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## GUIDELINES

# Summarized Vietnamese Guidelines for Diagnosis and Treatment of Adults with Obstructive Sleep Apnea

## *Résumé des Recommandations Vietnamiennes de Diagnostique et Traitement des Apnées du Sommeil chez les Adultes*

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### ABSTRACT

The prevalence of OSA in adults over 18 years old has been reported to be 8.5% in this country (EPSASIE study). OSA with symptoms of daytime sleepiness contributes to patient fatigue, reduced cognitive activity, work performance and quality of life. Excessive daytime sleepiness causes decreased attention and concentration, which is the cause of traffic and occupational accidents.

OSA also increases the incidence of metabolic syndrome and diabetes and the risk of non-alcoholic fatty liver disease. OSA is a common disease, causing a lot of burden on health, medical care and socio-economics. It is necessary to screen patients with OSA at the primary health care for early diagnosis and timely treatment, helping to avoid harmful consequences of the disease. Diagnosis of OSA is based on polysomnography or polysomnography.

Treatment is based on the cause and severity of the disease and aims to improve symptoms. Medical treatment for OSA includes behavioral changes and sleep hygiene, position therapy, non-invasive mechanical ventilation with CPAP (continuous positive airway pressure) or use of mandibular advancement device, associated with physical therapy.

**KEYWORDS:** Guidelines; Obstructive sleep apnea; Prevalence; Sleepiness; OSA; CPAP .

### RÉSUMÉ

La prévalence de l'AOS chez les adultes de plus de 18 ans serait de 8,5 % dans ce pays (étude d'EPSASIE). L'AOS accompagnée de symptômes de somnolence diurne contribue à la fatigue des patients, à une réduction de l'activité cognitive, des performances au travail et de la qualité de vie. Une somnolence diurne excessive entraîne une diminution de l'attention et de la concentration, ce qui est à l'origine d'accidents de la route et du travail.

L'AOS augmente également l'incidence du syndrome métabolique et du diabète ainsi que le risque de stéatose hépatique non alcoolique. L'AOS est une maladie courante qui pose un lourd problème sur la santé, les soins médicaux et la situation socio-économique. Il est nécessaire de dépister les patients atteints d'AOS dans les soins de santé primaires pour un diagnostic précoce et un traitement rapide, contribuant ainsi à éviter les conséquences néfastes de la maladie. Le diagnostic de l'AOS repose sur la polysomnographie ou la polysomnographie.

Le traitement est basé sur la cause et la gravité de la maladie et vise à améliorer les symptômes. Le traitement médical de l'AOS comprend des changements de comportement et d'hygiène du sommeil, une thérapie de position, une ventilation mécanique non invasive avec PPC (pression positive continue des voies respiratoires) ou l'utilisation d'un dispositif d'avancement mandibulaire, associé à une thérapie physique.

**MOTS CLÉS:** Recommandations; Apnées obstructive du sommeil; Prévalence; Somnolence; AOS; PPC.

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**PREVALENCE AND BURDEN OF OSA**

Obstructive sleep apnea (OSA) is a common medical condition, with an average frequency of 22% (range 9-37%) in men and 17% (range 4-50%) in women. gender [1]. It has been estimated that there are more than 900 million people have OSA [2-5]. However, OSA remains underconcerned because 93% of women and 82% of men with moderate to severe OSA remain undiagnosed [6]. According to estimates, in Vietnam there are more than 4 million adults over 30 years old with OSA and among them, about 2 million people have moderate-severe OSA [4]. The prevalence of OSA in adults over 18 years old is reported to be 8.5% in this country [5]. OSA with symptoms of daytime sleepiness contributes to patient fatigue, reduced cognitive activity, work performance and quality of life. Excessive daytime sleepiness causes decreased attention and concentration, which is the cause of traffic and occupational accidents [7]. In 2000, in the US, more than 800,000 drivers were recorded in car crashes related to OSA, causing nearly 16 billion USD in damages and 1,400 deaths [8].

