

Snoring, Irregular Respiration, Hypoventilation, and Apneas



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KEYWORDS

- Snoring • Apnea • Sleep apnea • Sleep-related breathing disorder • Obstructive sleep apnea
- Central sleep apnea • Obesity hypoventilation syndrome • Irregular respiration

KEY POINTS

- Sleep-related breathing disorders (SRBDs) are common causes of sleep disturbances and impairment of daytime function.
- Snoring, apnea, irregular respiration, and hypoventilation are signs that suggest the presence of SRBDs.
- It is important that health care providers recognize and regularly ask patients about these signs, along with other symptoms that may prompt further evaluation.
- Unrecognized or untreated SRBDs can lead to significant health consequences and overall poor quality of life.
- Various diagnostic and therapeutic options are available to manage the different types of SRBDs.

INTRODUCTION

The presence of snoring, apnea, irregular respiration, and hypoventilation suggest an underlying sleep-related breathing disorder (SRBD), which if untreated can lead to significant health consequences. This article discusses how to evaluate and manage patients with signs and symptoms suggestive of SRBD.

SNORING

Snoring is a common complaint in children and adults. It is regarded as a social nuisance, but now there is mounting evidence that snoring may be associated with serious health consequences. Snoring is a sound produced by vibration of the

soft tissues of the upper airway during sleep. It occurs in virtually all individuals, but habitual snoring is a health problem. Epidemiologic studies have shown that habitual snoring is common in 16% to 89% of the general population between the ages of 30 and 69 years.¹ In one study of adults 65 years and older, 30% of the men and 19% of the women reported loud snoring.² The male-to-female ratio is approximately 2:1. Snoring can vary in intensity and frequency nightly, and may be worse in the supine position. It can be associated with transient arousals during sleep. Snoring can occur in the absence of SRBD, especially in conditions that lead to narrowing of the upper airway, such as pregnancy, obesity, nasal congestion, hypothyroidism, acromegaly, adenotonsillar hypertrophy, and various craniofacial

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abnormalities. Also, snoring can occur with increased weight gain.³ Some epidemiologic studies have shown that snoring may be associated with increased risk of hypertension,⁴ and cardiovascular⁵ and cerebrovascular disease,⁶ but the evidence is not overwhelming due to inconsistent results from other studies,^{7,8} suggesting that snoring alone is not an independent risk factor. In one observational study of 110 patients, increased frequency of heavy snoring was associated with carotid artery atherosclerosis,⁹ and another recent study showed similar findings.¹⁰ Risk factors for snoring include male gender, older age, overweight, alcohol use, smoking, postmenopausal status, narrow nasal/oral cavity, broad neck, muscle relaxants, and sedative-hypnotic agents.

Clinical Evaluation

It is important to evaluate patients with habitual snoring, to determine if sleep disruption is present and to identify potential SRBD. Most patients are not aware that they snore; rather, it is noted by their bed partner. All patients should be asked about snoring, along with episodes of cessation in breathing or waking up choking or gasping for air during sleep. Other symptoms of sleep disruption include restless sleep, daytime sleepiness, fatigue, irritability, and poor concentration. The patient should be asked about mouth breathing and dryness, which suggests increased upper airway resistance. Further questioning should include use of alcohol, smoking, and medications that can contribute to increased airway narrowing or collapsibility.¹¹ Drugs such as muscle relaxants, barbiturates, and benzodiazepines can induce increased upper airway resistance in healthy volunteers leading to snoring.¹² Common physical examination findings include increased body mass index, larger neck circumference, narrow nasal/oral pharynx, nasal septal deviation, nasal polyps, adenotonsillar hypertrophy, swollen or hypertrophic turbinates, and other craniofacial abnormalities.

Diagnostic Evaluation

The differential diagnosis for snoring includes the following:

- Upper airway resistance syndrome (UARS)
- Obstructive sleep apnea (OSA)
- Stridor
- Sleep-related groaning (catathrenia)
- Chronic nasal congestion and other craniofacial disorders

Diagnostic testing in a patient who snores helps to confirm or exclude presence of SRBD.

If OSA is suspected, polysomnograph (PSG) or portable monitor (PM) should be performed. In patients suspected of having nocturnal desaturation, overnight oximetry can be performed, and if positive, warrants further evaluation. Diagnostic evaluation for suspected craniofacial abnormalities or adenotonsillar hypertrophy may include lateral cephalometric radiographic studies or fiberoptic pharyngoscopy, which provide information about upper airway patency. If other medical conditions are suspect, laboratory or imaging studies should be performed to identify and then treat those conditions.

Treatment

It is not clear that snoring progresses to OSA. In the absence of SRBDs, treating snoring helps to minimize any sleep disturbances to patient and bed partner, and alleviate upper airway discomfort and embarrassment. Conservative treatment includes weight loss, smoking cessation, avoidance of alcohol a few hours before bedtime, and change in sleep position (nonsupine position). Weight loss should be recommended for overweight or obese patients. In one study, weight loss reduced snoring frequency and intensity.¹³ Although smoking cessation is recommended, results showing correlation between snoring and smoking have been weak and inconsistent. One observational study did show increased risk of snoring among current and former smokers when compared with nonsmokers.¹⁴ Sleeping in the lateral position can reduce snoring frequency and intensity.¹⁵ Posture alarm devices, special pillows, and modified night wear have been used to increase the likelihood of maintaining nonsupine sleep position. Another attempt to decrease or eliminate snoring is by improving nasal patency or decreasing nasal congestion. Steroid-based intranasal spray may be helpful in snorers with chronic nasal congestion but data on long-term benefits are lacking. Furthermore, long-term benefits of lubricant nasal spray, homeopathic nasal preparations, and internal and external nasal dilators are lacking.¹⁶

The use of oral appliances (OAs) can reduce or eliminate snoring by increasing the size or preventing upper airway collapse during sleep. OAs, such as mandible-repositioning appliances (MRA) or tongue-retaining devices (TRDs), work by either advancing the mandible or protruding the tongue to enlarge the oropharyngeal cavity. OAs are highly effective if used properly and fabricated by a dentist with expertise in treating sleep apnea.¹⁷ Common side effects include teeth discomfort, teeth movement, bite changes, temporomandibular joint (TMJ) pain, xerostomia, and excessive

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