Scope

This guideline applies to adult patients with suspected obstructive sleep apnea (OSA). A brief section on children is included to support referral and diagnosis.

Currently in BC, patients with sleep complaints are referred by their primary care practitioner for sleep testing (see the Definitions section below) through one of several methods:

- To a privately-owned polysomnography clinic (Note: these facilities have in-house sleep disorder physicians)
- To a community-based sleep disorder physician who can refer to a hospital-based polysomnography lab (Note: UBC hospital sleep disorders program has sleep disorder physicians in-house)
- Directly to a hospital-based polysomnography lab (Note: only for those facilities who allow physicians who have developed a relationship to refer directly into the lab)
- Directly to a hospital-based respiratory department for overnight oximetry (Note: overnight oximetry is no longer recommended for OSA testing)
- To a homecare company that provides home sleep apnea testing (Note: all of these facilities are currently unaccredited)

Key Recommendations

- In sleep medicine, there is no substitute for a detailed history and physical examination with a focus on the upper airway and profile.
- The gold standard for testing for sleep disorders including OSA is the polysomnogram (PSG). This is the only test that actually measures sleep because this requires an electroencephalography (EEG).
- Home sleep apnea testing (HSAT) is not a sleep study although it is conducted when the patient is presumed to be asleep. It is only used to confirm the diagnosis of OSA (1 of 85 sleep disorders). A negative HSAT does not exclude OSA and should not be used to screen asymptomatic patients.
- Symptomatic patients without high pretest probability of moderate or severe OSA should be referred for a sleep disorder consultation.¹ (see Table 2 for HSAT exclusion criteria)
- HSAT should not be used in pediatric patients¹,² or patients with significant³,⁴ comorbid conditions, such as heart failure³-⁴, neuromuscular disease¹-⁴, chronic opiate use¹,⁴, stroke¹, moderate to severe chronic lung disease or other primary sleep disorders¹-⁴ (e.g. insomnia, restless leg syndrome, or central sleep apnea).
- Surgical referral for management of OSA should be done with the guidance of a sleep disorder physician.
- Once the diagnosis of OSA is established, short-term (to ensure patient on effective treatment) and long-term (annual basis) follow-up is important to monitor the patient’s symptoms, and response to, and compliance with treatment.
- Patients with OSA may be prone to drowsiness while driving. Physicians caring for these patients should be familiar with BC’s Driver Medical Fitness Information for Medical Professionals. [https://www2.gov.bc.ca/gov/content/transportation/driving-and-cycling/roadsafetybc/medical-fitness/medical-prof](https://www2.gov.bc.ca/gov/content/transportation/driving-and-cycling/roadsafetybc/medical-fitness/medical-prof)
- As patients with untreated OSA have increased perioperative morbidity and mortality, consider screening for it when referring patients for potential surgery (e.g. using the STOP-Bang Questionnaire, Appendix 1).
Definitions

- **OSA:** Is a serious chronic medical disorder characterized by recurring partial or complete upper airway obstruction during sleep. It may be associated with a variety of nocturnal and diurnal symptoms, such as recurrent awakenings, daytime sleepiness, and impaired vigilance and memory.

- **Central Sleep Apnea (CSA):** recurring pauses or partial reductions in airflow caused by reduced drive to breathe often related to underlying cardiac or CNS disease or opiate respiratory suppression.

- **Apnea Hypopnea index (AHI):** Is in addition to symptoms and comorbid disease one of the criteria used to determine the severity of sleep apnea. Severity thresholds include: normal (< 5), mild (≥ 5), moderate (≥ 15), severe (≥ 30). The HSAT tends to underestimate the AHI compared to a polysomnogram because the HSAT does not measure sleep or fully measure hypopnea.

- **Hypoventilation:** reduced ventilation due slower respiratory rate and/or reduced tidal volume resulting in hypoxemia and hypercapnia. This may occur due to significant obesity, neuromuscular disease affecting respiration or moderate-severe lung disease.

- **Nocturnal Hypoxemia:** arterial oxygen saturation less than 90% which may occur episodically with each individual apnea or it may be a baseline hypoxemia due to underlying lung disease or hypoventilation.