OSA is characterized by collapse of the upper airway during sleep leading to partial or complete disruption of airflow to the lungs resulting in respiratory events including apnea and/or hypopnea and may be associated with associated with decreased blood oxygen saturation, hypercapnia and/or microarousals and sleep fragmentation [9]. OSA is a risk factor for chronic diseases such as hypertension, pulmonary hypertension, coronary artery disease, heart failure, and stroke. OSA also increases the incidence of metabolic syndrome and diabetes [10-15] and the risk of non-alcoholic fatty liver disease which is one of the common causes of cirrhosis [16]. The rate of mental disorders increases significantly in subjects with OSA. Previous study showed that over 110,000 subjects with OSA, there was a significant increase in mental disorders including 21.8% depression, 16.7% anxiety, 11.9% had post-traumatic disorder, 5.1% had psychosis, and 3.3% had bipolar disorder [17].

**SCREENING FOR OSA IN THE COMMUNITY**

**Key message**

1. OSA is a common disease, causing a lot of burden on health, medical care and socio-economics, but the undiagnosed rate is still high.
2. It is necessary to screen patients with OSA at the primary health care for early diagnosis and timely treatment, helping to avoid harmful consequences of the disease.
3. Diagnosis of OSA is based on polysomnography or polysomnography; treatment is based on the cause and severity of the disease and aims to improve symptoms.

**Screening tool**

Medical staff can use the following 3 simple questions to screen for OSA in all patients coming to the primary care for any reason, thereby considering further investigation of medical history and related symptoms as needed (Table 1).

**TABLE 1. Three questions to screen patients suspected of having sleep apnea.**

<p><b>Do you snore when you sleep?</b> It is difficult to diagnose OSA without snoring. Therefore, if the answer is YES or NO, then ask the next questions.</p>
<p><b>Has anyone told you that you stop breathing when you sleep?</b> Isolated apnea is very common in people who snore. However, if it is prolonged or repeated and witnessed by someone, there is a high risk of OSA.</p>
<p><b>Are you sleepy a lot during the day?</b> Excessive daytime sleepiness is a common symptom of OSA. However, if this daytime sleepiness is accompanied by snoring or apnea without a clear cause or cardiovascular abnormalities, further investigation is needed. If daytime sleepiness is accompanied by impaired cognitive function or alertness, is associated with high-risk occupations or high cardiovascular risk, referral to a specialist should be given priority.</p>

**DIAGNOSIS OF OSA IN ADULTS**

Symptoms of OSA in adults are included in Table 2 [18].

**TABLE 2. Nighttime and daytime symptoms of OSA.**

Nighttime symptoms	Daytime symptoms
Snoring	Excessive daytime sleepiness
Witnessed apnea	Morning headache
Suffocation	Cognitive decline, forgetfulness
Wake up often	Reduced alertness, reduced motor coordination
Bruxism	Depression, anxiety, psychosis and dementia
Gastroesophageal reflux	Sexual dysfunction
Nocturia	Hypertension

Diagnosis of OSA is based on polysomnography. The recommendations of the American Academy of Sleep Medicine (AASM) for the diagnosis of obstructive sleep apnea (OSA) [19] can be applied in Vietnam:

1. **It is recommended not to use** clinical tools, questionnaires and prediction algorithms to diagnose OSA in adults despite the absence of polysomnography (PSG) or home sleep apnea testing - HSAT. **(STRONG)**

2. **It is recommended to use** PSG or HSAT with a technically appropriate device for the diagnosis of OSA in uncomplicated adult patients\* who have symptoms suggestive of moderate-high risk\*\* for OSA. **(STRONG)**

3. **It is recommended that** if an HSAT is negative, inconclusive, or technically incomplete, a PSG should be performed to diagnose OSA. **(STRONG)**

4. **It is recommended to use** PSG to diagnose OSA in patients with cardiovascular disease, respiratory myasthenia neuromuscular disorders, awake hypoventilation or suspected sleep-related hypoventilation, hypoventilation due to prolonged use of heroin derivatives, or history of stroke or severe insomnia. **(STRONG)**

5. Diagnosis of OSA in adults using Slip-Night PSG (SN-PSG) versus whole night: **It is recommended that** if clinically appropriate \*\*\*, use SN-PSG. **(WEAK)**

#### Note:

\*Uncomplicated patients: no central sleep apnea, hypoventilation and hypoxia, cardiovascular or respiratory disease, respiratory muscle weakness, history of stroke, chronic opioid use, excessive central sleepiness, sleepwalking, sleep-related movement disorders, severe insomnia;  
\*\* High risk of moderate-high OSA: excessive daytime sleepiness + 2/3 criteria: frequent loud snoring, episodes of apnea or gasping or choking, or a diagnosis of hypertension; \*\*\*Clinically appropriate: no conditions identified by a physician as likely to interfere for successful diagnosis and treatment using SN-PSG.

