



Management of Chemotherapy-induced Neuropathy

1.

What is the best management for chemotherapy induced neuropathy?

Question submitted by:
Dr. George Linn
Kingston, Ontario

Chemotherapy-induced peripheral neuropathy (CIPN) refers to a primarily sensory neuropathy consisting of paresthesias and pain, which may arise from the use of various chemotherapeutic agents. Although symptoms may improve following completion of chemotherapy, they may also become chronic, permanent, and, occasionally, debilitating. Commonly used agents associated with CIPN include the platinum (e.g., cisplatin, carboplatin, oxaliplatin) and taxane (e.g., docetaxel, paclitaxel) classes of medication. Unfortunately, there is currently a paucity of evidence on effective therapies for the management of CIPN.¹ Venlafaxine has had some reported success in a recent randomized, double-blind, placebo-controlled trial in the setting of oxaliplatin use and decreased acute and chronic neurotoxic effects.² The Northern Central Cancer Treatment Group (NCCTG) N06CA trial, a double-blind, placebo-controlled trial, also reported some benefit with a topical treatment consisting of topical baclofen (10 mg) plus ketamine (40 mg) and amitriptyline (20 mg) in a pluronic-lecithin organogel (BAK-PLO) for the treatment of CIPN.³ Other agents, including gabapentin, pregabalin, duloxetine, α -lipoic acid, and acetyl-L-carnitine, as well as Scrambler therapy and acupuncture have been tried, but the degree of benefit, if any, is uncertain. Clinical trials are currently in progress for a number of these agents, and results are awaited with interest.

References

1. Pachman DR, Barton DL, Swetz KM, *et al*: Troublesome Symptoms in Cancer Survivors: Fatigue, Insomnia, Neuropathy, and Pain. *J Clin Oncol* 2012; 30(30):3687–3696.
2. Durand JP, Deplanque G, Montheil V, *et al*: Efficacy of Venlafaxine for the Prevention and Relief of Oxaliplatin-induced Acute Neurotoxicity: Results of EFOF, A Randomized, Double-blind, Placebo-controlled Phase III Trial. *Ann Oncol* 2012; 23(1):200–205.
3. Barton DL, Wos EJ, Qin R, *et al*: A Double-blind, Placebo-controlled Trial of a Topical Treatment for Chemotherapy-induced Peripheral Neuropathy: NCCTG Trial N06CA. *Support Care Cancer* 2011; 19(6):833–841.

Answered by:
Dr. Roger Y. Tsang



Testing for STIs During a Pap Visit

2.

When doing an annual/biannual Pap, is there a role for a routine vaginal chlamydia swab?

Question submitted by:
Dr. Laura McConnell
Mississauga, Ontario

The annual/biannual Pap visit is meant as a well-woman screening evaluation. In the past, women were offered Pap smears annually, but most national and provincial organizations have recently increased the age of first screen to the 20s and have extended the intervals to two and three years in women with normal screening histories. Women most at risk of being infected with chlamydia are adolescents and younger women who are exploring their sexuality, especially those with multiple sexual partners. As the Pap test is now not necessarily part of the annual-well woman gynecologic health visit for these women, other practices, such as sexual health counselling and swabs for chlamydia or bacterial sexually transmitted infections (STIs) will take on a more central purpose for the health visit. Given the detrimental effects of pelvic infections from chlamydia and gonorrhea on fertility, a vaginal swab for chlamydia and gonorrhea should be considered in any young woman who is sexually active in an environment of changing partners. Furthermore, older women, including seniors in new relationships, should also be offered a vaginal swab, as they too can become infected and spread STIs without any symptoms.

Answered by:
Dr. Cathy Popadiuk

Bronchoscopy for Patients with Hemoptysis

3.

Should every patient with hemoptysis undergo bronchoscopy?

Question submitted by:
Dr. David Hawkins
Kelowna, British Columbia

The simple answer is no. When a patient is known to have a condition that may be associated with hemoptysis, such as bronchiectasis or a bronchial cancer, a bronchoscopy is generally not required. In most other circumstances, bronchoscopy should be considered in a patient with hemoptysis. The investigation of hemoptysis usually includes CT of the chest. It is a matter of judgment whether the bronchoscopy or the chest CT should be the initial investigation.

Answered by:
Dr. Robert Cowie

4.

