



## Guideline Summary NGC-10028

### Guideline Title

**Management of obstructive sleep apnea in adults: a clinical practice guideline from the American College of Physicians.**

### Bibliographic Source(s)

Qaseem A, Holty JE, Owens DK, Dallas P, Starkey M, Shekelle P, for the Clinical Guidelines Committee of the American College of Physicians. Management of obstructive sleep apnea in adults: a clinical practice guideline from the American College of Physicians. *Ann Intern Med.* 2013 Sep 24;159:471-83. [198 references] [PubMed](#)

### Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

### Scope

#### Disease/Condition(s)

Obstructive sleep apnea (OSA)

#### Guideline Category

Management

Treatment

#### Clinical Specialty

Family Practice

Internal Medicine

Nursing

Otolaryngology

Pulmonary Medicine

Sleep Medicine

Surgery

#### Intended Users

Advanced Practice Nurses

Physician Assistants

Physicians

Respiratory Care Practitioners

#### Guideline Objective(s)

To present the evidence and provide clinical recommendations on the management of obstructive sleep apnea (OSA) in adults

#### Target Population

Adults with obstructive sleep apnea (OSA)

#### Interventions and Practices Considered

1. Weight loss through intensive weight loss interventions

2. Continuous positive airway pressure (CPAP)
  - Fixed CPAP
  - Auto-CPAP
  - C-Flex
3. Mandibular advancement devices (MADs)

**Note:** Other obstructive sleep apnea (OSA) treatments, including positional therapy, oropharyngeal exercise, palatal implants, surgical interventions, pharmacologic therapy, and atrial overdrive pacing, were considered but no recommendations were made because of insufficient evidence.

### Major Outcomes Considered

- Cardiovascular disease (such as heart failure, hypertension, stroke, and myocardial infarction)
- Type 2 diabetes
- Death
- Sleep study measures (such as the Apnea-Hypopnea Index [AHI])
- Measures of cardiovascular status (such as blood pressure)
- Measures of diabetes status (such as hemoglobin A1c levels)
- Quality of life

## Methodology

### Methods Used to Collect/Select the Evidence

- Hand-searches of Published Literature (Primary Sources)
- Hand-searches of Published Literature (Secondary Sources)
- Searches of Electronic Databases

### Description of Methods Used to Collect/Select the Evidence

The Tufts Evidence-based Practice Center conducted the systematic evidence review. The literature search included studies identified using MEDLINE (1966 to September 2010), the Cochrane Central Register of Controlled Trials, and the Cochrane Database of Systematic Reviews and included peer-reviewed studies on adult human patients published in English. Further details about the methods and inclusion and exclusion criteria applied in the evidence review are available in the full Agency for Healthcare Research and Quality (AHRQ) report (see the "Availability of Companion Documents" field). No randomized, controlled trial (RCT) on obstructive sleep apnea (OSA) treatment with regard to mortality outcomes was identified.

The American College of Physicians (ACP) supplemented the AHRQ review (MEDLINE search, 1946 to October 2012) to identify English-language observational studies in humans reporting death or cardiovascular or cerebrovascular illness associated with OSA treatment strategies (that is, continuous positive airway pressure [CPAP], surgery, or mandibular advancement devices [MADs]), as well as more recent relevant RCTs.

### Number of Source Documents

Not stated

### Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

### Rating Scheme for the Strength of the Evidence

This guideline rates the evidence and recommendations by using the American College of Physicians (ACP) guideline grading system, which is based on the system developed by the Grading of Recommendations Assessment, Development and Evaluation (GRADE) workgroup (see the "Rating Scheme for the Strength of the Recommendations" field).

### Methods Used to Analyze the Evidence

- Meta-Analysis of Randomized Controlled Trials
- Review of Published Meta-Analyses
- Systematic Review with Evidence Tables

### Description of the Methods Used to Analyze the Evidence

To guide the recommendations, outcomes were prioritized on the basis of clinical importance, starting with death and including cardiovascular outcomes. In the absence of statistically significant effects on clinical outcomes, symptoms were considered (such as Epworth Sleepiness Scale [ESS] scores) and other physiologic measures (such as the Apnea-Hypopnea Index [AHI]).

The Tufts Evidence-based Practice Center conducted the systematic evidence review. Evidence on the comparative effectiveness of OSA treatments is summarized in the Appendix Table in the original guideline document. Further details

on data extraction, quality assessment, and data synthesis are available in the systematic evidence review (see the "Availability of Companion Documents" field).

