on the rise. Medicare payments for sleep testing grew from $62 million in 2001 to $235 million in 2009, according to the federal Office of the Inspector General. Private health plans are also beginning to look more closely at the potential overuse of sleep studies.

The AHRQ Effective Health Care Program funded this review comparing the effectiveness of approaches for diagnosis, screening and treating obstructive sleep apnea. *Diagnosis and Treatment of Obstructive Sleep Apnea in Adults* was prepared by the Tufts Medical Center Evidence-based Practice Center and published in August 2011.

The review evaluated the following diagnosis, screening and treatment approaches:

**Diagnosis**
- Polysomnography (PSG type I)
  - This standard test to diagnose sleep apnea involves an overnight stay in a sleep laboratory with monitoring of heart, lung and brain activity. Split-night polysomnography involves initial diagnosis during the first part of the night and titration of positive airway pressure during the second part of the night.
- Portable monitors (types II, III, and IV)
  - These monitors may be used at home, in hospitals or in other health care settings to diagnose sleep apnea.

**Screening**
- Questionnaires, including Berlin, STOP STOP-Bang, ASA Checklist, Epworth Sleepiness Scale and Hawaii Sleep questionnaire.
- Phased testing, defined as screening tests or battery followed by a full test.
- Perioperative screening to assess the impact of sleep apnea on surgical outcomes.

**OSA Signs and Symptoms**
- Excessive daytime sleepiness (hypersomnia)
- Loud snoring
- Observed episodes of breathing cessation during sleep
- Abrupt awakenings accompanied by shortness of breath
- Awakening with a dry mouth or sore throat
- Morning headache
- Difficulty staying asleep (insomnia)
- Difficult-to-control high blood pressure


**Treatment**
- Continuous Positive Airway Pressure (CPAP) device
  - This is the most common treatment for moderate to severe sleep apnea. A mask is worn over the nose, mouth, or nose and mouth while sleeping. The device pushes a stream of air to keep the airway open. There are different types of CPAP devices and some include humidifiers. Autotitrating CPAP devices (also known as Auto CPAP or APAP) make pressure changes throughout the night as needed to keep the airway open.
- Mandibular Advancement Device (MAD)
  - MAD is a mouthpiece that brings the jaw forward and keeps the airway open. The device is fitted and checked periodically by a dentist.
• Surgery
Surgery includes uvulopalatopharyngoplasty (removes tissue from the back of the throat to make the airway wider); laser-assisted uvulopalatoplasty (removes tissue at the back of the throat with a laser); radiofrequency ablation (removes tissue at the back of the throat with radiofrequency energy); and tracheostomy, which is typically only used when OSA is severe and other treatments have failed (a surgeon makes an opening in the neck and inserts a metal or plastic tube through which the patient breathes while sleeping).

• Weight loss programs

• Other treatments, including implants, exercises, approaches to positioning the body while sleeping, and nasal dilator strips

**Findings:**

**Health Outcomes of OSA**
- AHI ≥ 30 is a predictor of all-cause mortality (High strength evidence) and diabetes. (Low strength evidence)

**Diagnosis**
- Portable (at-home) monitors can accurately predict elevated AHI, but cannot estimate exact AHI values as measured by sleep lab PSG type I monitors. (Low to moderate strength evidence)
- There are insufficient data to compare the different types of portable monitors.

**Screening**
- The Berlin questionnaire may be accurate in screening for OSA. (Low strength evidence)
- There are insufficient data to evaluate the effectiveness of most questionnaires.
- There are insufficient data to evaluate the effectiveness of phased testing or the usefulness of preoperative screening for OSA to improve postoperative outcomes.

**Treatment**
- CPAP and MAD are effective treatments for OSA. (Moderate strength evidence)
- CPAP is superior to MAD in achieving an AHI of ≤5 events per hour. (Moderate strength evidence)
- There is not enough research to assess which patients would benefit most from treatment with CPAP compared to MAD.
- APAP and fixed CPAP are equally effective. (Moderate strength evidence) Evidence is insufficient to compare other CPAP devices (oral CPAP, nasal CPAP, bilevel PAP, flexible bilevel PAP, and humidified CPAP).
- There are not enough studies of surgical procedures to determine their relative effectiveness when compared to each other, to sham or no treatment, or to other OSA treatments.