Warfarin for Atrial Fibrillation

Is there an alternative to warfarin for treating patients with atrial fibrillation?

Question submitted by:

Dr. James Brown
Prince Albert, Saskatchewan

Atrial fibrillation (AF) is the most common cardiac arrhythmia, with an overall prevalence of 5.5% that increases up to 17.8% in individuals over 85-years-of-age. AF is a major risk factor for stroke. Warfarin is highly effective for the prevention of stroke in patients with AF, resulting in a 64% risk reduction compared with placebo and a 37% risk reduction compared with antiplatelet therapy. However, warfarin has significant limitations, particularly an unpredictable anticoagulant response and numerous food and drug interactions, which necessitates regular laboratory monitoring.

Over the last several years, novel oral anticoagulant drugs (NOACs), including direct thrombin inhibitors and factor Xa inhibitors, have been developed. Dabigatran, rivaroxaban, and apixaban are currently available for use in Canada. These agents have fewer food and drug interactions and a more predictable anticoagulant effect, thus allowing fixed dosing without the need for laboratory monitoring. A recent meta-analysis of NOACs reported reduced overall CV mortality, stroke and systemic embolism, major bleeding, and intracranial bleeding in comparison with warfarin.

The limitations of NOACs include higher cost, inability to monitor or easily reverse their effects, lack of data for concomitant use with ASA and newer antiplatelet agents, and safety concerns in patients with significant renal dysfunction.

For the complete Canadian Cardiovascular Society Atrial Fibrillation Guidelines, at www.ccs guidelineprograms.ca is an excellent resource.

References

1. Dentali F, Riva N, Crowther M, et al: Efficacy and Safety of the Novel Oral Anticoagulants in Atrial Fibrillation: A Systematic Review and Meta-Analysis of the Literature. *Circulation*. 2012; 126(20):2381–2391.
2. Camm AJ, Kirchhof P, Lip GY, et al: Guidelines for the Management of Atrial Fibrillation: The Task Force for the Management of Atrial Fibrillation of the European Society of Cardiology (ESC). *Eur Heart J* 2010; 31(19):2369–2429.

Answered by:

Dr. Brett Heilbron



Post-Lyme Syndrome with Motor Sensory Neuropathy

5.

What are the treatment options for post-Lyme syndrome with motor sensory neuropathy?

Question submitted by:

Dr. H. Zacharias
Morden, Manitoba

After several weeks or months without treatment, about 15% of patients with the North American form of Lyme disease may develop a neurological syndrome with signs of meningitis, encephalitis, cranial neuritis (especially Bell's palsy), motor and sensory radiculitis, mononeuritis multiplex, ataxia, or myelitis, in various combinations. Meningitis is associated with cerebrospinal fluid (CSF) pleocytosis, and peripheral symptoms are related to axonal nerve damage which can be observed on electromyography (EMG) and histology. Symptoms may resolve after weeks to months, recur, or become chronic. Chronic axonal polyneuropathy presents primarily with spinal radicular pain or distal paresthesias, with the EMG often showing a more diffuse process than suggested by the symptoms. Standard recommended treatment is ceftriaxone, 2 g IV q.d. for 14 to 28 days or penicillin G 20 million U IV in four divided doses daily for 14 to 28 days. Oral doxycycline has also been used, although some feel it is less effective. Acute neurological signs and symptoms usually respond over weeks, but chronic symptoms may take months to resolve. Objective evidence of relapse after a four-week course of therapy is rare.

Answered by:

Dr. Michael Libman

Any Specific Treatment Available for PLS?

6.

Is treatment available for primary lateral sclerosis?

Question submitted by:

Dr. Claude Gravel
Magog, Québec

There is no specific treatment that prevents progression of primary lateral sclerosis (PLS). However, symptomatic treatment, such as treatment of spasticity and weakness with medication and physiotherapy and/or assistive devices, is recommended.

Answered by:

Dr. Sarah A. Morrow



7.

What is mesenteric fibromatosis? What is the prognosis?

Question submitted by:

Dr. John Chan

Abbotsford, British Columbia

Mesenteric Fibromatosis and its Prognosis

Mesenteric fibromatosis, also referred to as intra-abdominal fibromatosis or a desmoid tumour, is a rare, benign fibroproliferative disorder without metastatic potential.¹⁻⁴ The small bowel mesentery is the most commonly affected site, particularly arising from the ileal region. These tumours tend to be locally aggressive, with bowel involvement. The average age at presentation is in the third and fourth decades of life (range, 14 to 75 years), and may affect either males or females.

