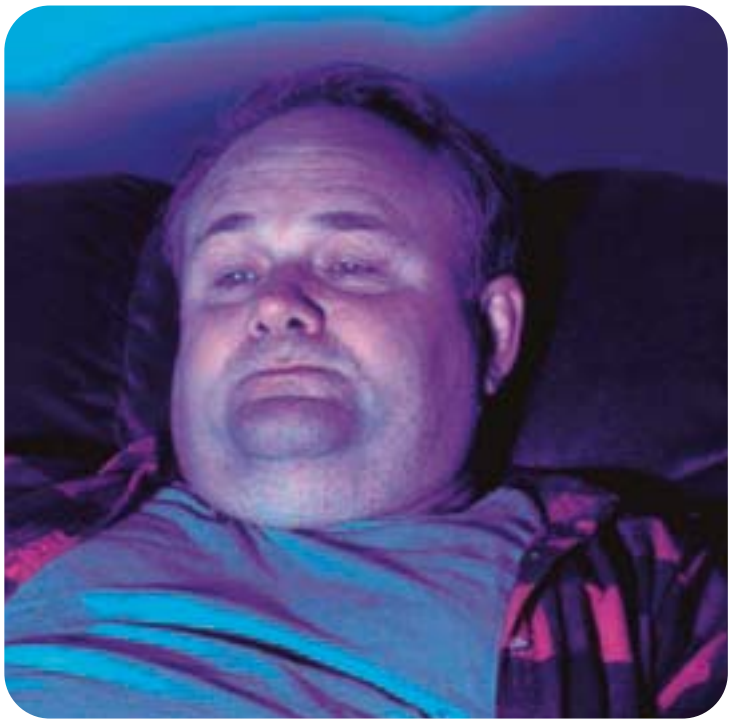
ROUND table
DIALOGUES IN MEDICAL MANAGEMENT

Sleep apnea

THIS MONTH'S INTERDISCIPLINARY PANEL DISCUSSES: • which patients to screen for sleep apnea • how it's diagnosed • choosing the right treatment approach



Parkhurst Exchange (**PE**): How serious is the problem of sleep apnea?

Dr. Kryger: It's a fairly significant health concern. Obstructive sleep apnea (OSA) is a disorder in which people repeatedly stop breathing while sleeping. The number of episodes can range from five to 100 or more per hour; we've observed that most of our patients stop breathing 30-40 times per hour. This leads to many complications, including drops in blood oxygen and increases in blood pressure during sleep and, in the daytime, a higher risk of hypertension and heart disease and severe sleepiness. It's also common: conservatively, 4% of men and 2% of women have OSA — and it can occur in any age group. The major risk factor for OSA is obesity; in most clinics, 70-80% of all new cases are significantly overweight. In people with a body mass index (BMI) of 30 or more, 20-30% turn out to have OSA, and roughly 50% of those with a BMI over 40 have the condition.

OSA is an underdiagnosed problem, with many family physicians not always appreciating that the condition can occur in women. In fact, women with OSA are often diagnosed with depression — it's often confounded by symptoms of daytime sleepiness.

Dr. Smyth: I agree that OSA is underdiagnosed. Many people presenting in doctors' offices with blood pressure problems, depression, headaches and other possible sequelae of OSA don't have a sleep history taken. This is really a missed opportunity, because up to a

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Richard R.J. Smyth, MB, FRCSC graduated in medicine in London, England, completed a fellowship in general surgery in England and South Africa, and trained in otolaryngology at the University of British Columbia. He is the Medical Director of the Sleep Surgery Centre in Coquitlam, BC, and performs otolaryngologic surgery at the Royal Columbian, St. Mary's and Eagle Ridge Hospitals in Vancouver.

Jonathan G. Howlett, MD, FRCPC completed his medical training at the University of Toronto and specialized in cardiology at Dalhousie University, where he is now an Associate Professor of Medicine. He performs invasive cardiology, attends at the Adult Congenital Heart Clinic, and is Medical Director of the Heart Function and Transplantation Clinic at the Queen Elizabeth II Health Sciences Centre in Halifax.

tenth of these might be attributable to OSA. If people with OSA aren't treated, they end up with greater morbidity and, ultimately, cost the healthcare system more money. Unfortunately, many treatments for OSA aren't covered by provincial plans, and access to sleep studies is often quite limited.