<table>
<thead>
<tr>
<th>Sleep Study Level</th>
<th>Alternate name</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Polysomnogram (PSG) - measures a complete set of biological signals, including electroencephalography (EEG), electrooculography (EOG), electromyography (EMG), oxygen saturation, thoracic effort, abdominal effort, body position, and leg movement. EEG is the only way to actually measure sleep. This test is used to diagnose all forms of sleep apnea, parasomnias, movement disorders, bruxism, and nocturnal seizures.</td>
</tr>
<tr>
<td>II</td>
<td>Ambulatory polysomnogram - used primarily for research purposes, currently not covered by MSP.</td>
</tr>
<tr>
<td>III</td>
<td>Home Sleep Apnea Test (HSAT) - measures two respiratory variables (e.g. thoracic effort and airflow), oxygen saturation, and a cardiac variable (e.g. pulse or electrocardiogram). It is only useful for diagnosing obstructive and central sleep apnea. It is not as sensitive as a PSG because it does not measure sleep.</td>
</tr>
<tr>
<td>IV</td>
<td>Overnight Oximetry - measures oxygen saturation and pulse rate. It does not differentiate between obstructive and central sleep apnea or underlying respiratory disease. It is not recommended for diagnosing OSA.</td>
</tr>
</tbody>
</table>

**Risks of Untreated or Undertreated OSA**

Untreated or undertreated OSA is a serious problem and can predispose patients to the following:

- Systemic hypertension
- Type 2 diabetes
- Cardiac dysrhythmias (e.g. atrial fibrillation)
- Coronary artery disease
- Stroke
- Congestive heart failure
- Dementia
- Fatigue, sleepiness, and increased risk of motor vehicle or occupational accidents
- Depression
- Obesity
- Cancer
- Seizures
- Perioperative complications
### Symptoms, Signs and Risk Factors

#### Table 1. Obstructive Sleep Apnea Symptoms, Signs, Physical Manifestations, Risk Factors and Commonly Associated Conditions

<table>
<thead>
<tr>
<th>Common Symptoms*</th>
<th>Signs, Physical Manifestations, and Risk Factors</th>
<th>Commonly Associated conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daytime sleepiness</td>
<td>Small upper airway</td>
<td>Family history of obstructive sleep apnea</td>
</tr>
<tr>
<td>Fatigue</td>
<td>Low-lying soft palate (Mallampatti Score)</td>
<td>Type 2 diabetes&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Snoring</td>
<td>Narrow airway</td>
<td>Metabolic syndrome</td>
</tr>
<tr>
<td>Morning headache</td>
<td>Large tonsils</td>
<td>Systemic hypertension&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Recurrent nighttime awakenings</td>
<td>Large tongue</td>
<td>Heart failure&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Choking, gasping, or pauses in breathing during sleep</td>
<td>Mandibular hypoplasia (retrognathia, micrognathia)</td>
<td>Coronary artery disease&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Unrefreshing sleep</td>
<td>Nasal and nasopharyngeal obstruction</td>
<td>Atrial fibrillation</td>
</tr>
<tr>
<td>Restless sleep</td>
<td>OSA is more common in people of East Asian&lt;sup&gt;8&lt;/sup&gt; origin and low quality sleep is higher among Indigenous peoples&lt;sup&gt;9&lt;/sup&gt;</td>
<td>Myocardial infarction</td>
</tr>
<tr>
<td>Impaired concentration</td>
<td></td>
<td>Stroke&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Nocturia</td>
<td></td>
<td>Depression</td>
</tr>
</tbody>
</table>

*These symptoms are not always present

### History

- Patient history should focus on nocturnal breathing abnormalities, daytime sleepiness, and family and personal medical history. History and physical examination are crucial first steps towards the recognition and diagnosis of OSA.<sup>1</sup> Whenever possible, the patient should be evaluated in person to examine the upper airway and profile.

- The most common symptom of OSA is excessive daytime sleepiness. However, the clinical presentation of patients with OSA varies greatly and many may also present with isolated recurrent nocturnal awakenings or no identifiable symptoms.

- **Breathing abnormalities (usually reported by bed partner or roommate):** presence of snoring, pauses in breathing, or nocturnal choking or gasping.

- **Daytime sleepiness or fatigue:** inquire about the impact of daytime sleepiness (e.g. “Have you had any accidents or near misses related to sleepiness while driving?” or “Have you ever had to stop an activity due to sleepiness?”) and request completion of the Epworth Sleepiness Scale (ESS, Appendix 2). A score of 10 or greater suggests significant daytime sleepiness, although a score less than 10 does not exclude daytime sleepiness or OSA.

