Sleep apnoea and elective surgery

What are the risks?

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Obstructive sleep apnoea (OSA) increases the risk of serious perioperative cardiorespiratory complications. Preoperative diagnosis and management of OSA will help to prevent adverse patient outcomes during the immediate postoperative period.

Key points

- **Undiagnosed OSA is extremely common in the elective surgery population.**
- **Untreated moderate to severe OSA increases the risk of serious postoperative cardiorespiratory complications.**
- **The STOP–Bang questionnaire can help identify patients who require further investigation for OSA.**
- **An overnight diagnostic sleep test should be arranged if the STOP–Bang score is 3 or higher.**
- **Over the perioperative period, treatment for OSA should be optimised and continue uninterrupted.**
- **Ensure that patients with OSA are reviewed by their sleep physician, and that both the surgeon and anaesthetist are aware of the diagnosis.**

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What is the risk of a patient having perioperative obstructive sleep apnoea?

The prevalence of obstructive sleep apnoea (OSA) is increasing at an astonishing rate and has reached epidemic proportions. The most recent estimates suggest a prevalence of moderate to severe OSA of up to 50% in men and 23% in women.[1] The prevalence of OSA in patients having elective surgery is substantially higher than in the general population, and is estimated to be between 50 and 90%. Unfortunately, between 80 and 90% of such patients are not diagnosed with OSA preoperatively.[2] Thus, the risk of having undiagnosed OSA prior to elective surgery, and therefore, perioperatively, is extraordinarily high.

Does this risk matter?

Having a high risk of perioperative OSA most certainly does matter. There are many large studies demonstrating that patients with moderate to severe OSA are at about double the risk of serious postoperative cardiorespiratory complications, including aspiration, pneumonia, cardiac arrhythmias (including atrial fibrillation), hypoxia and respiratory failure, re-intubation and transfer to the intensive care unit.[3] OSA clearly increases the clinical risk to the patient, and also has the potential to significantly increase the cost of care and length of hospital stay.

How can I identify which of my patients have OSA?

As almost 90% of patients with OSA who present for elective surgery will not have had their OSA diagnosed (nor even been suspected of having the diagnosis), the first and most important step is to think of the diagnosis preoperatively.

The clinical phenotype by which patients are most frequently identifed includes snoring, witnessed apnoeas, unrefreshing sleep and daytime sleepiness in an obese, middle-aged to elderly patient. It is worth noting that obesity is not a factor in up to 30% of adult cases. Other less common clinical phenotypes include retrognathia, micrognathia, enlarged tonsils and macroglossia due to multiple causes (e.g. hypothyroidism and acromegaly).

STOP–Bang questionnaire for OSA: questions asked

1. ***S***noring: Do you snore loudly (loud enough to be heard through closed doors)?
2. ***T***iredness: Do you often feel tired, fatigued or sleepy during the daytime?
3. ***O***bserved: Has anyone observed you stop breathing during your sleep?
4. Blood ***P***ressure: Do you have or are you being treated for high blood pressure?
5. ***B***MI: BMI more than 35 kg/m^2?
6. ***A***ge: Age over 50 years?
7. ***N***eck circumference: Neck circumference greater than 40 cm?
8. ***G***ender: Male?

However, the clinical phenotype is neither sensitive nor specific enough to make a diagnosis, and ultimately an overnight diagnostic sleep test is required to confirm the diagnosis. Clinical features are notoriously unreliable, even if the right questions are asked. Unfortunately, there is no blood test available to make a diagnosis of OSA, so patients with OSA are detected preoperatively with the help of simple screening algorithms.

What is a simple screening algorithm to identify a patient with OSA?

The STOP–Bang questionnaire (Snoring, Tiredness, Observed apnoeas, blood Pressure – BMI, Age, Neck circumference, Gender) is gaining widespread acceptance as a simple tool to use in preoperative clinics to identify patients with OSA; it is available online at www.stopbang.ca/osa/screening.php.[4] This questionnaire has been derived and validated in a Canadian surgical cohort, and is relatively simple to apply and use, comprising a list of eight Yes/No questions (Box).

A score of 3 or greater on the questionnaire has a high sensitivity of 93% for diagnosing moderate to severe OSA (an apnoea–hypopnoea index [AHI] of more than 15 events per hour) but a poorer specificity of only 43%. However, it is a reasonable method to rule out significant OSA in a proportion of the preoperative patient population.

What sleep investigations should GPs undertake in patients scheduled for elective surgery?

For patients already diagnosed with OSA, no further investigation is required. All other patients over 40 years of age should be administered the STOP–Bang questionnaire as far ahead of elective surgery as possible.

If the STOP–Bang score is below 3, the risk of the patient having OSA is low and no further investigation is required. If the STOP–Bang score is 3 or higher then an overnight diagnostic sleep test should be organised or the patient should be referred to a sleep physician for urgent assessment. Good quality home-based screening tests are acceptable for some patients unless they have other significant cardiac, respiratory or neurological comorbidities, in which case they should be referred for an in-laboratory sleep study. If the diagnostic sleep test confirms a diagnosis of moderate to severe OSA, the patient should be referred to a sleep physician for assessment regarding the need for further investigation and treatment before surgery. The GP should also forward a copy of the sleep study results to the surgeon and anaesthetist who will be undertaking the procedure. This approach is outlined in the flowchart.

What instructions should be given to a patient already diagnosed with OSA about OSA treatment during the perioperative period?

General advice about managing their sleep apnoea should be provided to all patients scheduled for elective surgery, including the need for weight loss, cessation of alcohol and sedatives, cessation of smoking and the management of nasal congestion.

