

A Pan-Canadian practice guideline: prevention, screening, assessment, and treatment of sleep disturbances in adults with cancer

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Abstract

Purpose This study aims to provide recommendations on the optimal strategies and interventions for the prevention,

screening, assessment, and management of cancer-related sleep disturbance (insomnia and insomnia syndrome) in adult cancer populations.

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Methods A systematic search of the published health literature was conducted to identify randomized controlled trials, clinical practice guidelines, systematic reviews, and other guidance documents. The Sleep Disturbance Expert Panel [comprised of nurses, psychologists, primary care physicians, oncologists, physicians specialized in sleep disturbances, researchers, and guideline methodologists] reviewed, discussed, and approved the final version of the guideline. Health care professionals across Canada were asked to provide feedback through an external review process.

Results Three clinical practice guidelines and 12 randomized controlled trials were identified as the evidence base. Overall, despite the paucity of evidence, the evidence and expert consensus suggest that it is important to screen and assess adult cancer patients for sleep disturbances using standardized screening tools on a routine basis. While prevention of sleep disturbance is the desired objective, cognitive behavioral therapies are effective in improving sleep outcomes. As part of the external review with 16 health care providers, 81 % indicated that they agreed with the recommendations as written.

Conclusions Sleep difficulty is a prevalent problem in cancer populations that needs greater recognition by health professionals. Prevention, screening, assessment, and treatment strategies supported by the best available evidence are critical. Recommendations and care path algorithms for practice are offered.

Keywords Sleep · Cancer · Insomnia · Chronic insomnia · Sleep disturbance · Oncology

Introduction

Insomnia in individuals with cancer ranges from 25 to 59 % [1–4]. Insomnia commonly presents as a transient inability to initiate or maintain sleep, whereas insomnia syndrome is the repeated experience of insomnia to the extent that it occurs more than 3 days/week and is associated with impaired daytime functioning or significant psychological distress for at least a month [5]. Insomnia syndrome can extend for considerable amounts of time, impacting a significant proportion of patients with cancer [3].

Risk factors for insomnia in patients with cancer are multifactorial and can include the cancer itself (e.g., tumors that increase steroid production, symptoms of tumor invasion resulting in pain, dyspnea, nausea, pruritus), treatment factors (e.g., corticosteroids and hormonal fluctuations), or cancer-related medications (e.g., opiates, chemotherapy, neuroleptics, sympathomimetics, steroids, sedative hypnotics). Other predisposing biological (e.g., headaches), psychological, and social factors (such as hyperarousability, increased sleep reactivity, or increased stress response), precipitating factors (such as the stress associated with a cancer

diagnosis or cancer treatment) and perpetuating factors (such as conditioned physical and mental arousal or learned negative sleep behaviors), and cognitive distortions can exacerbate sleep disturbance and lead to insomnia syndrome [2,4,6,7].

Moreover, insomnia can often co-occur with other primary sleep disorders, such as obstructive or central sleep apnea, restless legs syndrome, or periodic limb movement disorder. Insomnia can also co-occur with psychiatric conditions, such as anxiety or depression, or with medical conditions, such as hyperthyroidism, chronic pain, or other chronic respiratory or renal conditions. It is important to note that insomnia will not always resolve with the resolution of the co-occurring disorder or condition (e.g., depression, fatigue, pain). Persistent insomnia has been identified as a predictor of onset of major depression or depressive relapse [8–12]. This highlights the importance of treating insomnia alongside other medical and adjustment disorders.

The impact of insomnia syndrome includes distress directly related to the inability to initiate or maintain sleep, impairment in social or emotional areas, decreased quality of life, and/or impairment of daily functioning. The daytime consequences include dysphoric states such as irritability, impaired cognition such as poor concentration and memory, and daytime fatigue. Acute sleep problems may persist and become chronic with numerous negative consequences such as issues with employment, relationships, and worse health outcomes [13–15].

The initiation or exacerbation of sleep disturbances can be moderated if preventive measures are taken. While psychological (i.e., cognitive behavioral) or pharmacological interventions are often recommended for insomnia syndrome in the general population [7], nonpharmacological interventions are rarely offered to patients with cancer [16]. Insomnia is a frequently overlooked symptom, and patients may fail to report sleep disturbance, assuming it to be a normal and temporary reaction to the cancer diagnosis or treatment. Patients advocate for issues around sleep disturbance to receive greater attention in cancer and the need for early identification as early in the cancer journey as possible [16].

The purpose of this paper is to disseminate a practice guideline for sleep disturbance in cancer and care path algorithm for uptake into practice by health care professionals who engage in the care of adult patients. The associated systematic review, also developed by the Canadian Partnership Against Cancer, comprises the evidence base for the clinical practice guideline. For the unabridged version of the systematic review, please see <http://www.partnershipagainstcancer.ca/> or <http://www.capo.ca>.

Purpose

The objective of this practice guideline is to recommend optimal strategies and interventions in the prevention, screening, assessment, and management of sleep disturbance in adult cancer or survivor populations.

Target population

This practice guideline pertains to adults with cancer (age 18 years or older) of any type, disease stage, or treatment modality. Applicability to patients with advanced stage of disease may be limited since little research has been conducted in this population. The identification, assessment, and treatment of those with sleep disturbances who are at risk of, or have, insomnia symptoms or insomnia syndrome are the focus of this report. It is recognized that a significant proportion of cancer patients who report sleep disturbance will likely develop insomnia syndrome.

Target users

This practice guideline is intended to inform professional health care providers engaged in the care of adults with cancer. It is also intended to support Canadian health authorities, program leaders, and administrators in the development of policies and procedures related to the supportive care of individuals with cancer. The guideline is interprofessional in focus and the recommendations applicable to direct care providers (e.g., nurses, social workers, family physicians, etc.) in diverse care settings. The scope of practice for different professions may vary according to governmental or professional regulatory standards, and it is expected that users of this guideline will exercise skill and judgment to determine if the application of the recommendations are within their scope of practice. It is not the intent of this guideline to make recommendations for specialist practitioners (i.e., respirologists, psychologists, psychiatrists, or sleep medicine experts). Depending on the factors associated with the sleep disturbance, additional guidance documents should be accessed for further information on specific conditions (e.g., fatigue, pain, or depression guidelines). Users may wish to adapt this guideline to fit their local health care processes, resources, and context as part of knowledge translation and evidence implementation.

Scope

The present document addresses sleep disturbances that extend from initial sleep disturbance to insomnia syndrome in adults with cancer. Other sleep disorders that require management by sleep medicine specialists, such as sleep apnea or movement disorders in sleep, are not within the scope of this guideline, with the exception of their identification as part of initial screening to ensure the immediacy of referral to specialists for these problems.

