Patients with sleep apnea or sleep-disordered breathing are more susceptible to anesthesia complications, including difficult intubation, respiratory arrest, and even death.

A new study finds about 5% of elective surgery patients have sleep-disordered breathing. At highest risk are men and those who are obese—a population that is rapidly increasing.

What is needed to manage sleep apnea patients safely? Is it safe for these patients to have outpatient surgery?

Though some researchers believe these patients are poor candidates for ambulatory procedures, other experts say sleep apnea patients can undergo outpatient surgery—but only if the procedure is relatively superficial, is performed early in the day, and the patient receives minimal or no opioids and sedation.

Nurses who assess patients preoperatively should know how to assess patients for sleep disorders. And all nurses who care for surgical patients should be aware of how the risks can be managed.

**Definition, prevalence, and risk factors**

Obstructive sleep apnea occurs when the soft tissues in the upper airway become constricted and close repeatedly during sleep. Apnea is clinically defined as lack of breathing for more than 10 seconds, and sleep apnea syndrome is defined as 30 or more episodes of apnea during 7 hours of sleep.

Sleep apnea is associated with loud snoring, sudden awakening with choking, and low oxygen levels in arterial blood. The bed partner may notice apneic episodes or restlessness during sleep. This sleep disturbance causes excessive daytime sleepiness. Long-term outcomes can include high blood pressure, cognitive problems, car accidents, and occupational injuries. Signs of sleep apnea are similar in adults and children.

Clinically significant sleep apnea may affect 1% to 4% of middle-aged people in the U S. Some 16 million cases remain undiagnosed. The magnitude of the problem was highlighted at the 2003 meeting of the American Society of Anesthesiologists in a study led by Piotr K. Janicki, MD, PhD, DSci, professor of anesthesiology at Hershey Medical Center, Penn State College of Medicine, Hershey, Pa. Among 16,000 elective surgery patients questioned preoperatively about sleep problems, he found 4.8% had sleep-disordered breathing.

The terms obstructive sleep apnea and sleep-disordered breathing are not really interchangeable. Obstructive sleep apnea is merely the most common type of sleep-disordered breathing. Sleep studies are required for a clinical diagnosis of sleep apnea.

**Risks of anesthesia**

Anesthesia, preoperative sedatives, and postoperative opioids reduce activity of the pharyngeal muscles. In patients who already experience airway closure during sleep, anesthesia may increase episodes of sleep apnea while preventing the defense mechanism of waking up to breathe. Intubation can also cause swelling and narrowing of the airway.

In Dr Janicki’s study, difficult airways, difficult intubation, and delayed extubation were significantly more common in patients with sleep-disordered breathing than in controls.

Opioids can cause significant complications. Ann Lofsky, MD, a board member of The Doctors Company (a malpractice insurer) and an anesthesiologist in private practice in Santa Monica, Calif, published a report of eight cases of postoperative brain damage or death. All patients had had general anesthesia followed by opioids for pain, and all were discovered to have obstructive sleep
Risks of ambulatory surgery

According to the American Sleep Apnea Association, ambulatory surgery is a particular concern because patients are sent home without extensive monitoring. Some researchers believe patients with sleep apnea are poor candidates for outpatient procedures.

In an interview with OR Manager, Dr Janicki said sleep apnea patients can undergo outpatient surgery “if the procedure is relatively superficial and minor.”

Denise O’Brien, MSN, RN, CPAN, CAPA, clinical nurse specialist in perianesthesia nursing at the University of Michigan Hospital, Ann Arbor, agrees. “If a patient had a procedure where they had a regional anesthetic, they had minimal to no opioid agents and minimal to no sedation, and it’s relatively early in the day, that’s probably a patient who could safely go home.” Of course, such decisions should be individualized.

Dr Lofsky told OR Manager that, in her experience, 90% of cases of respiratory arrest did not involve ambulatory patients but inpatients receiving opioids.

“Probably, patients who are in the hospital are getting higher doses and more frequent pain management than patients who are ambulatory, and, almost ironically, are more at risk from sleep apnea complications in the hospital than had they been at home.”

Reducing risk preoperatively

Strategies that can reduce patients’ risk include:
• asking patients about sleep-disordered breathing
• discussing other options for anesthesia (eg, regional anesthesia)
• performing sleep studies when indicated
• considering the facility’s capabilities
• flagging charts to warn about the risks of opioids
• asking patients to bring their CPAP (continuous positive airway pressure) device from home.

The anesthesiologist and nurse should ask about any sleep complaints, including snoring, awakening with gasping for breath, and daytime sleepiness, as well as previous experiences with anesthesia. Poor candidates for general anesthesia should have regional anesthesia if possible, although complications can still occur from opioids given in epidurals or spinals as part of regional anesthesia.

Sleep studies should be performed in severe cases but are expensive and time-consuming and are not usually available for surgical patients. “We cannot simply send everybody who is going for surgery and has snoring to the sleep lab,” Dr Janicki says.

Preoperative questions help identify patients with sleep-disordered breathing more quickly and less expensively than sleep studies. “My data clearly indicate that if you just go by superficial symptoms reported by the patient, you already have an increased chance for detecting trouble during anesthesia,” he says.

“The key is identifying these patients so you can plan appropriate care both pre- and postoperatively,” agrees O’Brien. Asking a few pointed questions can help identify the patient who may have obstructive sleep apnea.