Although most cases are sporadic, there is an increased risk of developing mesenteric fibromatosis in patients with FAP familial adenomatous polyposis, in particular the Gardner syndrome variant, especially those with a history of previous abdominal surgery. Patients may have a history of previous trauma. They may be asymptomatic or present with symptoms and signs related to an abdominal mass with small bowel involvement, such as abdominal pain, abdominal fullness, early satiety, nausea/vomiting, gastrointestinal bleeding, small bowel obstruction, fistula formation or bowel perforation, and/or a palpable abdominal mass on physical examination. Weight loss and fever may also be present. Abdominal imaging using CT and/or MRI typically identifies a well-circumscribed, soft-tissue, attenuated mass, with or without mass effect and small bowel displacement. It is usually well-defined and non-contrast enhancing, but ill-defined borders and/or variable contrast enhancement or signal intensity are also seen.

Pathological examination with light microscopy and immunohistochemistry is critical to differentiate mesenteric fibromatosis from malignant processes, such as gastrointestinal stromal tumour, soft-tissue sarcoma (e.g., liposarcoma, fibrosarcoma, leiomyosarcoma, undifferentiated pleomorphic high-grade sarcoma, or malignant fibrous histiocytoma), lymphoma, or metastases from another primary site. Although wide surgical resection is used as a first-line treatment in most cases of mesenteric fibromatosis, a multi-disciplinary approach is recommended.⁴ **Due to the rarity of this condition, overall prognosis is uncertain. Although mesenteric fibromatosis is considered relatively benign, a variable clinical course has been described.¹⁻⁵ Despite surgical excision, recurrences are not uncommon.**

References

1. Levy AD, Rimola J, Mehrotra AK, et al: From the Archives of the AFIP: Benign Fibrous Tumors and Tumorlike Lesions of the Mesentery: Radiologic-pathologic Correlation. *Radiographics* 2006; 26(1):245-264.
2. Luk SY, Fung KH, Fung SH: Mesenteric Fibromatosis: An Uncommon Cause of Abdominal Pain. *J Hong Kong Col Radiol* 2010; 13:218-221.
3. Gari MKM, Guraya SY, Hussein AM, et al: Giant Mesenteric Fibromatosis: Report of a Case and Review of the Literature. *World J Gastrointest Surg* 2012; 4(3):79-82.
4. Kasper B, Strobel P, Hohenberger P: Desmoid Tumours: Clinical Features and Treatment Options for Advanced Disease. *Oncologist* 2011; 16(5):682-693.
5. Koh PK, Loi C, Cao X, et al: Mesenteric Desmoid Tumours in Singapore Familial Adenomatous Polyposis Patients: Clinical Course and Genetic Profile in a Predominantly Chinese Population. *Dis Colon Rectum* 2007; 50(1):75-82.

Answered by:

Dr. Roger Y. Tsang

8.

Pseudofolliculitis Barbae Treatment

How do you treat pseudofolliculitis barbae?

Question submitted by:

Dr. J.R. Gray
Vancouver, British Columbia

Pseudofolliculitis is a common, vexing condition where growing hair tends to curl back into the skin or through the follicle wall and enter the skin, causing irritation and nodule or cyst formation. This is usually seen in the beard area of men. The most effective relief is gained by letting the hair grow out. If a facial beard isn't desired, methods of hair removal with lasers can be somewhat effective. Topical remedies, such as steroids and oral and topical antibiotics, can help battle the inflammation.

There is a range of specialized products, including razors and balms, available in the market, but there is nothing that predominates as universally helpful.

Answered by:

Dr. Scott Murray

9.

Fallopian Tube Removal

Please comment on Fallopian tube removal for the prevention of ovarian cancer.

Question submitted by:

Dr. J. Mitchell
Brampton, Ontario

The hypothesis that epithelial ovarian cancer may start from the Fallopian tube has arisen from research on prophylactic salpingo-oophorectomy specimens in women at high risk for ovarian cancer, such as *BRCA1/2* carriers. When the Fallopian tubes from these patients were carefully reviewed, several cases of small, invasive, serous carcinoma or *in situ* disease were identified, often at the fimbriated end of the Fallopian tube, adjacent to an unaffected ovary. It has, thus, been hypothesized that ovarian cancer may start from the Fallopian tube and not the ovary itself, as previously thought. Whether this is the case in sporadic ovarian cancer has yet to be confirmed, but some research groups suggest it to be based on further pathologic observation. In the interim, as the evidence evolves, a number of gynecologic cancer specialists are advocating removal of the Fallopian tubes at the time of oophorectomy and/or hysterectomy for any indication.