Methodology

The Sleep Disturbance Expert Panel is comprised of nurses, psychologists, primary care physicians, oncologists, physicians specialized in sleep disturbances, researchers, and guidelines methodologists. Content experts and key stakeholders across the country (external review) were invited to review and provide input on the document. Final consensus on the recommendations was reached through a voting process. The literature will be periodically reviewed and the guideline will be updated as new or compelling evidence is identified.

This guideline was developed, in part, based on the ADAPTE methodology [17] and combined a systematic search for primary studies in accordance with the PRISMA guidelines with quality appraisal based on the AGREE II guideline development convention [18]. The literature search combined sleep-specific terms with oncology terms for systematic reviews, practice guidelines, or randomized controlled trials.

Study selection criteria

Inclusion criteria

Clinical practice guidelines, systematic reviews, or randomized controlled trials were included if the following were reported:

- Data on the treatment population of interest, i.e., cancer patients or survivors with sleep problems;
- Management or interventions to improve sleep quality;
- Results for the primary outcomes of interest, including sleep quality, efficiency, onset latency, duration, or disturbance.

Exclusion criteria

Articles were excluded if they:

- Reported data on subgroups unless it was reported separately on the population of interest and the analysis was preplanned;
- Were reported in a language other than English where data could not be extracted;
- Were not explicitly related to the review question;
- Were interventions for insomnia in noncancer populations.

Literature search results

Three clinical practice guidelines [7,19–21] and 12 randomized controlled trials were identified [22–33]. Twenty-seven supporting documents were also reviewed to fill gaps in the

evidence; these included reviews, information summaries, consensus statements, or guidelines that offered best practice advice, but were not necessarily cancer-focused or evidence-based [13,16,34–59].

Eight of the 12 trials used cognitive behavioral therapies as the intervention [22,23,25–28,30,31]. The cognitive behavioral therapies consisted of multicomponent intervention strategies such as sleep education, sleep restriction therapy, sleep hygiene counseling, and stimulus control. Two trials used an Internet-based cognitive behavioral intervention [27,30]. The remaining four trials [24,29,32,33] tested the effect of exercise therapies on sleep quality. Three trials [29,32,33] used a home-based walking or exercise intervention, whereas the remaining trial used Tibetan yoga intervention [24]. No pharmacological interventions were identified involving cancer patients with established sleep difficulties.

Quality assessment

The evidence was assessed for quality using the AGREE II instrument for the identified guidelines [18] and the Cochrane Risk of Bias tool (<http://www.cochrane.org>) for the randomized trials. Overall, the practice guidelines and randomized controlled trials fared modestly for overall quality. This assessment takes into consideration the rigor of development, the available evidence, the small sample sizes of the treatment groups, the short follow-up period measuring intervention effectiveness (usually 3 months), and a lack of transparency when reporting study methods. The supporting documents were included to cover any gaps in the evidence. A formal assessment of quality was not conducted as the documents were used to inform consensus expert opinion; however, checks were made to ensure that any supporting guidance was explicit in how studies were selected and assessed, how studies were clear about attempts to minimize biases, and how studies were integrated to form recommendations. Importantly, there were many gaps in the evidence, thus expert consensus was used to develop the majority of the recommendations.

External review

A draft version of this practice guideline was reviewed by 16 health care professionals from across Canada involved in the psychosocial and supportive care of cancer survivors. Respondents were asked to complete a survey on the relevance and quality of the guideline and comments on the draft were also invited. The Sleep Disturbance Expert Panel reviewed the results of the external review, addressed the comments, and made modifications accordingly. The findings of the external review are summarized in Table 1.

As seen in Table 1, when asked to rate their agreement on a seven-point scale (ranging from 1=strongly agree to 7=strongly disagree), the majority of the respondents were in agreement for the appropriateness of the guideline and 83 % indicated they would likely, or very likely, make use of the recommendations to inform the development of survivorship services in their own organization/practice/community program. A total of 75 % of respondents indicated that they did not currently follow a practice guideline on sleep disturbance and 81 % indicated that they agreed with the recommendations as written. Suggestions for improvement included more on pharmacological recommendations, be more inclusive of other disciplines such as social workers, and the provision of patient education materials. Several reviewers thought that implementation would be a challenge given the lack of sleep services and specialists available to receive referrals.

Discussion

Screening for sleep disturbances in adults with cancer is warranted, and a range of screening tools and self-report assessments are available. Health care professionals should screen for sleep disturbances and, if necessary, assess for the presence of symptoms, pertinent history, and risk factors. The emphasis in treatment and care is to restore a pattern of sleep that includes reduced early waking episodes, reduced time awake during the night, reduced time to fall asleep, reduced daytime fatigue, and improvements in patient perceptions of sleep quality. To achieve this goal requires individualizing the treatment plan based on the biological and psychological factors that contribute to the sleep disturbance. Referral to other guidelines and/or appropriate services may be necessary when underlying conditions are identified that require further evaluation and/or treatment.

Incorporating integrated sleep services as part of cancer programs where clinical programs use best practices to attempt to prevent insomnia and promote and tailor sleep hygiene would be an ideal service to provide patients before, during, and after their cancer treatment. To assist practitioners to meet this goal, recommendations for practice and tools for application are offered in the full guideline document (see <http://www.capo.ca>).

Recommendations

Unless stated otherwise, the following recommendations, strategies, and algorithms on the optimal screening, assessment, and management of adult patients with cancer who experience sleep disturbances should be considered consensus-based informed by the evidence. The algorithms (Figs. 1 and 2) provide a summary of practice recommendations based on the elaborated recommendations below.