Dr. Howlett: Congestive heart failure (CHF) is a condition that's frequently associated with sleep apnea. Two types of sleep apnea are associated with CHF: obstructive (OSA) which can be either symptomatic or asymptomatic and nonobstructive/central. Between 40-60% of patients with advanced CHF have some form of sleep apnea — half have OSA and the other half have the central form. We now know that CHF patients with symptomatic OSA respond very well to continuous positive airway pressure (CPAP) therapy, so it's important to diagnose and treat this condition in these people.

PE How is OSA diagnosed?

Dr. Kryger: When seeing any patient who's very overweight, particularly with a BMI above 40, physicians should strongly suspect OSA. The most frequent symptom of this condition is excessive sleepiness. This finding, in combination with obesity and blood pressure that's high or difficult to control, are clues that a patient may have OSA. The next step should be to ask if the patient snores or has been observed to stop breathing during sleep. If the answer is "yes," the patient should then be referred to a sleep clinic or specialist. Overnight polysomnography, or a sleep study, is the gold standard of sleep apnea diagnosis. The Canadian Sleep Society website has a list of sleep centres in Canada (**www.css.to/sleep/centers.htm**).

Dr. Smyth: Family physicians should easily pick up OSA from a patient's history. Hypertension, cardiovascular events, heart failure, strokes, depression and even car accidents are red flags to prompt questions about how patients are sleeping. I'd especially encourage family physicians to make use of the Epworth sleepiness test (page 114) to screen patients; copies can be made available in the waiting room for patients to fill out on their own. Anyone who scores 7 or higher should be evaluated further for OSA. Another useful test is the Berlin questionnaire (page 114), but it's a little longer.

Next, it's worth examining the patient's nose and throat, particularly in younger people. In children under age 15, OSA is fairly common, affecting about 3% of school-age children and a higher percentage of preschoolers. It's almost invariably due to tonsil and/or adenoid enlargement, so it's relatively easy to correct surgically. A very plugged nose in a child may also be a contributing factor, although it's not usually a cause of apnea on its own.

Because waiting lists for sleep studies may be quite long (e.g. six to eight months in BC), physicians often have to rely on less-than-adequate diagnostic tests. In our clinic, most of our diagnoses are based on history, examination and home oximetry. We only send the more difficult cases for sleep studies.

Some companies that sell CPAP machines offer free oximetry to family physicians, which purport to "diagnose" OSA by detecting hypoxia. Unfortunately, reports are usually generated by a respiratory technician, not a physician who can knowledgeably interpret the oximetry data — consequently, the patient isn't fully investigated. I'm not in favour of this approach. Family physicians should send patients for a proper assessment by a respirologist, otolaryngologist or other sleep specialist.

Dr. Howlett: All patients with symptomatic CHF should be screened for sleep apnea. Asymptomatic OSA in CHF patients is much more difficult to diagnose and manage than symptomatic cases. Keep in mind that the symptoms of OSA can overlap with those of CHF

— for example, one of the most common symptoms found in both conditions is fatigue. The major difference is that most CHF patients with OSA don't report the characteristic daytime sleepiness. Ultimately, it's decided by a clinical judgement of the relative prominence of various symptoms. For example, in a patient with well-controlled CHF with symptoms of fatigue and daytime sleepiness, instead of shortness of breath or inability to lie flat, you might conclude that he/she has symptomatic OSA. On the other hand, a patient with severe shortness of breath and peripheral swelling who can't lie flat, and happens to be tired too, likely has decompensted CHF.

Nonobstructive or central sleep apnea (CSA) in CHF is extremely challenging to diagnose — it is usually asymptomatic with respect to sleep, or patients may have insomnia or even paroxysmal nocturnal dyspnea, and correlates with the severity of the CHF. Patients with CSA are usually not obese in contradistinction to OSA. We don't know what causes CSA in CHF patients, but it's thought that the minor alterations in normal breathing patterns that occur in CHF become more pronounced in severe cases. The only sure way to diagnose CSA is to demonstrate significant desaturation in a sleep study.