## Methods Used to Formulate the Recommendations

Expert Consensus

### Description of Methods Used to Formulate the Recommendations

This guideline is based on a systematic evidence review sponsored by the Agency for Healthcare Research and Quality (AHRQ) (see the "Availability of Companion Documents" field) that addressed the following key questions related to obstructive sleep apnea (OSA) management:

1. What is the comparative effect of different treatments for OSA in adults?
  - a. Does the comparative effectiveness of treatments vary based on presenting patient characteristics, OSA severity, or other pretreatment factors? Are any of these characteristics or factors predictive of treatment success?
    - i. Characteristics: Age, sex, race, weight, bed partner, airway, other physical characteristics, and specific comorbid conditions.
    - ii. Obstructive sleep apnea severity or characteristics: Baseline questionnaire (and similar tools) results, formal testing results (including hypoxemia levels), baseline quality of life, positional dependency.
    - iii. Other: Specific symptoms.
2. In patients with OSA who are prescribed nonsurgical treatments, what are the associations of pretreatment, patient-level characteristics with treatment adherence?
3. What is the effect of interventions to improve adherence to device use (positive airway pressure, oral appliances, and positional therapy) on clinical and intermediate outcomes?

### Rating Scheme for the Strength of the Recommendations

The American College of Physicians' Guideline Grading System*		
Quality of Evidence	Strength of Recommendation	
	Benefits Clearly Outweigh Risks and Burden or Risks and Burden Clearly Outweigh Benefits	Benefits Finely Balanced with Risks and Burden
High	Strong	Weak
Moderate	Strong	Weak
Low	Strong	Weak
Insufficient evidence to determine net benefits or risks		

\*Adopted from the classification developed by the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) workgroup.

### Cost Analysis

Published cost analyses were reviewed.

### Method of Guideline Validation

Internal Peer Review

### Description of Method of Guideline Validation

This guideline was approved by the American College of Physicians (ACP) Board of Regents on November 17, 2012.

## Recommendations

### Major Recommendations

The strength of the evidence (**high, moderate, low, or insufficient evidence to determine benefits or risks**) and strength of recommendations (**strong, weak**) are defined at the end of the "Major Recommendations" field.

**Recommendation 1:** *The American College of Physicians (ACP) recommends that all overweight and obese patients diagnosed with obstructive sleep apnea (OSA) should be encouraged to lose weight. (Grade: strong recommendation; low-quality evidence)*

Obesity is a risk factor for OSA, and evidence showed that intensive weight-loss interventions help reduce Apnea-Hypopnea Index (AHI) scores and improve OSA symptoms. Weight loss is also associated with many other health benefits other than for OSA. Other factors, such as alcohol and opioid use, may be associated with adverse outcomes in patients with sleep apnea, but these factors were not addressed in the evidence review.

**Recommendation 2:** *ACP recommends continuous positive airway pressure (CPAP) treatment as initial therapy for patients diagnosed with OSA. (Grade: strong recommendation; moderate-quality evidence)*

In patients with excessive daytime sleepiness who have been diagnosed with OSA, CPAP is the most extensively studied therapy. This treatment has been shown to improve Epworth Sleepiness Scale (ESS) scores, reduce AHI and arousal index scores, and increase oxygen saturation. However, CPAP has not been shown to increase quality of life. Evidence on the effect of CPAP on cardiovascular disease, hypertension, and type 2 diabetes was insufficient. Studies have evaluated various alternative CPAP modifications. Fixed and auto-CPAP, as well as C-Flex, have similar adherence and efficacy. Data were insufficient to determine the comparative efficacy of other CPAP modifications. Greater AHI and ESS scores were associated with both adherence to CPAP

generally associated with better adherence to CPAP.

**Recommendation 3:** ACP recommends mandibular advancement devices (MADs) as an alternative therapy to CPAP treatment for patients diagnosed with OSA who prefer MADs or for those with adverse effects associated with CPAP treatment. (Grade: weak recommendation; low-quality evidence)

Evidence showed that MADs have been used as an alternative to CPAP for treatment of OSA. Patients had AHI scores between 18 and 40 events per hour. Evidence to suggest which patients would benefit most from MADs was insufficient. However, MADs can be considered in patients with adverse effects or for those who do not tolerate or adhere to CPAP.

**Definitions:**

The American College of Physicians' Guideline Grading System*		
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Insufficient evidence to determine net benefits or risks		

\*Adopted from the classification developed by the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) workgroup.

