Cognitive-Behavioral Therapy for Insomnia in Patients With Cancer

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Sleep-wake disturbances, particularly insomnia, are among the most prevalent and distressing symptoms experienced by patients with cancer. As a result of extensive interdisciplinary research conducted since 2000, cognitive-behavioral therapy now is considered the standard of care for the treatment of insomnia in the general population and also has been upgraded to "likely to be effective" in the Oncology Nursing Society Putting Evidence Into Practice weight of evidence category. Cognitive-behavioral therapy is a multicomponent psychological and behavioral treatment designed to eliminate the perpetuating factors of insomnia. The most frequently used strategies are stimulus control, sleep restriction and relaxation therapies, paradoxical intention, sleep hygiene, and cognitive restructuring. Although this insomnia treatment recommendation has been well publicized, the nursing literature has not effectively translated the theories and principles of cognitive-behavioral therapy into practical guidelines or considerations for use by oncology staff nurses and advanced practitioners. This article attempts to demystify cognitive-behavioral therapy and provide nurses at different levels of practice a foundation from which to evaluate and potentially deliver this promising insomnia intervention.

The incidence of sleep-wake disturbances in patients with cancer is reported to range from 30%–88%, which is almost twice the rate in the general population (Clark, Cunningham, McMillan, Vena, & Parker, 2004; National Cancer Institute, 2010). Insomnia is the most common sleep-wake disturbance experienced by patients with cancer and healthy adults (Page, Berger, & Johnson, 2006; Schutte-Rodin, Broch, Buysse, Dorsey, & Sateia, 2008). In the oncology setting, insomnia contributes to decreased quality of life and impaired immune, cognitive, and functional status (Chen, Yu, & Yang, 2008; Fiorentino & Ancoli-Israel, 2007; Graci, 2005; Vena et al., 2006). Frequently, researchers also have reported symptom clusters of insomnia with pain and depression (McMillan, Tofthagen, & Morgan, 2008; Savard & Morin, 2001) or pain and fatigue (Beck, Dudley, & Barsevick, 2005; Hoffman, Given, von Eye, Gift, & Given, 2007). Insomnia in patients with cancer has been associated with increased risk of death and loss to follow-up (Kozachik & Bandeen-Roche, 2008), as well as poorer recurrence-free periods and overall survival (Berger, 2009; Savard & Morin, 2001). Unfortunately, despite the critical and distressing effect of insomnia, it remains unreported by almost 85% of patients with cancer (Berger, 2009; Engstrom, Strohl, Rose, Lewandowski, & Stefanek, 1999) and continues to be assessed inadequately and undertreated by healthcare providers (Berger, 2009; Vena et al., 2006).

At a Glance

- Despite its prevalence, insomnia continues to be underreported and undertreated in patients with cancer.
- Cognitive-behavioral therapy for the treatment of insomnia offers many advantages and greater long-term effectiveness when compared to sleep medication.
- Oncology nurses and advanced practitioners can be educated to provide or facilitate delivery of this promising intervention.

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Extensive interdisciplinary sleep research conducted since 2000 has shown that certain cognitive and behavioral therapies for insomnia, referred to collectively as CBT-I, are as effective as many pharmacologic agents for the treatment of chronic insomnia in the general public (Ebben & Spielman, 2009; Perlis, Jungquist, Smith, & Posner, 2008). In fact, according to American Academy of Sleep Medicine standards, CBT-I now is the treatment of choice for insomnia (Harvey, 2010; Schutte-Rodin et al., 2008). Although less definitive, the efficacy of CBT-I for the treatment of insomnia in patients with cancer is encouraging. In July 2009, Berger, updating the 2005 Oncology Nursing Society (ONS) Putting Evidence Into Practice (PEP) sleep-wake disturbances resource, suggested new evidence-based practice guidelines recommending cognitive-behavioral interventions as "likely to be effective" (Berger, 2009; Page et al., 2006).

Now that oncology nurses have been advised that cognitive-behavioral therapy can be effective for their patients with insomnia, further education and guidance is needed for nurses to successfully understand and implement this treatment modality. A review of available nursing literature revealed several gaps or barriers to the practical application of CBT-I, including insufficient description of theoretical frameworks and principles and a lack of translation of those abstract concepts to actual nursing practice. In addition, the various available cognitive and behavioral therapies need further clarification, and nurses are left unsure about the most efficacious methods of delivery or which healthcare professionals are qualified to provide cognitive and behavioral therapies. The purpose of this article is to describe the problem of insomnia and then attempt to demystify cognitive-behavioral therapy to increase accessibility to this promising treatment.