Table 1 Summary of external review survey results

Survey items	Number (%)			
	Strongly agree	Agree	Somewhat agree	Undecided/NA
The overall objective of the sleep disturbance guideline is specifically described.	8 (50 %)	7 (44 %)	1 (0 %)	0 (0 %)
The target population for the sleep disturbance guideline is clearly described.	9 (56 %)	6 (38 %)	1 (6 %)	0 (0 %)
The target users of the sleep disturbance guideline are clearly defined.	9 (56 %)	5 (31 %)	2 (12 %)	0 (0 %)
Systematic search methods for identifying relevant guidelines for adaptation were used for the sleep disturbance guideline.	7 (44 %)	7 (44 %)	2 (12 %)	0 (0 %)
The methods for formulating the sleep disturbance recommendations are clearly described.	5 (33 %)	8 (53 %)	2 (13 %)	0 (0 %)
The recommendations for sleep disturbance are easily identifiable.	9 (56 %)	6 (38 %)	1 (6 %)	0 (0 %)
The recommendations for sleep disturbance are appropriate.	6 (40 %)	4 (27 %)	4 (27 %)	1 (7 %)
The recommendations for sleep disturbance are feasible.	3 (20 %)	4 (27 %)	5 (33 %)	2 (13 %)
When applied, the sleep disturbance guideline will produce more benefits for patients than harm.	9 (56 %)	5 (31 %)	2 (12 %)	0 (0 %)
How likely would you be able to apply the recommendations in the sleep disturbance guideline to clinical practice?	4 (25 %)	6 (38 %)	1 (6 %)	2 (12 %)

NA not applicable

Screening for sleep disturbance

- It is recommended that all health care providers routinely screen for the presence of symptoms of sleep disturbances from the point of cancer diagnosis onward.
- It is recommended that all patients with cancer be screened for sleep disturbances at initial diagnosis, start of treatment, regular intervals during treatment, end of treatment, posttreatment survivorship, upon recurrence or progression, at end of life, or during times of personal transition (e.g., family crisis).
- It is recommended that the identification of sleep problems be a two-step screening process as follows:

1. Identify the occurrence of a sleep problem (a non-“0” score for sleep as an “other” intensity scale on the ESAS-r [38] and/or a yes or a checkmark on the Canadian Problem Checklist) [60] followed by two additional questions to determine if this problem interferes with daily functioning: Do you have problems with your sleep or sleep disturbance on average (routinely, in the past month, etc.) for three or more nights a week? If yes, does the problem with your sleep negatively affect your daytime function or

quality of life? The PROMIS® “sleep thermometer tool” patient-reported outcome measure (eight items) can also be used to identify a sleep problem [37].

2. Identify patients that require immediate referral by determining excessive daytime sleepiness using the Epworth Sleepiness Scale [61] combined with specific targeted questions about nocturnal movements or excessive snoring, episodes of witnessed sleep apnea, or gasping for breath during night.

Focused assessment of sleep disturbances

- A focused assessment of sleep should identify signs and symptoms of sleep disturbance, the severity of insomnia, possible stressors, risk factors (e.g., fatigue, pain), and comorbid conditions associated with the sleep problem (e.g., depression) and should also explore other underlying problems or causes. For example, medical and substance-induced (e.g., corticosteroids, opioids, alcohol) causes of sleep disturbances should be identified.
- Parameters for assessing sleep disturbances should include: total sleep time, sleep latency, wake time after sleep onset, napping during the day, excessive daytime sleepiness, quality of perceived sleep, circadian rhythm,

and sleep efficiency. These can be gathered using a sleep diary. In addition, assessment includes asking about interference with daytime functioning and impacts on quality of life, employment, relationships, and beliefs (perceptions) about sleep.

- The following key questions could be asked during the clinical interview as part of the focused assessment process:

Questions	Recommendations
1. Have you had difficulties sleeping at night or staying awake in the day during the last month?	If no, stop the sleep assessment.
2. What is the nature of the sleep complaint (i.e., problems sleeping at night, excessive sleepiness during the day, or abnormal behaviors during sleep)?	
3. How long have these difficulties been present?	If <1 month, address precipitating events and keep monitoring.
4. What is the clinical significance of this problem (frequency, severity, and impact on daytime functioning)?	
5. Do the onset and course of this problem coincide with another medical or psychological problem?	If yes, treat both conditions concurrently, whenever possible.
6. Are there symptoms of other sleep disorders (e.g., sleep apnea, narcolepsy, restless legs syndrome)?	If yes, refer to a sleep disorders center.

- It is recommended that a sleep diary such as the Consensus Sleep Diary [62] be used to evaluate patterns of insomnia and the Insomnia Severity Index [13] to quantify perceived insomnia severity. These are valid and reliable tools that will support the systematic assessment of sleep problems and for evaluating if interventions are effective.

Treatment and care options for sleep disturbances

It is recommended that treatment for sleep disturbances consists of a combined approach that targets any contributing factors (e.g., hot flashes, pain, nocturia) and the factors that are believed to maintain the sleep difficulties over time (i.e., maladaptive sleep behaviors, dysfunctional beliefs about sleep). Although sleep disturbances might have been initially triggered by factors such as hot flashes, pain, etc., it is likely not sufficient to only treat those factors to address the sleep difficulty because insomnia becomes rapidly self-reinforced.

Nonpharmacological interventions for sleep disturbance

- It is recommended that cognitive behavioral interventions be used as first-line treatments prior to pharmacological treatment. However, patients may require short-term use of pharmacological interventions until cognitive behavioral therapy takes effect or is available.
- It is recommended that a stepped care approach be used to manage sleep problems; however, each patient must be considered individually. The person-centered and stepped care approach recommended for the nonpharmacological management of sleep disturbance in cancer patients is as follows (Figs. 1 and 2):
 - Step 1: Sleep hygiene and environmental strategies should be part of a supportive education approach combined with self-management strategies that patients can use, such as manuals or online resources;
 - Step 2: If patients are still symptomatic, cognitive behavioral therapy for insomnia delivered by direct care providers trained in the use of these skills and following a manualized approach;
 - Step 3: Cognitive behavioral therapy for insomnia delivered by sleep experts is recommended in face-to-face or online formats.

Step 1 It is recommended that all patients receive supportive education/information that includes coaching in sleep hygiene strategies as a standard preventive or early intervention approach in combination with other self-management strategies for the management of insomnia and as an adjunct to cognitive behavioral therapy. The patient should be advised and be coached in the use of the following behaviors:

1. Wake up at the same time (regardless of how many hours of sleep and including weekends)

Rationale: Morning rising time plays a large role in determining bedtime based on the accumulation of sleep pressure throughout the day. Considering that there is 24 h in a day, if the patient has an 8-h sleep need and they wake up at 6:00 a.m., approximately 16 h will need to pass before they are likely to feel sleepy ($24 - 8 = 16$). This would bring their predicted sleep time to 10:00 p.m. Sleeping in after a night of disrupted sleep, or on weekends, tends to perpetuate sleep problems by preventing the accumulation of sleep pressure, leading to more difficulty falling asleep or maintaining sleep.
2. Ensure light exposure soon after waking

Rationale: Exposure to natural or artificial light is thought to be an important regulator of sleep/wake rhythms. This is often compromised while in hospital or while recovering. Light exposure can help the