  - All patients should be questioned about driving or safety critical occupation (e.g. truck, taxi, bus drivers, railway engineers, airline pilots<sup>10</sup>) where sleepiness could be a hazard, whether they operate heavy equipment, the class of their driver’s license and whether they have fallen asleep at the wheel or come close to it in the past 5 years.
Other associated conditions: e.g. hypertension, atrial fibrillation, type 2 diabetes, myocardial infarction, depression, stroke.

Physical examination: examine the head and neck including measurement of neck circumference. It is useful to estimate Mallampati Classification (especially if 3 or 4) (Appendix 3).

As patients with untreated OSA have increased perioperative morbidity and mortality, consider screening for it when referring patients for potential surgery (e.g. using the STOP-Bang Questionnaire, Appendix 1).

Testing and Referral

Home sleep apnea tests (HSAT) can be used to confirm the diagnosis of OSA in patients with a moderate-to-high pretest probability of moderate or severe OSA based on comprehensive clinical sleep evaluation. See Table 2 for HSAT test appropriateness. To order an HSAT, see the Provincial Standard Diagnostic Sleep Medicine Requisition and Referral form.

Table 2. Inclusion and Exclusion Criteria for HSAT Testing

<table>
<thead>
<tr>
<th>Inclusion Criteria</th>
<th>Exclusion Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any three patient attributes / risk factors indicate a moderate to high pretest probability for OSA.</td>
<td>Refer patient for consultation with a sleep disorder physician if any of these criteria are met.</td>
</tr>
<tr>
<td>☐ Excessive daytime sleepiness. As indicated by nonrestorative sleep, fatigue, and an Epworth score of 10 or greater. (Appendix 2) ESS = _______</td>
<td>☐ Other suspected sleep disorder OR excessive daytime sleepiness without nocturnal breathing events.</td>
</tr>
<tr>
<td>☐ Nocturnal breathing events such as witnessed pauses in breathing, choking, gasping.</td>
<td>☐ Risk of hypoventilation (as in neuromuscular disease, morbid obesity)</td>
</tr>
<tr>
<td>☐ Chronic loud snoring</td>
<td>☐ Opioid use</td>
</tr>
<tr>
<td>☐ Body Mass Index ≥ 30kg/m². BMI = _______</td>
<td>☐ History of stroke or heart failure</td>
</tr>
<tr>
<td>☐ Large neck circumference: _______. [Male ≥ 17 in. (43cm). Female ≥ 16 in. (40.5cm)]</td>
<td>☐ Significant (moderate-severe) chronic lung disease</td>
</tr>
<tr>
<td>☐ Type II diabetes or systemic hypertension</td>
<td>☐ Patient requires a sleep study for follow-up of treatment e.g. weight loss, oral appliance or surgery</td>
</tr>
<tr>
<td>☐ Male or post-menopausal female</td>
<td>☐ Children &lt; 16 years</td>
</tr>
<tr>
<td>☐ Inability to complete necessary steps for the self-administered HSAT (cognitive impairment, age, language, other barriers)</td>
<td>☐ Inability to complete necessary steps for the self-administered HSAT (cognitive impairment, age, language, other barriers)</td>
</tr>
</tbody>
</table>

A ‘negative’ HSAT report does not exclude OSA. Patients with an inconclusive HSAT should be referred to a sleep disorder physician for consultation and detailed overnight polysomnogram. Similarly, patients who have sleep disorder symptoms but who do not meet criteria for HSAT should also be referred.

Patient priority levels: The Medical Services Commission has defined three levels of priority that are based on the presence or absence of: daytime sleepiness, comorbid disease, safety critical occupation, and abnormal overnight home oximetry (See Table 3 below).
Table 3. Prioritization for Level 1 Sleep Studies (Polysomnography)\textsuperscript{10}

<table>
<thead>
<tr>
<th>Priority 1</th>
<th>Priority 2</th>
<th>Priority 3</th>
</tr>
</thead>
</table>
| • Suspected sleep disorder and  
  • Major daytime sleepiness (ESS 10+) and  
  • One or more of the following:  
    o Significant co-morbid disease; or  
    o Safety critical occupation  
    o Overnight home oximetry which reveals >10/hour 4% desaturations  
| • Suspected sleep disorder and  
  • Major daytime sleepiness (ESS 10+) but  
  • With no significant co-morbid disease or safety critical occupation  
| • Suspected sleep disorder but without  
  o Major daytime sleepiness (ESS 10+); or  
  o Significant co-morbid disease; or  
  o Safety critical occupation  

• For patients with suspected OSA, Figure 1. outlines the patient pathway.