Answered by:

Dr. Cathy Popadiuk



10.

Treatment Options for Breast Lumps

How should one address benign breast lumps? Please discuss treatment options, including conservative vs. non conservative options.

Question submitted by:

Dr. M. D'Souza

Winnipeg, Manitoba

Benign breast lumps include cysts and solid lesions, such as fibroadenomas. Before considering treatment options (from conservative observation to surgical excision), one must:

1. Confirm the lesion is benign,
2. Determine what, if any, malignant potential there is for the patient through a thorough personal and family history, and
3. Consider patient preference and compliance in the management plan.

Once it is determined that the “lump” is benign, treatment depends on symptom relief and patient education. Some benign processes, such as proliferative lesions, are associated with an increased risk of breast cancer, not necessarily at that site, but throughout both breasts. Counselling regarding continued screening and preventive health strategies helps to educate patients and may minimize risk and promote dialogue.

Once a cystic lesion is confirmed as benign on imaging ultrasound and mammography, aspiration can be done for symptom relief and diagnostic confirmation. Bloody cyst fluid or suspicious lesions on imaging merit cyst removal, as do cysts that potentially obstruct adjacent breast tissue, thus affecting future examination and mammography interpretation. Patients with recurrent cysts can also be offered cyst removal when repeat aspirations become taxing.

Women who have solid masses that are benign on biopsy and are not excised should be followed initially to assure stability of the lesion, since biopsies can occasionally have false negative results for cancer. Lesions 2 cm in diameter or larger can be referred for excision if they cause discomfort or are generally worrisome for the patient. Smaller fibroadenomas can be left alone without any ill effects, but, again, management depends on patient preference. Surgical excision is a definitive treatment for benign lesions, but it must be tempered with the morbidity of possible scarring and dimpling, damage to the duct system, and mammographic changes. More recently, ultrasound-guided percutaneous excision with cryoablation has been found to be an alternative to surgical excision with arguably less morbidity and cosmetic impact, but it is not available in most Canadian centres, where simple excision can be done expediently without excessive morbidity.

Answered by:

**Dr. Cathy Popadiuk and
Dr. Mary Wells**



Opioid Induced Constipation

11.

What is the best laxative for opioid-induced constipation?

Question submitted by:
Dr. Darren Cargill
Windsor, Ontario

The foundation of the management of opioid-induced constipation includes appropriate prescription of opioids at the lowest dosages required for adequate analgesia, as well as the use of non-opioid analgesics (*e.g.* NSAIDs, neuroleptic agents) where indicated in patients that have had compatible structural colonic and anorectal dysfunction excluded. Basic lifestyle modifications, including optimized fibre intake (in patients who are fibre deficient), fluid, and activity levels, in combination with the incorporation of osmotic laxatives (*e.g.*, polyethylene glycol), titrated to clinical effect, may be effective for refractory symptoms.¹ The selective 5-HT₄ agonist and prokinetic agent-prucalopride has also been demonstrated to significantly improve spontaneous, complete bowel habit frequency as well as patient-rated severity of constipation and effectiveness of treatment, when compared to placebo in patients with chronic non-cancer pain suffering from opioid-induced constipation, and can be considered for more severe cases.² Methylnaltrexone, a peripherally-acting μ -opioid antagonist that increases oral-cecal transit in patients with opioid-induced constipation without reversing opioid analgesic effects or inducing symptoms of opioid withdrawal, has been recently approved in Canada for the treatment of opioid bowel dysfunction in palliative patients refractory to conventional laxative therapy.^{3,4}

References

1. Liu LW: Chronic Constipation: Current Treatment Options. *Can J Gastroenterol* 2011; 25 (Suppl B):22B–28B.
2. Sloots CE, Rykx A, Cools M, *et al*: Efficacy and Safety of Prucalopride in Patients with Chronic Noncancer Pain Suffering from Opioid-induced Constipation. *Dig Dis Sci* 2010; 55(10):2912–2921.
3. Thomas J, Karver S, Cooney GA, *et al*: Methylnaltrexone for Opioid-induced Constipation in Advanced Illness. *NEJM* 2008; 358(22): 2332–2343.
4. Garnock-Jones KP, McKeage K: Methylnaltrexone. *Drugs* 2010; 70(7):919–928.