Fundamentals of Sleep Architecture and Regulation

Although the physiology and purpose of sleep are not completely understood, many researchers agree that sleep provides a necessary restorative function and also plays a significant role in hormone secretion, thermoregulation, and immune modulation (Hearson & Sawatzky, 2008; Vena, Parker, Cunningham, Clark, & McMillan, 2004). Nocturnal sleep exhibits an ultradian architecture; it consists of four to five cycles of alternating rapid eye movement (REM) and non-REM sleep, with each cycle lasting 90–120 minutes. Non-REM sleep, or slow-wave sleep, begins each cycle and comprises four successive stages, during which electroencephalogram activity and autonomic functions progressively slow but voluntary muscle control is retained and sleep becomes deeper. Stage 1 is the transitional, lightest level; stage 4 is the deepest and most restorative. An individual then enters REM sleep. During this state, the brain is highly active and vivid dreaming, autonomic variability, and paralysis of the voluntary muscles occur. With each successive cycle, progressively more time is spent in REM sleep, particularly in the last third of the night, whereas non-REM sleep, particularly stages 3 and 4, predominates in the first third of the night. As people age, much more variability occurs in sleep architecture with less time spent asleep overall; typically, REM and stages 2, 3, and 4 sleep decrease, whereas stage 1 sleep increases (Borbely & Achermann, 2005; Potter & Perry, 2009; Vena et al., 2004).

The Two-Process Model of Sleep Regulation is a useful framework for understanding the physiologic mechanisms controlling the stages and cycles of sleep (Beersma, 1998; Berger, 2009; Vena et al., 2004). The model details the interaction of the homeostatic process S, a dependent process affected by prior amounts of sleep and wakefulness, and circadian process C, an independent clock-like mechanism controlled by the suprachiasmatic nuclei of the hypothalamus, which determines sleep and wake thresholds (or the onset and end) of sleep (Beersma, 1998; Vena et al., 2004). Process C largely is entrained by environmental cues, termed *zeitgebers*; adequate light exposure is the strongest, but regular meals, participation in daytime activities, and social interactions also are crucial. Process S is believed to drive intensity and duration of non-REM sleep, whereas process C primarily regulates the REM sleep fraction and total sleep time, resulting in periods of consolidated sleep and wakefulness (Beersma, 2002; Borbely & Achermann, 2005).

Insomnia

Insomnia may be defined as the perception or complaint of difficulty initiating or maintaining sleep, waking up too early, nonrestorative sleep, or sleep difficulty despite appropriate opportunities for sleep, resulting in daytime impairment that could include daytime sleepiness, fatigue, cognitive impairment, social dysfunction, or concerns about sleep (Berger, 2009; Berger & Niedfelt, 2005). Based on Savard and Morin's (2001) guidelines, the diagnostic criteria for insomnia syndrome must include all of the following: difficulty sleeping characterized by issues with either initiating (taking 30 minutes or more) or maintaining sleep (having more than 30 minutes of nocturnal awakenings and sleep efficiency lower than 85%), resultant significant impairment of daytime functioning, and an incidence of at least three nights per week. For definitions of terms, see Figure 1. Transient insomnia lasts less than one month, and short-term insomnia lasts more than one month but less than six months; insomnia must be present for six months or more to be considered chronic. However, some

Sleep Efficiency
Reflects calculation based on total sleep time divided by time in bed, multiplied by 100; should be 85% or higher for sleep to be considered effective

Sleep Latency
The number of minutes needed to fall asleep after going to bed; should be 30 minutes or less

Time in Bed
Total time spent between getting in and out of bed

Total Sleep Time
Time in bed after subtracting sleep latency and wake after sleep onset

Wake After Sleep Onset
The total number of minutes spent awake between the time of sleep onset and the time of final awakening

Figure 1. Sleep Assessment Terminology

Note. Based on information from Page et al., 2006; Schutte-Rodin et al., 2008.

sources consider insomnia to be chronic if it lasts more than one month (Yamamoto, 2010).

Multiple factors, alone or in combination, can impact processes C and S, disturbing the timing, duration, and architecture of sleep and potentially creating complaints of insomnia (Beersma, 2002; Berger, 2009; Buysse, 2003; Vena et al., 2004). According to Buysse (2003), superimposed behavioral and conditioning factors can exacerbate and continue insomnia even after the primary causes are resolved. The development of insomnia can be conceptualized using Spielman's Three-Factor Model of predisposing, precipitating, and perpetuating factors (Berger, 2009; Perlis et al., 2008). According to the model, underlying (predisposing) factors or traits interact with various situational (precipitating) factors, causing acute insomnia; the detrimental beliefs, behaviors, and strategies (perpetuating factors) employed to cope with loss of sleep lead to the development of chronic insomnia (Otte & Carpenter, 2009; Perlis et al., 2008). All types of insomnia, regardless of etiology, appear to share the final common pathway of cognitive and physiologic hyperarousal, causing an individual to cross the insomnia threshold (i.e., the point at which sleeplessness occurs) (Buysse, 2003; Perlis et al., 2008).

Insomnia in Patients With Cancer

Patients with cancer often suffer from a transient situational insomnia associated with an acute stressor such as cancer diagnosis, which then may become chronic. Cancer-related insomnia is classified as a secondary or comorbid insomnia, meaning that the insomnia is associated with a medical condition (Graci, 2005; Harvey, 2010; Reeve & Bailes, 2010; Schutte-Rodin et al., 2008). The literature reported the existence of insomnia for up to five years after cancer treatment (Babson, Feldner, & Badour, 2010). Patients also can have an underlying primary sleep disorder. Common sleep complaints in patients with cancer include difficulty falling asleep and staying asleep and frequent and lengthy night-time awakenings (Fiorentino & Ancoli-Israel, 2007). Multiple studies have shown that insomnia is prevalent particularly in patients with lung and breast cancer (Graci, 2005; Parker et al., 2008; Vena et al., 2004).