**Figure 1. Patient Pathway for Patients with Sleep Complaints**

Management

• Medical management is generally the most effective treatment and the severity of OSA will guide the treatment decisions. Typically, this includes positive airway pressure (PAP), of which continuous positive airway pressure (CPAP) is one form.\textsuperscript{11} Nasal CPAP consists of a blower providing pressurized airflow via a nasal mask. At the correct settings, it is effective in treating the upper airway obstructions associated with OSA and tolerated by most patients long-term.

• A Mandibular Advancement Device (MAD) can be an effective first line treatment for mild OSA. A MAD can be an effective treatment for moderate to severe OSA but the likelihood of similar effectiveness to CPAP is less than 50%. If prescribing MAD for moderate to severe OSA, it is critical to have follow up Level 1 testing to document effectiveness.

• Alternative medical management may be useful for those who do not tolerate nasal CPAP, even after...
thorough troubleshooting and optimization of treatment settings and modality. These include: MAD, positional management with electronic monitoring, and surgical procedures in carefully selected patients. Table 4 outlines the effectiveness of each treatment.

- Lifestyle changes, including exercise and weight loss programs, are not appropriate stand-alone treatment for symptomatic patients or moderate to severe OSA. However, some patients may benefit from these as an adjunct to another definitive treatment (e.g. in addition to CPAP in a patient with concurrent obesity).

**Table 4. Effectiveness of OSA treatment**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lifestyle changes (weight loss)</strong></td>
<td>Weight loss should be combined with additional treatment due to low cure rate by this approach alone. There is an association between greater PAP use and improved outcomes. A CPAP vendor may loan the CPAP to the patient for a one-month free trial under the care of a Registered Respiratory Therapist or Polysomnographic Technologist. This gives the vendor the opportunity to problem solve any issues and make sure treatment is effective before the patient has to decide to purchase the machine. This cannot be done properly through the internet so patients should be discouraged from purchasing machines from on-line vendors. Advanced PAP therapy including Bilevel Positive Airway Pressure (BiPAP), Adaptive Servo Ventilation (ASV) and Average volume-assured pressure support (AVAVPS) and Intelligent Volume Assured Pressure Support (iVAPS) should only be considered when patients have undergone a level one polysomnogram and a consultation by a sleep disorders physician. Only those physicians should issue prescriptions for these advanced modalities.</td>
</tr>
<tr>
<td><strong>CPAP</strong></td>
<td>Increased compliance (e.g. patient preference and acceptance) may result in similar overall treatment benefits to CPAP. It is recommended that patients should only be referred to qualified sleep dentists for an oral appliance – American Academy of Dental Sleep Medicine Diplomate’s (AADSM) or equivalent. Oral appliances need to be retested to confirm effectiveness of treatment.</td>
</tr>
<tr>
<td><strong>Mandibular Advancement Device (MAD)</strong></td>
<td>A positioning device (e.g., NightShift™ sleep positioner) to avoid sleeping supine should be used when initiating positional therapy for patients with sleep apnea primarily in the supine position based on testing. A pillow, backpack or tennis ball are not effective treatments.</td>
</tr>
<tr>
<td><strong>Positional management</strong></td>
<td><strong>Surgical intervention is an option in a specific subset of patients however surgical management should be done under the direction of a sleep consultation.</strong></td>
</tr>
<tr>
<td><strong>Surgery (e.g. tonsillectomy, adenoidectomy, craniofacial operations, and tracheostomy)</strong></td>
<td>Can contribute to the relief of other causes of residual sleepiness such as insomnia, parasomnia, or insufficient sleep.</td>
</tr>
<tr>
<td><strong>Sleep hygiene</strong></td>
<td></td>
</tr>
</tbody>
</table>
Follow-up

- OSA is a serious chronic disease that warrants short-term (to ensure patient on effective treatment) and long-term (annual basis) follow-up to monitor the patient’s symptoms, response to, and compliance with treatment.³
- Follow-up assessment includes: confirmation that snoring is resolved, AHI < 5 and ESS < 6 (Appendix 2). If the patient is on CPAP, confirm the mask fits well and that dry mouth, nasal congestion or dryness are all resolved. The primary care provider should expect CPAP downloads from CPAP vendors in a timely fashion.
- Patients with OSA may be prone to drowsiness while driving. Physicians caring for these patients should be familiar with BC’s Driver Medical Fitness Information for Medical Professionals. https://www2.gov.bc.ca/gov/content/transportation/driving-and-cycling/roadsafetybc/medical-fitness/