**OSA Severity Scale**
- AHI = 5 - 15 is mild OSA
- AHI = 15 - 30 is moderate OSA
- AHI ≥ 30 is severe OSA
• Weight loss programs may be an effective treatment for OSA in patients who are obese. *(Low strength evidence)*
• There is insufficient evidence to compare the relative effectiveness of other treatments for OSA, such as implants, exercises, approaches to positioning the body while sleeping, and nasal dilator strips.
• Long-term clinical outcomes have not been adequately studied. Effectiveness of treatments noted above is based on intermediate measures such as sleepiness and AHI.

**Adverse Events**
• Adverse events that may be associated with CPAP include claustrophobia, nasal or oral dryness, nosebleeds, pressure discomfort, gum or lip soreness or pain, excessive salivation, skin irritation, nasal irritation and obstruction, aerophagia (swallowing too much air), abdominal distention and chest wall discomfort.
• Adverse events that may be associated with MAD include sleep disruption; sensations of pressure in the mouth; mucosal erosions; excessive salivation; dental crown damage; loosening of teeth; tooth, mouth or jaw damage; and temporomandibular (TMJ) or jaw pain.
• Adverse events that may be associated with surgery include post-surgical complications such as infection, hemorrhage, nerve palsies, emergency surgical treatments, cardiovascular events, respiratory failure, rehospitalization and death; and long-term events such as speech or voice changes, difficulties swallowing, and airway stenosis (narrowing of the airway).
• There were no reported long-term adverse events associated with weight-loss programs.
Employers can use medical plan policies and health management programs to help employees prevent, diagnose and treat sleep apnea. However, appropriateness indications for the diagnosis and treatment of OSA can be complex, and employers should work with their health plans on details. Treatment adherence is a serious problem, but employers can use plan design to encourage it.

**Medical Plan**

- Require that patients have a face-to-face clinical evaluation with their doctor prior to a sleep study.

- Cover portable monitors as part of the diagnostic process for OSA. Portable monitors are less expensive than a lab study and can diagnose OSA, though they may not define its severity. However, knowing the level of severity usually does not change the treatment approach.

- Cover full-night, in-lab polysomnography to diagnose OSA, when the clinical evaluation and home sleep study are inconclusive. Also, cover split-night studies when the AHI score is definitive during the diagnostic portion of the study to avoid a second night in the lab.

- Ask your health plan to select sleep centers and facilities for the network based on performance and accreditation. The American Academy of Sleep Medicine has been accrediting sleep labs since 1977.

- Cover CPAP for the treatment of OSA. APAP devices use the same CPT code, although they are typically more expensive. The American Academy of Sleep Medicine includes both CPAP and APAP in its practice guidelines.

- Require patients to have a follow-up visit with the treating physician within three months to assess adherence. The CPAP or APAP device provides utilization information. Medicare requires documented use of the device ≥ 4 hours per night on 70% of nights to qualify for coverage beyond three months.

- Cover oral appliances (MAD) fitted by a dentist.

- Use prior authorization for surgery to treat OSA (such as tonsillectomy, adenoidectomy or uvulopalatopharyngoplasty). Surgery may be an appropriate treatment for OSA when narrowing of the airway is present or when narrowing of the airway is present and nonsurgical treatments are ineffective. Tracheostomy may be appropriate when OSA is severe and other medical and surgical treatments have failed. (See sample health plan coverage for surgical OSA treatments for adults in the text box below.)

- If you identify significant gaps in care for OSA or the potential overuse of sleep studies, consider a sleep management program offered by your health plan.
Employee Education and Support

- Educate employees about the association between OSA and overweight.