**OSA is diagnosed according to the criteria of ICSD (International Classification of Sleep Disorders), version 3, 2014 as followed [20]:**

1. There are > 5 obstructive respiratory events/hour (calculated based on sleep time with PSG/time recorded with HSAT), with obstructive events predominating (obstructive and mixed apneas, hypopnea or respiratory effort-related arousal - RERA) accompanied by one or more of the following symptoms or conditions:

- Drowsiness, fatigue, or insomnia.
- Waking up due to apnea, or gasping for breath.
- Snoring, intermittent breathing or both and witnessed by a person to sleep with.
- Associated with conditions such as, mood disorder,

cognitive disorders, hypertension, coronary artery disease, stroke, congestive heart failure, atrial fibrillation or type 2 diabetes.

**Or**

2. There are >15 obstructive (apnea-hypopnea) respiratory events/hour (calculated based on PSG sleep time/HSAT recording time), regardless of the presence of associated symptoms or comorbidities.

**Classification of OSA severity in adults is defined as following [20]:**

- **Mild:** 5 to 15 respiratory events (apnea-hypopnea episodes) per hour of sleep:

**15 > Apnea-Hypopnea Index (AHI) ≥5.**

- **Moderate:** 15 to 30 respiratory events (apnea-hypopnea episodes) per hour of sleep:

**30 > Apnea-Hypopnea Index (AHI) ≥15.**

- **Severe:** greater than 30 respiratory events (apnea-hypopnea episodes) per hour of sleep and/or oxygen saturation below 90% for more than 20% of total sleep time:

**Apnea-Hypopnea Index (AHI) ≥30.**

#### TREATMENT OF OSA IN ADULTS

- Medical treatment for OSA includes behavioral changes and sleep hygiene (weight loss, physical exercise, avoiding alcohol - tobacco, sedatives, or stimulants), position therapy, non-invasive mechanical ventilation with CPAP (Continuous Positive Airway Pressure) when indicated, use of MAD (Mandibular Advancement Device), and/or physical therapy; treating allergic rhinitis if presented.

- Surgical treatment is indicated to intervene in the causes of craniofacial and soft tissue abnormalities includes Septoplasty (nasal deviated septum), Palatal Implant Placement, Transpalatal Advancement Pharyngoplasty (TAP), Partial Epiglottidectomy, Uvulopalatopharyngoplasty (UPPP), Lingual Tonsillectomy, Genioglossus Advancement, or Hypoglossal Nerve Stimulation (HNS).

- Weight lost and CPAP therapy (4 hours/night and >70% of nights) have been shown as an effective in treatment [21-23].

**The choice of treatment methods for adults with OSA in Vietnam (or other emergent countries) can be based on the AHI index (Table 3 and Figure 1).**



FIGURE 1. Algorithm for diagnosis and treatment of OSA.

CPAP: continuous positive airway pressure; HSAT: home sleep apnea testing; MAD: mandibular advancement device; OSA: obstructive sleep apnoea; PSG: polysomnography.

TABLE 3. Prevention and treatment options based on AHI index [24-26].

AHI <5	Early prevention: adjust weight and/or weight loss (if overweight); avoid long-term risk factors for OSA; sleep hygiene and lifestyle modification to reduce weight or snoring (if any).
15 > AHI ≥5	In the case of additional symptoms of excessive daytime sleepiness or cardiovascular disease (hypertension), CPAP therapy or orthognathic devices (mandibular protrusion devices) may be considered; associated with weight loss (if overweight), sleep hygiene and lifestyle modification.
30 > AHI ≥15	Treatment is with CPAP therapy ( <b>preferred choice</b> ) or with orthognathic devices (mandibular protrusion devices); associated with weight loss (if overweight), sleep hygiene and lifestyle modification.
AHI ≥ 30	Treatment with CPAP and weight loss (if overweight).