Children

- While complete treatment of children’s issues is beyond the scope of this guideline, the following recommendations may be helpful in commonly encountered pediatric situations.
- The prevalence of OSA in children is 1-4% and typical treatment is adenotonsillectomy¹⁵ or orthodontics.
- Untreated OSA in children is associated with significant medical, developmental, and psychosocial complications.¹⁵

Table 5. Symptoms and Signs in Children

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Signs and Physical Manifestations</th>
<th>Associated or comorbid conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noisy breathing or snoring</td>
<td>Large tonsils or history of tonsillectomy</td>
<td>Down Syndrome</td>
</tr>
<tr>
<td>Restless sleep</td>
<td>Mal development of oral airway</td>
<td>Obesity</td>
</tr>
<tr>
<td>Daytime hyperactivity, irritability, or aggressiveness (may be</td>
<td>Hypertension</td>
<td>Any condition with craniofacial anomalies (e.g. Pfeiffer</td>
</tr>
<tr>
<td>misdiagnosed with ADHD, depression, or anxiety)</td>
<td>Dental abnormalities such as a crowded teeth</td>
<td>syndrome, Apert syndrome, and Crouzon syndrome)</td>
</tr>
<tr>
<td>Secondary Enuresis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficult to wake up in the morning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daytime sleepiness, including daytime napping in older children</td>
<td></td>
<td>Neuromuscular disorders (e.g. cerebral palsy, muscular dystrophy,</td>
</tr>
<tr>
<td>Morning headaches</td>
<td></td>
<td>and spinal muscular atrophy)</td>
</tr>
<tr>
<td>Poor academic performance or difficulty learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abnormal sleep pattern</td>
<td></td>
<td>Chronic headaches</td>
</tr>
<tr>
<td>Nasal congestion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure to thrive or unintentional weight loss</td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of dental extractions for crowded teeth</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- HSAT testing is not recommended to diagnose OSA in children.¹² Children with symptoms of sleep disorders may benefit from consultation with a pediatric sleep disorder specialist (e.g. BC Children’s) or sleep disorder physician.
- Severe OSA is associated with higher perioperative complications and some children are also at higher risk for residual OSA after surgery, including those with severe preoperative OSA.¹⁵
Abbreviations

• ESS - Epworth Sleepiness Scale
• HSAT – Home Sleep Apnea Testing
• OSA – Obstructive Sleep Apnea

Appendices

• Appendix 1: STOP-Bang Questionnaire
• Appendix 2: Epworth Sleepiness Scale
• Appendix 3: Mallampati Classification

Associated Documents

• Provincial Standard Diagnostic Sleep Medicine Requisition and Referral form

Resources

• The RACE program (Rapid Access to Consultative Expertise) is a BC Specific Monday-Friday 8AM – 5PM on-call program to connect primary care physicians and nurse practitioners with expert specialists, including sleep disorder physicians.
  o Telephone: A list of available hotline numbers, listed by region, can be found at: [https://sharedcarebc.ca/sites/default/files/BCMJ-Full-Page-Revised-v5.pdf](https://sharedcarebc.ca/sites/default/files/BCMJ-Full-Page-Revised-v5.pdf)
  o The race app: [www.raceapp.ca](http://www.raceapp.ca) (mobile phone by downloading from “RACEApp+” from iOS or Android stores)
  o More information on RACE (such as billing, and specialities available) can be found at [www.raceconnect.ca](http://www.raceconnect.ca)
• BC’s Driver Medical Fitness Information for Medical Professionals: [https://www2.gov.bc.ca/gov/content/transportation/driving-and-cycling/roadsafetybc/medical-fitness/medical-prof](https://www2.gov.bc.ca/gov/content/transportation/driving-and-cycling/roadsafetybc/medical-fitness/medical-prof)
• Home Sleep Apnea Testing Standards by College of Physicians and Surgeons of British Columbia [https://www.cpsbc.ca/programs/dap](https://www.cpsbc.ca/programs/dap)
• Standards for Sleep Medicine Diagnostic Services by College of Physicians & Surgeons of Alberta [http://www.cpsa.ca/accreditation/sleep-medicine/](http://www.cpsa.ca/accreditation/sleep-medicine/)

References


This guideline is based on scientific evidence current as of the Effective Date. This guideline was developed by the Guidelines and Protocols Advisory Committee and adopted by the Medical Services Commission.