Advanced age, race, female gender, personal or family history of insomnia, and a co-occurrence of a psychiatric disorder are common predisposing factors of insomnia in the general population (Savard & Morin; 2001; Vena et al., 2004). Low socioeconomic status and educational level also are associated with insomnia complaints (Graci, 2005). In the oncology setting, patients with both breast and lung cancer have reported the existence of insomnia even prior to diagnosis (Clark et al., 2004) or adjuvant treatment (Berger, Farr, Kuhn, Fischer, & Agrawal, 2007).

Precipitating factors of insomnia are overwhelming in patients with cancer. They include distressing cancer-related symptoms such as pain, nausea, hot flashes, incontinence, diarrhea, delirium, draining lesions, pruritus, and respiratory compromise. Lifestyle choices such as caffeine consumption, nicotine use, and poor sleep hygiene also may precipitate insomnia. Cancer and associated paraneoplastic syndromes can severely affect circadian processes through altered hormone secretion (i.e., cortisol and melatonin) and cytokine production (Vena et al., 2004). Chemotherapy, surgery, biotherapy, radiation therapy, bone marrow transplantation, and associated hospitalizations, as well as several classes of medications such as steroids and opioids, can affect both circadian and homeostatic processes. Depression, anxiety, and worry often accompany a cancer diagnosis or terminal illness, contributing to insomnia (Graci, 2005; Kvale & Schuster, 2006; National Cancer Institute, 2010; O'Donnell, 2004; Savard & Morin, 2001; Vena et al., 2004; Yamamoto, 2010).

Once the precipitating factors for insomnia have been controlled or resolved or the patient has adjusted to their presence, sleep may normalize. However, insomnia often becomes chronic when maladaptive responses to the initial sleep disturbance develop. As in the general population, those perpetuating factors include poor sleep habits and dysfunctional thoughts and beliefs about sleep that increase physiologic, cognitive, and emotional arousal and heighten anxiety about the ability to go to sleep. Individuals also may engage in nonrelaxing behaviors in the bedroom such as watching television, using the computer, talking or texting on the telephone, or watching the clock. Indications of chronic insomnia typically include increased time spent in bed, daytime napping, and maintenance of an irregular sleep-wake schedule. Although those strategies may initially seem helpful in coping with sleeplessness and fatigue, they will eventually desynchronize normal homeostatic and circadian processes (Savard & Morin, 2001; Schutte-Rodin et al., 2008).

Patients with cancer are at particular risk for developing chronic insomnia. Healthcare providers routinely encourage them to get extra rest, conserve energy by decreasing normal daytime activities, and nap when tired, particularly during active treatment. Patients may not have the benefit of normal zeitgebers (environmental cues) if they can perform activities only while in bed, lack social interaction, skip regular meals, or nap late in the day, further altering circadian rhythms (Savard & Morin, 2001; Vena et al., 2004). In advanced disease, patients may have their bedrooms and equipment relocated to the main living area of the home or be receiving potentially disruptive around-the-clock palliative care (Hearson & Sawatzky, 2008). Sleep-cycle–inducing cues such as a dedicated bed and bedroom area for sleeping and a consistent bedtime then are gradually disassociated from sleep.

Patients with cancer also may be uniquely prone to developing inaccurate beliefs and attitudes about the sleep-wake cycle, further perpetuating insomnia. Those include insufficient knowledge of the existence of perpetuating causes of insomnia, unrealistic expectations about necessary sleep requirements in the context of serious illness, blaming sleep difficulties for all symptoms of daytime impairment, and excessive concern that the inability to sleep will cause catastrophic consequences such as disease recurrence or treatment failure (Savard & Morin, 2001).

Assessment

Some clinicians believe that because insomnia is so prevalent, it should be considered another vital sign and be assessed routinely (Reeve & Bailes, 2010). Providers should keep in mind that patients with cancer may have many reasons for not sharing complaints of insomnia with their healthcare team, including the belief that sleep disturbances are an expected consequence of treatment or are not important in comparison to the cancer itself, limited appointment time during which more pressing concerns

may need to be addressed, expectations that the problem is temporary or that treatments are ineffective, or concerns about the prescription of sleep medications (Engstrom et al., 1999; Yamamoto, 2010). Therefore, asking about insomnia at each contact with the patient is even more essential.

Insomnia assessment in the clinical setting usually requires the use of self-reported measures (Reeve & Bailes, 2010). Several subjective tools for measuring sleep-wake disturbances have been validated in recent years for use in patients with cancer in clinical and research settings. Among those instruments are the Pittsburgh Sleep Quality Index, Insomnia Severity Index, Clinical Sleep Assessment for Adults (CSA), and maintenance of a two-week daily diary of sleep perception (Berger, 2009). The CSA in particular can be used quickly by clinical nurses and advanced practitioners to perform a focused sleep assessment. The tool can be shortened from seven to the most essential four questions (numbers 2, 3, 6, and 7) to ensure that enough time is available for this symptom to be addressed during a standard office visit (Lee & Ward, 2005). These essential questions quantify the use of sleep aids, perceived quality of sleep, number of nighttime awakenings, and daytime sleepiness for the week prior to assessment. To view the CSA, see Lee and Ward (2005) at http://informahealthcare.com/doi/abs/10.1080/01612840591008320.

