



Guideline Rationale

Identify patients who have Obstructive Sleep Apnea (OSA) prior to surgery to reduce risk perioperatively.

Key Points

- Screen all patients for OSA risk pre-operatively using STOP-Bang questionnaire
- Patients who score **intermediate or high risk** should be referred to sleep medicine prior to elective surgery for appropriate testing and treatment, if indicated.
- Patients who are identified as high risk for OSA or who have a diagnosis of OSA **and** who are being admitted, who receive postoperative continuous pulse oximetry monitoring for at least 24 hours.

Background

- Obstructive sleep apnea (OSA) is a condition characterized by repeat episodes of complete or partial upper airway obstruction. Arterial oxygen desaturation and sympathetic activation are typical with these episodes, and are terminated by cortical stimulation or awakenings. Sleep disruption leading to daytime sleepiness and habitual snoring are generally present.
- OSA can lead to physiologic disorders ranging from cerebrovascular and cardiovascular diseases to metabolic syndrome and depression. Numerous factors increase the risk of OSA and include alcohol consumption, obesity, smoking, increased neck circumference, male sex, advanced age, macroglossia, tonsillar/adenoidal hypertrophy, and craniofacial abnormalities.
- Prevalence varies by age and sex; 27% of women and 43% of men 50-70 years old have OSA, whereas, 9% of women and 26% of men age 30-49 years old. OSA is common in patients presenting for surgery, with the prevalence being that of the general population and up to as high as 70% in select patient populations (bariatric surgery).

Diagnosis – See Algorithm on Page 3

- Diagnosis of OSA is confirmed with a sleep study in which the number of apnea and/or hypopnea episodes per hour (apnea-hypopnea index (AHI)). The AHI is used to define the severity of OSA. Severity of OSA may increase in the postoperative period and therefore put these patients at increased risk of postoperative complications.

- Routine screening of adult patients presenting for surgery may identify patients with OSA and result in an increased awareness and risk reduction by implementing appropriate preoperative, intraoperative and postoperative interventions.
- The **STOP-Bang** tool is an easily available tool to screen for OSA. The STOP-Bang questionnaire consists of a total of eight dichotomous (yes/no) questions, as follows:

STOP questions:

1. Snoring
2. Tiredness
3. Observed apnea
4. Hypertension (**P**ressure)

Bang questions:

1. **B**MI > 35 kg/m²
2. **A**ge > 50 years
3. **N**eck circumference > 40 cm
4. **M**ale **G**ender

Patients with ≥ 3 STOP-Bang scores had an increased risk of perioperative complications. However, not all of the questions carry equal weight in assessing the risk of OSA (see table below).

Risk	Number of STOP-Bang Criteria Met
Low Risk	0-2
Intermediate Risk	3-4
High Risk	≥ 5
	STOP ≥ 2 + Male
	STOP ≥ 2 + BMI > 35 kg/m ²
	STOP ≥ 2 + Neck ≥ 40cm

Pre-Operative – See Algorithm 1

Pre-operative Screening

- For patients going to the OSU Preoperative Assessment Center (OPAC), patients who score high risk for OSA should be referred to sleep medicine prior to elective surgery for appropriate testing or treated as high risk.
- All patients, prior to elective surgery, will be screened for OSA using the STOP-Bang criteria, either at OPAC visit or during the preoperative anesthesiology consultation.

If a patient has a diagnosis of OSA, then screening is not required.

Post-operative Management – See Algorithms 1 and 2

Post-Operative Management (PACU)

For patients who have a **diagnosis of OSA**:

- Patients will have continuous pulse oximetry (SpO₂) in post-anesthesia recovery unit (PACU)
- Patients will have telemetry monitoring in PACU
- Consider using CPAP or BIPAP. Patients are encouraged to bring home machines, but if that is not available, as needed orders for CPAP or BIPAP should be utilized
- Consider smaller doses of opioids as patients can have increased sensitivity to respiratory depressant effects.
- Avoid basal narcotic PCA rates.