THE GUIDELINES AND PROTOCOLS ADVISORY COMMITTEE

The principles of the Guidelines and Protocols Advisory Committee are to:
- encourage appropriate responses to common medical situations
- recommend actions that are sufficient and efficient, neither excessive nor deficient
- permit exceptions when justified by clinical circumstances

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Disclaimer
The Clinical Practice Guidelines (the guidelines) have been developed by the Guidelines and Protocols Advisory Committee on behalf of the Medical Services Commission. The guidelines are intended to give an understanding of a clinical problem, and outline one or more preferred approaches to the investigation and management of the problem. The guidelines are not intended as a substitute for the advice or professional judgment of a health care professional, nor are they intended to be the only approach to the management of clinical problem. We cannot respond to patients or patient advocates requesting advice on issues related to medical conditions. If you need medical advice, please contact a health care professional.
## Appendix 1: STOP-Bang Questionnaire

Is it possible that you have Obstructive Sleep Apnea (OSA)?
Please answer the following questions below to determine if you might be at risk.

<table>
<thead>
<tr>
<th>STOP</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Snoring?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you Snore Loudly (loud enough to be heard through closed doors or your bed-partner elbows you for snoring at night)?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Tired?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you often feel Tired, Fatigued, or Sleepy during the daytime (such as falling asleep during driving or talking to someone)?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Observed?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has anyone Observed you Stop Breathing or Choking/Gasping during your sleep?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Pressure?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you have or are being treated for High Blood Pressure?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bang</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Body Mass Index more than 35 kg/m²?</strong></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Age older than 50?</strong></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Neck size large ? (Measured around Adams apple)</strong></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Is your shirt collar 16 inches / 40cm or larger?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Gender = Male?</strong></td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

### For general population

**OSA - Low Risk:** Yes to 0 - 2 questions

**OSA - Intermediate Risk:** Yes to 3 - 4 questions

**OSA - High Risk:** Yes to 5 - 8 questions

or Yes to 2 or more of 4 STOP questions + male gender

or Yes to 2 or more of 4 STOP questions + BMI > 35kg/m²

or Yes to 2 or more of 4 STOP questions + neck circumference 16 inches / 40 cm

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**Property of University Health Network**

Modified from:
Chung F et al. Anesthesiology 2008; 108: 812-821,
Chung F et al Br J Anaesth 2012; 108: 768-775,
Appendix 2: Epworth Sleepiness Scale

Used to assess daytime sleepiness, which can have many causes, including obstructive sleep apnea and neurological disorders.

In the situations listed below, how likely are you to doze off or fall asleep, in contrast to just feeling tired?

Assign the most appropriate score for your usual way of life in recent times. Even if you haven't done some of these things recently, try to work out how they might have affected you.

Answer each question as best as you can and add the values to calculate total Epworth score.

<table>
<thead>
<tr>
<th>Situation</th>
<th>Score</th>
<th>Scoring Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting and reading</td>
<td>0</td>
<td>0 - would never doze or sleep</td>
</tr>
<tr>
<td>Watching TV</td>
<td>1</td>
<td>1 - slight chance of dozing or sleeping</td>
</tr>
<tr>
<td>Sitting inactive in a public place</td>
<td>2</td>
<td>2 - moderate chance of dozing or sleeping</td>
</tr>
<tr>
<td>Being a passenger in a car for an hour</td>
<td>3</td>
<td>3 - high chance of dozing or sleeping</td>
</tr>
<tr>
<td>Lying down in the afternoon</td>
<td></td>
<td><strong>Understanding your Score</strong></td>
</tr>
<tr>
<td>Sitting and talking to someone</td>
<td></td>
<td>0–9 Normal range in healthy adults</td>
</tr>
<tr>
<td>Sitting quietly after lunch (no alcohol)</td>
<td></td>
<td>(does not rule out sleep apnea)</td>
</tr>
<tr>
<td>Stopping for a few minutes in traffic while driving</td>
<td></td>
<td>10+ Abnormal</td>
</tr>
</tbody>
</table>

Total Epworth score = 

☐ ☐ ☐ ☐
Appendix 3: Mallampati Classification

MALLAMPATI CLASSIFICATION of AIRWAY

Very useful in determining the pretest likelihood of potential obstructive sleep apnea.
**DIAGNOSTIC SLEEP MEDICINE**