**PERSONALIZED DIAGNOSIS AND TREATMENT FOR ADULTS WITH OSA**

The needs of personalized approaches for subjects with OSA in Vietnam and other emerging countries (Figure 2).

This is due to differences in people morphology, diversity in clinical phenotypes, and different resources in diagnosis and treatment of OSA in adults [27]. Therefore, a personalized medicine approach to diagnosis and treatment of OSA is necessary for physicians in clinical practice (Figure 2).

Adults without serious underlying medical conditions, polysomnography at sleep labs may be an inappropriate and inconvenient testing modality compared to home sleep apnea testing (HSAT).

In addition, the apnea-hypopnea index should not be considered as a single parameter for making treatment decisions [27]. The treatment of OSA should be personalized and based on individual tolerance to sleep-quality-related parameters measured by the microarousal index, harmful effects of OSA on the cardiovascular system related to severe hypoxia, and patients’ comorbidities.

The current treatment options for OSA include sleep hygiene, weight loss, lifestyle modification, position therapy, CPAP therapy, oral appliance, surgery, and other alternative treatments has been recommended for emerging countries [26-28]. Although CPAP therapy has been recommended as a cornerstone treatment for moderate-to-severe OSA in adults, not all patients can afford or tolerate CPAP therapy in these countries.

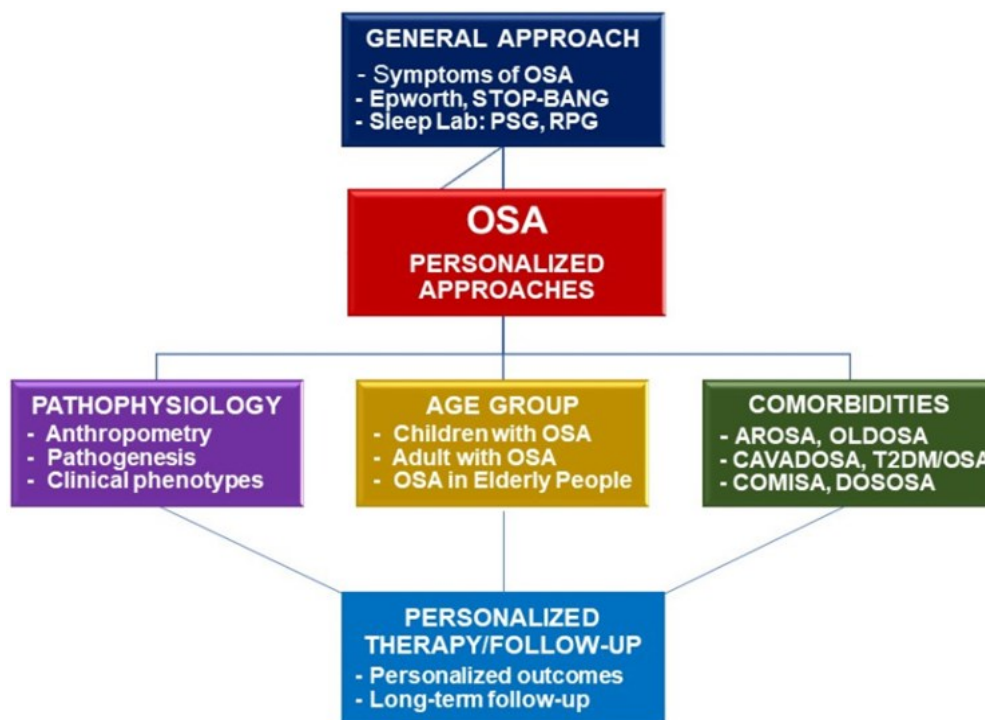


FIGURE 2. Framework of personalized approaches for diagnosis and treatment of OSA (26).

OSA: obstructive sleep apnea; PSG: polysomnography; RPG: respiratory polygraphy; AROSA: allergic rhinitis and OSA; OLDOSA: obstructive lung disease and OSA; CAVADOSA: cardiovascular diseases and OSA; T2DM: type 2 diabetes mellitus; COMISA: comorbid insomnia and OSA; DOSOSA: Down syndrome and OSA.

**CONFLIT OF INTERESTS**

The authors declare no conflict of interest.

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