For most elective surgery, the patient's OSA treatment will continue uninterrupted during the perioperative period, and this will result in the best clinical outcome.[5] Ensure that the patient's OSA is currently being treated and that they are coping well with treatment; if they are not being treated, are not compliant with treatment or are not responding to treatment, refer them to their sleep physician.

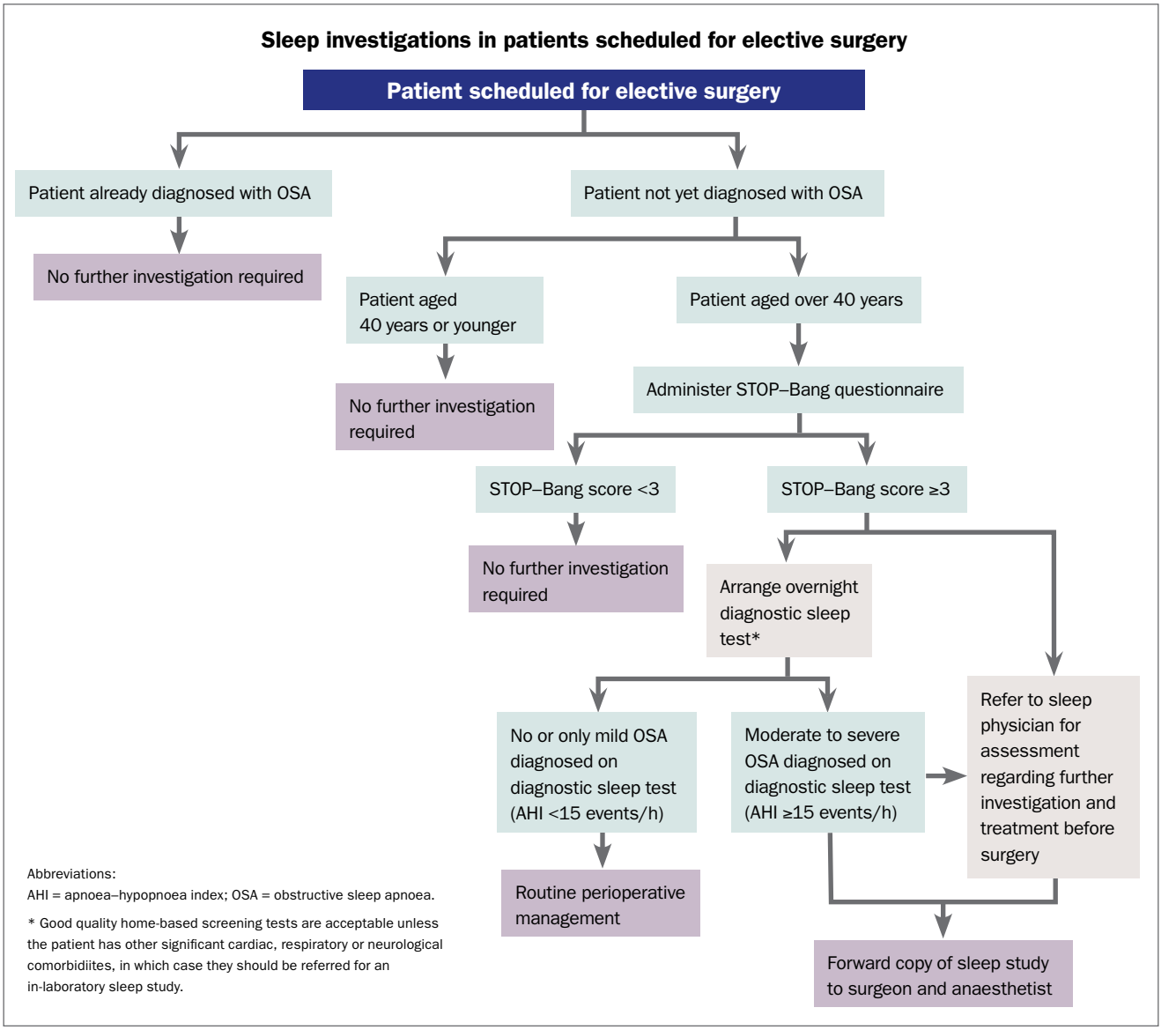
Patients using continuous positive airways pressure (CPAP) should be instructed to bring their own CPAP machine and all ancillary equipment with them to hospital, including their humidifier, tubing, mask and chin strap, as there is virtually no option to provide any of this equipment as part of the admission to any public or private hospital. If a patient is having any problems with their CPAP settings or equipment, they should be advised to contact their treating specialist and/or equipment provider for advice and review before hospital admission.

During admission, the patient should continue to use CPAP treatment as prescribed whenever they are sleeping.[5] The patient should remain responsible for the usage, application and appropriate fitting of their own CPAP equipment before sleep at all times while an inpatient, as they will be much more experienced with it than the nonsleep-specialist ward nursing or medical staff.

What about my patient who is newly diagnosed with moderate to severe OSA?

A sleep physician can determine the necessity for CPAP treatment in the perioperative period and make arrangements for this to be instituted if required. Often this is not practicable because of the short time period between diagnosis and surgery, so the earlier the sleep test is performed the better.

The risk of serious postoperative complications in a patient whose OSA is not treated in the perioperative period can be ameliorated by the judicious use of anaesthetic and analgesic agents coupled with more intensive postoperative monitoring in a high dependency or intensive care unit.[5] Thus, simply informing the anaesthetist and



the surgeon of the OSA diagnosis can go a long way to reducing the serious postoperative risks of untreated OSA.

Conclusion

Undiagnosed OSA is extremely common in the elective surgery population, and doubles the risks of serious cardiorespiratory complications. The STOP–Bang questionnaire is a simple screening test to help identify patients who have OSA and require further investigation. Management of patients with OSA with CPAP and careful monitoring in the postoperative period can reduce the risk of serious postoperative complications. RMT

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