The two-week daily sleep diary is an integral part of most cognitive-behavioral therapies because it details presenting issues and critical sleep parameters and then provides a means for ongoing evaluation of the efficacy of delivered interventions (Berger, 2009). Sleep logs usually incorporate the following information: bedtime, time to fall asleep, number of awakenings and duration of each awakening, time in bed, frequency, timing and duration of napping, subjective reports of sleep quality and daytime impairment, and medication, caffeine, and alcohol consumption for each 24-hour period (Schutte-Rodin et al., 2008).

Recommendations support the use of objective measures including polysomnography, considered the gold standard for detecting specific sleep and wake states, and wrist actigraphy, a portable device that records movement and is an indirect measurement of sleep, to validate subjective perceptions (Berger, 2009; Vena et al., 2004). However, those measures generally are used only in the research setting or when an underlying sleep disorder such as narcolepsy or obstructive sleep apnea is suspected; patients should then be referred to a sleep medicine practitioner or specialized sleep center (Berger, 2009; Yamamoto, 2010). Familiarity with terminology used in the subjective or objective assessment of the sleep-wake cycle is essential for research and clinical practice.

Treating Insomnia in Patients With Cancer

Once the insomnia assessment is complete, the primary goals of treatment are simply to improve the quality and quantity of sleep and reduce insomnia-related daytime impairments (Schutte-Rodin et al., 2008). Therefore, effective insomnia management should first include alleviation or control of cancer or treatment-related factors contributing to or perpetuating the disorder (National Cancer Institute, 2010; O'Donnell, 2004). Other comorbid medical and psychiatric conditions also must be identified and treated (Yamamoto, 2010). Once the healthcare provider is ready to select insomnia-specific interventions, ONS guidelines should be consulted (Berger, 2009; Page & Berger, 2009).

Cognitive-behavioral therapy currently is the only potentially effective therapy for insomnia (Berger, 2009). Other interventions include education and information, exercise, and complementary and alternative therapies (e.g. aromatherapy, guided imagery, massage therapy, yoga) (ONS, 2008). The patients should be made aware that although several of those treatments, particularly aerobic exercise, have shown promise (Payne, Held, Thorpe, & Shaw, 2008; Young-McCaughan et al., 2003), all need further testing; the ONS PEP resource still classifies them in the weight of evidence category as "effectiveness not established" (Berger, 2009; Page & Berger, 2009).

Although pharmacotherapy is the leading insomnia intervention in all adult populations (Ebben & Spielman, 2009; Savard & Morin, 2001; Schutte-Rodin et al., 2008), clinical evidence supporting the effectiveness of pharmacotherapy in patients with cancer is lacking. Prescription sleep medications (e.g. benzodiazepines, benzodiazepine-receptor agonists, melatonin-receptor agonists) remain in the "benefits balanced with harm" category (Berger, 2009; Berger et al., 2005) and should be prescribed cautiously related to issues with abuse and dependence, cognitive and motor impairment, rebound insomnia, and drug-drug interactions. Older adult patients are particularly vulnerable to the effects of those agents. Herbal supplements such as melatonin, valerian, and St. John's wort also are relegated to this category; no long-term safety and efficacy studies exist, and significant concerns have been raised about the effect of those substances on various cancer medications and therapies (Page et al., 2006; Yamamoto, 2010).

Cognitive-Behavioral Therapy

Cognitive-behavioral therapy, which originated in the 1980s, is an integration of cognitive therapy and behavioral modification techniques. Behavior therapy was developed in the 1950s, derived from the learning theories of B.F. Skinner, Ivan Pavlov, and Joseph Wolpe, known for their experiments in classical conditioning, operant conditioning, and desensitization, respectively. A behavioral therapist focuses solely on observable behaviors that can be modified in the present, not on examination of thoughts or their origins. The client gradually is taught to replace maladaptive learned responses with healthier behaviors, termed behavior modification, through the use of techniques such as positive and negative reinforcement (Belanger, Savard, & Morin, 2006; O'Donohue & Krasner, 1995).

Cognitive therapy was pioneered by psychologist Aaron Beck, MD, in the 1960s. The treatment premise is that maladaptive behavior is caused by irrational or inappropriate beliefs and perceptions developed from past experiences. An individual reacts not to the reality of a current situation but to his or her distorted view of it. Therapy challenges patients to evaluate and change their negative thoughts, a process known as cognitive restructuring (Belanger et al., 2006).

Cognitive and behavioral therapies are goal oriented and require active participation by the patient. Combined, their purpose is to effect behavioral change through the alteration of cognitive distortions. Cognitive-behavioral therapy has been used effectively to treat insomnia, depression, generalized

anxiety, and obsessive-compulsive and eating disorders, among others (Belanger et al., 2006; Reeve & Bailes, 2010).