PE What are the treatment options for OSA?

Dr. Kryger: First-line treatments for OSA are CPAP and weight loss (for those who are overweight). It's important to initiate referral to a sleep specialist not only for diagnosis, but also because the right amount of pressure to use in CPAP therapy is determined during the sleep study. Among patients using CPAP, 80-90% do extremely well on this therapy — most of their complications disappear and their prognosis is excellent. Many patients have had symptoms for several years before diagnosis, but we don't know the implications yet of having had long-term untreated OSA prior to starting treatment. Those with hypertension and OSA will often need to have their dose of antihypertensives cut — we've even had some patients who've been able to go off medications completely.

Weight loss is often difficult to achieve in these patients, but can be highly effective in reversing the symptoms of OSA. We've had many cases of people losing all their excess weight and returning their CPAP machines to us.

Patients with OSA should avoid alcohol and any sedating medications — even antihistamines can make their snoring worse. Testosterone replacement therapy in men can also aggravate OSA; it's thought that it may change the tissues in the upper airway.

Dr. Smyth: As an otolaryngologist, my focus is on the airway assessment, using a flexible fibre-optic laryngoscope, to find out at what level the patient is obstructing. Choosing the right treatment depends on this examination. The obstruction is generally in one of the following areas:

- high up, in the nasopharynx
- at the back of the mouth, at the velopharyngeal or palatal level
- lower down, at the back of the tongue (retrolingually)

Most snorers or sleep apneics obstruct primarily at the velopharyngeal level. About 10-20% of cases, however, are primarily retrolingual and aren't good candidates for surgery. They need to be treated with CPAP or a mandibular advancement device. In rare cases, a tumour may be causing the problem – another reason why the upper airway assessment is important.

I'm skeptical of weight loss as a first-line treatment for OSA because these sleep-deprived patients simply don't have the energy to lose weight. Many people will grasp at this option because they want to lose weight anyway, but then they fail and remain untreated. Around 10% of obese patients are finally able to lose weight, however, once the OSA has been treated. Because they're sleeping better, they're more active — some even slim down enough that they're able to stop using CPAP or dental appliances. You

have to break the cycle of sleep deprivation, feeling terrible, not exercising, and putting on more weight.

Although CPAP is highly effective in people who can tolerate it, some patients won't use it (e.g. those suffering from claustrophobia due to the mask). With quieter machines, more comfortable masks and better air delivery systems available now, CPAP is probably acceptable to 80% of OSA patients.

Mandibular advancement devices, or dental appliances, work well in snorers and mild cases of OSA, particularly in those with a retrolingual obstruction (e.g. large lingual tonsil or retrognathic). By bringing the jaw forward, the splint also pulls the tongue forward and opens up the hypopharyngeal airway. Unfortunately, it's been shown that only 30% of people are still using their splints after two years. These devices can cause problems by moving the lower teeth and leading to temporomandibular joint pain. Another disadvantage is that they're quite expensive, have to be replaced every few years, and often aren't covered by healthcare plans.

I don't advocate surgery for more than 30% of my patients, since we know that CPAP is the most effective therapy, and even those who can't tolerate it may still not benefit from surgery if they're primarily retrolingual obstructers. Surgery is generally reserved for patients who can't tolerate CPAP and who have a palatal obstruction.

The main operation done today for OSA is uvulopharyngopalatoplasty (UPPP), which involves removing the tonsils (if present), lateral pharyngeal mucosa on each side, the uvula and adjacent soft palate, with suture closure of the mucosa. The overall cure rates for UPPP, where patients end up scoring in the normal range on a sleep study, are about 75-80% for mild, 65% for moderate, and 50% for severe OSA. Patients have to be told that they may still need to use CPAP, but at a more comfortable pressure, or wear a dental appliance after their surgery.

Other surgeries include mandibular osteotomy, genioglossal advancement with hyoid suspension, and laser midline glossectomy. These procedures are mainly indicated for patients with retrolingual obstruction, but aren't used often since they're associated with significant morbidity. If these patients can't use CPAP, UPPP usually assists them. If they still can't use CPAP after the surgery, then a mandibular advancement splint will probably do the trick. Adenotonsillectomy is often used in children with OSA due to enlarged adenoids and/or tonsils. Finally, tracheostomy used to be done quite readily in the past, and we still perform it occasionally in extremely obese patients.