**REQUISITION AND REFERRAL FORM**

<table>
<thead>
<tr>
<th>Patient Information</th>
<th>Referring Physician</th>
<th>Copy to</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHN</td>
<td>Physician</td>
<td>Name(s)</td>
</tr>
<tr>
<td>Patient Name</td>
<td>Phone</td>
<td>Phone(s)</td>
</tr>
<tr>
<td>Date of Birth</td>
<td>Fax</td>
<td>Fax(es)</td>
</tr>
<tr>
<td>Email address</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preferred Language</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Whenever possible, a history and physical examination, including an upper airway examination, should be performed.
- A home sleep apnea test (HSAT) is only capable of diagnosing Obstructive Sleep Apnea (OSA).
- While HSAT is indicated for many patients where clinical examination reveals a high pre-test probability of moderate or severe OSA (see HSAT inclusion criteria), it is inappropriate for pediatric patients or those with significant comorbidities (see HSAT exclusion criteria).
- If HSAT is not appropriate, inconclusive or negative, refer the patient for consultation with a sleep disorder physician.
- A negative HSAT result does not rule out OSA.
- Children with sleep symptoms may benefit from consultation with a sleep disorder physician experienced in pediatrics.
- For questions on managing a patient with a suspected sleep disorder, sleep disorder physicians can be reached through the Rapid Access to Consultative Expertise (RACE) program. See page 2 for details.

**Type of referral (Please use HSAT TEST APPROPRIATENESS framework as a guide)**

- Home Sleep Apnea Testing (suspected obstructive sleep apnea)
  - If HSAT is negative or inconclusive, facility to refer patient directly to sleep disorder physician
- Referral to sleep disorder physician (other suspected sleep disorder or any exclusion criterion)

*Facilities that are approved to provide diagnostic polysomnography can be found at:*

https://www2.gov.bc.ca/assets/gov/health/practitioner-pro/medical-services-plan/diagnostic-facilities/dfa-polysomnography.pdf

**Patient History**

Medications, allergies, comorbid conditions. Attach recent prior consultation notes; prior sleep studies, CPAP reports etc.

<table>
<thead>
<tr>
<th>Details:</th>
<th>Reason for referral</th>
<th>Medical conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Parasomnia</td>
<td>□ MI/CAD</td>
</tr>
<tr>
<td></td>
<td>□ Chronic insomnia</td>
<td>□ Stroke</td>
</tr>
<tr>
<td></td>
<td>□ Witnessed apnea</td>
<td>□ Fibromyalgia</td>
</tr>
<tr>
<td></td>
<td>□ Frequent awakenings</td>
<td>□ Heart Failure</td>
</tr>
<tr>
<td></td>
<td>□ Excessive daytime sleepiness</td>
<td>□ Diabetes</td>
</tr>
<tr>
<td></td>
<td>□ Cataplexy</td>
<td>□ GERD</td>
</tr>
<tr>
<td></td>
<td>□ Periodic limb movements</td>
<td>□ Chronic Pain</td>
</tr>
<tr>
<td></td>
<td>□ Shift work related</td>
<td>□ Anxiety Disorder</td>
</tr>
<tr>
<td></td>
<td>□ Restless legs syndrome</td>
<td>□ Hypertension</td>
</tr>
<tr>
<td></td>
<td>□ Nocturnal seizures</td>
<td>□ Asthma/COPD</td>
</tr>
<tr>
<td></td>
<td>□ Sleep related accidents</td>
<td>□ Mood Disorder</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ Cardiac Ahythmia</td>
</tr>
</tbody>
</table>

**HSAT TEST APPROPRIATENESS**

**HSAT Inclusion Criteria**

*Any three patient attributes / risk factors indicate a moderate to high pretest probability for OSA.*

- Excessive daytime sleepiness. As indicated by nonrestorative sleep, fatigue, and an Epworth score of 10 or greater. (questionnaire on pg. 2) **ESS = ______**
- Nocturnal breathing events such as witnessed pauses in breathing, choking, gasping.
- Chronic loud snoring
- Body Mass Index ≥ 30kg/m². **BMI = ______**
- Large neck circumference: ________
  - [Male ≥ 17 in. (43cm). Female ≥ 16 in. (40.5cm)]
- Type II diabetes or systemic hypertension
- Male or post-menopausal female

**HSAT Exclusion Criteria**

*Refer patient for consultation with a sleep disorder physician if any of these criteria are met.*

- Other suspected sleep disorder OR excessive daytime sleepiness without nocturnal breathing events.
- Risk of hypoventilation (as in neuromuscular disease, morbid obesity)
- Opioid use
- History of stroke or heart failure
- Significant (moderate-severe) chronic lung disease
- Patient requires a sleep study for follow-up of treatment e.g. weight loss, oral appliance or surgery
- Children < 16 years
- Inability to complete necessary steps for the self-administered HSAT (cognitive impairment, age, language, other barriers)

**Requesting Physician:_________________________ Referral Date: _______________**
The Epworth Sleepiness Scale

Used to assess daytime sleepiness, which can have many causes, including obstructive sleep apnea and neurological disorders.

