Sleep Disordered Breathing and Anesthesia

1 - Understand it

**Definitions**
- **Apnea**: a cessation of air flow >10 seconds
- **Hypopnea**: a 30-50% reduction of air flow > 10 seconds associated with a fall in SpO₂
- **Apnea / Hypopnea Index (AHI)**: # of events per hour
- **Respiratory Effort-Related Arousal (RERA)**: 10 second episode of reduced airflow leading to arousal, but not quite a Hypopnea

**Classification:**
- **Mild** = AHI 5-15
- **Moderate** = AHI 15-30
- **Severe** = AHI > 30

**Pre-disposing Factors**
- Small Mouth - Receding Jaw - Large Tonsils - Nasal Obstruction
- >80% of patients with Sleep Apnea are undiagnosed!

**Signs and Symptoms**
- May be subtle!
- Actively seek OSA in EVERY patient

**Spectrum of Disease**
- Mild OSA is common (15% of adult males).
- The undiagnosed moderate to severe OSA patients are at greatest risk in the peri-operative period.

**Progression of Disease**
- Moderate to severe OSA leads to hypertension, heart failure, and multiple other health problems.
- Some patients develop hypoventilation with CO₂ retention over time

2 - Seek it

**Screening Tools**

<table>
<thead>
<tr>
<th>S</th>
<th><strong>Snoring</strong>: Do you snore loudly (loud enough to be heard through closed doors)?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td><strong>Tired</strong>: Do you often feel tired, fatigued or sleepy during the daytime?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>O</td>
<td><strong>Observed</strong>: Has anyone observed you stop breathing during your sleep?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>P</td>
<td><strong>Blood pressure</strong>: Do you have or are you being treated for high blood pressure?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>B</td>
<td><strong>BMI</strong>: BMI more than 35 kg/m²</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>A</td>
<td><strong>Age</strong>: Age over 50 years</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>N</td>
<td><strong>Neck circumference</strong>: Neck circumference &gt; 40 cm</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>G</td>
<td><strong>Gender</strong>: Male</td>
<td>Yes</td>
<td>No</td>
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</tbody>
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**STOP-BANG Score of 3-4 at risk. Score 5-8 high risk**

With permission: Toronto Western Hospital, UHN, University of Toronto

3 - Manage it

**OSA Safe Anesthesia Principles**
- Expect a difficult airway
- Regional if possible (caution with intrathecal opioids)
- If general anesthesia, use short acting agents
- Minimize opioids - use enhanced recovery principles.
  - **Short acting**
  - **Avoid basal rates on PCA pumps**
  - **Consider Multimodal analgesia**
- Ensure full reversal of NMB agents
- Sit up for extubation
- Mobilize early

**Post-op Care**
- Sit up in bed and position laterally if able.
- Very cautious with opioids
- If high risk then monitor with oximetry

**Post-op CPAP**
- Re-institute CPAP masks ASAP on day of surgery for those on home PAP therapy
- Check ABG if somnolent:
  - if PaCO₂ >10mmHg above norm then consider bilevel pressure support

**Long term**
- Discuss long-term health risks
- Follow-up sleep evaluation

Further resources

[www.SASMHQ.org](http://www.SASMHQ.org)