Dr. Howlett: CHF patients with symptomatic OSA should definitely be treated. We recommend a multilateral approach that includes optimization of CHF treatment, weight loss (if appropriate) and CPAP. For those with CHF and asymptomatic OSA, however, it's still controversial whether these patients should be offered CPAP although one study showed substantial improvement in ejection fractions with this therapy. Consequently, when I come across patients with CHF and asymptomatic sleep apnea, it's my practice to consider them for the ongoing Canadian CPAP Trial for CHF Patients with CSA (CANPAP) or treatment, in collaboration with a respirologist.

We don't know whether CHF patients with CSA should be treated or not, and with what. Anecdotally, I've seen many cases of CSA where improving their CHF, particularly with newer, more effective medications such as beta-blockers, leads to less snoring and periodic breathing, and patients feel more refreshed in the morning. Oxygen by nasal prongs has been shown to improve the breathing pattern in such patients but there are no long-term outcome studies. It's been shown that CPAP can improve ejection fractions, but there aren't adequate endpoint data yet to show that it can keep patients out of hospital longer or extend lifespans. The CANPAP trial will hopefully answer these questions.

QUESTIONNAIRE 1: Epworth Sleepiness Screening Test

How likely are you to actually doze off or fall asleep — not just feel tired — in the following situations?

This refers to your usual way of life in recent times. Even if you haven't done some of these things recently, try to work out how they would have affected you.

Use the following scale to choose the most appropriate number for each situation:

0 = never
1 = slight chance
2 = moderate chance
3 = high chance

If your score is 7 or higher, you may have sleep apnea and should talk about it with your doctor.

Situation	Chance of dozing			
1. Sitting and reading	0	1	2	3
2. Watching TV	0	1	2	3
3. Sitting still in a public place (e.g. theatre or meeting)	0	1	2	3
4. As a passenger in a car for an hour, without a break	0	1	2	3
5. Lying down to rest in the afternoon	0	1	2	3
6. Sitting and talking to someone	0	1	2	3
7. Sitting quietly after a lunch without alcohol	0	1	2	3
8. In a car while stopped for a few minutes in traffic	0	1	2	3
Total score:				

Adapted from: Johns MW. *Sleep* 1991;14:540-5.

QUESTIONNAIRE 2: Berlin questionnaire for sleep evaluation

name:_____ address:_____

height:____ age:____ weight:____ gender:____ _____

Category 1

1. Do you snore?

☐ yes ☐ no ☐ don't know

If yes:

2. How loud is your snoring?

☐ slightly louder than breathing
☐ as loud as talking
☐ louder than talking
☐ very loud – can be heard in the next room

3. How often do you snore?

☐ almost every day ☐ 3-4 times per week
☐ 1-2 times per week ☐ 1-2 times per month
☐ never or almost never

4. Does your snoring bother other people?

☐ yes ☐ no

5. How often has someone else noticed that you stop breathing during sleep?

☐ almost every day ☐ 3-4 times per week
☐ 1-2 times per week ☐ 1-2 times per month
☐ never or almost never

Category 2

6. How often are you tired after sleeping?

☐ almost every day ☐ 3-4 times per week
☐ 1-2 times per week ☐ 1-2 times per month
☐ never or almost never

7. When you're awake, how often are you tired?

☐ almost every day ☐ 3-4 times per week
☐ 1-2 times per week ☐ 1-2 times per month
☐ never or almost never

8. Have you ever nodded off or fallen asleep while driving?

☐ yes ☐ no

Category 3

9. Do you have high blood pressure?

☐ yes ☐ no ☐ don't know

BMI = _____

Scoring:

Any answer within a box outline is a positive response

- Category 1 (questions 1-5) is positive with 2 or more positive responses
- Category 2 (questions 6-8) is positive with 2 or more positive responses
- Category 3 (question 9) is positive with 1 positive response and/or BMI > 30

Final result: 2 or more positive categories indicates a high likelihood of sleep-disordered breathing

Adapted from: Netzer NC et al. *Ann Intern Med* 1999;131:485-91.