Cognitive-Behavioral Therapy for Insomnia

As outlined in Spielman's Three-Factor Model, insomnia is perpetuated or maintained by a variety of interacting cognitive and behavioral factors (Berger, 2009). The goal of cognitive-behavioral therapy is to reduce those perpetuating factors below the insomnia threshold and decondition the hyperarousal response (Berger, 2009; Perlis et al., 2008). Studies with various populations have demonstrated that 70%–80% of patients benefit from cognitive-behavioral therapy and that a durable response to CBT-I of almost 12 months is achievable. Therapy generally is conducted over a

STIMULUS CONTROL THERAPY[a]

Theoretical Foundation
Insomnia is the result of conditioning that occurs when patients associate the bed and bedroom with the inability to sleep or other arousing events.

Goal
To reassociate the bed and bedroom with rapid sleep onset and to develop a stable sleep-wake cycle

Procedure
- Use the bed only for sleep or sex.
- Do not nap during the day.
- Relax for at least one hour before going to bed.
- Develop a bedtime ritual.
- Go to bed only when sleepy.
- Do not spend more than 15–20 minutes in bed awake.
- If awake after 20 minutes, leave the bedroom and engage in a relaxing activity such as reading or listening to music. Avoid watching television, eating, using the computer, or other activities that are stimulating or that reward for being awake.
- Return to bed only when sleepy.
- Repeat this process if after returning to bed, sleep does not occur within 20 minutes.
- Repeat the steps as many times as required throughout the night.
- Set the alarm for the same time each morning, including on days off.

Key Point
Patients should be advised not to watch the clock, but to leave the bedroom after about 20 minutes of perceived time awake.

SLEEP RESTRICTION THERAPY[a]

Theoretical Foundation
Insomnia is perpetuated by excess time in bed not sleeping. Restricting time in bed causes sleep deprivation, which will increase the homeostatic drive to sleep and strengthen the association between bed and sleeping.

Goal
To achieve greater sleep continuity and increase sleep efficiency to 85% or higher (total sleep time approximates time in bed)

Procedure
- A sleep diary is kept for two weeks to determine average total sleep time.
- Time in bed is prescribed equal to average total sleep time. The patient is scheduled to wake by alarm at the same time seven days per week.
  - Example: total sleep time is five hours and the patient must be up on work days at 6:30 am. Therefore, the daily schedule is 1:30 am bedtime and 6:30 am wake time.
- No napping is allowed.
- Sleep efficiency is calculated for each night and time in bed is adjusted accordingly.
  - Sleep efficiency higher than 85%–90% over seven days: increase time in bed by 15–30 minutes.
  - Sleep efficiency lower than 85% over seven days: decrease time in bed by 15 minutes.
  - Older adult patients may have time in bed increased for sleep efficiency higher than 80% and may be permitted one 30-minute nap.
- Repeat time in bed adjustment every seven days.
- Treatment usually requires six to eight weeks.

Key Point
Patients should be cautioned to expect increased sleepiness and fatigue, particularly early in treatment.

RELAXATION TRAINING[b]

Goal
To decrease physiologic and cognitive states of arousal that interfere with sleep

Most Commonly Used
Progressive muscle relaxation and guided imagery

Procedure
- Progressive muscle relaxation: teaching the body to relax
  - Patient is asked to sit comfortably in a chair during the session.
  - Individual muscle groups are tensed for 10–15 seconds and then relaxed for the same length of time while the patient focuses on the changing experience of tension.
  - The technique should be practiced during the day only.
  - Once the technique is mastered, it can be used at night to promote sleep.
- Guided imagery
  - The patient is asked to sit or lie comfortably with eyes closed.
  - The patient is guided to a peaceful scene by an audio recording or the clinician.
  - The technique can be easily used at home to promote a restful state.

[a] Components of standard cognitive and behavioral therapies for insomnia

[b] Optional component

Figure 2. Summary of Common Behavioral Therapies for Insomnia

Note. Based on information from Belanger et al., 2006; Bonnet & Arand, 2010; Ebben & Spielman, 2009; Edinger & Means, 2005; Harvey, 2010; Savard & Morin, 2001; Schutte-Rodin et al., 2008.

period of 6–10 weeks (Belanger et al., 2006; Espie, 2009; Perlis et al., 2008). In addition, CBT-I has been shown to halve the use of sleep medication in patients with cancer (Simeit, Deck, & Conta-Marx, 2004).

More than 20 cognitive-behavioral therapies have been developed that may be used alone or in combination. The most commonly used strategies in the oncology setting are stimulus control therapy, sleep restriction therapy, relaxation therapies, paradoxical intention, and sleep hygiene education (ONS, 2008). Standards for the initial treatment of chronic primary and comorbid insomnia, published by Schutte-Rodin et al. (2008), include the highest levels of evidence such as at least one behavioral intervention (e.g., stimulus control therapy), relaxation therapy, or the combination of cognitive therapy, stimulus control therapy, and sleep restriction therapy with or without relaxation therapy (i.e., CBT-I).

Multicomponent behavioral therapy not including cognitive therapy, as well as sleep restriction, paradoxical intention, and biofeedback, also are recommended, but at a lower level of evidence. For a detailed description of CBT-I components, see Figures 2 and 3. Sleep hygiene education is not recommended to date for single use in the treatment of insomnia, but is an important component of combination therapy (see Figure 4). In fact, several clinical trials have shown improvement in sleep when sleep hygiene education has been used as the control intervention (Bonnet & Arand, 2010).

