

When (and how) should you evaluate a child for obstructive sleep apnea?

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Evidence-based answer

Well-child visits are the appropriate time to screen all children for a history of snoring and apnea (strength of recommendation [SOR]: **C**, based on expert opinion).

Children should be further evaluated for obstructive sleep apnea if parents note habitual nightly snoring, especially if accompanied by pauses, snorts, or gasps (SOR: **C**, based on case series

and expert opinion). Single overnight polysomnography is the test of choice to evaluate a child for obstructive sleep apnea, since it can't be excluded by history or physical exam. Other evaluation methods for sleep apnea lack either adequate sensitivity or specificity (SOR: **C**, based on case series, systematic review of case series, and expert opinion).

Clinical commentary

Add a question about snoring to your parental questionnaire

How many of us routinely ask about snoring or sleep apnea at a wellness visit for our young patients? Here we learn that asking a simple question—"Does your child snore heavily most nights or seem to stop breathing when he or she sleeps?"—improves our ability to recognize obstructive sleep apnea in children.

In addition, a relatively simple, one-time, noninvasive test tells us whether the child has obstructive sleep apnea—or not. In light of this information, I plan on putting a revised well-child visit questionnaire that asks about snoring/apnea in my waiting room right away.

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Obstructive sleep apnea among kids has a prevalence of 2%, but occurs in 13% to 25% of those who snore

Evidence summary

Experts advise screening all children for obstructive sleep apnea by asking about snoring and sleep apnea at routine health supervision visits.¹ Obstructive sleep apnea among children has an overall prevalence of 2% but occurs in approximately 13% to 25% of those who snore regularly and heavily.^{1,2}

Obstructive sleep apnea is unlikely in the absence of habitual snoring (expert opinion), and snoring loudness does

not correlate with severity. Children with obstructive sleep apnea tend to exhibit symptoms typical of attention-deficit and hyperactivity disorder rather than daytime somnolence.²

Adenotonsillar hypertrophy may be to blame

The most common cause of obstructive sleep apnea is adenotonsillar hypertrophy. Additional risk factors include obesity,

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A clinical assessment score did not correlate well with polysomnography

allergic rhinitis, neuromuscular disease, craniofacial anomalies, Down syndrome, premature birth, and family history.¹

A prospective case-series of 62 consecutive children referred to a sleep clinic for suspected obstructive sleep apnea correlated nightly snoring (relative risk [RR]=10.67; 95% confidence interval [CI], 2.72–41.8) and observed apnea (RR=3.43; 95% CI, 1.42–6.76) with obstructive sleep apnea diagnosed by polysomnography.³ Children with underlying neurological or craniofacial problems were excluded. A retrospective, nonconsecutive cohort study of 50 children previously diagnosed with obstructive sleep apnea found that all presented with “continuous heavy snoring, interrupted by pauses and associated with snorts.”⁴

Don't count on the physical exam and history

Experts consider overnight polysomnography to be the gold standard test for obstructive sleep apnea.² Physical examination alone usually has normal results. A systematic review of 12 studies including 1058 children under age 18 compared evaluation by polysomnography with clinical evaluation by history and physical examination alone. Clinical evaluation had a positive predictive value (PPV) of 55.8% (95% CI, 42.1%–69.6%); no single component demonstrated sensitivity and specificity more than 65%.⁵

Symptom questionnaires or scales did not correlate well with polysomnography results in 3 studies (which excluded children with craniofacial anomalies, significant medical problems, or prior upper airway surgery). The best study—a prospective, randomized, investigator-blinded, controlled trial of 59 consecutive children clinically diagnosed with obstructive sleep apnea—compared a “clinical assessment score” (comprised of standardized history, physical exam, voice recording, sleep audio recording, lateral neck radiograph, and echocardiogram) with overnight polysomnography. The majority of children had mild obstructive

sleep apnea. Overall, the clinical assessment score did not correlate well with polysomnography (PPV=48%).⁶

Avoid sequential and abbreviated tests

Sequential overnight polysomnography did not dramatically improve sensitivity or specificity over a single test in 2 prospective studies of children with suspected obstructive sleep apnea. The larger study recruited 70 consecutive children (ages 2 to 17 years) from a sleep lab and performed polysomnography on 2 consecutive nights. The first test correctly identified obstructive sleep apnea in 64 children; the second identified 6 additional cases, all of which were “mild.”⁷

Abbreviated polysomnographies have inadequate sensitivity. A retrospective chart review included 143 children between 1 and 18 years of age with adenotonsillar hypertrophy referred for overnight polysomnography after normal or mildly abnormal “nap polysomnography.” Mildly abnormal nap polysomnography predicted abnormal overnight polysomnography (PPV=77%; $P<.0001$), but normal nap polysomnography were not predictive of normal overnight polysomnography (NPV=49%; $P=.8$).⁸

Video recordings have low specificity

A prospective cohort study of home sleep video recordings included 58 consecutive children who were 2 to 6 years of age with snoring or labored breathing during sleep. Parents filmed 30 minutes of sleep during “worst breathing” episodes. An expert investigator evaluated the recordings using both a standardized scoring system and subjective impression, and compared these with overnight polysomnography results, finding 94% sensitivity and 68% specificity.⁹

Two prospective trials compared standardized scoring of home sleep audio recordings with overnight polysomnography testing. The best study, an investigator-blinded RCT, scored 20-minute

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Children with obstructive sleep apnea may need CPAP or a tonsillectomy or adenoidectomy

recordings of “worst breathing” in 59 consecutive children referred for snoring or nocturnal breathing problems, 47% of whom had sleep apnea. Results: PPV=62%, NPV=83%, sensitivity=88%, specificity=52%.⁷

Abnormal pulse ox is highly predictive

A retrospective, cross-sectional study of 349 children between the ages of 6 months and 18 years determined that abnormal home pulse oximetry studies were highly predictive of obstructive sleep apnea on polysomnography (positive likelihood ratio [LR+]=19.4; CIs not given; posttest probability=97%), but that inconclusive or normal pulse oximetry studies were not predictive of negative polysomnographies (LR+ =0.58; CIs not given; posttest probability 47%). Children had been referred for suspected obstructive sleep apnea, and the pretest probability was 60%. Oximetry records were evaluated by a sleep laboratory physician blinded to clinical and polysomnography data.¹⁰

Tonsillar-pharyngeal ratio misses mild cases

A prospective cohort study of 35 children compared the tonsillar-pharyngeal ratio measured from lateral neck x-rays to overnight polysomnography. X-ray measurements predicted moderate or severe obstructive sleep apnea on polysomnography (sensitivity=96%, specificity=82%, PPV=92%, NPV=90%), but did not accurately differentiate normal children from those with mild obstructive sleep apnea.¹¹

Recommendations from others

The American Academy of Pediatrics recommends that children be screened during well child visits for regular snoring or apnea episodes during sleep. Children with positive screens should have an overnight polysomnography. Children with confirmed obstructive sleep apnea should be referred to a sleep medicine specialist to consider continuous positive air-

way pressure therapy during sleep, or to an otolaryngologist for possible surgery (tonsillectomy or adenoidectomy).² ■

References

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