- Use weight management programs, health coaches, on-site clinics and related services to support employees in making lifestyle changes that may help improve mild to moderate OSA. These lifestyle changes include the following:
  - Maintaining healthy weight or losing weight;
  - Quitting smoking;
  - Limiting alcohol consumption; and
  - Avoiding sleeping on one’s back.

- Provide medical decision-support services to help members understand OSA, the diagnostic and screening tools available to assess its severity, the potential benefits and adverse events associated with each treatment, and the importance of treatment compliance.

Sample Health Carrier Coverage Policy for OSA Surgical Treatments in Adults

Plan X covers tonsillectomy and/or adenoidectomy for the treatment of OSA as diagnosed by polysomnography.

Plan X covers uvulopalatopharyngoplasty for the treatment of OSA when all of the following criteria are met:
- There is narrowing or collapse of the airway; and
- The criteria for a positive airway pressure device were met and the individual could not tolerate or failed the treatment.

Plan X covers tracheostomy for the treatment of OSA when other medical and surgical options have failed, or when necessary due to clinical urgency.

Plan X covers maxillo-mandibular advancement for the treatment of severe OSA when all of the following criteria are met:
- The criteria for a positive airway pressure device was met and the individual could not tolerate or failed the treatment.
- A MDA oral device has been considered and found to be ineffective or undesirable.
- The individual has craniofacial disproportion or deformities.

Plan X does not cover any of the following procedures for the treatment of OSA:
- Laser-assisted uvulopalatoplasty (LAUP)
- Cautery-assisted palatal stiffening operation (CAPSO)
- Radiofrequency ablation
- Provent™ Professional Sleep Apnea Therapy Device
- Electrosleep therapy
- Injection Snoreplasty
Conclusion

More than 12 million Americans have OSA. It is a chronic and potentially serious condition that is associated with increased risk for diabetes, high blood pressure, heart failure, stroke and accidents due to sleepiness. OSA is most common among middle-aged and older adults and people who are overweight. Employers can use medical plan policies and health management programs to help employees prevent, diagnose and treat sleep apnea. Since appropriateness indications for the diagnosis and treatment of OSA can be complex, it is best for employers to work with their health plans on details.

Resources

**Diagnosis and Treatment of Obstructive Sleep Apnea in Adults: Executive Summary**
Agency for Healthcare Research and Quality, August 2011

**Questions are the Answer**
Agency for Healthcare Research and Quality
This is an easy-to-use consumer website that helps patients take an active role in their health care by asking questions so that they understand their condition and options. http://www.ahrq.gov/questionsaretheanswer/

**For Free Print Copies of the Consumer and Clinician Summaries**
AHRQ Publications Clearinghouse – 800.358.9295
Consumer Summary: *Treating Sleep Apnea: A Review of the Research for Adults*, August 8, 2011
AHRQ Pub. No. 11-EHC052-A

Clinician Summary: *Comparative Effectiveness of Diagnosis and Treatment of Obstructive Sleep Apnea in Adults*, August 8, 2011
AHRQ Pub. No. 11-EHC052-3

REFERENCES


A GUIDE FOR EMPLOYERS

Using Comparative Effectiveness Research

MAY 2012

Diagnosis and Treatment of Obstructive Sleep Apnea in Adults

Written by:
Veronica V. Goff, M.S.

Acknowledgements:
The National Business Group on Health would like to acknowledge the members of the National Committee on Evidence-Based Benefit Design for their valuable guidance and review. We would also like to thank the Agency for Healthcare Research and Quality, Department of Health and Human Services and Joint Commission Resources, Inc., for their support of this project.

All materials are in the public domain. Additional copies of this Guide are available at www.businessgrouphealth.org.

About the National Business Group on Health

The Business Group is the only non-profit organization devoted exclusively to representing large employers’ perspectives on national health issues and providing solutions to its members’ most important health care and health benefits challenges. The Business Group fosters the development of a safe health care delivery system and treatments based on scientific evidence. Members share strategies for controlling costs, improving patient safety and quality of care, increasing productivity and supporting healthy lifestyles.