Delivery Methods

The delivery of CBT-I has been studied extensively in the general population as well as in certain patients with cancer. Available provider-driven options include individual therapy, small-group therapy, and telephone consultations. A study by Bastien, Morin, Ouellet, Blais, and Bouchard (2004) of 45 adults with insomnia showed no significant difference in effectiveness between any of those three treatment modalities with regard to improvement in sleep efficiency, wake after sleep onset, and sleep quality. Other studies have demonstrated the efficacy of either nurse- or psychologist-led individual or small-group sessions of CBT-I in improving sleep efficiency, wake after sleep onset, and sleep quality (Berger et al., 2009; Epstein & Dirksen, 2007; Espie et al., 2007, 2008). Historically, CBT-I has been provided by sleep medicine clinicians and mental health practitioners trained in cognitive-behavioral therapy techniques; however, patient access to those providers is limited, particularly in the oncology setting, and cost often is prohibitive (Espie, 2009; Savard, Villa, Simard, Ivers, & Morin, 2010).

A variety of self-help methods, such as educational booklets, videos, and particularly online treatments, also have been tested and shown to significantly improve such parameters as sleep quality, daytime fatigue, cognitive arousal, dysfunctional beliefs about sleep, sleep efficiency, severity of insomnia, and quality of life (Morin, Beaulieu-Bonneau, LeBlanc, & Savard, 2005; Savard et al., 2010; Vincent & Lewycky, 2009). A randomized, controlled trial conducted by Morin et al. (2005) used six educational booklets containing information about insomnia, healthy sleep practices, behavioral sleep scheduling, and cognitive strategies, which were mailed weekly to 96 adult participants. The treated participants experienced a durable improvement in several sleep parameters including sleep efficiency, sleep quality, total sleep time, and wake after sleep onset, which were not experienced by the control group (Morin et al., 2005). Vincent and Lewycky (2008) randomized 118 adults with chronic insomnia to a five-week online self-help CBT-I program or to a waiting list; they found that online treatment significantly improved sleep quality, insomnia severity, and daytime fatigue, as well as reduced participants' incorrect beliefs about sleep. Savard et al. (2010) used a six-week self-help CBT-I treatment (consisting of a 60-minute animated video and six booklets) in 11 patients with breast cancer. Several sleep variables including perceived quality of sleep improved, but perhaps most importantly, participants expressed a high level of satisfaction with the self-administered intervention. Of interest, some participants expressed a desire for personal support at some point during the treatment. Savard et al. (2010) were encouraged by the success and potential cost-effectiveness of the intervention and currently are proceeding with a larger randomized, controlled trial.

Colin Espie, BSc, PhD, MAppSci, a leading insomnia researcher and psychologist, has expressed concern about patients' lack of access to CBT-I and has proposed a model of "stepped care"

COGNITIVE THERAPY[a]

Theoretical Foundation
Unrealistic expectations and dysfunctional beliefs and perceptions about sleep lead to emotional arousal and perpetuation of insomnia.

Goal and Therapeutic Approach
Patients are challenged to evaluate the accuracy of their thoughts, beliefs, and perceptions about sleep through cognitive restructuring techniques.

Treatment Targets
- Unrealistic sleep expectations: "I have to get at least eight hours of sleep at night."
- Misconceptions about the causes of insomnia: "The cause of my insomnia is a chemical imbalance."
- Distorted perceptions about the consequences of insomnia: "If I don't sleep tonight, my day will be terrible tomorrow."
- Inaccurate beliefs about sleep-promoting practices: "I should just stay in bed and try harder to sleep."
- Coexisting anxiety-provoking thoughts and worries: concerns about cancer diagnosis, treatment, finances, family issues, etc.

PARADOXICAL INTENTION

Theoretical Foundation
Exaggeration of problematic symptoms to confront the fear of staying awake

Goal
Eliminate "performance anxiety" connected with falling asleep.

Procedure
- Patients are instructed to try to stay awake in bed as long as possible.
- May not be considered an acceptable therapy by many patients.

[a] Component of standard cognitive and behavioral therapies for insomnia

Figure 3. Summary of Common Cognitive Therapies for Insomnia

Note. Based on information from Belanger et al., 2006; Bonnet & Arand, 2010; Ebben & Spielman, 2009; Edinger & Means, 2005; Harvey, 2010; Savard & Morin, 2001; Schutte-Rodin et al., 2008.

Goal

To teach patients about healthy lifestyle choices that improve sleep and minimize sleep disturbances

Instructions for Patients

- Reduce the intake of nicotine, caffeine, and other stimulants. The elimination half-life of caffeine is 4.5 hours, so consume the last caffeinated food or drink four to six hours before desired bedtime.
- Avoid using alcohol to fall asleep. As alcohol is metabolized during the night, it produces awakenings and fragmented sleep.
- Avoid excessive fluid intake before bedtime. Rule of thumb: do not exceed 1 cup of liquid within 4 hours of bedtime.
- Exercise regularly. Aim for 20 minutes daily, but at least four to five hours prior to bedtime.
- Keep a regular daytime routine for work, rest, meals, and treatments.
- Eat a healthy diet.
- Do not go to bed hungry. A light snack is fine, but avoid greasy or spicy foods that could cause gastric reflux.
- Avoid stimulating activities before bedtime (e.g., watching TV, talking or texting on the telephone, using the Internet).
- Remove the clock from the bedroom.
- Minimize or eliminate napping during the day. If needed, nap earlier in the day and limit the duration.
- Maintain a dark and quiet sleeping environment.
- Sleep only as much as necessary to feel rested, then get out of bed.
- Do not take problems to bed; resolve worries or concerns before bedtime.