For patients who are **high-risk** for OSA:

- Patients will have continuous SpO₂ monitoring in PACU
- Patients will have telemetry monitoring in PACU
- Consider ordering CPAP or BIPAP if patient demonstrates respiratory depression or excessive somnolence
- Consider smaller doses of opioids as patients can have increased sensitivity to respiratory depressant effects.
- Avoid basal narcotic PCA rates.

Inpatient Post-Operative Management

Patients who have a **diagnosis of OSA** being admitted post-operatively:

- Order continuous post-operative pulse oximetry **and** cardiac (telemetry) monitoring for at least 24-hours
 - If patient is receiving opioids or other sedative medications, consider continuing SpO₂ monitoring beyond the 24-hour period
- Order use of patient's home CPAP or BIPAP when sleeping during entire hospital stay
 - If patient does not use home CPAP/BIPAP, consider ordering CPAP/BIPAP when patient is sleeping
- Consider multimodal therapies for pain management to minimize opioid use

Patients who are **high risk** for OSA being admitted post-operatively:

- Order continuous post-operative pulse oximetry **and** cardiac (telemetry) monitoring for at least 24-hours
 - If patient is receiving opioids or other sedative medications, consider continuing SpO₂ monitoring beyond the 24-hour period
- Consider ordering CPAP or BIPAP for patient to use when sleeping
- Consider multimodal therapies for pain management to minimize opioid use
- Provide patient and family with OSA education and advise patient to follow-up with Primary Care Provider.
- Consider referring patient to Sleep Clinic.

Outpatient Post-Operative Management:

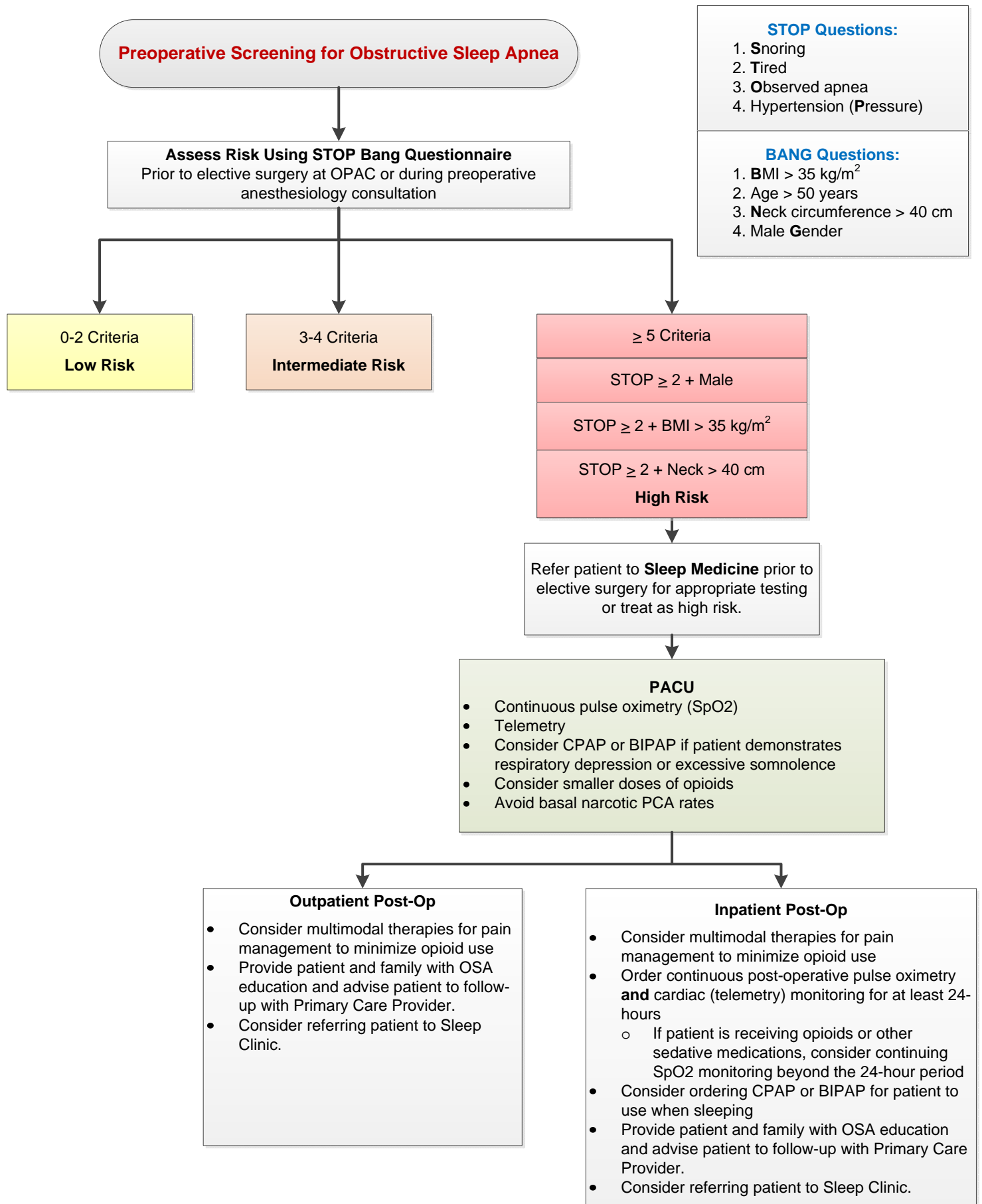
Patients with **OSA or high risk for OSA**:

- Consider multimodal therapies for pain management to minimize opioid use
- Discharged criteria:
 - SpO₂ is at (or above) preoperative baseline and other vital signs are within 20% of preoperative baseline
 - Patient is not requiring the use of noninvasive positive pressure ventilation (CPAP or BIPAP) for at least 1-hour
- If high risk for OSA, provide patient and family with OSA education and advise patient to follow-up with Primary Care Provider and consider referring patient to Sleep Clinic.

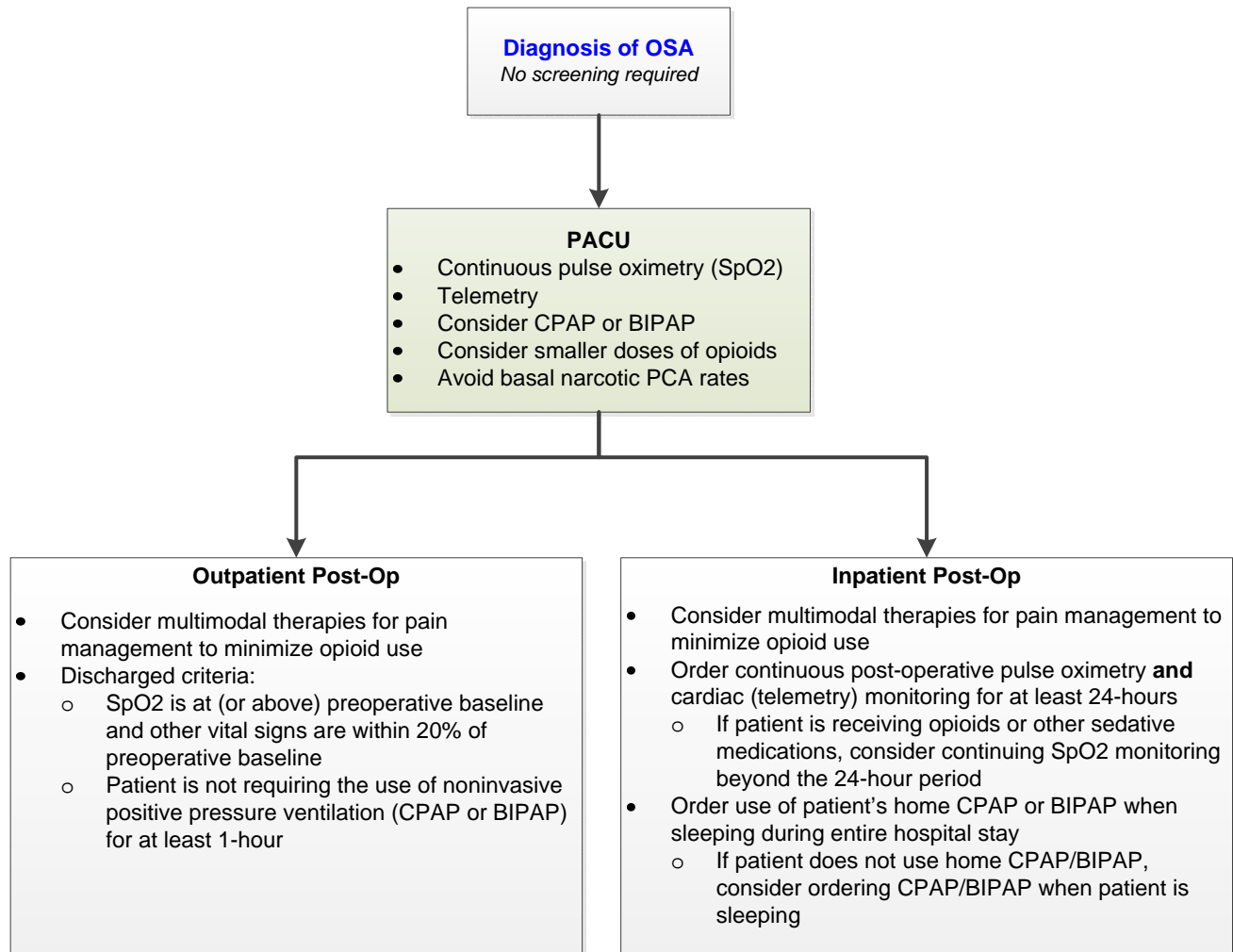
References

- [OSU Surgical Team Safety Checklist](#). The Ohio State University Wexner Medical Center, Rev 2017
- [Standard of Practice: Anesthesia Recovery-Phase I and II](#). Rev 2017;
- Chung, F., Memtsoudis, S. G., Ramachandran, S. K., Nagappa, M., Opperer, M., Cozowicz, C., Auckley, D. (2016). Society of Anesthesia and Sleep Medicine Guidelines on Preoperative Screening and Assessment of Adult Patients With Obstructive Sleep Apnea. *Anesthesia and Analgesia*, 123(2), 452–473.
- American Association of Anesthesiologists. Practice guidelines for the perioperative management of patients with obstructive sleep apnea. *Anesthesiology*. 2014; 268-286

Algorithm 1 OSA Risk Assessment



Algorithm 2 OSA Diagnosis



Quality Measures

- Percent of patients having elective surgery who are screened for OSA in the Anesthesiology Preoperative Assessment or OPAC. Exclusions: emergent procedures; intubated patients; patients with a diagnosis of OSA
- Percent of patients who are identified as high risk for OSA or who have a diagnosis of OSA and who are being admitted, who receive postoperative continuous pulse oximetry and telemetry monitoring for 24 hours

Order Sets

- OSU IP ANE: Frequent PACU Orders [2097]
- Pre-op Note

Patient Education Materials

- [Obstructive Sleep Apnea \(OSA\)](#)
- [Care after Sedation If You Have Sleep Apnea](#)

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Disclaimer: *Clinical practice guidelines and algorithms at The Ohio State University Wexner Medical Center (OSUWMC) are standards that are intended to provide general guidance to clinicians. Patient choice and clinician judgment must remain central to the selection of diagnostic tests and therapy. OSUWMC's guidelines and algorithms are reviewed periodically for consistency with new evidence; however, new developments may not be represented.*