Obstructive Sleep Apnea – Guidelines for Diagnosis and Treatment

This information package has been prepared by the FMC Sleep Centre as a resource to provide referring physicians with the necessary information on diagnosis and management of obstructive sleep apnea (OSA). It is intended to assist in managing patients with OSA without an assessment by a specialist.

Background information on obstructive sleep apnea

Obstructive sleep apnea (OSA) is a sleep-related breathing disorder that is characterized by intermittent closure of the upper airway associated with desaturation and arousal from sleep. Approximately 25% of the Canadian population is at risk of OSA, but only about 5% have been diagnosed.

Untreated OSA is associated with excessive daytime sleepiness, which leads to an increased risk of motor vehicle crashes, poor quality of life and decreased workplace productivity. Patients with moderate-severe OSA are at increased risk of cardiovascular complications such as hypertension, ischemic heart disease and stroke. Patients with OSA are also at increased risk of perioperative complications. However, there is considerable variability between patient presentations so that not all patients with severe OSA have symptoms and some individuals will be symptomatic with relatively mild disease.

Treatment of OSA has been shown to improve subjective symptoms of OSA, reduce motor vehicle crashes and potentially improve cardiovascular outcomes.

Differential diagnosis of excessive daytime sleepiness

It is important to recognize the broad differential diagnosis of a patient with excessive daytime sleepiness. These disorders, which can co-exist, are listed in the table below:

Table 1: Causes of Daytime Sleepiness

<table>
<thead>
<tr>
<th>Sleep Restriction</th>
<th>Sleep-Disordered Breathing</th>
<th>Movement Disorders in Sleep</th>
<th>Primary Hypersomnia</th>
<th>Medications</th>
<th>Medical/Psychiatric Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioural</td>
<td>Obstructive sleep apnea</td>
<td>Restless legs syndrome</td>
<td>Narcolepsy</td>
<td>Antidepressants (almost all)</td>
<td>Mood/anxiety disorder</td>
</tr>
<tr>
<td>Jet lag</td>
<td>Sleep-related hypoventilation</td>
<td>Periodic limb movement disorder</td>
<td>Idiopathic hypersomnolence</td>
<td>Sedatives/Alcohol</td>
<td>Chronic disease (e.g. CHF, CKD)</td>
</tr>
<tr>
<td>Shift work</td>
<td>Central sleep apnea</td>
<td>Parasonia (e.g sleep-talking; sleep-walking)</td>
<td></td>
<td>Narcotics</td>
<td></td>
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<tr>
<td>Circadian Rhythm Disorder</td>
<td></td>
<td></td>
<td></td>
<td>Stimulant withdrawal</td>
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</tbody>
</table>
Identifying patients at high risk for OSA

Several tools for assessing risk of OSA have been described – we suggest using either the STOP-BANG questionnaire or the Adjusted Neck Circumference. Patients with intermediate or high probability should be tested for OSA.

STOP-BANG (score 1 point for each)

- Do you **Snore Loudly**? (loud enough to be heard through closed doors or your bed partner elbows you for snoring at night)
- Do you often feel **Tired, Fatigued** or **Sleepy** during the daytime? (such as falling asleep during driving or talking to someone)
- Has anyone **Observed** you Stop Breathing or Choking/Gasping during sleep?
- Do you have or are you being treated for **High Blood Pressure**?
- **BMI** > 35 kg/m²?
- **Age** > 50 years old?
- **Neck size** ≥ 17 inches/43 cm (M) or 16 inches/41 cm (F)?
- **Gender** = Male?

Adjusted Neck Circumference (add number of points to measured neck circumference)

- Neck circumference (in cm) +
- HTN (4)
- gasping/choking (3)
- witnessed apneas (3)

Probability of OSA:
- **Low** = 0-2
- **Intermediate** = 3-4
- **High** = 5-8 **OR**

2 of STOP + 1 of:
- Male sex
- BMI > 35
- Enlarged neck

Diagnostic tests for OSA

- Polysomnogram (PSG) (Level 1) – gold standard for OSA/other sleep disorders; available through accredited laboratories in Alberta (e.g. FMC Sleep Centre)
- Home Sleep Apnea Test (HSAT) – identifies OSA in individuals with high pre-test probability and no significant cardiopulmonary comorbidity; available as part of clinical consultation at FMC Sleep Centre and from private respiratory homecare providers
  - May be preferable to Level 1 in appropriate patients due to access and cost
- Severity of OSA is determined on polysomnography by the Apnea-Hypopnea Index (AHI) and on HSAT by the Respiratory Disturbance Index (RDI). These both represent the number of respiratory events per hour.
  - Normal – AHI or RDI < 5/hr
  - Mild OSA – AHI or RDI 5-15/hr
  - Moderate OSA – AHI or RDI 15-30/hr
  - Severe OSA – AHI or RDI ≥ 30/hr