In the situations listed, how likely are you to doze off or fall asleep, in contrast to just feeling tired?

Assign the most appropriate score for your usual way of life in recent times. Even if you haven’t done some of these things recently, try to work out how they might have affected you.

Answer each question as best as you can and add the values to calculate total Epworth score.

**Situation** | **Score**
--- | --- | ---
Sitting and reading | 0 | 1 | 2 | 3
Watching TV | | | | |
Sitting inactive in a public place | | | | |
Being a passenger in a car for an hour | | | | |
Lying down in the afternoon | | | | |
Sitting and talking to someone | | | | |
Sitting quietly after lunch (no alcohol) | | | | |
Stopping for a few minutes in traffic while driving | | | | |

Total Epworth Score = ___

**Scoring Legend**
0 - would never doze off or fall sleep
1 - slight chance of dozing or sleeping
2 - moderate chance of dozing or sleeping
3 - high chance of dozing or sleeping

**Understanding your Score**
0–9 Normal range in healthy adults (does not rule out sleep apnea)
10+ Abnormal

The RACE program (Rapid Access to Consultative Expertise) is a BC Specific Monday-Friday 8AM – 5PM on-call program to connect primary care physicians and nurse practitioners with expert specialists, including sleep disorder physicians. A list of available hotline numbers, listed by region, can be found at: [https://sharedcarebc.ca/sites/default/files/BCMJ-Full-Page-Revised-v5.pdf](https://sharedcarebc.ca/sites/default/files/BCMJ-Full-Page-Revised-v5.pdf)

### Prioritization for level 1 sleep studies (polysomnography)

<table>
<thead>
<tr>
<th>Priority 1</th>
<th>Priority 2</th>
<th>Priority 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Suspected sleep disorder and</td>
<td>• Suspected sleep disorder and</td>
<td>• Suspected sleep disorder but without</td>
</tr>
<tr>
<td>• Major daytime sleepiness (ESS 10+) and</td>
<td>• Major daytime sleepiness (ESS 10+) but</td>
<td>o Major daytime sleepiness (ESS 10+); or</td>
</tr>
<tr>
<td>• One or more of the following:</td>
<td>• With no significant co-morbid disease or</td>
<td>o Significant co-morbid disease; or</td>
</tr>
<tr>
<td>o Significant co-morbid disease; or</td>
<td>safety critical occupation</td>
<td>o Safety critical occupation</td>
</tr>
<tr>
<td>o Safety critical occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Overnight home oximetry which reveals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;10/hour 4% desaturations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Sleep Medicine Referral and Requisition – Patient Pathway

1. **Patient with sleep complaint**
   - Referring Practitioner - Patient assessment
     - Polysomnography / sleep disorder physician consultation indicated
       - Accredited Sleep Lab or Affiliated Sleep Disorder Physician
       - Sleep testing
       - Referring Practitioner - Follow-up
         - Treatment effective
           - Treatment and monitoring
             - Interpretation by appropriately credentialed physician
         - Treatment ineffective
           - Treatment and monitoring
             - Interpretation by appropriately credentialed physician
       - HSAT indicated
         - Accredited HSAT clinic
           - HSAT not indicated
             - HSAT
               - HSAT test result
                 - Treatment ineffective
                   - Treatment and monitoring
                     - Interpretation by appropriately credentialed physician
               - Equivocal test result
                 - Treatment ineffective
                   - Treatment and monitoring
                     - Interpretation by appropriately credentialed physician
               - Treatment effective
                 - Treatment and monitoring
                   - Interpretation by appropriately credentialed physician
         - Home Sleep Apnea Testing (HSAT) indicated
           - Accredited HSAT clinic
             - HSAT
               - HSAT test result
                 - Treatment ineffective
                   - Treatment and monitoring
                     - Interpretation by appropriately credentialed physician
               - Equivocal test result
                 - Treatment ineffective
                   - Treatment and monitoring
                     - Interpretation by appropriately credentialed physician
               - Treatment effective
                 - Treatment and monitoring
                   - Interpretation by appropriately credentialed physician