Sleep-Wake Disturbances in Adults with Cancer Part I: Screening and Assessment

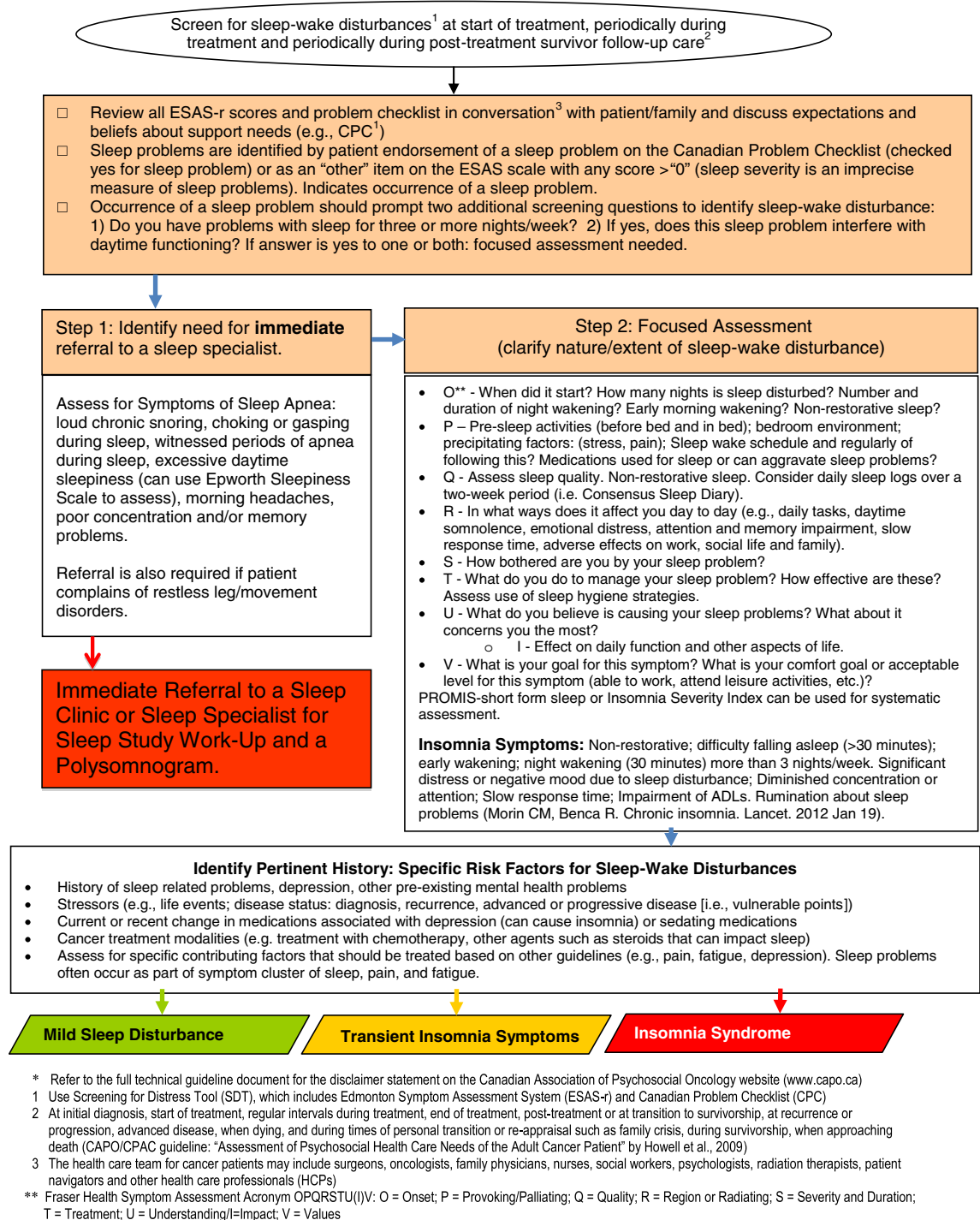
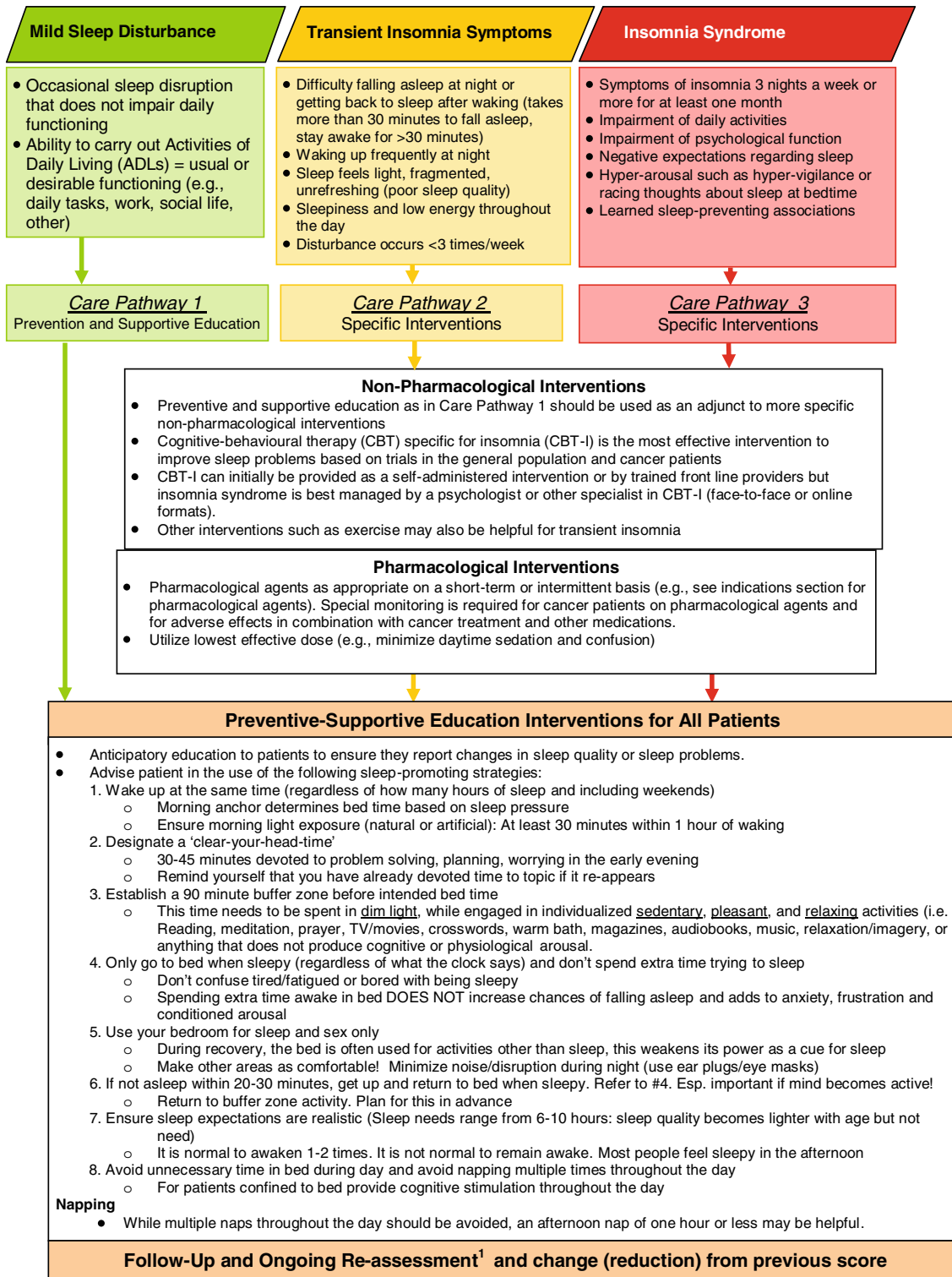