Answered by:

Dr. Theodore Xenodemetropoulos

12.

When to Use Benzodiazepines for Panic Attacks

When are benzodiazepines indicated for the treatment of panic attacks?

Question submitted by:
Dr. Trevor Campbell
Calgary, Alberta

There are a number of benzodiazepines that are used in psychiatry, and each of them has its own unique niche, based on the side effect and half-life profile of the medication. The benzodiazepines may be broken into four classes based on a mix of onset of action and half-life: ultra-short-acting, short-acting, intermediate-acting, and long-acting.

The clinician then needs to address the severity and impact of the patient's anxiety. For example, is it trigger based? How long does it last? What nonmedication interventions have helped? How many events does the patient have per day or per week? How much do the panic attacks impact the patient's functionality and quality of life?

A good patient and medication history may help determine the root cause of the panic attacks. Could it result from stimulants, narcotics, or rebound effects? Could it be due to problems with sleep, caffeine, or illicit substances? Often, though, panic attacks have a root epidemiology in stress, anxiety, anticipatory events, or phobic avoidance. Several forms of psychotherapy, including gentle immersion therapies, and cognitive behavioural or dialectical behavioural therapies, may aid the patient.

In the interim, [the best two benzodiazepines that we use to control panic attacks are lorazepam and clonazepam](#). My personal preference for patients would be clonazepam, as it blends a quicker onset of action with a longer half-life, which is beneficial for patients with repetitive attacks that impact quality of life and functionality. In rarer phobic situations, such as claustrophobia, secondary to a needed medical intervention (e.g., MRI), a dose of lorazepam 0.5 to 2 mg, 45 minutes to one hour before the procedure is indicated.

Addressing the root cause may help steer the clinician towards verbal psychotherapy interventions and possibly necessitate the use of antidepressant or even low-dose augmentation using agents like quetiapine.

Answered by:
Dr. Joel Lamoure



Decreased TSH in a Patient with Graves' Disease

13.

Which tests should one routinely order to differentiate between Graves' disease and other causes of a decreased thyroid-stimulating hormone?

Question submitted by:
Dr. Nafsia Aptekar
Brampton, Ontario

A decreased thyroid-stimulating hormone in a patient not on levothyroxine is usually suggestive of hyperthyroidism. There are many causes of hyperthyroidism, Graves' disease being the most common. Other causes include thyrotoxicosis associated with thyroiditis and hyperthyroidism occurring in patients with either a solitary, autonomously functioning thyroid nodule or a toxic multinodular goiter. Generally, the best test is to obtain a radioactive iodine uptake and scan, which usually differentiate between the various causes of hyperthyroidism. Patients with Graves' disease have a diffusely elevated uptake; patients with thyroiditis have a reduced uptake; and patients with autonomously functioning nodules have a localized area of increased uptake with suppression of the remainder of the gland. Measurement of thyroid antibodies also aids in the diagnosis. An elevated thyroid stimulating immunoglobulin is suggestive of Graves' disease, whereas elevated antithyroid globulin and antithyroid peroxidase antibody can be seen in patients with thyroiditis.

Answered by:
Dr. Hasnain Khandwala

Controlling Supraventricular Tachycardias

14.

When do you choose intravenous verapamil vs. diltiazem for controlling supraventricular tachycardias (SVT)?

Question submitted by:
Dr. Elisabeth Lewke-Bogle
Milk River, Alberta

Both intravenous verapamil and intravenous diltiazem are equally effective for converting supraventricular tachycardias (except atrial fibrillation and atrial flutter). Intravenous infusions of these drugs may also help to control the ventricular rate response to atrial fibrillation and flutter when the diagnosis is confirmed. A review of the literature reveals that intravenous verapamil has a more negative effect on myocardial contractility than does intravenous diltiazem. It also results in a more hypotensive response. Accordingly, I would avoid intravenous verapamil when a drop in blood pressure is of concern, and when there is known congestive heart failure or significant left ventricular systolic dysfunction. I would use both drugs with extreme caution in the elderly who may have an underlying sick sinus syndrome in whom converting SVT in this way may result in asystole.