Dr Lofsky advises that all morbidly obese patients be treated as if they have sleep apnea, but she warns that not all sleep apnea patients are obese. “Part of the danger is in patients who look completely normal who just have floppy airways that you really wouldn’t pick up unless you specifically asked them.”

Because most people with sleep apnea do not realize they have it, sleep partners should be interviewed also. Patients who already know or suspect they have sleep apnea should tell their anesthesia provider so he or she can be prepared to deal with any problems. The American Society of Anesthesiologists has a patient-education brochure on the subject (www.asahq.org/patientEducation/sleepApnea.pdf).

A facility should consider its capabilities when considering ambulatory sur-
surgery for patients with obstructive sleep apnea. Ask if the facility has the equipment and personnel to handle that type of patient, O’Brien suggests.

Facilities should flag the charts of sleep apnea patients to warn about the risks of prescribing opioids. Opioids should be avoided in outpatients.

**Postoperative management**

Patients with sleep apnea will benefit from:
- use of a CPAP device in the post-anesthesia care unit
- reduced or no opioids
- careful monitoring
- a low threshold for admitting ambulatory patients to the hospital
- admission to the ICU if necessary.

Controlling pain without risking respiratory depression is problematic in patients with sleep apnea. O’Brien advocates regional anesthesia as an alternative.

Monitoring should continue for at least a few hours until the effects of anesthesia and sedatives wear off. Patients receiving postoperative opioids should be monitored for oxygen saturation and respiratory status. Patients having ambulatory surgery should be admitted for overnight or longer observation if necessary.

Some monitoring techniques have drawbacks. In monitoring the respiratory rate, nurses may not distinguish between effective and ineffective respiratory effort, and sleep apnea patients may not even have slowed breathing. Supplemental oxygen may actually increase apnea because it eliminates hypoxia, which is believed to be the stimulus for breathing efforts in sleep apnea patients.

Some clinicians are critical of audible pulse oximetry because it may not be heard at the nurses’ station and gives many false alarms. Dr Lofsky comments, “It’s not the pulse oximeter that monitors the patient—it’s the person who’s watching the pulse oximeter.” Facilities can use “sitters,” lay people who are trained to watch monitors and get nursing assistance when an alarm goes off.

Observational or step-down units may be effective because nurse-to-patient ratios are higher than on med-surg units. But O’Brien notes, “Some step-down units are actually individual rooms, and you’re not going to gain unless you have some other central monitoring. If you have central monitoring, you need somebody to be monitoring the monitor.”

New telemetry and paging systems are excellent options, although somewhat expensive. ICU admission is needed in rare cases.

**Cost implications**

Identifying patients at risk is the best solution for patient safety and cost-effectiveness, Dr Janicki explains, “If you think about a lot of these procedures, the whole idea is to discharge the patient home quickly. If we don’t know which patients are at risk, then we are increasing the chances the patient will stay longer. So it makes economic sense to try to figure out who actually needs to be admitted or who needs to be monitored.”

He continues, “You cannot put everybody with sleep apnea in the intensive care unit, not even in the intermediate care unit, because the costs will be staggering.”

**Obesity means increase in sleep apnea**

With the explosion of obesity, sleep apnea problems will increase. Dr Janicki notes that problems with anesthesia are “exponentially increasing in the morbidly obese population, and this is not something that was seen 10 years ago.”

Aggressive pain management may be contributing. Dr Lofsky speculates that respiratory arrest in patients with sleep apnea is “probably one of the side effects, an unanticipated problem that we’re sort of unmasking.” Procedures are changing accordingly. Previously, “it was not substandard to send these patients to the ward unmonitored, because that’s what everybody did,” she says. Now the standard is slowly changing as awareness increases.

New devices may allow patients to diagnose sleep-disordered breathing at
home. These usually consist of a nasal cannula attached to a recorder. The device measures indices such as the frequency and loudness of snoring and oxygen saturation in the blood, and the disk is sent to the manufacturer for analysis. These simplified sleep studies may reduce the need for expensive laboratory testing.

**Need for further study**

Dr Janicki has observed “tremendous interest” in sleep apnea. “Everybody agrees further research is needed, and it’s absolutely critical for the safety of these patients.”

Current data on sleep apnea are controversial because of discrepancies in diagnostic criteria and types of procedures among studies. Because previous trials were retrospective, prospective studies with larger populations are needed, but it is difficult to secure funding.

More specific criteria are needed to identify patients with sleep-disordered breathing, in particular, the small percentage who may actually have complications during anesthesia. Dr Janicki hopes for a simplified test or simplified diagnostic criteria for this purpose.

Standard procedures for anesthesia and monitoring are also needed. O’Brien believes, “If it’s left up to the individual [clinician], it could be, ‘I had a bad experience, so therefore I’m always going to do this a certain way,’ or ‘I’ve never had a problem, so I don’t see it being an issue,’ and we have to get past that; we have to go with the evidence.”

How can we provide patients with the services they need in the safest way? The solution, she says, is using the evidence, bringing together the experts, building consensus, and establishing good protocols. ❖

—Laura J. Ninger, ELS

**Resources**


**Sleep apnea risk factors**

Patients at highest risk for sleep apnea are:

- middle-aged men
- obese patients, particularly those with a short, thick neck
- family history of sleep apnea
- those who smoke or use alcohol
- of Mexican, African-American, American Indian, or Pacific Islander ancestry.