Fig. 1 Screening and assessment—sleep disturbance in adults with cancer (refer to the full technical guideline document for the disclaimer statement on the Canadian Association of Psychosocial Oncology website; <http://www.capo.ca>). 1 Use Screening for Distress Tool (SDT), which includes the Edmonton Symptom Assessment System (ESAS-r) and Canadian Problem Checklist (CPC). 2 at initial diagnosis, start of treatment, regular intervals during treatment, end of treatment, posttreatment or at transition to survivorship, at recurrence or progression, advanced disease, when dying, and during times of personal transition or reappraisal such as

family crisis, during survivorship, when approaching death (CAPO/CPAC guideline: “Assessment of Psychosocial Health Care Needs of the Adult Cancer Patient” by Howell et al. 2009), 3 the health care team for cancer patients may include surgeons, oncologists, family physicians, nurses, social workers, psychologists, radiation therapists, patient navigators, and other health care professionals. *Two asterisks* denote the Fraser Health Symptom Assessment Acronym OPQRSTU(I)V: *O* onset, *P* provoking/palliating, *Q* quality, *R* region or radiating, *S* severity and duration, *T* treatment, *U* understanding/*I* impact, *V* values

Sleep-Wake Disturbances in Adults with Cancer Part 2: Differential Diagnosis and Management

Practice Guideline: Sleep disturbance



*Refer to the full technical guideline document for the disclaimer statement on the Canadian Association of Psychosocial Oncology website (www.capo.ca) Authors: Howell D., Oliver T, Keller-Olaman S., Davidson J., Garland S., Samuels C., Savard J., Harris CA., Aubin M., Olson K., Sussman J., Taylor, C.

Fig. 2 CareMap – Sleep-Wake Disturbances in Adults with Cancer*

patient “set” their circadian clock, making it easier for them to continue to keep the same wake up time.

3. Designate a “clear-your-head time”

Rationale: Patients sometimes avoid thoughts that are unpleasant and worrisome during the day. This is counterproductive as these thoughts will often reappear when we they are not able to distract or busy themselves, such as when they are trying to sleep. Establishing 30–45 min devoted to problem solving, planning, and worrying in the early evening can assist patients to deal with the concerns that may contribute to mental activity at night. It is often recommended for patients to write these concerns down to avoid mental rehearsal and to remind themselves that they have already devoted time to the topic if it reappears.

4. Establish a 90-min buffer zone before the intended bedtime

Rationale: The implementation of a designated time to unwind in the evening before bedtime enables the patient to create an environment that is conducive to sleep. A sleep-promoting external environment should have reduced or dim light. Creating an internal environment conducive to sleep involves engaging in relaxing, pleasant, and sedentary activity. Some examples of individualized patient activities may include reading, meditation, prayer, TV/movies, crossword, warm bath, magazines, audiobooks, music, relaxation/imagery, or anything that does not produce cognitive or physiological arousal.

5. Only go to bed when sleepy (i.e., feels sleepy regardless of what the clock says) and do not spend extra time trying to sleep

Rationale: During recovery, it can be difficult for patients to differentiate tiredness, fatigue, or boredom with feelings of sleepiness. A common coping strategy for patients is to spend more time in bed and try harder to sleep. Spending extra time awake in bed and trying to sleep DOES NOT increase chances of falling asleep. In fact, this strategy can be counterproductive because it can contribute to performance anxiety, frustration, and the eventual development of conditioned arousal.

6. Use your bedroom for sleep and sex only

Rationale: During recovery, the bed is often used for activities other than sleep. In order to preserve the bed as a strong environmental and psychological signal for sleep, it is necessary for the patient to make the other areas where they spend time during the day as comfortable as their bed.

7. If the individual is not asleep within 20–30 min, get out of bed and return when sleepy

Rationale: If patients are not asleep and their minds becomes active after being in bed for 20–30 min, it is

recommended that they interrupt the tendency to try harder to sleep by getting out of bed and return to their buffer zone activity. Once the patient feels that sleep is imminent (i.e., feels sleepy), they should return to bed. This may need to be planned for in advance or repeated several times until the disruptive sleep cycle is broken. The goal of this strategy is to reinforce the association between the bedroom and sleep.

8. Ensure that sleep expectations are realistic

Rationale: There are several frequently held, yet inaccurate, sleep beliefs that can contribute to increased patient anxiety surrounding sleep. One of the most common is that 8 h of sleep is optimal for everyone when, in fact, individual sleep needs vary for adults between 7 and 9 h [63]. Short sleep durations (4–5 h) appear to contribute to adverse health outcomes [14] and in an epidemiological survey of cancer patients, those who slept 7 h had lower rates of mortality [64]. Additional problematic beliefs are often related, but not limited, to:

Age: Sleep needs do not change with age, but sleep quality does (it becomes lighter).

Awakenings: It is normal to awaken one to two times. It is not normal to remain awake.

9. Restrict napping

- It is generally recommended to avoid multiple naps, especially in the evening; however, a short nap (<1 h) taken in the afternoon, starting before 3:00 p.m., may be helpful and is less likely to interfere with nighttime sleep.
- If resting, rather than sleeping, it should be done in a room other than the bedroom.

10. Additional strategies for minimizing sleep disturbances in the hospital setting

- Minimization of noise/disruption during night;
- Use ear plugs/eye masks;
- Advocate for effective symptom control, especially pain;
- Avoid unnecessary time in bed during the day;
- For patients confined to bed, provide as much cognitive and physical stimulation as possible throughout the day with the appropriate buffer zone prior to sleep onset.