**Clinical Algorithm(s)**

None provided

**Evidence Supporting the Recommendations**

**Type of Evidence Supporting the Recommendations**

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

**Benefits/Harms of Implementing the Guideline Recommendations**

**Potential Benefits**

Appropriate interventions for obstructive sleep apnea (OSA), taking into account the relative benefits and risks associated with each intervention

**Potential Harms**

Evidence on adverse effects related to various management strategies for obstructive sleep apnea (OSA) was sparse, especially from randomized control trials (RCTs). The Appendix Table in the original guideline document summarizes adverse effects associated with each treatment. Tooth loosening, dental crown damage, and temporomandibular joint pain were the most commonly reported adverse effects with mandibular advancement devices (MADs); however, long-term consequences were not reported. Overall, approximately 5% to 15% of patients treated with continuous positive airway pressure (CPAP) reported adverse effects that they considered to be substantial, but these symptoms were potentially transient. In general, adverse effects in patients treated with CPAP could be alleviated with termination or modification of the treatment. No long-term adverse effects were reported for weight-loss interventions.

**Qualifying Statements**

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- Clinical practice guidelines are "guides" only and may not apply to all patients and clinical situations. Thus, they are not intended to override clinicians' judgment. All American College of Physicians (ACP) clinical practice guidelines are considered automatically withdrawn or invalid 5 years after publication, or once an update has been issued.
- The authors of this article are responsible for its contents, including any clinical or treatment recommendations. No statement in this article should be construed as an official position of the Department of Veterans Affairs.

**Implementation of the Guideline**

**Description of Implementation Strategy**

An implementation strategy was not provided.

**Implementation Tools**

Mobile Device Resources

Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

## Institute of Medicine (IOM) National Healthcare Quality Report Categories

### IOM Care Need


Getting Better  
Living with Illness

### IOM Domain

Effectiveness  
Patient-centeredness

## Identifying Information and Availability

### Bibliographic Source(s)

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### Adaptation

Not applicable: The guideline was not adapted from another source.

### Date Released

2013 Sep 24

### Guideline Developer(s)

American College of Physicians - Medical Specialty Society

### Source(s) of Funding

Financial support for the development of this guideline comes exclusively from the American College of Physicians (ACP) operating budget.

### Guideline Committee

Clinical Guidelines Committee of the American College of Physicians

### Composition of Group That Authored the Guideline



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### Financial Disclosures/Conflicts of Interest

#### Potential Conflicts of Interest


Dr. Shekelle: *Personal fees:* ECRI Institute, Veterans Affairs; *Grants:* Agency for Healthcare Research and Quality, Veterans Affairs, Centers for Medicare & Medicaid Services, National Institute of Nursing Research, Office of the National Coordinator for Health Information Technology. All other authors have no disclosures.

Disclosures are available on the [American College of Physicians Web site](#) . A record of conflicts of interest is kept for each Clinical Guidelines Committee meeting and conference call and is also available from the [American College of Physicians Web site](#) .

### Guideline Status

This is the current release of the guideline.  
This guideline meets NGC's 2013 (revised) inclusion criteria.

### Guideline Availability

Electronic copies: Available from the [Annals of Internal Medicine Web site](#) .

Print copies: Available from the American College of Physicians (ACP), 190 N. Independence Mall West, Philadelphia PA 19106-1572.

### Availability of Companion Documents

The following are available:

- Qaseem A, Snow V, Owens DK, Shekelle P. The development of clinical practice guidelines and guidance statements of the American College of Physicians: summary of methods. *Ann Intern Med.* 2010 Aug 3;153(3):194-199. Electronic copies: Available from the [Annals of Internal Medicine Web site](#) [↗](#).
- Balk EM, Moorthy D, Obadan NO, Patel K, Ip S, Chung M, Bannuru RR, Kitsios GD, Sen S, Iovin RC, Gaylor JM, D'Ambrosio C, Lau J. Diagnosis and treatment of obstructive sleep apnea in adults. Comparative effectiveness review No. 32. (Prepared by Tufts Evidence-based Practice Center under Contract No. 290-2007-10055-1). AHRQ Publication No. 11-EHC052-EF. Rockville, MD: Agency for Healthcare Research and Quality (AHRQ). July 2011. Electronic copies: Available from the [AHRQ Web site](#) [↗](#).

Print copies: Available from the American College of Physicians (ACP), 190 N. Independence Mall West, Philadelphia PA 19106-1572.

A collection of Recommendation Summaries for all current American College of Physicians Clinical Guidelines is now available for Personal Digital Assistant (PDA) download from the [ACP Web site](#) [↗](#).

### Patient Resources

None available

### NGC Status

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