Probability of OSA:
- **Low** = <43 cm
- **Intermediate** = 43-48 cm
- **High** = >48 cm
Treatment recommendations

Considerations in ALL patients

- Lifestyle modification
  - Reduction/cessation of alcohol consumption and sedative use
  - Weight loss if overweight

- Driving safety – patients are responsible to self-report their diagnosis of OSA to the Ministry of Transportation in the province of Alberta (Ayas Can Respir J 2014) ([http://www.transportation.alberta.ca/1929.htm](http://www.transportation.alberta.ca/1929.htm)).
  - Exception to the above is Class I license holders, whose diagnosis of OSA should be reported by the healthcare provider

Devices

The decision to treat OSA and choice of treatment depends on disease severity and presence or absence of OSA symptoms (e.g. daytime sleepiness, unrefreshing sleep, fatigue, poor concentration) or related comorbidity (e.g. depression, hypertension, cardiovascular disease). Importantly, the decision to treat is dependent upon the results of sleep diagnostic testing in the context of a clinical sleep assessment and patient preference. Below we provide an overview of appropriate treatment and follow-up, with practical information (e.g. sample prescription) in the appendix.

**NOTE:** Patients with suspected nocturnal hypoventilation should not be started on therapy (including oxygen) outside of a monitored setting. Such patients are at increased risk of worsening respiratory failure and should be referred for polysomographic titration of PAP therapy.

- Treatment options include:
  - Continuous positive airway pressure – pressurized air delivered through mask and tubing; designed to act as a pneumatic airway splint
    - If diagnosis of OSA without suspected sleep hypoventilation is made using HSAT, a trial of auto-titrating CPAP (6-16 cm H2O) with conversion to 90th percentile pressure is recommended
  - Oral appliance – prefabricated or custom-fitted device placed in the mouth during sleep; designed to protrude the mandible/tongue to open upper airway

- The following patients should be offered a trial of therapy:
  - Patients with AHI or RDI $\geq 5$ with daytime sleepiness or equivalent symptoms (fatigue, poor concentration) $\Rightarrow$ CPAP or oral appliance therapy
  - Patients with severe OSA as defined by AHI or RDI $\Rightarrow$ CPAP as first line therapy; oral appliance for patients who do not tolerate or refuse CPAP

- **All** patients who are started on therapy should be clinically reassessed within 2-4 weeks to ensure that symptoms have improved and that OSA is adequately treated
For patients whose symptoms are not clearly due to OSA, a trial of CPAP allows the patient to avoid committing to custom-fitted oral appliances until the effectiveness of OSA treatment has been established.

Hours of PAP use, mask leak and reduction in RDI can be obtained from CPAP machine downloads that are generally sent to the referring physician by the CPAP provider. CPAP usage of 4 hours/night on at least 70% of nights is generally considered the minimum required to see improvement in symptoms and quality of life.

Upper airway surgery

- Upper airway surgery for OSA is a complex multi-stage surgery that is typically reserved for patients that are intolerant or unwilling to use CPAP or oral appliance therapy in the long term.
- In highly selected patients, referral for upper airway surgery may be an option; consultation with a sleep specialist should be considered before the patient commits to this therapy.

Table 2: Comparison of OSA Therapies

<table>
<thead>
<tr>
<th></th>
<th>CPAP</th>
<th>Oral Appliance</th>
<th>Upper Airway Surgery</th>
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</thead>
<tbody>
<tr>
<td>Reduction in AHI (or RDI)</td>
<td>• AHI should normalize</td>
<td>• AHI ↓ by &gt; 50% in 65% of patients</td>
<td>• 87% ↓ in AHI on average</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• AHI &lt; 5/hr in 35% of patients</td>
<td>• &lt; 10/hr in most</td>
</tr>
<tr>
<td>Symptomatic Improvement</td>
<td>• Excellent (if adherent)</td>
<td>• Similar to CPAP</td>
<td>• Improves (limited studies)</td>
</tr>
<tr>
<td>Adherence</td>
<td>• ~ 30-70%</td>
<td>• 80-85%</td>
<td>• 100%</td>
</tr>
<tr>
<td>Established Outcomes</td>
<td>• ↓ Blood pressure</td>
<td>• ↓ Blood pressure</td>
<td>• Symptomatic improvement</td>
</tr>
<tr>
<td></td>
<td>• ↓ MVA</td>
<td>• ↑ Mood/Cognition</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ↑ Mood/Cognition</td>
<td>• ↑ Quality of Life</td>
<td></td>
</tr>
<tr>
<td>When to Use</td>
<td>• Severe OSA</td>
<td>• Mild-moder OSA (patient preference)</td>
<td>• intolerant of CPAP/OA (after sleep specialist assessment)</td>
</tr>
<tr>
<td></td>
<td>• Mild-moder OSA (patient preference)</td>
<td>• Intolerant of CPAP</td>
<td>• Weigh surgical risk</td>
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</table>
Troubleshooting OSA therapy