Step 2 It is recommended that, if patients are still symptomatic or exhibit signs of chronic insomnia following step 1 interventions, cognitive behavioral therapy for insomnia delivered by direct care providers trained in the use of these skills and following a manualized approach is provided (self-guided interventions are also emerging as an effective approach and may be considered as an option) [65].

- Step 3 It is recommended that patients presenting with signs of chronic insomnia or whose sleep problem is not managed through step 2 interventions be referred for cognitive behavioral therapy for insomnia delivered by sleep experts (face-to-face or online formats).
- The recommended number of individual or group sessions with cancer patients is approximately six to eight sessions.
 - It is recommended that patients be advised of other strategies such as exercise or yoga that may help to improve transient insomnia or as an adjunct to cognitive behavioral therapy interventions.

Pharmacological approaches

- Pharmacological management is considered a short-term or occasional intervention while waiting for cognitive behavioral therapy to take effect.
- Consider short-term pharmacologic therapy if there is no benefit following a period of approximately 8 weeks of cognitive behavioral therapy (i.e., individual remains dissatisfied with the quality of their sleep).
- It is not recommended to pursue a daily pharmacological treatment for more than 4 weeks; however, if an improvement in sleep is observed, it is reasonable to offer a combined psychological–pharmacological intervention in which the medication is gradually tapered off.
- It may be appropriate to consider pharmacologic therapy in patients who are very ill and/or unable to complete cognitive behavioral therapy for insomnia.
- The choice of a medication should be informed by patient-specific factors, including age, proposed length of treatment, primary sleep complaint, history of drug or alcohol abuse, side effect profiles of the medications, tolerability of treatment, including the potential for interaction with other current medications, response to prior treatment, and patient preference. Patients should be warned of any potential harm or adverse effects.
- Offer support and provide education and information about sleep disturbance and its management to all patients and their families and what specific symptoms warrant a call to the physician or nurse.

Training and implementation

Cancer survivors are a growing population in Canada. Greater recognition of the demand for survivorship services and increased training and education among frontline providers is needed to address issues around sleep disturbance at every point in the cancer trajectory. This includes greater resources and specific programs for those with cancer who suffer from

sleep disturbance, as well as patient education and strategies to prevent sleep disturbance.

Currently, many health care providers do not have the training or education to screen or assess for sleep disturbances, and of those that do, many do not refer patients for cognitive behavioral therapy because of limited resources for the provision of this service. There was no evidence identified that provided insight on the potential resource implications of applying the recommendations; however, it is well known that resources can vary widely across Canadian health jurisdictions. A promising emerging intervention model for sleep disturbance is self-guided interventions [65] and online cognitive behavioral therapy programs [30] that could be used widely for relatively little resource allocation. In the face of limited resources, pharmacological approaches are often used, and perhaps overused; however, this is not ideal, and cognitive behavioral therapy offered through specialists are the preferred first-line course of action. More information on sleep clinics and their locations in Canada can be found at <http://www.canadiansleepsociety.com> or the National Sleep Foundation (<http://www.sleepfoundation.org>).

The guideline recommendations were developed for implementation in a variety of frontline health settings. The guideline summary and care paths were designed to facilitate that implementation and will be distributed widely. Barriers to implementation and application of the guideline recommendations include the need to increase awareness of sleep disturbance issues among frontline practitioners and cancer survivors and also providing adequate services in the face of limited resources. As part of the next steps, the guideline will be translated into French, and partnering with the Canadian Association of Psychosocial Oncology will also ensure greater exposure and guideline implementation. The guideline will be posted on the websites of the Canadian Partnership Against Cancer (Cancer Journey Advisory Group) and the Canadian Association of Psychosocial Oncology. Furthermore, this guidance document will be disseminated through cancer advocacy survivorship groups, including the Canadian Cancer Action Network and the Canadian Cancer Society.