Points for Clinicians to Consider

- Discuss with patients first how this list of rules applies to their lifestyles.
- Tailor the list to each individual patient.
- Assist patients in making a to-do list to help them successfully incorporate the instructions into their daily routines.

Figure 4. Sleep Hygiene and Education

Note. Based on information from Bonnet & Arand, 2010; Graci, 2005; Perlis et al., 2008; Schutte-Rodin et al., 2008.

to ensure accessibility to treatment and delineate appropriate providers for each level of care. According to Espie (2009), self-administered cognitive-behavioral therapy is the best entry-level treatment, and second-level treatment should consist of nurse-delivered manualized (adhering strictly to a protocol) small group cognitive-behavioral therapy. Espie has advocated the training of nontraditional providers, particularly nurses, to deliver several CBT-I components (Edinger, 2009). As needed, patients then can move to progressively more intensive therapies provided by psychologists or sleep medicine clinicians (Espie, 2009).

Cognitive-Behavioral Interventions for Insomnia in Patients With Cancer

Cognitive-behavioral interventions now are recommended as "likely to be effective" according to ONS PEP criteria for patients with cancer based on the results of four randomized, controlled trials conducted during the past five years (Berger, 2009). Those randomized, controlled trials confirmed the promising results of several earlier quasiexperimental studies testing CBT-I in patients with breast cancer, most notably Berger et al. (2002, 2003); Quesnal, Savard, Simard, Ivers, and Morin (2003); and Savard, Simard, Ivers, and Morin (2005). Most CBT-I research to date has been conducted with patients with breast cancer and survivors; those populations have demonstrated an extremely high prevalence of insomnia as well as a willingness to participate in clinical trials.

Epstein and Dirksen (2007) studied the use of CBT-I with 72 breast cancer survivors; they found that their intervention group reported overall sleep as more improved when compared to the control group, who received only sleep and hygiene education. However, all participants improved in several sleep diary measures, including sleep latency, total sleep time, and time in bed. In a prospective randomized trial of 179 patients with breast cancer, Arving et al. (2007) used cognitive-behavioral therapy–trained oncology nurses or psychologists to deliver individualized psychosocial support. Significant improvements over time in insomnia, dyspnea, and financial difficulties were found between the standard care and intervention groups. In addition, the patients receiving care from nurses experienced fewer intrusive thoughts than patients receiving standard care and had higher levels of perceived benefit regarding disease-related problems compared to patients receiving care from psychologists (Arving et al., 2006). Espie et al. (2008) trained four experienced oncology nurses to provide CBT-I to 150 post-treatment patients with breast, prostate, colorectal, and gynecologic cancers. Sustained improvements, particularly in sleep latency and nocturnal wake time, were demonstrated, with a median reduction in insomnia symptoms of almost one hour. Significant positive effects on physical and functional quality of life, fatigue, and daytime well-being also were reported. In addition, Berger et al. (2009) demonstrated the effectiveness of the CBT-I–based Individualized Sleep Promotion Plan on sleep quality over time and better sleep per diary in 219 patients with breast cancer undergoing adjuvant chemotherapy treatment. Research nurses with bachelor's of science degrees, trained by a sleep psychologist, were used to negotiate and monitor each patient's Individualized Sleep Promotion Plan.

Implications for Nursing

The oncology nursing role in insomnia management ranges from simple assessment to the delivery of complex multimodal CBT-I interventions. The principles of Espie's (2009) stepped care model can serve as a framework to identify the appropriate provider for each available level of intervention. Minimally, nursing personnel should first screen all patients by simply asking whether they are experiencing any problems with sleeping or with staying awake during the day (Berger et al., 2005). Those two questions also should be included on the initial or follow-up intake questionnaires used in most clinical settings. If the patient has a complaint of one or both difficulties, the nurse then could administer the CSA or the abbreviated CSA, which can be completed while the patient is in the examination room waiting for an appointment (Lee & Ward, 2005). Information obtained from the CSA then can be shared with the physician or nurse practitioner and used to guide the plan of care.

Oncology nurses with basic education in the principles of CBT-I also can assume a much more proactive role in insomnia management. The stepped care model suggests that self-help methods should be the entry level to CBT-I (Espie,

2009); therefore, nurses must be familiar with available print and online resources and be able to provide this information to their patients. The American Academy of Sleep Medicine has excellent educational resources for nurses (for more information, visit www.aasmnet.org). Patients wishing to learn more about insomnia and CBT-I may be interested in the American Academy of Sleep Medicine's patient-specific Web site at (www.sleepeducation.com), as well as the the National Sleep Foundation's Web site (www.sleepfoundation.org). In addition, patients' private health insurance companies may provide Web-based access to educational materials; for example Cigna offers information at www.cigna.com/healthinfo/zq1031.html#zq1032.