Three common issues that arise during follow-up are non-adherence to CPAP therapy, CPAP intolerance and persistent sleepiness on therapy. Some practical tips for each of these are:

- **Non-adherence to CPAP** – considerations include:
  - Lack of interest/understanding of OSA – extent to which importance of treatment is reinforced depends on indication for treatment and severity of disease
  - CPAP intolerance (see below)
  - Lack of improvement in symptoms (see below)

- **CPAP intolerance** – this is common and should be addressed by CPAP provider.

### Table: Causes of CPAP Intolerance

<table>
<thead>
<tr>
<th>Reason for CPAP Intolerance</th>
<th>Recommended Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mouth/nasal dryness</td>
<td>Adequate hydration and heated humidity in CPAP machine</td>
</tr>
<tr>
<td>Nasal congestion</td>
<td>Saline nasal rinses +/- intranasal steroid</td>
</tr>
<tr>
<td>Claustrophobia</td>
<td>Trial of CPAP while awake, sitting or supine, before using during sleep</td>
</tr>
<tr>
<td>High pressure</td>
<td>Ramp feature on CPAP machine; habituate with lower pressure; Auto-titrating CPAP may be preferred by some</td>
</tr>
<tr>
<td>Noise</td>
<td>Current machines are very quiet; machine upgrade may be required if CPAP is old</td>
</tr>
</tbody>
</table>

- **Persistent sleepiness** – several easily remedied issues that should be explored by history and by reviewing CPAP machine downloads:
  - Non-adherence/intolerance – typically aim for 4 hrs/night on 70% of nights
  - Mask leak – due to facial hair, weight gain, mask replacement every 6-12 months
  - Equipment failure – uncommon; should see CPAP provider if this occurs
  - Sub-therapeutic pressure – weight gain, alcohol/sedative use
  - Another sleep disorder – concomitant sleep disorder in 25-30% of OSA patients
    - Review differential diagnosis of excessive daytime sleepiness and consider referral to a sleep specialist (see table above)
Funding for CPAP

There is currently no universal public funding program for CPAP or oral appliance therapy in Alberta. For patients who are on AISH, Alberta Works, or for low-income senior citizens, there is funding support for CPAP; however, polysomnography is required to confirm the diagnosis of OSA (RDI>15) and its response to CPAP. More information can be found at the websites below, but CPAP providers should be well versed in these rules:

- AISH (www.alberta.ca/aish.aspx)
- AB Works (www.humanservices.alberta.ca/financial-support/3171.html)
- SNAP (http://www.seniors-housing.alberta.ca/seniors/special-needs-assistance.html)

Many private insurance plans pay some or all of the cost of CPAP and oral appliances. Patients are encouraged to call their insurance company and/or work with their healthcare provider for details.

Questions

If you have questions about this information package or concerns about your patient, please call our Sleep Triage Clinician at 403-944-8324. If you choose to re-refer your patient, please consider initiation of therapy as described in this document.
Appendix

1. Sample CPAP prescription

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**CPAP Prescription**

- **Date:** __________
- **RDI / AHI:** __________
- **PSG:** __________
- **HSAT:** __________
- **Auto CPAP min:** __________ **max:** __________ cmH2O
- **CPAP:** __________ cmH2O
- **Auto CPAP may be switched to standard CPAP based on Auto trial 90% pressure**
- **O2 1Lpm nocturnal/entrained**
- **O2 2Lpm nocturnal and titrate daytime O2 to keep SpO2 ______%**

**CPAP Provider:** ________________________________

**Follow up Plan:**

- **If you are unable to contact or arrange set up with patient within two weeks of receiving prescription, please let this office know.**
- **Please fax CPAP compliance, once established to this office.**
- **Other:** ________________________________

**Physician Signature:** ________________________________

**Print name:** ________________________________

**Office information (stamp):** ________________________________
2. Sample oral appliance prescription
3. CPAP Providers – Calgary and Area

A current list of CPAP providers that have met with our team and agreed to adhere to management guidelines established at the FMC Sleep Centre and is listed on the Alberta Health Services website (http://www.albertahealthservices.ca/assets/programs/ps-1771-sleep-pap-providers.pdf). Referring physicians are encouraged to explore a few in their area as the service delivery models differ across providers.