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References

- Davidson JR, MacLean AW, Brundage MD, Schulze K (2002) Sleep disturbance in cancer patients. *Soc Sci Med* 54(9):1309–1321
- Palesh OG, Roscoe JA, Mustian KM, Roth T, Savard J, Ancoli-Israel S, Heckler C, Purnell JQ, Janelins MC, Morrow GR (2010) Prevalence, demographics, and psychological associations of sleep disruption in patients with cancer: University of Rochester Cancer Center-Community Clinical Oncology Program. *J Clin Oncol* 28(2):292–298. doi:10.1200/JCO.2009.22.5011
- Savard J, Ivers H, Villa J, Caplette-Gingras A, Morin CM (2011) Natural course of insomnia comorbid with cancer: an 18-month longitudinal study. *J Clin Oncol* 29(26):3580–3586. doi:10.1200/JCO.2010.33.2247
- Savard J, Villa J, Ivers H, Simard S, Morin CM (2009) Prevalence, natural course, and risk factors of insomnia comorbid with cancer over a 2-month period. *J Clin Oncol* 27(31):5233–5239. doi:10.1200/JCO.2008.21.6333
- Harsora P, Kessmann J (2009) Nonpharmacologic management of chronic insomnia. *Am Fam Phys* 79(2):125–130
- Ancoli-Israel S (2009) Recognition and treatment of sleep disturbances in cancer. *J Clin Oncol* 27(35):5864–5866. doi:10.1200/JCO.2009.24.5993
- Schutte-Rodin S, Broch L, Buysse D, Dorsey C, Sateia M (2008) Clinical guideline for the evaluation and management of chronic insomnia in adults. *J Clin Sleep Med* 4(5):487–504
- Breslau N, Roth T, Rosenthal L, Andreski P (1996) Sleep disturbance and psychiatric disorders: a longitudinal epidemiological study of young adults. *Biol Psychiatry* 39(6):411–418
- Franzen PL, Buysse DJ (2008) Sleep disturbances and depression: risk relationships for subsequent depression and therapeutic implications. *Dialogues Clin Neurosci* 10(4):473–481
- Lustberg L, Reynolds CF (2000) Depression and insomnia: questions of cause and effect. *Sleep Med Rev* 4(3):253–262. doi:10.1053/smr.1999.0075
- Perlis ML, Giles DE, Buysse DJ, Tu X, Kupfer DJ (1997) Self-reported sleep disturbance as a prodromal symptom in recurrent depression. *J Affect Disord* 42(2–3):209–212
- Roberts RE, Shema SJ, Kaplan GA, Strawbridge WJ (2000) Sleep complaints and depression in an aging cohort: a prospective perspective. *Am J Psychiatry* 157(1):81–88
- Buscemi N, Vandermeer B, Friesen C, Bialy L, Tubman M, Ospina M, Klassen TP, Witmans M (2005) Manifestations and management of chronic insomnia in adults. *Evid Rep Technol Assess (Summ)* 125:1–10
- Cappuccio FP, D'Elia L, Strazzullo P, Miller MA (2010) Sleep duration and all-cause mortality: a systematic review and meta-analysis of prospective studies. *Sleep* 33(5):585–592
- Fleming L, Gillespie S, Espie CA (2010) The development and impact of insomnia on cancer survivors: a qualitative analysis. *Psychooncology* 19(9):991–996. doi:10.1002/pon.1652
- Davidson JR, Feldman-Stewart D, Brennenstuhl S, Ram S (2007) How to provide insomnia interventions to people with cancer: insights from patients. *Psychooncology* 16(11):1028–1038. doi:10.1002/pon.1183
- Fervers B, Burgers JS, Haugh MC, Latreille J, Mlika-Cabanne N, Paquet L, Coulombe M, Poirier M, Burnand B (2006) Adaptation of clinical guidelines: literature review and proposition for a framework and procedure. *Int J Qual Health Care* 18(3):167–176. doi:10.1093/intqhc/mzi108
- Brouwers MC, Kho ME, Browman GP, Burgers JS, Cluzeau F, Feder G, Fervers B, Graham ID, Hanna SE, Makarski J (2010) Development of the AGREE II, part 1: performance, usefulness and areas for improvement. *CMAJ* 182(10):1045–1052. doi:10.1503/cmaj.091714
- National Health Service (2009) Clinical Knowledge Summaries (CKS)—insomnia (revised July 2009). Available at <http://www.cks.nhs.uk/insomnia#376442001>. Accessed 1 Nov 2010
- Oncology Nursing Society. Sleep/wake disturbances. Available at <http://www.ons.org/Research/PEP/Sleep>. Accessed 1 July 2010
- Page MS, Berger AM, Johnson LB (2006) Putting evidence into practice: evidence-based interventions for sleep–wake disturbances. *Clin J Oncol Nurs* 10(6):753–767. doi:10.1188/06.CJON.753-767
- Barsevick A, Beck SL, Dudley WN, Wong B, Berger AM, Whitmer K, Newhall T, Brown S, Stewart K (2010) Efficacy of an intervention for fatigue and sleep disturbance during cancer chemotherapy. *J Pain Symptom Manag* 40(2):200–216. doi:10.1016/j.jpainsymman.2009.12.020
- Berger AM, Kuhn BR, Farr LA, Von Essen SG, Chamberlain J, Lynch JC, Agrawal S (2009) One-year outcomes of a behavioral therapy intervention trial on sleep quality and cancer-related fatigue. *J Clin Oncol* 27(35):6033–6040. doi:10.1200/JCO.2008.20.8306
- Cohen L, Warneke C, Fouladi RT, Rodriguez MA, Chaoul-Reich A (2004) Psychological adjustment and sleep quality in a randomized trial of the effects of a Tibetan yoga intervention in patients with lymphoma. *Cancer* 100(10):2253–2260. doi:10.1002/cncr.20236
- Dirksen SR, Epstein DR (2008) Efficacy of an insomnia intervention on fatigue, mood and quality of life in breast cancer survivors. *J Adv Nurs* 61(6):664–675. doi:10.1111/j.1365-2648.2007.04560.x
- Espie CA, Fleming L, Cassidy J, Samuel L, Taylor LM, White CA, Douglas NJ, Engleman HM, Kelly HL, Paul J (2008) Randomized controlled clinical effectiveness trial of cognitive behavior therapy compared with treatment as usual for persistent insomnia in patients with cancer. *J Clin Oncol* 26(28):4651–4658. doi:10.1200/JCO.2007.13.9006
- Farrell-Camahán L, Ritterband LM, Bailey ET, Thorndike FP, Lord HR, Baum LD (2010) Feasibility and preliminary efficacy of a self-hypnosis intervention available on the web for cancer survivors with insomnia. *Electron J Appl Psychol* 6(2):10–23
- Fiorentino L, McQuaid JR, Liu L, Natarajan L, He F, Cornejo M, Lawton S, Parker BA, Sadler GR, Ancoli-Israel S (2009) Individual cognitive behavioral therapy for insomnia in breast cancer survivors: a randomized controlled crossover pilot study. *Nat Sci Sleep* 2010:1–8. doi:10.2147/NSS.S8004
- Payne JK, Held J, Thorpe J, Shaw H (2008) Effect of exercise on biomarkers, fatigue, sleep disturbances, and depressive symptoms in older women with breast cancer receiving hormonal therapy. *Oncol Nurs Forum* 35(4):635–642. doi:10.1188/08.ONF.635-642
- Ritterband LM, Bailey ET, Thorndike FP, Lord HR, Farrell-Camahán L, Baum LD (2012) Initial evaluation of an Internet intervention to improve the sleep of cancer survivors with insomnia. *Psychooncology* 21(7):695–705. doi:10.1002/pon.1969
- Savard J, Simard S, Ivers H, Morin CM (2005) Randomized study on the efficacy of cognitive-behavioral therapy for insomnia secondary to breast cancer, part I: sleep and psychological effects. *J Clin Oncol* 23(25):6083–6096. doi:10.1200/JCO.2005.09.548
- Sprod LK, Palesh OG, Janelins MC, Peppone LJ, Heckler CE, Adams MJ, Morrow GR, Mustian KM (2010) Exercise, sleep quality, and mediators of sleep in breast and prostate cancer patients receiving radiation therapy. *Community Oncol* 7(10):463–471
- Tang MF, Liou TH, Lin CC (2010) Improving sleep quality for cancer patients: benefits of a home-based exercise intervention. *Support Care Cancer* 18(10):1329–1339. doi:10.1007/s00520-009-0757-5
- Alberta Medical Association (2010) Diagnosis to management: guideline for adult primary insomnia, 2010. Available at <http://www.topalbertadoctors.org>
- Alberta Medical Association (2010) Assessment to diagnosis: guideline for adult insomnia, 2010. Available at <http://www.topalbertadoctors.org>
- Bruera E, Kuehn N, Miller MJ, Selmsler P, Macmillan K (1991) The Edmonton Symptom Assessment System (ESAS): a simple

