

## CLINICAL INQUIRIES

Evidence Based Answers  
from the Family Physicians  
Inquiries Network

# Sleep apnea in adults: How accurate is clinical prediction?

## Evidence-based answer

Moderately accurate, depending on which tool you use. Questionnaires, physical examination, and clinical prediction rules estimate the pretest probability of obstructive sleep apnea hypopnea syndrome (OSAHS), but are not specific enough to make the diagnosis (strength of recommendation [SOR]: **B**, meta-analyses,

prospective cross-sectional studies). The Epworth Sleepiness Scale is a reliable measure of daytime sleepiness (SOR: **B**, factor analysis). The Berlin Questionnaire, Mallampati score, and truncal obesity can be used to assess pretest probability of OSAHS (SOR: **B**, multivariate analyses, cross-sectional studies).

## Evidence summary

OSAHS is marked by daytime somnolence, snoring, difficult-to-control hypertension, refractory arrhythmias, angina, or heart failure.<sup>1</sup> The syndrome is defined as an apnea-hypopnea index (AHI) of 5 or more events per hour during a sleep polysomnogram, accompanied by either excessive daytime sleepiness or 2 of the following: choking or gasping during sleep, recurrent awakenings from sleep, daytime fatigue, and impaired concentration.<sup>2</sup>

### What questionnaires can tell you

The Epworth Sleepiness Scale rates the likelihood of dozing in 8 situations. Factor analysis of test-retest on 104 medical students and 150 patients with various sleep disorders showed that the scale was internally consistent but measured only daytime sleepiness.<sup>3</sup>

The Berlin Questionnaire assesses snoring, daytime sleepiness, history of hypertension, age, and body mass index (BMI). The questionnaire was evaluated in 744 adults presenting for unrelated problems at 5 primary care sites. Of

100 patients who underwent sleep studies, a finding of high risk on the Berlin Questionnaire predicted an AHI>5 with 86% sensitivity and 77% specificity, a positive likelihood ratio of 3.79.<sup>4</sup>

### Mallampati scores, truncal obesity offer clues

Mallampati scoring grades visibility of the posterior pharynx when the patient opens his mouth and sticks out his tongue. Visibility is ranked on a scale of 1 to 4, with 1 representing the greatest visibility and 4 the least. Prospective multivariate assessment of Mallampati scores in adults referred to a sleep clinic yielded likelihood ratios of OSAHS for Mallampati grades 1 to 4 of 0.4, 0.7, 1.6, and 1.7, respectively.<sup>5</sup>

A cross-sectional study correlating OSAHS with truncal obesity in 192 patients referred to a sleep clinic found that the likelihood of OSAHS was 2.6 times greater if the waist-to-hip ratio was >1 in men and >0.85 in women.<sup>6</sup>

### No single model is sufficient

A systematic review and meta-analysis of

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## FAST TRACK

**Questionnaires, physical examination, and clinical prediction rules predict probable sleep apnea but aren't specific enough to diagnose it.**

249 studies of sleep apnea diagnosis from 1980 through November 1997 concluded that studies of focused questionnaires were too heterogeneous to be combined in a meta-analysis. Sensitivity and specificity were good for clinical prediction rules in general, but evidence was insufficient to justify adoption of any single model.<sup>7</sup>

A 2000 prospective study of 4 previously developed clinical prediction models for OSAHS in sleep center populations found sensitivities of 75% to 96% and specificities of 13% to 54% for identifying patients, using a criterion of AHI >9.<sup>8</sup>

A 2004 prospective evaluation examined a clinical decision rule on 837 patients referred for polysomnogram that used age, sex, BMI, snoring, and cessation of breathing during sleep to stratify patients into low-, moderate-, or high-risk groups. The study found OSAHS prevalences of 8%, 51%, and 82%, respectively.<sup>9</sup>

### Recommendations

The Institute for Clinical Systems Improvement recommends polysomnography for patients with symptoms of OSAHS and 1 or more of the following: cardiovascular disease, hypertension, coronary artery disease, obesity, sleep complaint, type 2 diabetes mellitus, recurrent atrial fibrillation, and large neck circumference.<sup>10</sup>

The Canadian Thoracic Society states that clinical prediction formulas assess the pretest probability of sleep-disordered breathing and prioritize patients for evaluation, but are insufficient for diagnosis. The guidelines recommend that all patients with suspected sleep-

disordered breathing complete an assessment of daytime sleepiness such as the Epworth Sleepiness Scale.<sup>11</sup>

The American Academy of Sleep Medicine recommends no single clinical model to predict the severity of OSAHS. Polysomnography is indicated for diagnosis of any sleep-disordered breathing.<sup>12</sup> ■

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### FAST TRACK

**One study found that sleep apnea was 2.6 times more likely if the waist-to-hip ratio was >1 in men and >0.85 in women.**

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