Nurses can apprise patients of the availability of self-help CBT-I programs that can be purchased in an online or CD format at minimal cost from Internet sources such as www.cbtforinsomnia.com. CD sets could be purchased by an oncology practice and made available for patients to borrow. Although attrition for online programs can be as high as 33% of participants (Vincent & Lewycky, 2009), nurses can increase the success of those and other self-help methods by maintaining ongoing personal or telephone contact during treatment, helping to enhance patients' expectations for improvement and maximizing the quality of the nurse-patient relationship (Savard et al., 2010; Tremblay, Savard, & Ivers, 2009).

As an adjunct to self-help therapies, basic sleep hygiene education instructions, although not yet considered effective as a stand-alone treatment, can be provided as a foundation for better sleep practices. Nurses also can guide patients in the use of progressive muscle relaxation or abdominal breathing by using commercially available materials such as videos, CDs, or downloadable applications for personal electronic devices. Patient access to CBT-I at this first level requires a minimal time commitment from members of the oncology care team, particularly if information and resources are incorporated into a waiting room brochure. Nursing staff also might have some availability to discuss CBT-I during administration of chemotherapy.

The literature supports the use of appropriately trained oncology nurses and nurse practitioners to provide CBT-I in individual and group formats (Arving et al., 2006, 2007; Berger, 2009; Espie et al., 2008; Hellbom et al., 2001), although extensive training is not required (Espie et al., 2008). Espie's (2009) stepped care guidelines for the second level of insomnia treatment specify that CBT-I provided by nursing personnel should be highly structured to ensure consistency in clinical practice. Behavioral strategies such as stimulus control and sleep restriction are easiest to teach and implement; cognitive therapy techniques are likely to require more intensive psychotherapeutic training (Belanger et al., 2006). Licensed psychologists generally have been the clinicians recruited to educate nurses (Espie, 2009). Oncology nurse practitioners, after receiving proper education, could train other nurses in their practice setting and also deliver brief CBT-I interventions to patients during routine office visits. They also may partner with other oncology nursing colleagues or local therapists skilled in cognitive-behavioral therapies to provide group CBT-I after hours as a special program or during a series of support group meetings. Perlis et al.'s (2008) book *Cognitive Behavioral Treatment of Insomnia: A Session-by-Session Guide* is an excellent example of a manualized resource available for use in planning individual or group CBT-I.

Of note particularly for hospice and palliative care nurses, little research has been done on the treatment of insomnia in patients with advanced cancer or in the end-of-life setting (Hearson & Sawatzky, 2008). Polypharmacy, cognitive impairment, and poorly controlled symptoms often are prevalent in those populations; therefore, CBT-I frequently may not be feasible (Hultman, 2006). Kvale and Shuster (2006) recommended that CBT-I only be used with a patient whose prognosis exceeds the length of time required to benefit from this treatment, usually at least four to six weeks. Relaxation therapy also may be difficult for a patient with severe weakness or pain from bony metastases. However, nurses can recommend several behavioral measures to reinforce normal sleep cycles; those include establishing a regular sleep routine, maintaining a schedule of activities, remaining out of bed as much as possible, and engaging in some cognitive stimulation during the daytime (Dy & Apostol, 2010; Hearson & Sawatzky, 2008).

Conclusions

Traditionally, oncology nurses at all levels of practice have been committed to providing superior evidence-based cancer care. Insomnia is a highly distressing symptom that has been underassessed and undertreated in the oncology setting. CBT-I is an exciting therapy that has been recognized as having the potential to significantly impact insomnia symptoms and improve quality of life in patients across the cancer continuum (Berger, 2009). Despite the higher prevalence of insomnia and precipitating factors in patients with cancer as compared to individuals in the general population, cognitive-behavioral therapy still can be an effective treatment option because it targets the perpetuating factors of insomnia. It is a safe, well-tolerated therapy that empowers patients to actively participate in the management of their own symptoms.

Minimally, all oncology nurses should screen for the presence of insomnia because patients usually will not report this symptom without being asked. After a more thorough assessment, nurses can provide sleep hygiene education, instruction on relaxation techniques, and links to written or electronic CBT-I self-help materials, as appropriate. With additional training and education, advanced practitioners and nurses can successfully use sleep restriction, stimulus control, and certain cognitive therapies with their patients. Patients with primary sleep disorders or who are refractory to treatment should be referred to specialized sleep medicine centers, clinicians, or cognitive-behavioral therapists.

Additional research is needed to move CBT-I to the ONS PEP "recommended for practice" weight of evidence category. Research priorities include demonstrating the efficacy of CBT-I in populations other than patients with breast cancer or breast cancer survivors, determining which delivery methods are most effective and at what doses, and defining the appropriate roles of oncology nurses and advanced practitioners in the management of insomnia using CBT-I. Hopefully after reading this article, oncology nurses will no longer feel as if cognitive-behavioral therapy is "one of our best kept secrets in the sleep medicine world" (Edinger, 2009, p. 1539).

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