- method for the assessment of palliative care patients. *J Palliat Care* 7(2):6–9
37. Buysse DJ, Yu L, Moul DE, Germain A, Stover A, Dodds NE, Johnston KL, Shablesky-Cade MA, Pilkonis PA (2010) Development and validation of patient-reported outcome measures for sleep disturbance and sleep-related impairments. *Sleep* 33(6):781–792
 38. Chang VT, Hwang SS, Feuerman M (2000) Validation of the Edmonton Symptom Assessment Scale. *Cancer* 88(9):2164–2171
 39. Cheuk DK, Yeung WF, Chung KF, Wong V (2007) Acupuncture for insomnia. *Cochrane Database Syst Rev* 3:CD005472. doi:10.1002/14651858.CD005472.pub2
 40. Cooper KL, Relton C (2010) Homeopathy for insomnia: a systematic review of research evidence. *Sleep Med Rev* 14(5):329–337. doi:10.1016/j.smr.2009.11.005
 41. Espie CA (2009) “Stepped care”: a health technology solution for delivering cognitive behavioral therapy as a first line insomnia treatment. *Sleep* 32(12):1549–1558
 42. Fernandez-San-Martin MI, Masa-Font R, Palacios-Soler L, Sancho-Gomez P, Calbo-Caldentey C, Flores-Mateo G (2010) Effectiveness of Valerian on insomnia: a meta-analysis of randomized placebo-controlled trials. *Sleep Med* 11(6):505–511. doi:10.1016/j.sleep.2009.12.009
 43. Howell D, Currie S, Mayo S, Jones G, Boyle M, Hack T, Green E, Hoffman L, Collacutt V, McLeod D, Simpson J (2009) A Pan-Canadian clinical practice guideline: assessment of psychosocial health care needs of the adult cancer patient. Canadian Partnership Against Cancer (Cancer Journey Action Group) and the Canadian Association of Psychosocial Oncology, Toronto
 44. Kirkova J, Davis MP, Walsh D, Tiernan E, O’Leary N, LeGrand SB, Lagman RL, Russell KM (2006) Cancer symptom assessment instruments: a systematic review. *J Clin Oncol* 24(9):1459–1473. doi:10.1200/JCO.2005.02.8332
 45. Kvale EA, Shuster JL (2006) Sleep disturbance in supportive care of cancer: a review. *J Palliat Med* 9(2):437–450. doi:10.1089/jpm.2006.9.437
 46. Linden W, Yi D, Barroetavena MC, MacKenzie R, Doll R (2005) Development and validation of a psychosocial screening instrument for cancer. *Health Qual Life Outcomes* 3:54. doi:10.1186/1477-7525-3-54
 47. Montgomery P, Dennis J (2003) Cognitive behavioural interventions for sleep problems in adults aged 60+. *Cochrane Database Syst Rev* 1:CD003161. doi:10.1002/14651858.CD003161
 48. Morin CM, Bootzin RR, Buysse DJ, Edinger JD, Espie CA, Lichstein KL (2006) Psychological and behavioral treatment of insomnia: update of the recent evidence (1998–2004). *Sleep* 29(11):1398–1414
 49. National Cancer Institute (2010) Sleep disorders (PDQ): supportive care—health professional information. Available at <http://www.cancer.gov/cancertopics/pdq/supportivecare/sleepdisorders>. Accessed 1 April 2010
 50. National Comprehensive Cancer Network (2012) Cancer-related fatigue (v.1.2012). Available at http://www.nccn.org/professionals/physician_gls/f_guidelines.asp
 51. Nekolaichuk C, Watanabe S, Beaumont C (2008) The Edmonton Symptom Assessment System: a 15-year retrospective review of validation studies (1991–2006). *Palliat Med* 22(2):111–122. doi:10.1177/0269216307087659
 52. Panossian LA, Avidan AY (2009) Review of sleep disorders. *Med Clin North Am* 93(2):407–425. doi:10.1016/j.mcna.2008.09.001, ix
 53. Ramakrishnan K, Scheid DC (2007) Treatment options for insomnia. *Am Fam Physician* 76(4):517–526
 54. Savard J, Villa J, Simard S, Ivers H, Morin CM (2011) Feasibility of a self-help treatment for insomnia comorbid with cancer. *Psychooncology* 20(9):1013–1019. doi:10.1002/pon.1818
 55. Swift N, Stewart R, Andiappan M, Smith A, Espie CA, Brown JS (2012) The effectiveness of community day-long CBT-I workshops for participants with insomnia symptoms: a randomised controlled trial. *J Sleep Res* 21(3):270–280. doi:10.1111/j.1365-2869.2011.00940.x
 56. Vincent N, Lewycky S (2009) Logging on for better sleep: RCT of the effectiveness of online treatment for insomnia. *Sleep* 32(6):807–815
 57. Watanabe SM, Nekolaichuk C, Beaumont C, Johnson L, Myers J, Strasser F (2011) A multicenter study comparing two numerical versions of the Edmonton Symptom Assessment System in palliative care patients. *J Pain Symptom Manag* 41(2):456–468. doi:10.1016/j.jpainsymman.2010.04.020
 58. Wilson SJ, Nutt DJ, Alford C, Argyropoulos SV, Baldwin DS, Bateson AN, Britton TC, Crowe C, Dijk DJ, Espie CA, Gringras P, Hajak G, Idzikowski C, Krystal AD, Nash JR, Selsick H, Sharpley AL, Wade AG (2010) British Association for Psychopharmacology consensus statement on evidence-based treatment of insomnia, parasomnias and circadian rhythm disorders. *J Psychopharmacol* 24(11):1577–1601. doi:10.1177/0269881110379307
 59. Youngstedt SD (2005) Effects of exercise on sleep. *Clin Sports Med* 24(2):355–365. doi:10.1016/j.csm.2004.12.003, xi
 60. Canadian Partnership Against Cancer (CPAC) and Cancer Action Journey Group (2009) Guide to implementing screening for distress, the 6th vital sign: moving towards person-centered care. Part A. Background, recommendations and implementation. CPAC, Toronto
 61. Johns MW (1991) A new method for measuring daytime sleepiness: the Epworth Sleepiness Scale. *Sleep* 14(6):540–545
 62. Carney CE, Buysse DJ, Ancoli-Israel S, Edinger JD, Krystal AD, Lichstein KL, Morin CM (2012) The consensus sleep diary: standardizing prospective sleep monitoring. *Sleep* 35(2):287–302
 63. National Sleep Foundation. How much sleep do we really need? Available at <http://www.sleepfoundation.org/article/how-sleep-works/how-much-sleep-do-we-really-need>. Accessed 1 April 2013
 64. Youngstedt SD, Kripke DF (2004) Long sleep mortality: rationale for sleep restriction. *Sleep Med Rev* 8(3):159–174
 65. Savard J, Villa J, Simard S, Ivers H, Morin CM (2011) Feasibility of a self-help treatment for insomnia comorbid with cancer. *Psychooncology* 20(9):1013–1019