Answered by:
Dr. Wayne Warnica

15.

Investigating Occult Coronary Artery Disease

What are the current recommendations for investigating occult coronary artery disease in patients with erectile dysfunction?

Question submitted by:
Dr. B.L. Chandrarajan
Kingston, Ontario

The mechanisms of both endothelial function and erectile function are linked by the vasodilatory action of nitric oxide. Not surprisingly, erectile dysfunction (ED) and endothelial dysfunction go hand-in-hand, and where one is present, the other is sure to follow. With the advent of noninvasive testing, such as coronary artery calcium scoring, it has been shown that the atherosclerotic disease burden is also greater in patients with ED.¹ As such, ED has been recognized as an independent risk marker for the development of CVD.² In fact, incident ED has a similar, or even greater, predictive value for CV events when compared to traditional risk factors like smoking, hyperlipidemia, and a family history of premature coronary artery disease.³ For example, in the Olmsted County Study, men 40- to 49-years-of-age with ED had a remarkable 50-fold higher incidence of new incident coronary artery disease than those without ED.⁴ Therefore, physicians need to inquire about ED symptoms in all men over 30-years-of-age, especially if other CV risk factors are present. Identification of ED, particularly in men < 60-years-old and those with diabetes, represents an important first step toward CVD risk detection and reduction. Furthermore, each patient with ED needs to be screened for dyslipidemia and glucose intolerance and be considered for aggressive risk factor intervention, with a LDL cholesterol goal of < 2.0 mmol/L.⁵ As well, risk stratification with exercise stress testing has been shown to be of value in helping to uncover occult occlusive coronary artery disease in patients with ED.⁶

References

1. Yaman O, Gulpinar O, Hasan T, *et al*: Erectile Dysfunction May Predict Coronary Artery Disease: Relationship Between Coronary Artery Calcium Scoring and Erectile Dysfunction Severity. *Int Urol Nephrol* 2008; 40(1):117–123.
2. Miner M, Seftel AD, Nehra A, *et al*: Prognostic Utility of Erectile Dysfunction for Cardiovascular Disease in Younger Men and Those with Diabetes. *Am Heart J* 2012; 164(1):21–28.
3. Feldman HA, Johannes CB, Derby CA, *et al*: Erectile Dysfunction and Coronary Risk Factors: Prospective Results from the Massachusetts Male Aging Study. *Preventive Medicine* 2000; 30(4):328–338.
4. Burke JP, Jacobson DJ, McGree ME, *et al*: Diabetes and Sexual Dysfunction: Results From the Olmsted County Study of Urinary Symptoms and Health Status Among Men. *J Urol* 2007; 177(4):1438–1442.
5. Genest J, McPherson R, Frohlich J, *et al*: 2009 Canadian Cardiovascular Society/Canadian Guidelines for the Diagnosis and Treatment of Dyslipidemia and Prevention of Cardiovascular Disease in the Adult — 2009 Recommendations. *Can J Cardiol* 2009; 25(10):567–579.
6. Solomon H, Man J, Martin E, *et al*: Role of Exercise Treadmill Testing in the Management of Erectile Dysfunction: A Joint Cardiovascular/Erectile Dysfunction Clinic. *Heart* 2003; 89(6):671–672.

Answered by:

Dr. Theodore Fenske



How to Diagnose Sleep Apnea

16.

How is sleep apnea diagnosed?

Question submitted by:

Dr. Stephane Darveau, Tracadie-Sheila, New Brunswick

Sleep disordered breathing, including obstructive sleep apnea, is usually suspected when a patient complains of daytime drowsiness and when a sleeping partner has observed periods of apnea. The daytime drowsiness may be critical, and it can be responsible for motor vehicle accidents and accidents in the workplace when machinery is involved.

The diagnosis of sleep apnea requires a sleep study. The simplest of studies can be done in the patient's home and relies on the characteristic drop in oxygen saturation that is associated with apnea. The equipment may be available from private companies or at sleep centres and will often be able to characterize the type of apnea — central or obstructive — and determine the number of apneic episodes per hour. When the disorder is severe or complex, and when it is associated with hypoventilation (elevated serum bicarbonate or an elevated arterial CO₂ tension), it is recommended that a full sleep study (polysomnogram) be conducted in a sleep centre.

Answered by:

Dr. Robert Cowie